Host Software Component (MVS Implementation)

System Programmer's Guide

Release 5.1

313486402

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What's New With This Release?

HSC 5.1 includes the following changes and enhancements:

- SMP/E APPLY and ACCEPT installation steps for HSC are now included in the NCSAPPLY and NCSACCPT sample members, respectively.
- The ALLOC operator command no longer honors the following parameters:
  - Gdgall
  - SMSAcsr
  - SMSMod
  - Unitaff
  - UXPrms
  - X02sub
  - X08sub.

  The SMC provides allocation functions. Refer to the *SMC Configuration and Administration Guide* for more information.
- The allocation and job processing components of the TRace operator command have been moved to the SMC TRACE command. Specifically, support has ended in the HSC for the ALLCdata parameter and the following component names:
  - ALlocati
  - JES3Aloc
  - JES3Dira
  - JES3Msgs
  - JES3Sep
  - Job.

  Refer to the *SMC Configuration and Administration Guide* for more information.
- Swap processing is now controlled by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.
- Volume ranges can be specified either as alphabetic or numeric ranges for all commands and utilities that allow ranges to be entered.
- The Scratch Conversion utility compares tape management data base (TMC) scratch entries to volume and VTV entries in the CDS and scratches only volumes in the CDS that are not already in scratch status. Volumes that are already scratch or are not library or virtual volumes are ignored.

- The PGMI SLSXREQM macro has been modified to include the SLXEXLM0, SLXEXLM1, and SLXEXLM2 fields. These fields are used for ExLM license key verification.
- The Intercepted Messages List appendix, formerly Appendix B in the *HSC System Programmer's Guide*, has been moved to the *SMC Configuration and Administration Guide.* The SMC is now responsible for intercepting MVS, JES3, and TMS mount, dismount, and swap messages.
- Support for StorageTek's T9940B Cartridge Subsystem and T9940B cartridge for Open Systems clients.
- Message changes, additions and deletions.

Preface

Scope

This guide provides information about the Storage Technology Corporation (StorageTek®) Host Software Component (HSC) and its use with the Automated Cartridge System. Reference information is provided for systems programmers to install, debug, and provide systems support to users of the HSC and the automated library.

Intended Audience

This guide is intended primarily for systems programmers responsible for installing and maintaining HSC software at their library sites. Library operators and computer system administrators may also find information contained in this guide useful on occasions to review or understand some HSC system concepts.

Users responsible for installation and maintenance of HSC software involving the technical details should be familiar with the following software topics:

- MVS™ operating system
- JES2 principles and functions
- JES3 principles and functions (if applicable)
- ACF/VTAM functions and principles
- System Management Facility (SMF)
- System Modification Program Extended (SMP/E).

Organization of This Guide

- **Chapter 1, "System Description"** provides a general overview of the Automated Cartridge System (ACS) and the Host Software Component (HSC).
- **Chapter 2, "Host Software Component Functions"** describes major functional components of the HSC.
- **Chapter 3, "HSC Control Statements and HSC Start Procedure"** describes how to define parameter library (PARMLIB) and definition data set control statements and how to start HSC execution.
- **Chapter 4, "JES3 Support"** provides information on drive exclusion and allocation and LIBGEN considerations.

- **Chapter 5, "Utility Functions"** provides an overview description, syntax, JCL requirements, JCL examples, and a description of output for each HSC utility. Example reports are shown for most utilities.
- **Chapter 6, "Software Diagnostics and Recovery"** describes diagnostic capabilities supported by the HSC (tracing, dumps, and logging failures) and various recovery capabilities including those for control data sets and cartridges.
- **Chapter 7, "Performance Considerations"** provides information on how to control various aspects of library performance. Included is information on how to: maintain and redistribute scratch volumes, define CAP preferences, use SMF records for data collection, define PARMLIB parameters, define HSC in a performance group, set host-to-host communications for high performance, and define control data sets for improved library integrity. In addition, the effects of using the VIew command, how to load cartridges in the library, the effect of excessive pass-thrus, and other pertinent topics are included.
- **Chapter 8, "Software Interaction"** provides considerations for interfacing certain third-party software with the HSC.
- **Chapter 9, "User Exits"** presents available user exits including: descriptions, entry/return specifications, return codes, programming considerations, examples, storage mapping, record layouts, and parameter cross referencing.
- **Appendix A, "Macros, Control Statements, Utilities, and Commands Syntax Reference"** provides syntax conventions, LIBGEN macros, parameter library (PARMLIB) control statements, utilities and operator commands.
- **Appendix B, "Record Formats"** contains record layouts for control data set records, SMF records, and LOGREC records.
- **Appendix C, "Logging ACS Robotics Motion"** contains information about logging library robot motions. Included is the type of information that can be logged, how information is logged, and LMU response codes.
- **Appendix D, "Programmatic Interface (PGMI)"** describes programmatic interface services, using the interface, request functions, authorization, and interface macros.
- **Appendix E, "Batch Application Program Interface (API)"** explains how to retrieve CDS library element information in batch mode.
- **Appendix F, "Remote-linked Libraries"** presents typical remote-linked library configurations, programming considerations, and operational considerations.

A glossary and index are also included.

How To Use This Guide

This guide may be read entirely; however, it is more important that you familiarize yourself with the overall organization and location of various information for reference purposes.

Chapters 1 and 2 provide general overview information that is useful to anyone associated with the Automated Cartridge System and the HSC software. It is recommended by StorageTek that these two chapters be read and understood.

Most of the information in this guide is of primary interest to the system programmer and computer system administrator. The *HSC Configuration Guide* is used when installing the HSC and may be referred to later. The remainder of the guide contains reference information that you will refer to as needed.

Reference To HSC Product Releases

The HSC Release 5.1.0 product is referred to as HSC 5.1.

Related Publications

Some or all of the following documents are referenced in this guide. Additional information may be obtained on specific topics relating to the Automated Cartridge System from these publications.

Storage Technology Corporation Publications

The following documents are available for MVS and VM operating systems, respectively, and related miscellaneous topics.

StorageTek NCS 5.1 Publications — MVS Environment

- *NCS Installation Guide*
- *Storage Management Component (SMC) Configuration and Administration Guide*

StorageTek HSC 5.1 Publications — MVS Environment

- *Configuration Guide*
- *Operator's Guide*
- *System Programmer's Guide*
- *Messages and Codes Manual*
- *Reference Summary*

Miscellaneous Publications

- *A Guide to Magnetic Tape Management*
- *Automated Cartridge System Hardware Operator's Guide*
- *Hardware Operator's Guide*
- *Requesting Help from Software Support*
- *Nearline Physical Planning Guide*
- *Physical Planning Guide*
- *POST Stand-Alone Executive Reference Manual*
- *POST Reference Manual*
- *POST Messages and Codes Manual*
- *POST FRIEND Function Reference Manual*
- *POST Diagnostic Reference Manual*

Computer Associates International, Inc. Publications

- *CA-1 User Manual, Volume 1*

Reader's Comments

We'd like to know what you think about this guide. E-mail your comments to Software Information Development directly. Our Internet address is:

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sid@stortek.com
```

Be sure to include the number and title of the guide you are referencing.

StorageTek Product Support

StorageTek Customer Services provides 24-hour assistance for questions or problems related to StorageTek products. Calls from our customers receive immediate attention from trained diagnostic specialists.

Refer to the guide *Requesting Help from Software Support* for detailed information on product support and applicable telephone numbers for support calls.

Chapter 1. System Description

Automated Cartridge System Overview

The StorageTek Automated Cartridge System (ACS), called the library, is an automated storage and retrieval facility for tape cartridges. The library incorporates the Host Software Component (HSC) to accomplish automated mounting and dismounting of resident cartridges for the library-attached cartridge transports. The library may be attached to a maximum of 16 CPUs (hosts) with an HSC installed on each attached host system.

The library consists of four major elements:

- Host Software Component (HSC) — functions as the interface between the host operating system, and if applicable, a tape management interface (TMI).
- Library Storage Module (LSM) — contains storage cells for tape cartridges. The storage capacity of an LSM depends upon the LSM model. There are several LSM models available:
  - Standard (Model 4410)
  - PowderHorn (Model 9310)
  - WolfCreek (Model 9360), which includes:
    - 9360-100 (1,000 cartridge capacity)
    - 9360-075 (750 cartridge capacity)
    - 9360-050 (500 cartridge capacity)
  - TimberWolf (Model 9740).

  An attached Library Control Unit (LCU) with associated electronics controls LSM robot movement. The LSM access door, contains a Cartridge Access Port (CAP), for entering or removing tape cartridges from the LSM. The types of CAPs available, depending upon how the LSMs are configured in an ACS, include:

  - Standard and Enhanced CAP used in standard (4410) and PowderHorn (9310) LSMs.
  - WolfCreek (9360) standard 20-cell and optional 30-cell CAPs. The WolfCreek LSM holds approximately 500, 750, or 1000 cartridges depending on the number of cartridge drives, pass-thru ports, and CAPs installed.

- TimberWolf (9740) 10-cell removable magazine or 14-cell permanent rack CAP.

The complete inventory of each LSM and the storage location for each cartridge is contained in the library control data sets maintained by the HSC.

- Library Management Unit (LMU) — controls the Library Storage Modules (LSMs) in the ACS. The LMU interprets the commands from the host and relays the instructions to an LSM for execution. One LMU can control up to 16 LSMs.
- Tape Cartridge Subsystem — consists of the tape cartridge drives containing tape transports where tape cartridges are placed by the robot for read or write operations.

Host Software Component Overview

The HSC performs a variety of functions including:

- determining if the requested cartridge is stored within an LSM
- minimizing cartridge enters and ejects
- ensuring the correct media type is mounted on the correct transport type
- delivering library mount/dismount instructions to the LMU via a terminal control unit
- providing exits at key points
- providing for operator control of the library through a set of operator commands and utility programs
- determining the LSM location of each library cartridge from the library control data set (CDS)
- providing a programmatic interface for library control.

Integrity of the control data set can be assured through the following techniques employed at an installation:

- allocating secondary (shadow) and standby data sets in addition to the primary control data set
- scheduling regular backups of the control data sets
- utilizing journal data sets to log library transactions.

After the SMC intercepts a mount or dismount message, the HSC issues cartridge movement requests to an LMU station via the terminal control unit. The LMU relays information to the Library Control Unit (LCU) enabling the robot in the LSM to locate and mount/dismount the requested cartridge.

In a dual LMU environment when the master LMU fails, the standby LMU takes over. The standby LMU completes the work in progress and services all future ACS requests.

HSC Subsystem Components

The HSC is a secondary subsystem as defined by MVS. The HSC contains the following components:

- **External Components** — External components interface with MVS, an operator, an administrator, and/or a system programmer. The external components consist of an installation component, the initialization/termination component, a command component, the utility component, and an application program interface (Programmatic Interface, a tape management interface component).
- **Common Components** — Common components provide distinct functions required by the external and common components. The common components consist of the mount/dismount components, the CAP component, and the recovery component.
- **Control Components** — Control components provide logical control over system entities used by both common components and external components. The control components consist of the volume/cell control component and the configuration control component.
- **Server Components** — The server components provide physical control of system entities for the control components. The server components consist of the database server, the LMU server, the WTO component, and the address space communications server.

HSC Architecture

Figure 1 on page 6 is a block diagram of the HSC architecture with the user's address space on the left side, and other HSC components located in the HSC address space on the right side.

Note: The initialization/termination external component resides entirely in the HSC address space.

The Address Space Communications Server spans both the user's address space and the HSC address space. It handles requests from components in the user's address space that require services from components located in the HSC address space.

The following section briefly describes the functions of each external component.

Operator Command component

The operator command component receives control from the CONSOLE address space to process a subsystem command. The requests are directed to the appropriate components located in the HSC address space.

Batch Utilities external component

The batch utilities component handles services required by a utility that are requested thru the address space communications server. Responses to those requests are returned to the utility's address space and processing continues.

Programmatic Interface external component

The programmatic interface component receives and directs requests for configuration, status, mount, dismount, and other information, from users and programs.

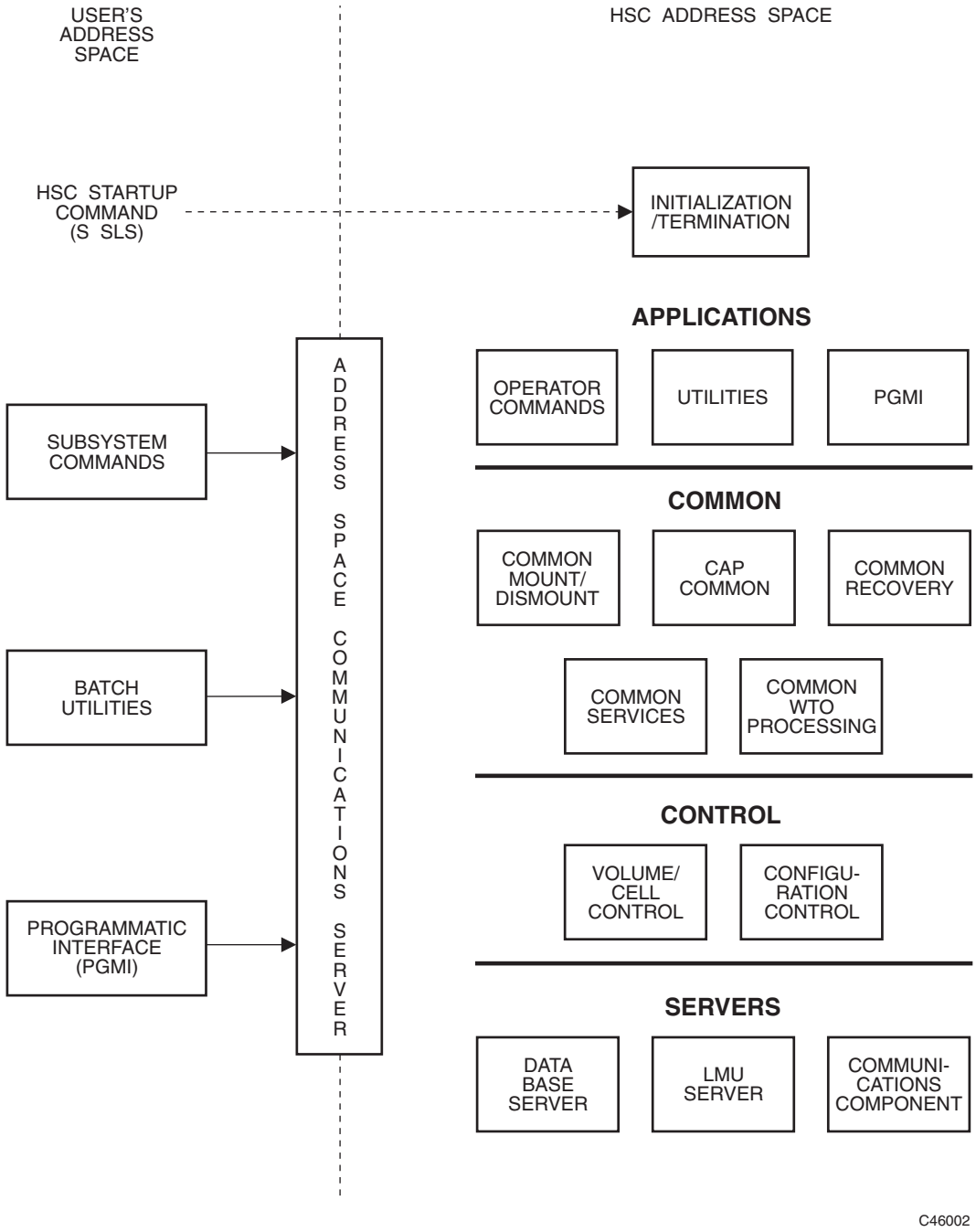

Figure 1. HSC Architecture

HSC and Automated Cartridge System Interaction

After the HSC is enabled by the MVS START command and completes full initialization, mount or dismount requests are received, and the library control data set is used to determine the location of the requested cartridge (library-controlled or nonlibrary).

The library control data set is created on a DASD volume when you perform a data set initialization during installation. Figure 2 on page 9 shows that it is necessary to share the control data set between all hosts requiring access to the library.

Automated cartridge mounts/dismounts are performed in response to operator commands, MVS or JES3 system messages intercepted by the SMC, or requests from the programmatic interface. The HSC determines that a mount/dismount is required for a volume under automated library control (cartridge resides in an LSM storage cell), and it communicates with the appropriate LMU.

If the request is for a mount, the following information is communicated to the LMU:

- the LSM and panel/row/column in which the volume resides
- the destination LSM (where the volume is to be mounted on a transport).

If all drives in an LSM are busy, a cartridge can be moved to another LSM to satisfy the mount request. This action is performed without operator intervention, since the pass-thru port (PTP) makes the cartridge available to the attached LSM.

If the request is for a dismount, this information is passed to the LMU:

- the LSM, cartridge drive, and transport in which the volume resides
- the destination (storage cell, CAP, or PTP) of the cartridge.

Automated Mount

Figure 2 on page 9 shows the LMU communicating with the LSM through LAN 0. In this illustration, LAN 1 is represented as the backup used in case of a LAN 0 failure.

Note: The LMU can select either LAN for communications with the LSM(s). Whichever LAN is not picked becomes the backup.

Within the LSM, the robot's hands are positioned to the correct panel/row/column cartridge location. The external Tri-Optic label is verified by the robot's vision system, the robot's hand extends, and the hand grasps the cartridge from its storage cell. The robot's hand retracts with the cartridge and the robot moves to the appropriate position (PTP cell or transport). The robot hand extends and the cartridge is positioned and released at its destination (PTP cell or transport).

If the destination is a PTP cell, the cartridge is made available to the adjacent LSM, and the process repeats until the cartridge is placed in a transport.

Automated Dismount

An automated dismount is the reverse of the mount procedure. The LMU communicates with the LSM via the LAN, and the robot's hands are positioned at the transport to be

dismounted. The external Tri-Optic label is verified using the vision system. A hand is extended and the cartridge is grasped from the transport. The hand retracts with the cartridge and the robot is moved to the cartridge's destination. The hand is extended and the cartridge is positioned and released into the storage cell.

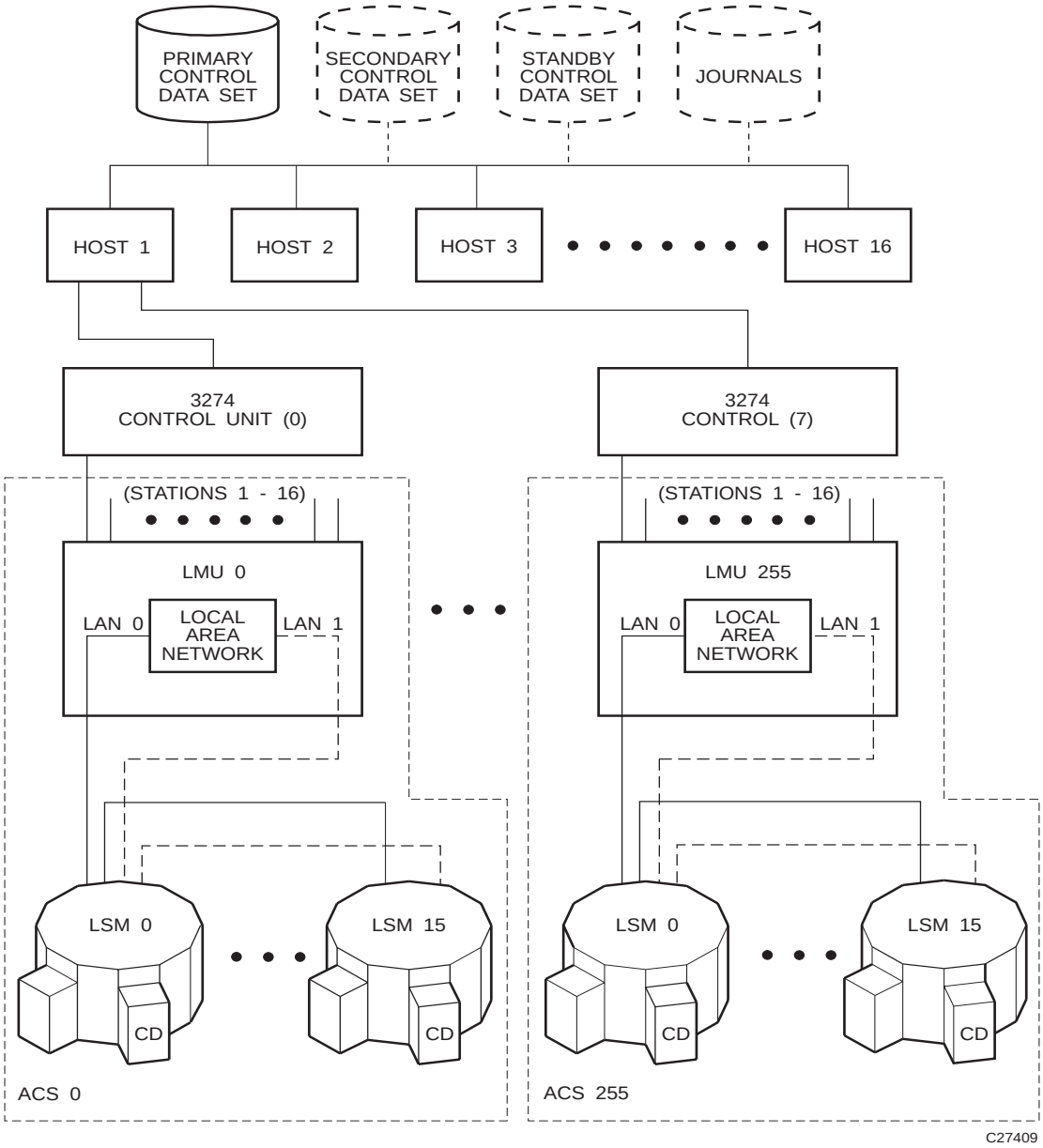

Figure 2. HSC/Automated Cartridge System Interaction

In a library configuration containing more than one LSM, if a pass-thru operation occurs to obtain the cartridge for mounting, the cartridge may be returned by one of these possible ways:

- If the MNTD Float command is set to ON (the HSC initial value), the cartridge is returned to any new cell location in the LSM containing the tape transport from which it was dismounted. For more information on the MNTD Float command, refer to the *HSC Operator's Guide*.
- If the MNTD Float command is set to OFF, the cartridge is passed through to the origin LSM and placed into its originating cell location. For more information on the MNTD Float command, refer to the *HSC Operator's Guide*.
- If the LSM is full, the cartridge is passed thru to another LSM and placed in any cell location
- A temporary enter on a mount operation means an eject upon dismount (the cartridge does not remain in the LSM).

The library control data set is automatically updated to reflect the new location of the cartridge.

Dual LMU Environment

In a dual LMU environment, the HSC maintains contact with both LMUs. Both LMUs are varied online. One LMU functions as the master LMU and the other functions as the standby LMU. Requests and responses are channeled through station paths on the master LMU. Paths on the standby LMU are online, but not used.

The master LMU continually informs the HSC of the status of the standby LMU. The HSC informs the operator when status changes.

The standby LMU constantly polls the master LMU. If the master LMU fails, the standby LMU informs the HSC that status has changed. The standby becomes the master. The HSC also informs the operator that the previous master LMU is not communicating.

At switchover, the HSC:

- notifies the operator that switchover is occurring
- verifies the configuration for the LMU
- sends the new master LMU all the work that was in progress
- terminates ENTER operations.

After switchover, the HSC sends the new master all ACS requests.

Switchover should not affect movement in process. All moves should complete. If not, the cartridges become errant and are found when the LSMs perform ‘‘quick initialization’’ processing. ENTER operations must be restarted after switchover.

User Control of HSC Functions

Various controls are in place in the HSC software to permit you to select how the HSC functions. Macros, Utilities, HSC control statements, and User Exits are normally used by the systems programmer to tune and customize the system. Commands are normally invoked by a systems operator in the performance of daily operations tasks. A description of the function of each of these available controls follows.

Macros

Macros are provided primarily to help you set up the library software configuration or library generation (LIBGEN). Refer to the *HSC Configuration Guide* for detailed information about the LIBGEN macros and how they are used to configure a library.

Utilities

Utilities are provided to allow you to manage library resources. The utilities enable you to dynamically:

- perform maintenance on control data sets
- control cartridge and scratch volume functions
- produce performance, activity, and inventory reports relating to a library.

Refer to Chapter 5, “Utility Functions” for detailed information about the HSC utilities and how they are used to manage library resources.

HSC Control Statements

Two types of control statements are available: PARMLIB, used to set initial values for system functions at HSC initialization, and definition data set, provided to define mixed media and devices. PARMLIB control statements set HSC functions such as:

- host-to-host communications parameters
- definition of scratch subpools
- data set definitions including: the primary, secondary, standby control data sets, and journals
- extended parameter list for startup.

Definition data set control statements allow you to determine that the correct media type and device are selected by defining the following items to the HSC:

- tape request characteristics
- volume attributes
- unit attributes.

Refer to Chapter 3, “HSC Control Statements and HSC Start Procedure” for detailed information about control statements and usage.

Commands

Operator commands are available for Systems Operators to use in daily library operation to perform various tasks. Commands perform such functions as:

- assigning a preference to a specific cartridge access port (CAP)
- displaying system status, such as control data set status, ACS, LSM, and volume status
- entering, ejecting, mounting, and dismounting cartridges
- setting of system parameters.

Refer to Chapter 2, ‘‘Commands, Control Statements, and Utilities’’ in the *HSC Operator’s Guide* for information about HSC operator commands and usage.

User Exits

User exits are provided with the HSC software so you can customize operation of your library to meet specific requirements. User exits are provided by StorageTek in source and object form on the distribution tapes. It is necessary for you to code routines designed especially for your library. You can then replace the StorageTek provided user exits with these custom-coded routines.

Note: User exits 1, 2, 4, 8, 9, 10, 11, 12, and 13 are invoked by the SMC and not directly by the HSC.

User exits permit:

- interfacing to tape management systems (knowledge of cartridge insert and delete)
- influencing allocation of tape transports
- defining scratch subpools
- implementing authorization checking
- implementing reporting for cartridges added or deleted from the library control data sets
- processing installation-specific messages (special message parsing)
- providing flexibility in user exit processing
- enabling esoteric substitution
- controlling deferred mounting
- controlling unit affinity separation
- controlling JES3 deferred mounting
- controlling JES3 drive prioritization for a specific volume

- establishing and cleaning up global user information.

Refer to Chapter 9, “User Exits” for detailed information about each user exit. Information includes:

- functional description including entry and return specifications, and return codes
- programming considerations
- restrictions and limitations
- parameter list, DSECT, record layout, and parameter cross reference.

Chapter 2. Host Software Component Functions

Overview of HSC Functions

This chapter describes the basic function of the HSC. Functions for each of the HSC components fit within the architecture structure presented in Figure 1 on page 6. Not all of the components of the architecture structure have capabilities directly visible to you. Only those HSC functions that you can control or those that are operationally apparent are described in this chapter.

Note: Drive allocation, previously influenced by the HSC, is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* **for details.**

System functions relating to HSC architecture components represented in Figure 1 include:

- installation
- configuration
- initialization/termination
- mount/dismount processing
- volume/cell control
- CAP processing
- near continuous operations
- common recovery
- renaming control data sets
- command
- utility
- LMU server
- communication
- programmatic interface
- batch application program interface.

The Automated Cartridge System provides the facilities and software to perform various functions with or without operator intervention. Such major system functions are described in this chapter.

Automatic Functions of the HSC

Among the functions handled automatically by the HSC are:

- mounting and dismounting of cartridges
- automatic and manual operating modes
- handling of abnormal situations occurring during mounting or dismounting of cartridge
- Cartridge Access Port processing to allow the operator to enter or eject cartridges
- tape management system assistance
- automatic cleaning of tape transports with cleaning cartridges under the control of the HSC and the library
- restricting the write access to volumes in the library through the Virtual Thumbwheel feature that interfaces with the MVS System Authorization Facility (SAF)
- dual LMU support
- control data set recovery.

Facilities Available for User Control of HSC Functions

There are facilities available for system programmers and operators to use to control various system functions. These include:

- macros
- utilities
- HSC control statements
- operator commands
- programmatic interface (PGMI) requests
- user exits.

Installation Functions

Installation functions pertain to installation of the HSC subsystem. Refer to the HSC installation section in the *NCS Installation Guide* for information about installation planning and instructions, including:

- preparing for the HSC installation
- installing the HSC Base Function
- performing post-installation tasks.

Configuration Functions

Installation functions relate to configuration or reconfiguration processing of the HSC subsystem. The *HSC Configuration Guide* presents detailed information about configuration planning, including:

- performing preexecution tasks
- defining the library configuration (LIBGEN)
- defining PARMLIB control statements
- initializing the control data sets
- verifying library generation
- starting HSC execution
- testing the installation
- planning and executing cartridge migration into the library
- planning migration to new HSC releases
- performing library modifications
- library configuration checklist.

Initialization/Termination Functions

Initialization/termination functions control initialization and termination of HSC components. This section describes the major initialization/termination functions.

Note: An SMC subsystem must be active for the HSC to initialize. Refer to the "Starting SMC" chapter in the *SMC Administration and Configuration Guide* for more information.

HSC Service Levels

To provide you with a more flexible, dynamic, automated cartridge mounting execution environment, the HSC has a service level strategy. Operation at either of the two service levels impacts the HSC subsystem. Operation flexibility is provided at a base service level to tolerate failures in certain isolated areas without impacting the functions of other sections of the HSC or your entire data center. Overall, this fault-tolerant HSC gives you greater availability of your automated library and lessens the need to shutdown and reinitialize. The HSC subsystem operates at two service levels:

Base service level
provides minimal functionality keeping the HSC running while having the capability of applying software maintenance or altering the subsystem parameters at the same time. This level is the lower level of functionality.

Full service level
provides full functionality of the HSC.

Normally, the HSC initializes to the full service level when started. HSC can be started at the base service level by coding a parameter field in the MVS START command. Refer to "Starting the HSC at the Base Service Level" on page 169 for information on command syntax.

Description of Base Service Level

The base service level is the nucleus of the HSC subsystem. It involves the functions necessary to execute as an extension of the operating system. The service level and its functions satisfy the requirements defined by the operating environment in place at the time of execution. Base service level functions include the capabilities to:

- issue subsystem commands
- execute certain utilities
- access the control data sets
- support the operating system interfaces and front-ends and maintain HSC host-to-host communications.

All operator commands can be issued with the HSC executing at the base service level. However, the commands which involve library hardware cannot perform their function completely. Table 1 on page 19 indicates which commands have complete functionality at the base service level.

Table 2 on page 20 indicates which utilities can be executed at the base service level.

Description of Full Service Level

The full service level of operation for the HSC provides all of the functions available and necessary to invoke and sustain complete library operations. These functions include:

- mount/dismount processing
- CAP processing
- cartridge and cell inventory management
- LMU access
- library resource recovery
- support for utilities which require services from the hardware
- support for user exits
- support for the programmatic interface.

At initialization, the HSC builds data areas, loads program modules, and sets up the required operating system services to support the two service levels of operation. Termination of the HSC, including normal termination by issuing the MVS STOP

command, and abnormal termination through abends or issuing the MVS CANCEL or FORCE commands, removes the service level structure and services.

On your system with the HSC operating at full service level, all commands, utilities, etc. are fully functional. Should you decide to manually intervene by issuing the Service Level command (SRVlev) to change from full to base service level, the functionality of the HSC is reduced.

See “Starting the HSC at the Full Service Level” on page 169 for information about setting the service level at HSC initialization.

Table 1. HSC Command Execution at Base and Full Service Levels

Command	**Service Level Execution**	
	Base	**Full**
ALLOC	YES	YES
CAPPref	NO	YES
CDs	YES	YES
CLean	NO	YES
COMMPath	YES	YES
DISMount	NO	YES
Display	YES *	YES
DRAin	NO	YES
EJect	NO	YES
ENter	NO	YES
Journal	YES	YES
MNTD	NO	YES
MODify (F)	NO	YES
MONITOR (MN)	YES	YES
Mount	NO	YES
MOVe	NO	YES
OPTion	YES	YES
RECover	NO	YES
RELease	NO	YES
SENter	NO	YES
SRVlev	YES	YES

Table 1. HSC Command Execution at Base and Full Service Levels (Continued)

Command	Service Level Execution	
	Base	Full
STOPMN (PM)	YES	YES
SWitch	NO	YES
Trace	YES	YES
TRACELKP	YES	YES
TREQDEF	YES	YES
UEXIT	YES	YES
UNITDEF	YES	YES
Vary	NO	YES
VIew	NO	YES
VOLDEF	YES	YES
Warn	NO	YES

* Display options that require hardware interaction are not valid at the base service level

.

Table 2. Utility Execution at Base and Full Service Levels

Command	Service Level Execution	
	Base	Full
ACTIvities	YES	YES
AUDIt	NO	YES
BACKup	YES	YES
EJECt	NO	YES
LIBGen	YES	YES
INITialize	NO	YES
MERGEcds	YES	YES
MOVe	NO	YES
OFFLoad	YES	YES
REPLaceall	YES	YES
RESTore	NO	NO
SCRAtch	YES	YES
SCREdist	NO	YES

Table 2. Utility Execution at Base and Full Service Levels

Command	Service Level Execution	
	Base	Full
SET	YES	YES
UNSCratch	YES	YES
UNSElect	YES	YES
VOLRpt	YES	YES

Displaying/Setting Service Level

An HSC operator command, SRVlev, sets a different service level. Refer to ‘‘DISPLAY Command’’ in the *HSC Operator’s Guide* for information on how to display the current HSC service level.

Starting the HSC Subsystem at Base Service Level

If the HSC and the library are new to your data center, you may want to install the HSC software and start the subsystem at the base service level before your library hardware is physically installed. Starting the HSC at the base service level allows you to perform many of the preliminary tasks involved in configuring your library and performing preliminary tests on basic operation.

Normally the HSC subsystem is initialized to the full service level when started. The HSC can be started at the base service level only by coding PARM=BASE in the MVS START command. Then, the Service Level (SRVlev) command can be used to bring the HSC to full service level whenever you are ready.

See “Starting the HSC at the Base Service Level” on page 169 for information about setting the service level at HSC initialization.

Drive Allocation

The SMC subsystem handles all allocation requests. Refer to either “SMC Allocation in a JES2 Environment” or “SMC Allocation in a JES3 Environment,” as appropriate, in the *SMC Configuration and Administration Guide* for more information.

SMC Common Allocation

The Storage Management Component (SMC) manages common allocation. The SMC provides single, consistent functionality between the HSC and MVS/CSC, in both JES2 and JES3 environments. Refer to the *SMC Configuration and Administration Guide* for more information.

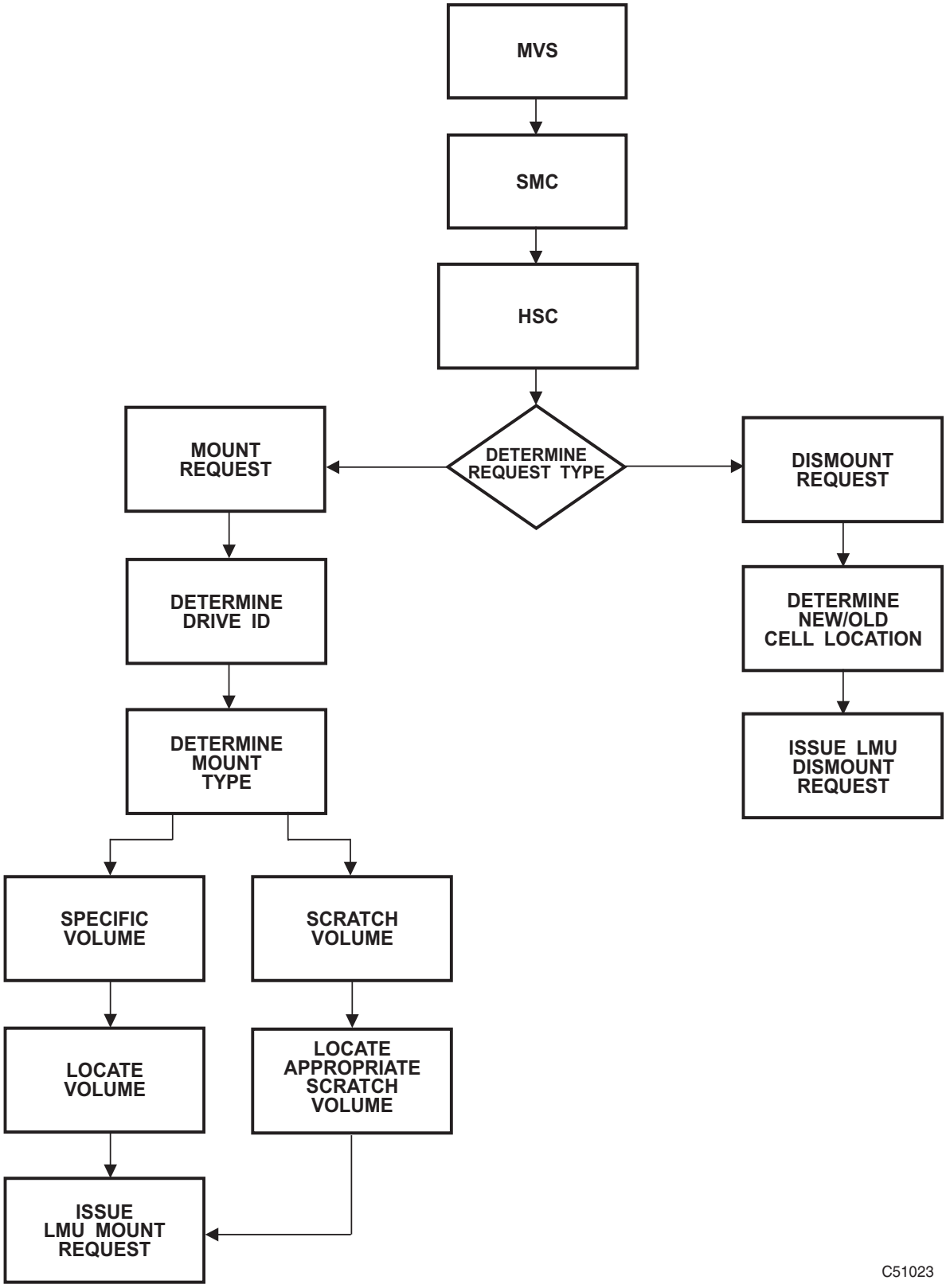

Figure 3. HSC Job and Mount/Dismount Processing

Common Allocation

Common allocation is the process of influencing MVS allocation to select the most desirable device for a request. The Storage Management Component (SMC) consolidates the allocation components of the HSC and MVS/CSC and communicates with these subsystems to determine policies, volume locations, and drive ownership. Refer to the *SMC Configuration and Administration Guide* for detailed descriptions of this product.

Mixing Media Types and Recording Techniques

The HSC supports mixing media types and transport models with different recording techniques in a library environment without requiring the user to change JCL or invoke HSC user exits. The supported media types are standard, ECART, ZCART, helical, STK1 (9840 and T9840B), and STK2 (T9940A and T9940B).

Note: The STK1 media type is not related to the STK1 storage group defined in DFSMS/MVS.

The supported transports are the StorageTek 18-track model 4480; 36-track models 4490, 9490, and 9490EE; helical model SD-3; model 9840 and T9840B; and model T9940A and T9940B.

Notes:

1. The main physical external difference between standard, ECART, and ZCART cartridges is that the ECART and ZCART housings are two-toned (ECART is black and tan; ZCART is black and red). Since ECARTs are in 36-track format, they cannot be read from or written to on a 4480 (18-track) transport. ZCARTs can be read from or written to only on 9490EE transports.
2. Transport models 4490, 9490, 9490EE, SD-3, 9840, T9840B, T9940A, and T9940B appear to the operating system as the following types of devices
   - 4490 – 3490E
   - 9490 – 3490E
   - 9490EE – 3490E
   - SD-3 – 3490E or 3590
   - 9840 and T9840B – 3490E or 3590
   - T9940A and T9940B – 3490E or 3590.

Virtual Storage Manager (VSM) Media/Recording Technique Support

VSM support for the virtual media and recording technique has been added for certain control statements and operator commands. See the VTCS documentation for more information.

Definition Data Set Control Statements

Definition data sets contain control statements that can be used to define to the HSC the volume attributes, unit attributes, and tape request characteristics for your data center. The HSC uses this information to ensure:

- the correct media type is selected to satisfy the request
- the cartridge is mounted on an appropriate transport model (i.e., 4480, 4490, 9490, 9490EE, SD-3, 9840, T9840B, T9940A, and T9940B).

Definition data set control statements include:

- OPTion TITLE which places an identifying string in a definition data set

- Tape Request (TAPEREQ) which describes the media type and recording technique to be used for a particular data set
- Tape Request Definition (TREQDEF) which identifies the definition data set containing TAPEREQ control statements
- Unit Attribute (UNITATTR) which describes the recording technique attributes of library and nonlibrary transports
- Unit Attribute Definition (UNITDEF) which identifies the definition data set containing UNITATTR control statements
- Volume Attribute (VOLATTR) which describe the media type and recording technique attributes of cartridge tape volumes
- Volume Attribute Definition (VOLDEF) which identifies the definition data set containing VOLATTR control statements.

See “Definition Data Set Control Statements” on page 105 for additional information.

MEDia and RECtech Parameters

MEDia and RECtech parameters are specified on the TAPEREQ and VOLATTR control statements. Parameter values associated with MEDia and RECtech, and their hierarchy, are shown in Figure 4.

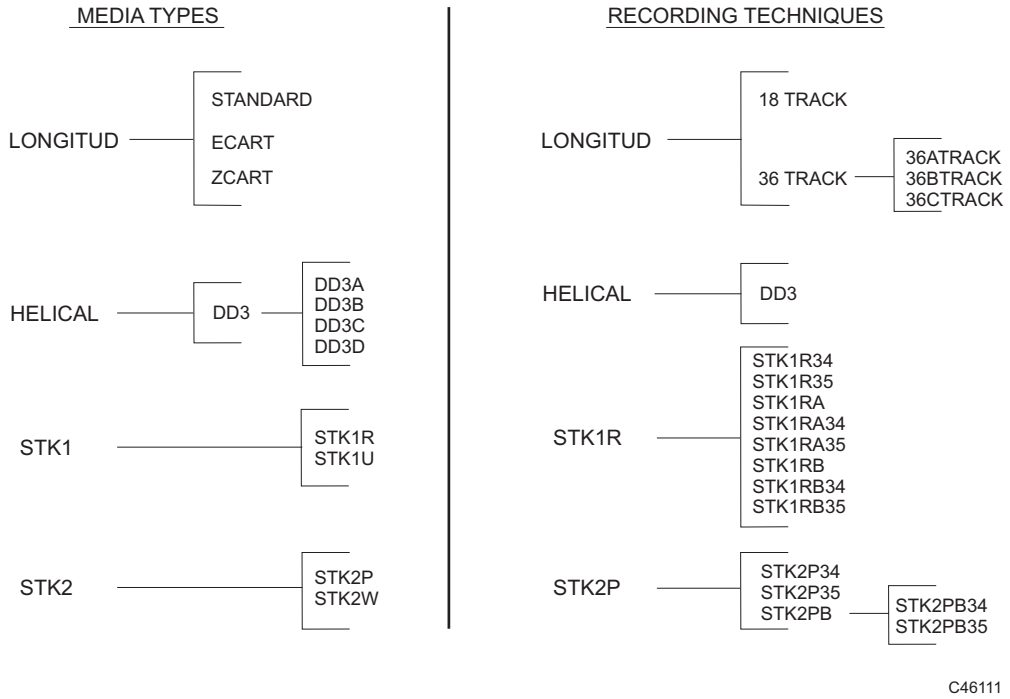

Figure 4. MEDia/RECtech Hierarchy

Model Parameter

The MODel parameter is specified on the TAPEREQ and UNITATTR statements. MODel values are processed as if they were RECtech values. UNITATTR control statements do not use the RECtech parameter. Table 3 shows the relationship between MODel and RECtech parameters.

Table 3. MODel/RECtech Translation

MODel	Resulting RECtech
4480	18track
4490	36Atrack
9490	36Btrack
9490EE	36Ctrack
SD3	DD3
9840	STK1R
984035	STK1R
T9840B	STK1R
T9840B35	STK1R
T9940A	STK2P34
T9940A35	STK2P35
T9940B	STK2PB34
T9940B35	STK2PB35

Device Preferencing

Device preferencing is applicable only to library configurations containing a mixture of StorageTek's 36-track 4490, 9490, and 9490EE Cartridge Subsystems and is managed by the Storage Management Component (SMC). Refer to the *SMC Administration and Configuration Guide* for more information.

Mount/Dismount Functions

Mount and dismount functions consist of the following processing:

- mounting specific volumes
- mounting scratch volumes
- swapping mounted volumes to another tape transport
- dismounting library volumes
- handling abnormal mounts and dismounts
- virtual thumbwheel (VTW)
- automated tape transport cleaning.

The SMC message handling component is driven by operating system message traffic and sends requests to the HSC mount/dismount component to cause tape cartridges to be mounted, dismounted, or swapped. Requests for the same transport are sometimes logically queued until the required physical actions have completed (e.g., tape rewound and dismounted so the next mount can occur) or until the operator has responded to a decision message with a desired action. See Figure 3 on page 23 for an overview of HSC mount/dismount processing.

Several options exist to allow users to specify how they want mount/dismount to react in various situations. Refer to ‘‘MNTD (Mount/Dismount Options) Command and Control Statement’’ in the *HSC Operator's Guide* for a description of these options.

Mount Processing for Specific Volumes

The HSC maintains a record of the library location for each cartridge and instructs the LMU to mount the requested cartridge on the selected transport.

Mount processing occurs as a result of:

- the programmatic interface (PGMI) interpreting a request for library transports, or
- SMC message handling interpreting a WTO/WTOR message for library transports, or
- issuance of the HSC operator Mount command, or
- a clean request.

A volume may be temporarily or permanently entered into the library to satisfy a mount on a library transport. If a volume is temporarily entered into an LSM, a notation is made in the library control data set for this volume to be automatically ejected, via a CAP, when the volume is dismounted.

Mount Processing for Scratch Volumes

To process scratch mount requests, the HSC determines which volumes within an LSM are considered as scratch volumes. The HSC makes the determination from information contained in the library control data set.

Note: A scratch volume is marked as nonscratch when it is mounted, even if it is not written on.

Normally, only requests for nonspecific VOLSERs and the appropriate label type (as defined in the LIBGEN) are considered as requests for scratch volumes. However, the HSC allows selection of scratch volumes from different scratch subpools and different label types via interaction with User Exits 01, 02, 03, and 04, SCRPOOL statements, and the Allocation command LSMpref, LOWscr, and SCRtech options. User Exit 02 is used for JES2; User Exit 04 is used for JES3 with SETUP processing.

In addition, other means are available for controlling scratch volume activity. These are at the operator command and programmer utility levels. See "Scratch Subpool Management" on page 43 for more information. See Chapter 9, "User Exits" on page 397 for a more detailed explanation of scratch subpools and controlling user exits.

Note: During initialization, or in the process of implementing the FULL service level, scratch subpooling is not honored for those pending mounts occurring prior to HSC processing at the FULL service level.

The scratch status of cartridges listed in the library control data set is updated through the use of the Scratch Update utility. One part of this function is a Scratch Conversion utility, supporting Computer Associates' CA-1, CA-DYNAM/TLMS, and IBM's DFSMSrmm, which produce a list of scratch volume serial numbers in a format acceptable as input to the Scratch Update utility. No modification of either tape management system is required.

The second part of this function, the Scratch Update utility, accepts a list of volume serial numbers for addition to or deletion from the control data set's list of scratch volumes.

For other third-party or customized tape management systems, the user must provide the interface routine between the tape management system being used and the Scratch Update function. The source code of the Scratch Conversion utility is provided on the distribution tape for use in developing the interface routine.

Swap Processing for Swapping Mounted Volumes to Another Tape Transport

Swap processing is activated by tape error recovery procedures or an MVS operator command. This action can be initiated by the operator issuing an MVS SWAP command, or by the operating system when it detects an error on a particular transport and determines the need to move the volume to another transport.

The SMC attempts to automate swaps involving library devices.

Enhanced Swap Processing

In enhanced swap processing, the SMC replaces dynamic device reconfiguration (DDR) messages with messages containing devices the SMC recognizes as compatible.

Dismount Processing for Library Volumes

The HSC determines when a library volume is to be dismounted from a library transport. Dismount processing occurs as a result of:

- SMC message handling interpreting a keep or retain WTO/WTOR message identifying a library transport, or
- a PGMI request identifying library transports
- issuance of the HSC operator DISMount command
- the completion of a clean operation.

The MNTD Float command is useful for influencing pass-thru operations and returning cartridges to their original cells or to new cells after a mount/dismount request has been completed.

If the MNTD command Float option is on (i.e., MNTD Float(ON)), when a volume is passed to a transport in another LSM, dismount processing frees the original cell location and assigns the volume to a cell in the same LSM as the transport as long as empty cells exist. If no empty cells exist, a location is chosen in the nearest LSM with free cells or volumes can be forced to their original home cell at dismount time. If Float is off, the HSC returns the volume to its original home cell location.

The MNTD SCRDISM parameter allows scratch volumes mounted in a WolfCreek LSM to be archived either in the same WolfCreek LSM or in the next largest storage device (currently, the 9310 LSM).

The MNTD PASSTHRU parameter works with SCRDISM by setting the maximum number of pass-thrus that can occur for a cartridge that is to be archived.

Refer to the ‘‘MNTD (Mount/Dismount Options) Command and Control Statement’’ in the *HSC Operator’s Guide* for a description of all the options associated with this command.

If the dismount occurs for a temporary volume, the volume is ejected through a CAP, and a message informs the operator to retrieve the cartridge.

It may be required to interpret the volume disposition and note if it is to be scratched. If the delete disposition for volumes is SCRTCH (as specified in the LIBGEN), then the SMC examines the dismount message to determine if the volume is to be scratched. To ensure deleted volumes are retained as nonscratch during the TMS grace period, TMS users should specify NOSCRTCH for the delete disposition in LIBGEN.

You can intervene in how the HSC controls library operation. Tape cartridge movement, as well as many other functions, can be controlled to function in ways that you prefer. Refer to Chapter 5, “Utility Functions” on page 181 for information about utilities that can be used to control HSC operation of the library. Refer to Chapter 2, ‘‘Commands, Control Statements, and Utilities’’ in the *HSC Operator’s Guide* for information about operator commands that can be used for controlling library operation.

Abnormal Mounts/Dismounts

The HSC handles abnormal situations through communication with the operator so intervention may take place to accomplish the mount. The following examples indicate the types of situations in which this communication takes place:

- The transport is in an ACS, but the volume is not. The HSC issues a WTOR. The operator may:
  - reply that the mount request is to be ignored and then cancel the job
  - reply that the volume is to be permanently entered into the library
  - reply that the volume is to be temporarily entered into the library
  - enter the volume and the HSC automatically retries the volume lookup.
- The volume and/or transport resides in a manual mode LSM.
  - All mount and dismount requests are queued until either a response is made to one of the manual mode WTORs or the LSM is returned to automatic mode. At this point, all queued requests are processed.
  - A console interaction (WTOR) is provided to indicate the VOLSER's location.
  - Whenever the volume's LSM is in manual mode, "M *volser*" and the volume's location are alternated on the transport display panel (located inside the LSM) until the volume is mounted on the transport or the request is removed.
  - When a transport's LSM is in manual mode or the robotics control path to the LSM is inoperative, operator intervention is requested to assist in performing the mount.
  - When the transport being dismounted is in a manual mode LSM, the operator is requested to dismount the cartridge and to remove it from the LSM. The volume is deleted, or the operator may be asked if the volume is to be deleted, from the control data set.

    The volume may be deleted from the control data set depending on the setting of the MNTD command. A delete occurs unconditionally if MNTD Dismount(Auto) is entered. Otherwise, a reply is required.
- A message to the operator's console indicates that MVS detects the wrong volume is mounted.
  - The volume is dismounted. If the next mount request for that drive specifies the VOLSER that was dismounted, operator intervention is requested. StorageTek recommends that the volume be ejected.
- A message to the operator's console indicates that the wrong scratch volume is mounted.
  - The HSC dismounts the current volume, removes it from the scratch list, and mounts another scratch volume.

Virtual Thumbwheel (VTW)

Cartridges are usually entered into an LSM with the physical thumbwheel set to the write enabled position. Virtual Thumbwheel is a facility provided with the HSC that allows this physical thumbwheel to be electronically ‘‘set’’ to allow read-only access. This virtual thumbwheel setting to enforce read-only access varies according to the allowed access defined by your security package.

The virtual thumbwheel function allows read-only access to a cartridge in an ACS if the user requesting the tape is not actually authorized to update the volume. This verification of user access authority is accomplished by calling the MVS System Authorization Facility (SAF) with the appropriate volume serial number.

If the SAF response indicates that the user has authorization to update the cartridge, the HSC mounts the tape cartridge with write enabled; otherwise, the cartridge is mounted for read only. The HSC does not enable update ability if the physical thumbwheel is set to write protect.

If the SAF response indicates that the user is not authorized to update the volume, the HSC mounts the cartridge with the virtual thumbwheel set to write-protect.

Security Software Requirements

The HSC virtual thumbwheel facility does not add any security controls to the system. The HSC simply honors the recommendations of the SAF interface regarding the write-protect requirement for a volume mounted on a library transport.

The HSC invokes the SAF interface by issuing a RACROUTE macro with the following parameters:

```
REQUEST=AUTH,
ATTR=UPDATE,
CLASS=TAPEVOL,
ENTITY=tape-volser
```

This is the same type of RACROUTE call that is subsequently issued by the operating system when the tape volume is opened.

Virtual thumbwheel does not have any effect on mount processing unless there is a data security program product installed that uses the SAF interface to protect tapes at the volume level (`CLASS=TAPEVOL`). If a data security product is installed, refer to the product documentation or contact the product vendor to determine if it meets these criteria.

HSC Mount Command Support

The Mount command provides support for virtual thumbwheel. The Readonly operand for the Mount command enables a volume to be mounted with the virtual thumbwheel set to write protect.

Example of Mount Command with Readonly Operand

```
MOUNT VOLØØ1,BØØ,,READONLY
```

Note: Operands for operator commands are positional. In the example above, two commas must follow the drive operand to indicate that the *host-id* operand is not specified.

This command option is provided to respond to a situation where the security environment changes between the time the HSC issues its RACROUTE request (when the volume is mounted) and the time when MVS issues its RACROUTE (when the volume is opened). It is possible that the rules governing the tape volume could change during this interval, so when the volume is opened the user is no longer authorized to update the volume. In this case, MVS dismounts the volume and issues a message, requesting that the volume be remounted with write enabled.

If this situation occurs, or if a message is issued for any other reason, the operator can issue the Mount command with the Readonly option specified to remount the volume with the virtual thumbwheel set to write-protect.

Tape Transport Cleaning

The HSC allows you to automate the cleaning process or to manually clean library-attached tape transports. When a library transport needs to be cleaned, it informs the LMU, which broadcasts a ‘‘`drive needs cleaning`’’ message to all connected hosts. The LMU broadcast causes the HSC to issue a console message indicating that a transport needs cleaning. Until a cleaning cartridge is loaded, future mounts continue to initiate this message.

If auto-cleaning is disabled, HSC processing is complete, and the transport must be cleaned manually. To manually clean a transport, see “Manual Tape Transport Cleaning” on page 41 for more information.

Note: The initial value for transport cleaning is for automated cleaning to be disabled.

Automated Tape Transport Cleaning

If auto-cleaning is enabled, the HSC sets the transport to ‘‘needs cleaning’’ status. The next time a mount is issued for that tape transport, the following cleaning process is invoked prior to mounting the requested cartridge:

1. The HSC selects a cleaning cartridge from the pool of compatible cleaning cartridges in the LSM that contains the tape transport that needs cleaning (or from the closest LSM that contains a compatible cleaning cartridge).
2. The cleaning cartridge is mounted.
3. The tape transport is cleaned.
4. The cleaning cartridge is dismounted.

When the cleaning process is complete, the original requested cartridge is mounted on the transport.

Note: If auto-cleaning is enabled, cleaning can also be scheduled for a transport by issuing the CLean command. See “Activating Automated Cleaning” for additional information.

Activating Automated Cleaning

The MNTD AUtocln command is used to turn auto-cleaning on or off on a host-by-host basis. The following example shows how to activate automatic cleaning.

```
MNTD AUTOCLN(ON)
```

Note: It is probably more useful to have automated cleaning on for all hosts in a JES2 installation unless library transports are allocatable only by some hosts. In a JES3 environment, most mounts are done by the global processor and auto-cleaning should be set on for at least the global processor.

Once auto-cleaning is activated, the CLean command can be issued to initiate cleaning of specified drives on specified hosts. An example of issuing the CLean command is:

```
CLEAN 582 MVSA
```

Notes:

1. The MNTD AUtocln command must be set to ON before attempting to use the CLean command.
2. The CLean command sets the transport to ‘‘needs cleaning’’ status. The cleaning process is not initiated until the next mount is issued against the transport. Refer to the *HSC Operator’s Guide* for an explanation of the CLean command.

Identifying Cleaning Cartridges

Cleaning cartridges are identified to the HSC by a unique three-character alphabetic prefix in their volser. All cartridges identified with that prefix, which are valid cleaning media, make up a pool of cleaning cartridges in each LSM.

The parameter CLNPRFX, contained in the LIBGEN SLILIBRY macro, specifies the volser prefix for cleaning cartridges. CLNPRFX must be three alphabetic characters, and identifies cleaning cartridges associated with the library. The default is CLN. Refer to ‘‘SLILIBRY Macro’’ in the *HSC Configuration Guide* for additional information.

Notes:

1. Any cartridges identified by the cleaning prefix are treated exclusively as cleaning cartridges; they cannot be scratched or initialized by HSC utilities.
2. Extra overhead can be avoided if the range of cleaning cartridge volsers in an LSM and ACS is both narrow and dense. For example, if three cleaning cartridges are in a single LSM, labels of CLN020, CLN021 and CLN022 would cause less processing overhead than if they were labeled CLN001, CLN501 and CLN901.
3. The cleaning prefix can be changed using the SET CLNPRFX utility. However, before the cleaning prefix is changed, all cleaning cartridges must be ejected from all ACSs. See the description of the SET utility for the complete procedure.

Cleaning Media and Drive Compatibility

Tape transports must be cleaned with cleaning cartridges of a compatible cleaning media type. Longitudinal transports must be cleaned with longitudinal cleaning media, RedWood transports with helical cleaning media (DD3D), 9840 and T9840B transports with 9840 cleaning media (STK1U), and T9940A and T9940B transports must be cleaned with 9940 cleaning media (STK2W).

Notes:

1. Different cleaning cartridge media types may have different maximum cleaning usage limits. Grouping cleaning cartridges of different media types into different volser ranges makes it easier to specify these limits with the VOLATTR control statement MAXclean parameter(s). For example, if the helical cleaning cartridges have volsers between CLN500 and CLN599, the following VOLATTR statement can be used to set a different maximum cleaning usage limit for this range of helical cleaning cartridges:

```
VOLATTR SERial(CLN500-CLN599) MAXclean(nn)
```

2. Contact your StorageTek Customer Services Engineer for appropriate MAXclean values for different cleaning media types.

Limits on the Use of Cleaning Cartridges

Cleaning cartridges should only be used a limited number of times. The MNTD MAXclean command globally specifies how many cleaning operations are allowed before a cleaning cartridge should be removed from the ACS and replaced (the default is 100 uses). This maximum cleaning usage limit can be different for different cleaning media. Use the VOLATTR MAXclean parameter to specify a different maximum cleaning limit for different cleaning cartridge media.

Notes:

1. Refer to ‘‘MNTD (Mount/Dismount Options) Command and Control Statement’’ in the *HSC Operator’s Guide* and to “Volume Attribute (VOLATTR) Control Statement” on page 146 for additional information about the MAXclean value.

2. Ejecting and reentering used cleaning cartridges should be avoided. When a cartridge is ejected and reentered, its select count is set to zero. The select count is used to track the number of times a cleaning cartridge has been used. Used cleaning cartridges which are reentered will be used more times than specified by the applicable MAXclean value.

Each cleaning media type is used in a different way to clean tape transports. Some media types use the same cleaning surface many times, while other media types use the cleaning surface only once. Some media types use the cleaning material fewer times before they are unable to clean a tape transport.

When a cleaning cartridge is no longer able to adequately clean a tape transport, it is over-use.

Over-use (Over-limit and Spent) Cleaning Cartridges

An *over-use* cleaning cartridge means either that the usage (select) count is over the MAXclean value (‘‘over-limit’’) or all of its cleaning material is used or ‘‘spent.’’

- An *over-limit* cleaning cartridge has been used more than the value (limit) specified by either the MNTD MAXclean or VOLATTR MAXclean settings. This cleaning cartridge may not be able to adequately clean a tape transport. If an over-limit cleaning cartridge is mounted on a tape transport, the cleaning process is attempted and may succeed.
- A *spent* cleaning cartridge’s cleaning material is completely used up or exhausted and can no longer be used for cleaning. When a spent cleaning cartridge is mounted on a transport, the LMU automatically returns it to its source location before notifying the HSC. The HSC will not use spent cleaning cartridges during automated tape transport cleaning.

Over-use cleaning cartridges should be removed from the LSM and replaced with new cleaning cartridges. By default, the HSC ejects all over-limit cleaning cartridges that it finds during tape transport cleaning. The default can be changed by using the MNTD EJctauto command.

Managing Over-use Cleaning Cartridges

If an operator is not available to empty a CAP, it may be desirable to retain over-use cleaning cartridges in the LSM for later removal.

The MNTD EJctauto command allows you to control processing of over-use cleaning cartridges.

Options for this command include:

ON
Use this option when operators are available to remove cleaning cartridges from a CAP during automated tape transport cleaning. ON is the initial value for the HSC.

MSg
Use this option when operators are available to respond to console messages during automated tape transport cleaning.

OFf
With this option, no operator intervention is required for automated tape transport cleaning.

When the HSC is searching for a cleaning cartridge to clean a tape transport, it skips all over-use cleaning cartridges that are detected in the ACS until it finds a compatible cleaning cartridge.

If no compatible cleaning cartridges are found in the ACS, the HSC prompts the operator to enter a cleaning cartridge or skip the clean process.

If compatible over-limit cleaning cartridges are found in the ACS, the HSC acts based on the MNTD EJctauto setting.

- If MNTD EJctauto(ON) or (MSg) are set, an operator prompt is issued. The operator can reply to use one of these over-limit cleaning cartridges, enter a cleaning cartridge, or skip the clean process.
- If MNTD EJctauto(OFf) is set, a compatible over-limit cleaning cartridge is automatically selected to clean the transport.

When the clean process is finished, the cleaning cartridge is dismounted from the tape transport. If the cleaning cartridge is over-limit, the HSC acts based on the MNTD EJctauto setting.

- If MNTD EJctauto(ON) is set, the cleaning cartridge is automatically ejected from the ACS.
- If MNTD EJctauto(MSg) is set, an operator prompt is issued. The operator can reply to eject the cleaning cartridge from the ACS or keep the cleaning cartridge in the ACS.
- If MNTD EJctauto(OFf) is set, the cleaning cartridge is automatically kept in the ACS.

Messages are written to the console if any over-use cleaning cartridges are found in the ACS, how many were found, and if an over-use cleaning cartridge has been kept in the ACS. These messages help the operator manage cleaning cartridges in the ACS.

Managing Cleaning Cartridges

Appropriate numbers of compatible cleaning cartridges must be available to clean the transports attached to an LSM. While there is no minimum number of cleaning cartridges, optimally, each LSM should contain multiple cleaning cartridges for each type of transport attached to the LSM. This ensures that automated cleaning avoids pass-thrus for cleaning cartridges.

If all transports in an LSM are scheduled for cleaning at the same time (by a scheduled or operator-entered CLean command), each LSM should contain one cleaning cartridge for every tape transport attached to the LSM.

Managing cleaning cartridges is especially important when automatic ejection of over-use cleaning cartridges has been disabled by the MNTD EJctauto command. On a regular basis, these cleaning cartridges must be identified, ejected from the ACS, and replaced with new cleaning cartridges.

Use the Volume Report utility to identify over-use cleaning cartridges. Select the cleaning cartridges by volser range and sort the output by use:

```
VOLRpt VOLser(CLN000-CLN999) SORT(USE) DEScend
```

The ‘‘Cln Use’’ column on the report identifies:

N = Not usable cartridges (including spent cleaning cartridges)

M = Over MAXclean, for over-limit cleaning cartridges

Spent and over-limit cleaning cartridges are also identified on the SLSCDATA flat file requested by the VOLDATA parameter. Volume data is mapped by the SLUVVDAT macro. Volumes that are not usable (i.e., spent) are identified by **VOLNOUSE**. The MAXclean value that applies to a cleaning cartridge is carried in the **VOLMXCLN** field.

Manual Tape Transport Cleaning

If auto-cleaning is disabled, tape transports must be cleaned manually. This process can be performed without entering the LSM.

Note: StorageTek recommends using automated cleaning instead of manual cleaning because automated cleaning respects the maximum cleaning limits for different cleaning cartridges and does not select spent cleaning cartridges.

Two methods that can be used to accomplish this task are:

- issue a Mount command to mount a cleaning cartridge on the transport. When cleaning is complete, enter a DISMount command to remove the cleaning cartridge from the transport.
- use an automated operations package to mount and dismount the correct cleaning cartridge(s) on the transport(s). Coordination and setup is required to implement this solution. This task can be used to initiate the clean process for all drives at a predetermined time.

Volume/Cell Control Functions

Volume/cell control functions coordinate and control the location of tape cartridges in the library.

Volume/cell control functions described in this section include:

- moving volumes within the library
- scratch subpool management
- scratch threshold task restart.

Moving Volumes within the Library

Often there is need to move a single volume, several volumes, or a range of volumes to other locations within a library. The destination for the volume(s) may be within the same LSM or different LSM(s). The Volume Move function provides you with the capability to move volumes at your discretion. Volume movement may be required because of:

- changes in your library hardware configuration. Addition of tape transports or LSMs to a library configuration often requires that volumes be moved to accommodate the new hardware configuration. Panels can be frozen to prevent allocation of new volumes to those panels. It is not necessary to move volumes that reside on a panel before it is frozen, however, volumes should be moved off frozen panels that will be changed.

- the need to achieve better control over library tape activity.

Volumes can be moved by any of the following methods:

- MOVe operator command
- MOVe utility
- programmatic interface MOVE request
- tape management interface MOVE request
- Scratch Redistribution utility.

These methods provide you with the operational flexibility often needed within a library installation.

Scratch Subpool Management

Management of scratch subpools within the library is an important function affecting library performance and your ability to have greater control over scratch volume activity.

The HSC provides support for mounting of scratch volumes from subpools resulting from MVS mount messages. You can effectively manage your scratch subpools by several available means. These include:

- **Defining subpool information** — Scratch subpools can be defined using either Scratch Subpool (SCRPOol) PARMLIB control statements or User Exit 03.

  Note: Using the SCRPOol control statement is preferable to specifying User Exit 03.

  SCRPOol permits you to enter the following information for each subpool:

  - a subpool name
  - the range of volume serial numbers
  - the label type
  - the HOSTID.

- **Enabling scratch subpools** — Scratch subpools specified by SCRPOol are defined in the SLSSYSxx command list and are executed when the HSC is initialized. Refer to "Scratch Subpool Control Statement" on page 102 for detailed information on how to implement scratch subpooling using the SCRPOol control statement. (The syntax for the SCRPOol PARMLIB control statement is also contained in Appendix A, "Macros, Control Statements, Utilities, and Commands Syntax Reference" on page 503).

  User Exit 03 is also used to define scratch subpools and is called at HSC initialization. Refer to "How to Enable/Disable/Reload User Exits" on page 401 for more information.

- **Implementing scratch subpool user exits** — User Exits 01, 02, and 04 are used to implement the operational portion of scratch subpooling.

  Note: User Exit 01 must be coded to allow the HSC to select the volume from the correct subpool. If you do not assign a subpool using User Exit 01, the HSC selects a qualifying scratch tape from its general subpool (subpool 0), which includes all scratch tapes in the ACS including those scratch tapes in named subpools.

  User Exits 02 and 04 select the tape transport in the LSM that has the most scratch volumes of the correct subpool type. Refer to "User Exits and Scratch Subpooling" on page 401 for additional information about these user exits.

- **Specifying scratch subpool parameters with operator commands** — Several commands are available for controlling scratch subpools. Complementing these commands are scratch subpool parameters in two utilities.
  The syntax for each operator command is contained in Appendix A, “Macros, Control Statements, Utilities, and Commands Syntax Reference” on page 503.

  The commands that can be used to display scratch subpool information include:

  - Display SCRatch and Display THREShold commands
  - Warn command.

  Commands that include scratch subpool parameters are:

  - EJect
  - ENter
  - Mount.

  Utilities that include scratch subpool parameters are:

  - Scratch Redistribution (SCREdist) control statement
  - EJECt utility.

  Refer to the *HSC Operator’s Guide* for detailed information about operator commands and to Chapter 5, “Utility Functions” on page 181 for information about utilities.

Scratch Threshold Task Restart

The scratch threshold task is a function within the HSC that maintains a count of scratch volumes that are available within a library. Should this task fail, the HSC is unaware of the number of scratch volumes available. Thus, a failure of this task could result in impairing any library processing relying on scratch volumes.

The HSC provides automatic recovery and reinstatement of this task if a failure occurs. This recovery and reinstatement is transparent to users except for a message displayed on the system console indicating that the task is reinstated.

In the event, because of unusual circumstances, that the task is not reinstated, a message on the system console also informs you of the condition and appropriate action to take.

Refer to ‘‘WARN Command’’ in the *HSC Operator’s Guide* for information about the Warn operator command used to dynamically modify scratch threshold values.

Cartridge Access Port (CAP) Processing Functions

CAP processing functions control cartridge enter and eject functions. The HSC provides operator commands and utilities which permit you to:

- enter cartridges into the library
- eject cartridges from the library.

The CAP is the focal point for the activities of entering or ejecting cartridges. At least one CAP is located on the access door of every LSM, and indicators are provided for the operator to identify what CAP operations are active. At some points, operator interaction is required. Refer to your ACS *Hardware Operator's Guide* for more information about CAPs.

CAP processing functions described in this section include:

- entering cartridges into the library using the ENter command.
- ejecting cartridges from the library using either the EJect command or EJECt utility
- CAP exception processing
- releasing an allocated CAP.

Enter and eject operations are accomplished concurrently with other normal LSM operations: automated mounts, automated dismounts, pass-thrus, and so forth.

For multiple CAPs, each enter and eject operation is processed separately. The user can run concurrent tasks against CAPs on a single LSM.

PCAPs are used for single cartridge enter and eject operations. These are controlled by the user through the PGMI or user exits.

Operator commands and detailed instructions for controlling CAP processing functions are described in the *HSC Operator's Guide*; utilities are discussed in Chapter 5, in this document.

Entering Cartridges into the Library

To enter cartridges into the library, execute the HSC ENter or SENter command and identify which CAP is to be used for the operation. Specifying the *cap-id* is optional for the ENter command. Following the procedures described in the *HSC Operator's Guide*, open the CAP door, place cartridges into the CAP cells, and close the CAP door.

The CAP automatically locks when the door is pushed closed. The robot scans the Tri-Optic label (must be unique) of a cartridge, and the cartridge is moved by the robot to an empty cell in one of the LSM panels.

For a CAP in automatic mode, do not issue an ENter command. The operator need only open the door, insert cartridges, and close the door. No other operator intervention is required.

Ejecting Cartridges from the Library

Cartridges are ejected from the library by using either the EJect command or the EJECt utility. Either a single cartridge, a range of cartridges, or a list of cartridges can be identified for removal from the library. The robot locates the appropriate storage cell, withdraws the cartridge from its cell, and moves it to an available cell in a CAP.

The operator must remove cartridges from the library through the CAP. All cartridges contained in the CAP must be removed once they are placed in the CAP by the robot. Refer to the *HSC Operator's Guide* for operator procedures for CAP processing.

CAP Mode Considerations

Unlike manual mode CAPs which are allocated for enters from specific hosts, automatic mode CAPs may be serviced by any active host. Placing a CAP in automatic mode improves CAP performance and is best utilized when:

- operator intervention is not required
- it is acceptable to receive and respond to HSC WTORs from any active host console.

Entering cartridges that require operator intervention may create problems in library configurations utilizing automatic mode CAPs, especially if you enter many cartridges without external Tri-Optic labels. WTORs are issued by the host currently servicing the automatic mode CAP which may present an inconvenience if you are expecting the WTORs at a specific host console, but they are being directed to an unattended host console. If you require WTORs to be returned to a specific host console, you must allocate one or more manual mode CAPs and use the Enter command from that host.

CAP Exception Processing

Enter and eject processes are based on a cartridge-by-cartridge basis. This affords a significant amount of isolation between requests. However, in certain cases redundant errors may be incurred due to abnormal conditions external to an individual request. Mechanisms have been provided to help when these situations arise:

- Releasing a CAP may be necessary to free up cartridge and CAP resources and to end an enter or eject process.
- Modifying a CAP offline isolates it from being used until the error is corrected.
- The next use of the CAP invokes CAP cleanup and recovery, which requests that the operator check the CAP for cartridges.

Note: If an enter process has not moved all cartridges from a CAP or an eject process has moved cartridges to the CAP when a release occurs, the cartridges are left in the CAP but are not in the control data set. Refer to the *HSC Operator's Guide* for more details on CAP.

Releasing an Allocated CAP

The RELease *cap-id* operator command allows you to release a CAP that is allocated to a failed host.

A CAP can be left allocated to a system if the HSC terminated without recovery while the CAP is active.

When you issue the command, appropriate messages inform you of conditions and actions to take. You are prompted by an initial message to confirm or terminate release of the specified CAP. This confirmation prevents the release of a CAP that is currently being used by the system.

This feature is of significant importance to you by giving you control to release a CAP without having to recycle all of the HSCs that share control data sets.

Refer to the *HSC Operator's Guide* for additional information.

Near Continuous Operations

A number of HSC facilities and techniques are provided that customers can employ to avoid outages and make changes less disruptive to their library hardware and HSC environment.

This section discusses the following topics:

- using multiple CDS copies
- automatic recognition of configuration changes
- using the MERGEcds utility
- using the SET utility instead of LIBGEN and reconfiguration
- defining a new configuration to avoid future reconfigurations
- defining planned ACSs with no stations
- defining planned drives
- changing panels
- using CDS rename/relocate/expand.

In addition, several other timesaving benefits are described in other places in the HSC documentation set. These are:

- resolving LSM and panel type configuration mismatches. Refer to either the *HSC Configuration Guide*, ‘‘Configuration Mismatches,’’ in Chapter 7, ‘‘Initializing the HSC’’ **or** see the *HSC System Programmer’s Guide*, “Configuration Mismatches” on page 165.

- changing drive panel types without running a MERGEcds or reconfiguration. Refer to the *HSC System Programmer’s Guide*, “SET Device Numbers for Drives” on page 330.

- automatic internal cold start for HSC 2.0.1 and later releases. Refer to either the *HSC Configuration Guide*, ‘‘Starting HSC Execution’’ in Chapter 7, ‘‘Initializing the HSC’’ **or** see the *HSC System Programmer’s Guide*, “Starting HSC Execution” on page 164.

- suppressing the ‘‘ACS Disconnected’’ message to allow for future hardware expansion. Refer to the *HSC Operator’s Guide*, ‘‘OPTION Command and Control Statement,’’ in Chapter 2, ‘‘Commands, Control Statements, and Utilities.’’

Using Multiple CDS Copies

When multiple copies of the CDS are defined and enabled, the HSC automatically recovers from errors on one of these copies. In a multiple-host environment, CDS recovery is coordinated among the HSCs on all hosts.

- When there is a mismatch between information on the same block on the primary and secondary CDS copy, the HSC automatically selects the most recent copy. When the CDS is updated, the modified block is written to both the primary and secondary CDS copies.

- If a secondary CDS copy is active, and a failure occurs in accessing the current primary CDS copy, the HSC automatically makes the secondary CDS copy the

primary copy. If a standby CDS copy is active, the new primary CDS copy is copied over the standby CDS copy, and the standby becomes the new secondary copy.

- If a standby CDS copy is active, and a failure occurs in accessing the secondary CDS copy, the current primary CDS copy is copied over the standby CDS copy, and the standby becomes the new secondary copy.

To utilize full automatic CDS recovery capabilities of the HSC, StorageTek recommends that all three CDS copies (primary, secondary, and standby) should be used. CDS copies must be created (by the SLICREAT program), defined to the HSC (by the CDSDEF control statement in PARMLIB), and active (by the CDs Enable/Disable command). CDS copies should be located on different DASD volumes for redundancy.

For more details about automatic CDS recovery, refer to “Control Data Set Recovery” on page 57 and “CDS Recovery Capabilities” on page 365.

Automatic Recognition of Configuration Changes

Some changes to the library configuration are automatically recognized by the HSC.

Automatic Update of LSM from 4410 to 9310

When an LSM comes online, the LSM type is reported to the HSC by the LMU. If the LSM is defined in the CDS as a 4410, but it is actually a 9310 (PowderHorn), the LSM type is automatically updated in the CDS. Thus, an LSM upgrade from a 4410 to a 9310 is automatically recognized and recorded in the CDS without running the MERGEcds or Reconfiguration utilities.

Note: Replacing a 9310 with a 4410 LSM does not result in an automatic update of the LSM type. (In some cases the hardware report of this change may not be accurate.)

If an LSM is defined to the HSC as a 9310, but it is actually a 4410, the HSC manages it without problems, since the panel configurations and LMU requests and responses are the same for 4410 and 9310 LSMs. However, HSC preferencing by LSM type will not work correctly in the following cases:

- ALLOC LSMpref(*lsm-type*) for scratch requests
- MNTD SCRDISM(CURRENT/ARCHIVE) for scratch dismount requests.

Run-time Recognition of 9740 CAP Configuration

The 9740 CAP can either be a 14-cell array, or it can hold a 10-cell removable magazine. The HSC recognizes the current CAP size when the LSM is modified online. This allows the user to change the 9740 CAP configuration without running the MERGEcds or Reconfiguration utilities or recycling the HSC.

Using the MERGEcds Utility

The MERGEcds utility replaces the Reconfiguration utility and also copies volume information from specified ACSs and/or LSMs to other specified ACSs and/or LSMs. As a result, MERGEcds supports all of these activities:

- adding new ACSs and/or LSMs to a configuration or changing a configuration (currently, the Reconfiguration utility does this).
- merging two or more libraries and CDSs into a single library and CDS (without requiring an AUDIt to update the resulting CDS with volume information from the second and later libraries).
- splitting a single library and CDS into two or more libraries and CDSs, and using MERGEcds to copy the volume information from the old CDS to the new CDS for each library.
- merging two or more ACSs into a single ACS. For example, if you merge ACS 01 and 02 into a single ACS 01, and if both ACSs contain two LSMs, LSMs 020 and 021 become LSMs 012 and 013.
- splitting an ACS into two or more ACSs.
- changing the ACSid and/or LSMid of ACS(s) and/or LSM(s), and using MERGEcds to copy the affected volume information from the old CDS to the new CDS.

Refer to “MERGEcds Utility” on page 260 for syntax and procedural information.

Using the SET Utility Instead of LIBGEN and Reconfiguration

Changing a configuration using the MERGEcds or Reconfiguration utilities requires a global outage. Many of the changes made by the SET utility can be performed while HSC subsystems are up that are not directly affected. Then, these subsystems can be recycled (brought down and then restarted) to pick up the changed information. Cycling the affected HSCs can be done at a convenient time, with only one HSC down at a time. This permits an HSC server to remain up, servicing requests from clients such as MVS/CSC.

Note: In many instances, the SET utility can run while HSC subsystem(s) are active. However, some SET options require that the HSC(s) affected must be down, e.g., SET HOSTID.

In most cases, the LSM and/or ACS affected must remain offline until HSCs on affected hosts are recycled, e.g., when deleting or changing drive unit addresses with SET SLIDRIVS.

In most cases, all affected HSCs must be recycled to reinitialize and support the new configuration. Refer to “SET Utility” on page 317 for restrictions on the specific SET options and processes to follow when making configuration changes.

Defining a New Configuration to Avoid Future Reconfigurations

When you define a new configuration with LIBGEN, you can add some flexibility to avoid running MERGEcds or reconfigurations in the future.

- If additional hosts may be added later, define dummy host IDs now.
  Entries for future hosts can be defined in the SLILIBRY macro, `HOSTID=(host0,...,host15)` parameter. For example, host IDs of FREE1, FREE2, and FREE3 could be defined. Then, the SET utility HOSTID option can be used to change these ‘‘reserved’’ host IDs to the new ones being added to the configuration.

```
SET HOSTID(newhost),FORHOST(FREE1)
```

- When a CDS is created, it is desirable to allocate more then the minimum amount of space. The free blocks can be used later when additional drives are added.

Defining Planned ACSs with no Stations

HSC 5.1 allows users to define an ACS without specifying station addresses (refer to the SLIACS macro in the *HSC Configuration Guide*).

Using this feature means that a planned ACS can be placed into the LIBGEN/SLICREAT process and remain disconnected without generating message SLS1664A (`‘‘ACS AA is disconnected’’`) or requiring the user to enter the OPTion DISCmsg command to suppress SLS1664A.

If planned ACSs have been defined previously with dummy station addresses, these stations can be removed using the SET SLISTATN utility. In this case, the user does not specify any output stations. Refer to “SET LMU Station Address Numbers” on page 333 for more details.

When the planned ACS becomes available, SET SLISTATN can be used to add stations for the ACS. The ACS can then be brought online without recycling the HSC.

Defining Planned Drives

For MVS 5.2 and later, unit addresses can be defined for devices that do not physically exist. The HSC allows users to exclude these drives from being allocated in the following cases:

- If the drives are to be added outside the library and are identified in the nonlibrary esoteric (NNLBDRV), they can be excluded from allocation by specifying MODel(IGNORE) in the UNITATTR control statements.
- If the drives are to be added inside the library and are identified in the ACS esoteric (ACSDRV), they can be excluded from allocation by specifying them in the SLIDRIVS LIBGEN macro, or in the SET SLIDRIVS utility, as library unit addresses.

Note: Drive panels can contain either four, ten, or twenty drive addresses. For example, by defining ten unit addresses for panels that contain only four physical drives, users can reserve addresses for planned drives.

Changing Panels

The following procedures describe methods to make changes to panels. These include changing panels types in an LSM and removing cartridges to facilitate hardware changes.

- To change panel types in an LSM:

  1. Use the SET utility to freeze the panel, preventing any additional cartridges from being moved to it. This prohibits new cartridge home cell locations from being allocated on the frozen panel.

```
SET FREEZE(ON),FORLSMID(aal),FORPANEL(pp)
```

  2. Use the MOVe utility or the MOVe or EJect commands to move all cartridges off the panel being changed

```
MOVe Flsm(aal) Panel(pp) TLsm(aal)
```

     Because the panel has been frozen, cartridges cannot be moved to it, and it will remain empty.

  3. Change the panel type, either using the SET SLIDRIVS utility to change between standard and wide drive panels or running the LIBGEN, SLICREAT, MERGEcds process to change other panel types.

Notes:

1. StorageTek CSEs will change the library hardware at the same time the panel type is being changed.
2. The HSC must be recycled before the LSM and ACS containing the changed panel configuration can be brought online to the HSC.

4. After the hardware changes are complete, unfreeze the panel, if it is still frozen.

```
SET FREEZE(OFf),FORLSMID(aal),FORPANEL(pp)
```

Notes:

1. If a frozen panel type is changed by the MERGEcds or Reconfiguration utilities, the new panel is not frozen. Frozen panels that did not change remain frozen after a MERGEcds or reconfiguration.
2. When SET SLIDRIVS is used to change panel types, SET FREEZE(OFf) can follow the SET SLIDRIVS statement.

- To remove cartridges from rows on panel(s) to facilitate hardware (e.g., cabling) changes:

1. Use the SET utility to freeze the panel, preventing any additional cartridges from being moved to it. This prohibits new cartridge home cell locations from being allocated on the frozen panel.

```
SET FREEZE(ON),FORLSMID(aal),FORPANEL(pp)
```

2. Use the MOVe utility or the MOVe or EJect commands to move all cartridges off the panel rows being changed.

```
MOVe Flsm(aal) Panel(pp) TLsm(aal)
```

Because the panel has been frozen, cartridges cannot be moved to it, and the rows will remain empty. The StorageTek CSEs will make the hardware changes required.

3. After the hardware changes are complete, unfreeze the panel, if it is still frozen.

```
SET FREEZE(OFf),FORLSMID(aal),FORPANEL(pp)
```

Using CDS Rename/Relocate/Expand

The HSC can rename, relocate, and expand an existing CDS(s) without requiring tape activity to be suspended or the HSC to be taken down on all hosts. To use these features, users must be at HSC 5.0 or later, however, compatible down-level releases of the HSC may be initialized after the CDS has been modified as long as the CDSDEF control statements are consistent with the active CDS definitions.

For a rename or relocation operation, the CDS must be disabled (inactive) on all HSC hosts to ensure that no active HSC hosts attempt to update or read the target CDS copy during a rename or relocation activity. When using the CDS EXpand function, all CDS copies are reformatted at the same time, so all CDSs must be enabled (active) on all hosts.

CDs Command

The CDs operator command provides rename, relocation, and expand capabilities. Refer to the "Commands, Control Statements, and Utilities" chapter in the *HSC Operator's Guide* for a description of the keywords used to perform these operations.

Renaming/Relocating a CDS - Scenarios

To rename and relocate a CDS copy, only one copy of the CDS must be disabled at a time. For example,

```
CDS DISABLE DSN(ACS.DBASEOLD)
```

Renaming a CDS Copy

Before you enable the renamed CDS copy, assume only one CDS has been disabled using the CDs Disable command (see above), and ACS.DBASEOLD is renamed to ACS.DBASECPY. The inactive (disabled) data set is then enabled using the following command:

```
CDS ENABLE DSN(ACS.DBASECPY)
```

If the Enable command fails for the renamed CDS, CDS definitions are restored to what they were before the command was issued. Users must modify CDSDEF control statements to keep them consistent with the active CDS.

Renaming and Relocating a CDS Copy

To relocate a CDS copy with the CDS Enable command, the user must first create a data set containing the appropriate CDS attributes: a fixed, 4096-byte record, single extent, physical sequential file. Optionally, users may rename the CDS.

The data set can be created using JCL as shown for the SLICREAT job discussed in the *HSC Configuration Guide* or using the TSO 3.2 Data Set Utility facility.

Note: TSO 3.2 may create a single extent data set even when no secondary quantity is specified.

It is not necessary to initialize the CDS copy, that is, you do not have to execute SLICREAT or copy another CDS copy to the new data set.

Assume that ACS.DBASECPY has been disabled and deleted (or uncataloged), and ACS.DBASENEW has been allocated and cataloged. The following command enables the renamed and relocated CDS:

```
CDS ENABLE DSN(ACS.DBASENEW) NEWLOC
```

Note: MVS uses catalog services to resolve the volume and unit definitions, if not specified.

If a rename or relocate operation fails, CDS definitions are restored to what they were before the command was issued. Users must modify CDSDEF control statements to keep them consistent with the active CDS.

Relocating an Uncataloged CDS Copy

Assume that ACS.DBASECPY has been disabled and deleted (or uncataloged), and ACS.NOTCATLG has been allocated and cataloged. The following command relocates an uncataloged CDS copy:

```
CDS ENABLE DSN(ACS.NOTCATLG) NEWVOL(HSC00 1),NEWUNIT(ABC)
```

Users must modify CDSDEF control statements to make them consistent with the CDS definitions in this command. If a rename or relocate operation fails, CDS definitions are restored to what they were before the command was issued.

Note: The **NEWVOL** and **NEWUNIT** parameters are required for VM.

Expanding a CDS - Scenario

Before expanding all CDSs, each CDS must be disabled one at a time and created with a larger space allocation in the JCL. Then, all CDS copies must be enabled before issuing the following command:

```
CDS EXPAND
```

Warning: StorageTek recommends backing up all CDS copies prior to issuing the CDS EXpand command. Failures during the expand operation usually cause the CDS to be unusable. It is important to back up the CDS before invoking the CDS EXpand command to insure that the latest copy of the CDS is available in case of a failure during the expand operation.

The number of formatted blocks in the CDS remains constant for all copies of the CDS regardless of the physical space allocated for CDS copies. The number of formatted blocks is determined by the maximum number of 4096 blocks that can be written in the smallest CDS copy.

Users must modify CDSDEF control statements to make them consistent with the CDS definitions in this command.

Common Recovery Functions

Common recovery functions consist of information gathering from the control data sets and journals, and processing to recover from a database or hardware failure.

The most vital recovery function is control data set recovery which is described in this section.

Control Data Set Recovery

Control data sets contain valuable information required for the HSC software and the library to function. The control data sets contain:

- inventory information on all volumes in a library
- the library configuration, including how many ACSs, LSMs, tape transports, etc.
- information about library hardware resource ownership across multiple processors
- information for controlling the communication link between HSC subsystems running on multiple processors.

The HSC subsystem has the capability of operating with several control data sets and journals simultaneously:

- **Primary control data set** — This data set is required for every installation
- **Secondary control data set** — This data set is optional, but highly recommended
- **Standby control data set** — This data set is strictly optional, but also recommended

Note: The SLIRCVRY LIBGEN macro TCHNIQE parameter determines how many CDS copies will be initialized by the SLICREAT program and whether or not journals will be initialized by SLICREAT. Refer to ‘‘SLIRCVRY Macro’’ in the *HSC Configuration Guide* for more information.

The number of CDS copies used by the HSC is dependent on the number of CDS copies defined in the CDSDEF PARMLIB control statement. It is not determined by the TCHNIQE parameter.

The HSC uses all of the CDS copies defined in the CDSDEF control statement (whether this includes more or less CDS copies than are specified by the TCHNIQE parameter). However, if journaling is specified by the TCHNIQE parameter, journals must be defined for successful HSC initialization.

- **Journals** — Two journals per host are kept to record library transactions. Each journal contains a record of changed data. The changed data consists only of bytes of data that have been changed. The record is made at the time the transaction occurs. The journals can be applied to a backup control data set, for recovery purposes, to make the control data set current.

Note: Journals are optional and are no longer a recommended recovery method. Secondary and standby data sets provide a faster and more reliable method for ensuring CDS integrity.

Control data sets can be accessed by different hosts and are kept synchronized. In event of a failure, the BACKup and RESTore utilities can be used to perform extensive error checking and synchronization of the data. A backup control data set and journals are used to reconstruct the control data sets.

The integrity of the control data sets is extremely important. In multiple processor environments, data set integrity is much more difficult to maintain. Because of this, the HSC subsystem is designed to keep the control data sets intact and configured to recover from failures. Features such as shadowing for the control data set, journaling, backup and restore were previously in place in prior releases to maintain data set integrity.

Control Data Set Recovery Techniques

There are several techniques to accomplish control data set recovery. These techniques are:

- dynamic recovery of CDS errors (when possible)
  - switch
  - internal CDS directory rebuild
  - standby CDS copy.
- diagnostic information on CDS errors, error detection, and correction of the CDS through the BACKup and RESTore utilities
- the ability of the HSC to continue running on one copy of the CDS
- user control of enabling and disabling control data sets with operator commands
- automatic communication with other hosts in a complex when control is switched from one CDS to another.

User Control of Control Data Sets

The HSC offers flexibility for definition and control of control data sets. User control of these data sets includes:

- allocation of data sets at initialization
- ability to dynamically enable or disable the library control data sets
- reassigning control data set names in the Database Heartbeat record.

Allocation of Control Data Sets

Control data sets are defined at HSC initialization by PARMLIB control statements rather than defined by JCL. These definitions are invoked at HSC initialization and remain set until HSC termination. The definitions cannot be altered without HSC shutdown and restart.

See “PARMLIB Control Statements” on page 83 for additional information.

Dynamic Enable/Disable of Control Data Sets

Operator commands are supplied to give you control over which data sets the HSC is utilizing. This functionality is particularly useful in a multiple-processor environment.

Before attempting to enable or disable any data set, you can use the Display CDS command to display the current status of the control data sets.

The commands to enable or disable a control data set can be issued without halting HSC execution or disrupting any running HSC.

Refer to the“CDS Enable/Disable Command’’ in the *HSC Operator’s Guide* for detailed information about operator commands for enabling or disabling control data sets.

Reassigning Control Data Set Names in Database Heartbeat Record

The names of the control data sets are recorded by the HSC in the Database Heartbeat (DHB) record to identify the correct primary, secondary and standby control data sets. When HSC is initialized, it assigns its control data set copies as primary, secondary and standby based on the Database Heartbeat record, not on the assignment in the CDSDEF PARMLIB statement.

Assigning specific control data sets as primary, secondary, and standby happens automatically and is not normally of concern.

Either of the following procedures can be used to change the assignment of control data sets as primary, secondary and standby in the Database Heartbeat record.

- Procedure using CDS Disable and CDS Enable commands:

  1. Use CDS Disable and CDS Enable commands to rotate the control data sets into the desired sequence.
  2. Use the Display CDS command to view the current status and assignment of the control data sets.

  For example, to switch the assigned order of a primary control data set (with `DSN=SLS.DBASE1`) and a secondary control data set (with `DSN=SLS.DBASE2`):

  1. Issue the command:

```
DISPLAY CDS
```

     to view the current control data set status and assignments.

  2. Make the current secondary control data set the new primary control data set by issuing the command:

```
CDS DISABLE PRIMARY
```

3. Make SLS.DBASE2 the new secondary control data set by issuing the command:

```
CDS ENABLE DSN=SLS.DBASE2
```

4. Issue the command:

```
DISPLAY CDS
```

to view the current control data set status and assignments.

- HSC BACKup and HSC RESTore procedure:
  1. Stop the host software on all hosts.
  2. Back up the control data set with the HSC BACKup utility.
  3. Restore the control data set with the HSC RESTore utility. This will clear the control data set information in the Database Heartbeat record.
  4. Start an HSC system, specifying the desired primary, secondary, and standby control data sets in the CDSDEF PARMLIB statement. During HSC initialization, the control data sets assigned as primary, secondary, and standby will be recorded in the Database Heartbeat record.

Renaming Control Data Sets

The control data set names are recorded in the Database Heartbeat (DHB) record. During HSC initialization, the data set names in the DHB are compared with the DSNs specified in the CDSDEF PARMLIB control statement.

If a DSN specified in the CDSDEF statement does not match any of the control data set names recorded in the DHB, that DSN is disabled. If all the specified DSNs are disabled, the HSC will not initialize. The specific assignment of enabled DSNs to the primary, secondary, and standby control data set(s) is made based on the control data set assignments recorded in the Database Heartbeat record.

If the control data set(s) needs to be renamed, use the HSC BACKup and RESTore utilities as described in the rename procedure below. Do **not** use MVS, TSO ISPF, or third-party utilities to rename the control data set(s) without running the BACKup and RESTore utilities.

Procedure to Rename Control Data Sets

Use the following procedure to rename the control data set(s):

Note: Use this procedure to move or copy the control data sets to new data set names, if the new control data sets are to be used as the control data sets. In these cases, the new control data sets can be allocated when they are restored.

1. Stop the HSC on all hosts.
2. Back up the control data set using the HSC BACKup utility. Refer to “BACKup Utility” on page 214 for details on the BACKup utility.
3. Rename the control data sets using standard MVS or TSO ISPF utilities. If you want to move the control data sets, this can be done at this time.
4. Restore the backup of the control data sets to the renamed control data sets using the HSC RESTore utility. Refer to “RESTore Utility” on page 285 for details on the RESTore utility. The control data set names in the Database Heartbeat record are blanked out.
5. Start the HSC, specifying the desired primary, secondary, and standby control data sets in the CDSDEF PARMLIB control statements.

During HSC initialization, the new control data set names are recorded in the Database Heartbeat record.

Command Functions

Command functions consist of real-time control of automated cartridge handling, dynamic selection of HSC processing options, and various query operations.

Figure 5 illustrates the specific areas within a library where HSC commands enable you to control processing.

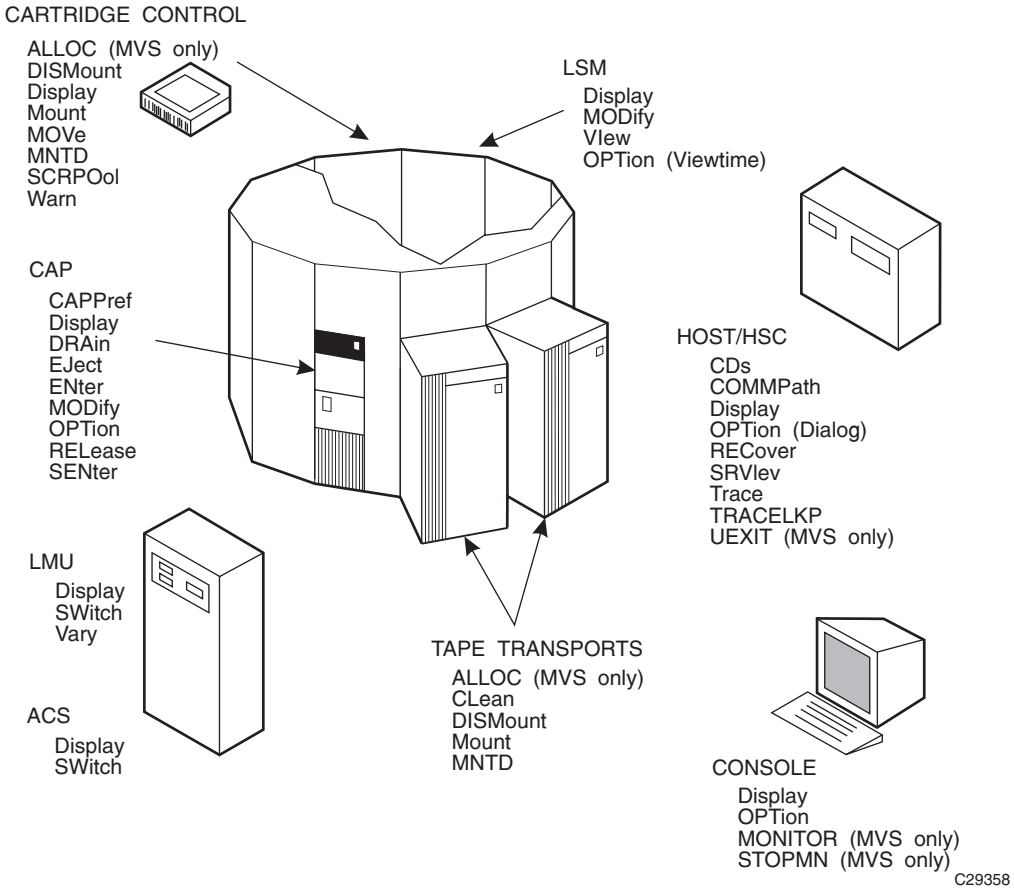

Figure 5. HSC Command Functions Overview

Refer to Chapter 2, ‘‘Commands, Control Statements, and Utilities’’ in the *HSC Operator’s Guide* for a complete description of HSC operator commands, syntax, and examples for usage.

If you are interested only in reference information on command syntax, refer to Appendix A, “Macros, Control Statements, Utilities, and Commands Syntax Reference” on page 503.

Enabling/Disabling/Reloading User Exits

User exits can be enabled, disabled, or reloaded without interrupting library operations or recycling the HSC.

Note: The above statement is true for all user exits except User Exit 03. User Exit 03 is enabled at HSC initialization, and the UEXIT operator command cannot be used to disable or reload the exit.

You can specify a unique exit load module name to the HSC by using the UEXIT operator command. This command permits you to enable, disable, or reload any user exit that you have customized for the HSC.

Refer to the ‘‘User Exit (UEXIT) Command and Control Statement’’ in the *HSC Operator’s Guide* for detailed information about the UEXIT command.

Advantages of Using the UEXIT Command

If any of your user exits do not perform as expected, you can easily disable the exit, make any required changes, then reload and enable it again. This all can be done without interfering with the operation of the HSC and your library system.

Controlling LSM Operating Mode

The operating mode for any LSM is controlled by using the MODify command to place the LSM online or offline. An LSM operating mode is a relationship between an LSM and all attached hosts. The two LSM operating modes are:

- automatic — the LSM is online to all hosts.
- manual — the LSM is offline to all hosts.

When an LSM is online, the LSM is in the automatic mode, meaning that the robot is fully operational. When an LSM is offline, the LSM is in manual mode.

Refer to the *HSC Operator’s Guide*, Chapter 4, “JES3 Support” on page 171 for procedures describing how to operate an LSM in manual or automatic mode.

Controlling CAP Operating Mode

The operating mode for CAPs is controlled by the CAPPref and MODify commands. The four CAP operating modes are:

- automatic — the user can enter cartridges into an LSM without using HSC commands or utilities.
- manual — the user must issue HSC commands and utilities to use the CAP.
- online — the CAP is online to all hosts.
- offline — the CAP is offline to all hosts.

Refer to the *HSC Operator's Guide*, Chapter 3, ''Operating an Automated Cartridge System,'' for a description of CAP modes and Chapter 4, ''Managing Library Resources,'' for procedures describing how to operate an LSM in manual or automatic mode.

Viewing the Interior Components of an LSM

Should you have a need to determine the state of a tape transport or any other component inside of an LSM, you can use the VIew command to ''see'' inside of an LSM for visual inspection of a tape transport, pass-thru port, storage cell, CAP, or playground cell.

Using the VIew command offers benefits; you do **not** need to:

- vary tape transports offline
- modify the LSM offline
- physically open the LSM access door to inspect the inside of the LSM
- disable the LSM for minutes at a time.

Note: This feature is standard on the model 4410 (Cimarron), 9310 (PowderHorn), and 9740 LSMs. A 9360 (WolfCreek) LSM requires an optional vision system.

Using the VIew command to Inspect an LSM Component

When you issue the VIew command, you direct the vision system to focus on an item inside of the LSM for a specified length of time. Upon entering the command, the following events occur:

- A VIew request is sent to the controlling LMU.
- A WTOR is displayed on the console when the camera is in position; the message indicates which camera/robot hand is focused on the specified object.

  Note: If you respond to the message before the expiration of the requested time interval, the VIew request is cancelled.

  Refer to the OPTion command and the Viewtime parameter for controlling the view interval. See ''OPTION Command and Control Statement'' in the *HSC Operator's Guide* for a description of the operator commands.

- The message on the console is DOMed.
- Optionally, a subtype 8 SMF record is written. The record includes the length of time that the camera was held in a static position for this particular VIew command. Refer to Appendix B, "Record Formats" on page 561 for more information on SMF records.

Utility Functions

Utility functions provide control and recovery of library resources. In addition, reporting of library and volume activity can be invoked using various HSC utilities.

Figure 6 illustrates the control concept provided by the various HSC utilities.

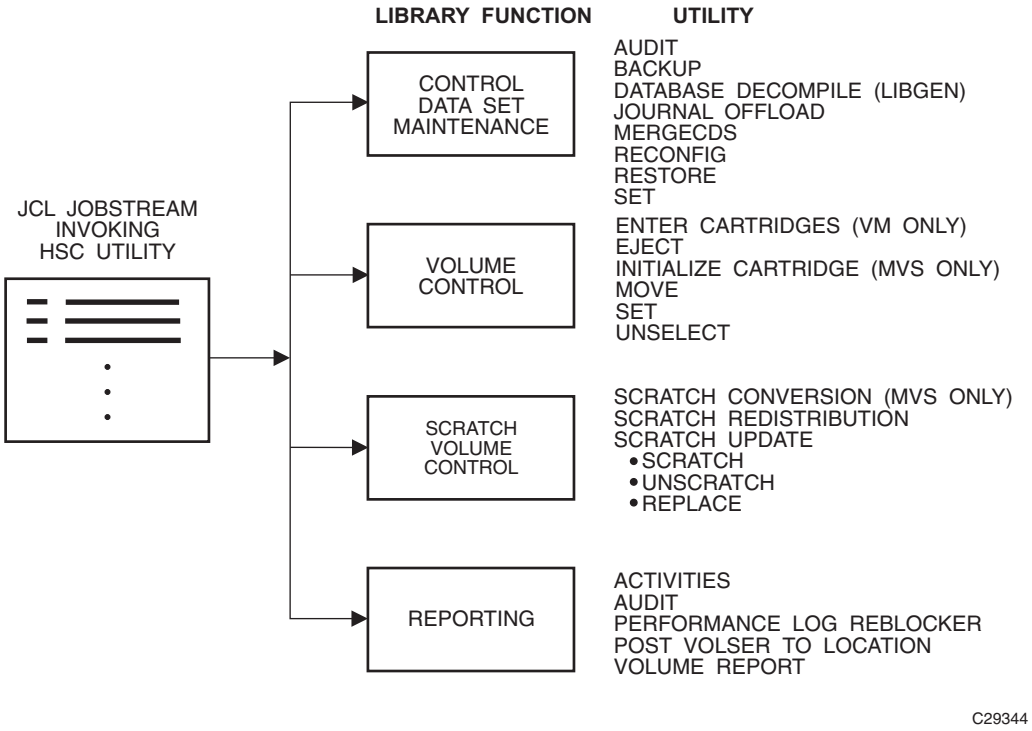

Figure 6. Utility Functions Overview

Refer to Chapter 5, “Utility Functions” on page 181 for detailed descriptive information about all HSC utilities, including description, syntax and parameters, JCL requirements and examples, and samples of output.

LMU Server Functions

LMU server functions control each of the Automated Cartridge Systems within a library. Many of the LMU server functions are completely transparent to users. This section contains information about LMU server tasks of which you should be aware.

Dual LMU Functionality

With dual LMU functionality, a switch happens when the LMU designated as the master fails, or is forcibly switched by issuance of an operator command. The operator is also notified when the LMU designated as the standby fails.

If the Master LMU Fails

When the master LMU fails:

- the standby LMU detects the failing master and informs the HSC
- the HSC reports the failure by issuing a message
- the HSC reacts as necessary to recover and continue processing mounts and dismounts.

If the Standby LMU Fails

The standby LMU constantly polls the master. The master LMU acknowledges this polling.

In the communications between the HSC and the master LMU, the master, as part of its acknowledgment, informs the HSC of the status of the standby. The standby LMU is either ready or not ready.

The master LMU thinks that the standby is ready if the standby has polled the master in the required time interval. If the standby LMU has not polled the master in the required time interval, the master informs the HSC that the standby is not ready.

The HSC issues a message which is highlighted and non-scrollable. This informs the operator of the status change (not ready) in the standby LMU.

Operator Control of LMUs

A library operator can control which LMU is operating with the SWitch command. When the SWitch command is issued, all hosts connected to the ACS are affected.

If after entering a SWitch command, the new master LMU fails and the switchover does **not** occur in 20 seconds, the HSC attempts to resume working with the old master. (The HSC has been waiting for the standby LMU to take over as the master LMU, but the switch did not take place.)

If the SWitch command fails, the system issues an error message. The operator can force the completion of the command-generated switchover either by:

- manually re-IPLing the master LMU, or
- powering off the master LMU.

LMU Switchover Messages

The *HSC Messages and Codes Manual* contains all the messages appropriate to the LMU switchover process.

After an LMU Switch Occurs

After a switch of LMUs occurs and the LSMs have finished quick initialization procedures, all cartridge motion requests are redriven and completed. If a motion request cannot be completed, the cartridge in question is made errant.

Note: ENter and EJect operations may need to be restarted after a switchover.

HSC/LMU Software Combinations

Table 4 describes the various possible combinations of HSC software with LMU microcode and installed hardware. The table indicates valid combinations.

Table 4. HSC/LMU Validity Matrix

HSC Version	LMU Version	Number of LMUs Powered Up	Valid Combination	Functionality Available
1.2 + ECap SPE	3.2	1	Yes	New HSC features are available. Dual LMU can be configured*, but switchover cannot occur.
		2	Yes	New HSC features are available. Dual LMU must be configured*. Switchover can be automated.
1.2 or later	3.6 or later	1	Yes	New HSC features are available. Dual LMU can be configured*, but switchover cannot occur.
		2	Yes	New HSC features are available. Dual LMU must be configured*. Switchover can be automated.
2.0 or later	9315/30 1.0 or later.	1	Yes	New HSC features are available. Dual LMU can be configured*, but switchover cannot occur.
		2	Yes	New HSC features are available. Dual LMU must be configured*. Switchover can be automated.

* Configuration of dual LMU is done by a StorageTek Customer Services Engineer (CSE).

Adding New Stations to an ACS

The following is an example of JCL for the SET utility that can be used as a pattern for adding new stations to an ACS without requiring a reconfiguration.

Note: Update LIBGEN control statements to make changes permanent. You do not have to execute the Reconfig utility to implement these changes. Refer to "Reconfiguration Utility" on page 279 for more information about reconfiguration.

JCL to Add New Stations to an ACS

```
//HSCUPDAT JOB (acctno),'LMU STATIONS',MSGCLASS=1,CLASS=A,
//             MSGLEVEL=(1,1)
//STEPØ   EXEC PGM=SLUADMIN
//*  The following DD is the HSC STEP library
//STEPLIB   DD DSN=SLS.PROD.LINKLIB,DISP=SHR
//SLSPRINT  DD SYSOUT=*
//* The following DD statement identifies the HSC primary CDS
//SLSCNTL   DD DISP=SHR,DSN=SLS.DBASE1
//*  The following DD statement identifies the HSC secondary CDS
//SLSCNTL2  DD DISP=SHR,DSN=SLS.DBASE2
//SLSIN     DD *
  SET SLISTATN(ØCD,ØCE,ØDØ,ØD1) FORACS(Ø) FORHOST(MVS1)
  SET SLISTATN(ØCD,ØCE,ØDØ,ØD1) FORACS(Ø)
//
```

Notes for the Example

1. The first SET control statement defines the listed stations for only one host.

   Note: All stations must be specified (not just the new ones).

2. The second SET control statement defines the listed stations for all hosts.

   Note: All stations must be specified (not just the new ones).

3. The following are installation dependent:
   - STEPLIB data set
   - SLSCNTL data set
   - SLSCNTL2 data set
   - station identifiers
   - ACS numbers
   - host IDs.

4. The standby CDS is not required for this JCL.

The HSC does not need to be recycled to recognize the new addresses. Varying the ACS offline and back online automatically uses the new station configuration.

Reconstructing a LIBGEN

The Database Decompile (LIBGEN) utility can be used to reconstruct a LIBGEN, reflecting the true configuration of your HSC subsystem if for some reason your LIBGEN has been lost.

Refer to “Database Decompile (LIBGEN) Utility” on page 227 for details on how to use the Database Decompile utility.

Dynamic LMU Connection

LMU network connections can be defined dynamically to TCP/IP addresses using the LMUPATH and LMUPDEF control statements.

Note: For information on implementing TCP/IP connections, refer to the LMUPATH and LMUPDEF control statements in Chapter 3, "HSC Control Statements and HSC Start Procedure" and to display information about the LMUPDEF data set, refer to Display LMUPDEF in the *HSC Operator's Guide*.

In addition to the control statements, the following informational and procedural topics are discussed in this section:

- security administration considerations
- recovery maintenance requirements
- HSC port number assignments
- multiple TCP/IP stack implications
- transitioning between 3270 and TCP/IP
- recovering TCP/IP communications
- configuring VM for TCP/IP support.

Security Administration Considerations

All users at OS/390 V2R5 and above must define an OMVS segment in RACF for the userid associated with the HSC. If this is not done, an OS/390 UNIX process initialization failure occurs. To define the OMVS segment, refer to the IBM document "*OS/390 IBM Communications Server IP Migration Guide*."

If you are running a functionally equivalent security product (e.g., ACF2), refer to the documentation for that product.

Recovery Maintenance Requirements

Two sets of PTFs must be applied to allow the recovery processes described in "Recovering TCP/IP Communications" on page 73 to function correctly:

- for HSC 4.0, L1H10KE and L1H10LC
- for HSC 4.1, L1H10L4 and L1H10LE.

These PTFs contain HOLDDATA that describes new messaging and station status during recovery.

For HSC release levels later than HSC 4.0 and 4.1, these enhancements are included in the base FMID.

HSC Port Number Assignments

The 9330 TCP/IP LMU listens on ports 50001 through 50016. The port assignment used by the HSC is determined by adding the host index number within the CDS to 50000, i.e.,

host index number + 50000

Users can find out the host index number of the system(s) running the HSC by entering:

```
Display CDS
```

Part of the output from this command displays hostids using this CDS. The first hostid in the list represents host index number 1, the second host index number 2, and so forth.

For example, if a user enters Display CDS and the following output appears

```
HOSTID---LEVEL-FLAG---DESCRIPTION---
MVSA     4.0.0 (F0)   ACTIVE PRIMARY SECONDARY STANDBY
MVSB     4.0.0 (F0)   ACTIVE PRIMARY SECONDARY STANDBY
MVSC     4.0.0 (F0)   ACTIVE PRIMARY SECONDARY STANDBY
MVSD     4.0.0 (F0)   ACTIVE PRIMARY SECONDARY STANDBY
```

then, MVSA is host index number 1, which when added to 50000 means that the HSC on MVSA uses port number 50001, the HSC on MVSB uses 50002, the HSC on MVSC uses 50003, and the HSC on MVSD uses 50004.

Multiple TCP/IP Stack Implications

When multiple TCP/IP stacks run on the same host as the HSC, the TCP/IP stack used for LMU communications must be identified to the HSC.

Modify the HSC JCL to include the SYSTCPD DD statement. This statement must specify the TCPIP.DATA data set used by the TCP/IP stack for LMU communications. The TCPIP.DATA data set contains configuration information required by the TCP/IP client and server programs.

Transitioning Between 3270 and TCP/IP

A number of methods are available to move between 3270 station connections and TCP/IP LMU network attachment. **StorageTek recommends cycling the HSC as the preferred process to transition between 3270 and TCP/IP.** However, the following procedures offer alternative ways to accomplish the transition.

Note: The host ACS client must be upgraded to NCS 4.0 or higher and must be running IBM TCP/IP.

3270 to TCP/IP

1. After the hardware modification to the LMU has been made to support network communications, vary the stations offline.

   ```
   Vary STation Ø28 OFFline
   ```

   Notes:

   1. Users can also vary the ACS offline.

      ```
      Vary ACS ØØ OFFline
      ```

   2. Station addresses specified in the LIBGEN SLISTATN macro do not have to be removed for the HSC to communicate to the LMU using TCP/IP.

2. Load the LMUPDEF statements containing the LMUPATH parameters that specify the hostname or IP address for each ACS.

   ```
   LMUPDEF DSN('xxx.xxx.xxx(xxx)')
   ```

   StorageTek recommends that the LMUPDEF statement be specified in the initialization parameters, however, this statement can be issued from the console as well.

3. Use the Vary ACS command to bring each ACS online. Message SLS0054I indicates that the ACS is online. After all ACSs to be network-attached are online, the HSC is ready for processing.

TCP/IP to 3270

1. Vary the ACS offline.

   ```
   Vary ACS ØØ OFFline
   ```

2. Load an LMUPDEF control statement that includes either an empty data set (no statements) or a data set that only contains an OPTion TITLE statement.

3. Either vary the ACS online, or vary the 3270 station addresses online.

Recovering TCP/IP Communications

StorageTek suggests either performing a normal HSC shutdown or changing the HSC state to the base service level prior to recycling TCP/IP or taking TCP/IP down for any extended period of time.

Note: Please refer to "Recovery Maintenance Requirements" on page 70 to see PTFs that must be applied before recovery processes discussed in this section can be implemented.

Unlike 3270 station protocol, TCP/IP station protocol requires the socket interface to be reopened (restarted) by the HSC before communication to the LMU can be reestablished. If the LMU station connection is lost, the HSC begins network recovery to the station. During recovery, the HSC continues trying to reestablish the connection between its socket and the remote station socket every 10 seconds for 30 minutes. Once the network problem is resolved, the next time the HSC attempts network connectivity, it reestablishes communication to the LMU.

Note: When 30 minutes is exceeded, no further reconnection attempts are made, and operator intervention is required.

In a dual LMU environment, users can switch to the standby station if other host processing is not greatly impacted. If connectivity is lost to both LMU stations, network recovery is simultaneous.

When the HSC detects TCP/IP interface errors or timeout conditions, message SLS6012E is issued.

```
SLS6012E ACS AA recovery of network connection to station C...C is now
active
```

When the HSC successfully recovers network connectivity, message SLS6013I is issued and all outstanding LMU requests are redriven.

```
SLS6013I ACS AA recovery of network connection to station C...C
successful
```

If the HSC network recovery times out, message SLS6014E is issued, the station is considered in error, no further reconnection attempts are made, and operator intervention is required.

```
SLS6014E ACS AA unable to reestablish connection to station C...C
```

Caution: During network recovery or timeout situations, only use the Display Acs command to view ACS and station status. The Display Cap and Display LSM commands involve LMU requests and will not execute.

Operator Intervention - Single LMU Configuration

If the HSC network recovery times out, the ACS is automatically changed to an offline state and all outstanding LMU requests are purged. After troubleshooting the network connection, vary the ACS online.

```
Vary ACS acs-id ONline
```

Note: During network recovery, the ACS can be forced offline, however, all outstanding LMU requests are purged. StorageTek recommends that users allow the HSC network recovery process to remain active and not to force the ACS offline.

Operator Intervention - Dual LMU Configuration

Communication Lost to Master LMU

If network recovery times out on the master LMU, and the HSC is still connected to the standby LMU, the ACS is still considered in an online state. Issue the SWitch command to make the current standby LMU the new master LMU.

```
SWitch Acs acs_id
```

The HSC redrives requests to the new master LMU.

Communication Lost to Standby LMU

If network recovery times out on the standby LMU, resolve the network problem and IPL the standby LMU. After the IPL is complete, the master LMU notifies the HSC that the standby LMU is now ready and network connectivity is reestablished with the standby.

Communication Lost to Both LMUs

If network recovery times out on both LMUs, the ACS is automatically changed to an offline state and all outstanding LMU requests are purged. After the network problems are resolved, vary the ACS online.

Note: When network recovery is active on the master and standby LMUs, the ACS can be forced offline, however, all outstanding LMU requests are purged. StorageTek recommends that users allow the HSC network recovery process to remain active and not to force the ACS offline.

Configuring VM for TCP/IP Support

The following items must be updated to allow VM to support TCP/IP station protocol.

- System Definition File
- System Profile File
- HSC Startup Job File
- LMUPATH Definition Data Set.

System Definition File (ACS SYSDEF)

To define the IUCV connection with the LMU communications component, add the TCP/IP file statement to the ACS SYSDEF file.

```
FILE LCOMM IUCV <tcpip> DSN <tcpip>.LMU.COMM
```

where *tcpip* is the user ID of the TCP/IP service machine.

System Profile File (ACS SYSPROF)

Add the LMUPDEF command and control statement to the ACS SYSPROF file.

```
LMUPDEF <vaddr> DSN <dsname> VOL <volser>
```

where

vaddr is the virtual address of the data set that contains the LMUPATH statements.

dsname is data set name.

volser is the volume serial number of the volume on which the data set resides.

HSC Startup Job File (ACS SLKJCL)

Add the LMUPDEF command and control statement to the ACS SLKJCL file.

```
LMUPDEF DSN(dataset.name) VOLUME(volser) UNIT(vaddr)
```

where

dataset.name is data set name of the volume.

volser is the volume serial number of the volume on which the data set resides.

vaddr is the virtual address of the data set that contains the LMUPATH statements.

Initializing the LMUPATH Definition Data Set

The next three tasks apply to the LMUPATH definition data set.

Minidisk Statement for the LMUPATH Data Set

Add a minidisk statement to the directory entry for the STKACS userid. Refer to "Define the ACS Service Machine" in the *HSC 4.0 VM Installation Guide* for an example.

Minidisk Format

Format the minidisk as an OS or CMS RESERVED minidisk using the SLIMDISK utility. Refer to "Allocation of OS-formatted Minidisk" and "Allocation of CMS RESERVED Minidisk" in the *HSC 4.0 VM Installation Guide* for more information.

Commands to Format OS Minidisk:

```
EXEC SLIMDISK <vaddr> <volser> (INIT

EXEC SLIMDISK <vaddr> <volser> <numcyls> 4080 80 DSN <dsname>
```

where

vaddr is the virtual address.

volser is the DASD volume serial number.

numcyls is the number of cylinders to allocate.

dsname is the data set name to assign to this space.

Commands to Format CMS Reserved Minidisk:

```
EXEC SLIMDISK CMSR <vaddr> <volser> 512 (INIT

EXEC SLIMDISK CMSR <vaddr> <volser> DSN <fname> <ftype>
```

where

vaddr is the virtual address.

volser is the DASD volume serial number.

fname is the file name of the data set.

ftype is the file type of the data set.

LMUPATH Definition Data Set

Add the LMUPATH statements to the LMUPDEF data set using the ACS UTIL VOLCOPY command.

Note: ACS UTIL VOLCOPY creates skeleton JCL that you modify to match your configuration.

```
/JOB  SLSXUTIL SLUGENER
/PARM RECCOPY
/FILE SYSPRINT DEV PRNT CLASS A
/FILE SYSUT2 DEV <vaddr> DSN <dsname>
/FILE SYSUT1 *
LMUPATH ACS(aa) LMUADDR(nnn.nnn.nnn.nnn)
LMUPATH ACS(aa) LMUADDR(nnn.nnn.nnn.nnn)
      .
      .
      .
```

Communication Functions

HSC communication functions ensure that passing of pertinent information between HSC components and hosts is accomplished successfully.

Host-to-Host Communications Services

The HSC permits you to select the hierarchy of methods used for host-to-host communications. The communications services are designed to provide you with fail-safe communications between HSC hosts in a data center complex.

Information Passed Between Hosts

The following kind of information is passed between hosts:

- control data set switch information
- CAP status information.

Types of Communications Services

Communications services that are available fall into three categories:

- telecommunications access method through the ACF/VTAM network — This method of host-to-host communications provides the highest performance and reliability.
- communication through the LMU — This method of host-to-host communications is a lower performance method than ACF/VTAM.
- communication through the CDS — This method of host-to-host communications is a lower performance method than either ACF/VTAM or LMU.

Figure 7 on page 79 illustrates the available communication methods and relative hierarchy of the methods.

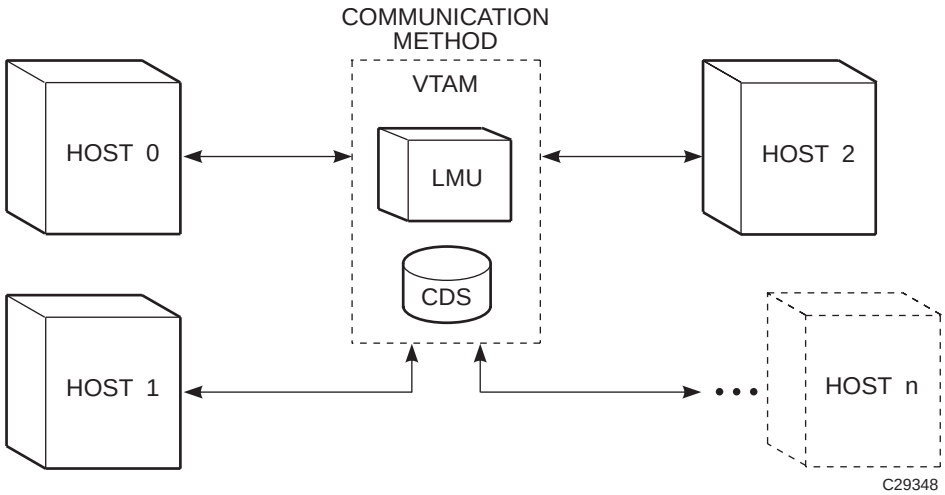

Figure 7. HSC Communication Methods

How Communications Services are Set or Changed

Communications services are set or changed by the Communications Path (COMMPath) command and control statement. This command specifies host, communication method, LMU paths and VTAM path name for the associated host. The communication path definitions can be modified at any time during library operation without terminating the HSC.

The COMMPath command and control statement sets up a table of definitions for the host that is executing the command. Each host's table must contain a list of path definitions for itself and a separate list for each defined host. Therefore, on each host, the command must be issued once to define the paths for itself, once to define the paths for a second host, once to define the paths for a third host, and so on, until all hosts are defined.

For example, the library is operating in an environment with three hosts: Host 0, Host 1, and Host 2. The COMMPath command must be issued three times on each host. The table of definitions for Host0 must contain a list of paths for Host 0, a list for Host 1, and a list for Host 2. The same is true for Host 1 and Host 2.

For one host to communicate with another, they must have matching entries in their respective lists of defined paths. The highest-performance method that is common to two hosts is selected as the current method of communications between the two. A host can use one method of communications with a second host, and a different method of communications with a third host.

Figure 8 on page 80 illustrates how different communication methods can be used between multiple hosts.

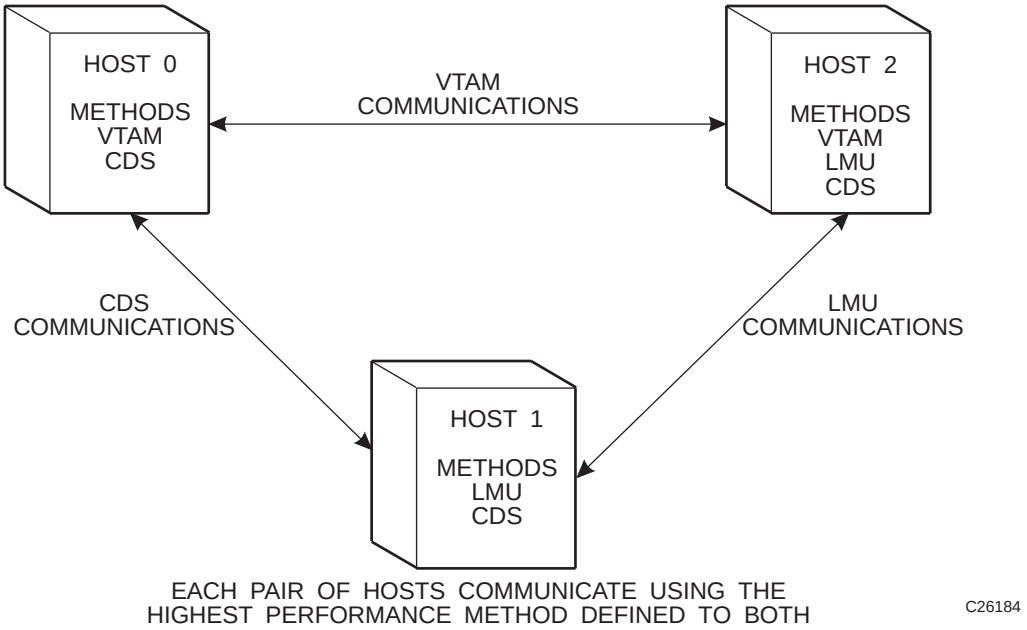

Figure 8. HSC Communication Methods Between Multiple Hosts

COMMPath can be specified by an operator as an operator command, or by a systems programmer as a PARMLIB control statement. Before COMMPath is issued, all methods of communications are set to CDS. Refer to ‘‘Communications Path (COMMPath) Command and Control Statement’’ in the *HSC Operator’s Guide* for information on the usage of the command.

It is recommended that host-to-host communications be defined in PARMLIB at startup. The COMMPath operator command is best used to switch communications paths, or to delete paths.

Displaying Current Status of Communication Services

The current status of the communications method is displayed by issuing the Display operator command. Issuing the Display command, specifying the COMMPath parameter, and optional HOSTid parameter results in a summary display at the console.

When issuing the command, individual host IDs or all hosts can be specified. If you exclude the HOSTid parameter in the command, a summary of current parameter settings for all hosts is displayed in a message. If the HOSTid is specified as ‘‘*’’ the current settings are displayed for the host from which the command is entered. If the ALL parameter is issued, the current settings for all defined hosts are displayed.

The message provides a summary list for the current HSC host-to-host communications parameters.

Tracing the host-to-host communications method is done with the operator Trace command. Upon issuance of the command at the system console, an appropriate message is displayed indicating a list of ACS subsystem components with tracing status.

Switching Communications Paths

The performance ranking of the communications methods takes on meaning when it becomes necessary to switch from one method to another because of a failure. A switch can be initiated automatically by the HSC or dynamically by the operator using the COMMPath command. The HSC issues a message to the console when a communications path switch occurs, regardless of how it is initiated.

The HSC can initiate

- a lateral switch from one defined LMU path to another, or
- a downward switch from a higher performance method to any lower performance method (VTAM to LMU, LMU to CDS, or VTAM to CDS).

The COMMPath command can initiate a switch to a higher, lower, or equivalent method.

Note: After an automatic downward switch has occurred, an upward switch can only be accomplished using the COMMPath command.

Software Requirements

The following software requirements apply:

- LMU 3.0 (or higher) or 9315/9330 1.0 (or higher) µ-software is required for a multiple-level communications service.
- ACF/VTAM 3.2 (or higher) must be available to use the VTAM method of communications.

Programmatic Interface

The programmatic interface component provides you with the interface definitions to use for customizing the HSC. Using the detailed definitions provided, you can interface third-party software or create custom programming to run with the HSC.

In MVS, tape management systems are interfaced to the HSC using user exits rather than through the programmatic interface.

Refer to Appendix D, “Programmatic Interface (PGMI)” on page 685 for detailed information about programmatic interfaces.

Batch Application Program Interface (API)

The Batch API allows you to retrieve 2.0- and 2.1-level CDS information in batch mode. The CDS specified as input to the request does not have to be active nor does it have to be referenced by the HSC address space (the request executes in the user address space). In addition, the HSC does not have to be active to submit the request. Refer to “Batch Application Program Interface (API)” on page 819 for more information.

Chapter 3. HSC Control Statements and HSC Start Procedure

Overview

This chapter discusses two kinds of control statements, PARMLIB (below) and definition data set (refer to “Definition Data Set Control Statements” on page 105), and the HSC Start procedure (refer to “HSC Start Procedure” on page 159). For more information about HSC installation and initialization, refer to the *HSC Configuration Guide.*

PARMLIB Control Statements

Parameter library (PARMLIB) control statements provide you a way, at HSC initialization, to statically specify various operation parameters. Identifying your system needs and then specifying various control statements permits you to tailor the HSC to the needs of your data center.

Some PARMLIB options can be altered after HSC initiation with the HSC running. These options can be changed using an appropriate operator command. With these options it is not necessary to stop the HSC and restart it to initialize the new or changed options that you want to specify. Those PARMLIB control statements that can be altered with the HSC running are identified as PARMLIB commands or control statements in this chapter.

Any operator command can be specified as a PARMLIB control statement.

Note: Refer to Appendix A, “Macros, Control Statements, Utilities, and Commands Syntax Reference” on page 503 for the rules and conventions that apply to command and control statement syntax.

Defining PARMLIB Control Statements

PARMLIB control statements are defined in a sequential data set or a single partitioned data set (PDS) member that is opened when the HSC is initialized.

There are two methods for defining PARMLIB control statements:

- defining PARMLIB members in user-defined data sets
- defining PARMLIB members in SYS1.PARMLIB.

The PARMLIB control statements are invoked by specifying MEMBER(*xx*) or M(*xx*) on the input parameter in the startup procedure. The suffix ‘‘*xx*’’ is concatenated with

SLSSYS to form a name. The name is used either as the ddname in the startup procedure or as a member in SYS1.PARMLIB.

If the ddname is not specified in the startup procedure, then the SYS1.PARMLIB data set is dynamically allocated and a search for the member name is made in that data set.

If the data set named in the SLSSYS*xx* DD is a partitioned data set (PDS), you MUST specify the member name containing the control statements. If the SLSSYS*xx* DD is a sequential data set, only the data set name (DSN) needs to be specified.

With either method, the PARMLIB data set (or SYS1.PARMLIB member) is opened and read to obtain the parameters for running the HSC software.

Note: Although SYS1.PARMLIB can be used in a multiple-system environment, it is recommended that a user-defined data set, other than SYS1.PARMLIB, be used.

Processing PARMLIB Control Statements

PARMLIB control statements are processed at HSC initialization.

The following are examples of JCL for HSC execution. The examples contain DD statements defining data sets and members that contain PARMLIB control statement definitions.

Example JCL Defining Sequential PARMLIB Data Sets

```
//SLSØ        PROC
//IEFPROC     EXEC PGM=SLSBINIT,
//            TIME=144Ø,
//            REGION=2ØØØK,
//            DPRTY=(7,5),
//            PARM='E(EØ86) F(23) M(ØØ)'
//*
//STEPLIB     DD DISP=SHR,DSN=SLS.SLSLINK
//*
//SLSSYSØØ    DD DISP=SHR,DSN=parmlibØ-data set
//SLSSYSØ1    DD DISP=SHR,DSN=parmlib1-data set
//SLSSYSØ2    DD DISP=SHR,DSN=parmlib2-data set
```

Example JCL Defining Partitioned PARMLIB Data Sets

```
//SLSØ        PROC
//IEFPROC     EXEC PGM=SLSBINIT,
//            TIME=144Ø,
//            REGION=2ØØØK,
//            DPRTY=(7,5),
//            PARM='E(EØ86) F(23) M(ØØ)'
//*
//STEPLIB     DD DISP=SHR,DSN=SLS.SLSLINK
//*
//SLSSYSØØ    DD DISP=SHR,DSN=parmlibØ-data set(member)
//SLSSYSØ1    DD DISP=SHR,DSN=parmlib1-data set(member)
//SLSSYSØ2    DD DISP=SHR,DSN=parmlib2-data set(member)
```

Note: In the JCL examples, ‘‘M(*xx*)’’ is the MEMBER parameter described in “Defining PARMLIB Control Statements” on page 83.

Multiple PARMLIB data sets can be allocated. At HSC startup, members can be specified at your discretion.

Examples of SLSSYS*xx* command streams and PARMLIB control statements are contained in members SLSSYS00, SLSSYS12, and SLSSYS20 of the HSC SAMPLIB.

Options Offered by PARMLIB Control Statements

The PARMLIB control statements offer various HSC operating options. At HSC installation you identify the control statements to the HSC for those processes that you want to tailor to your installation. The options are placed in the PARMLIB data set. Options that you can control by using PARMLIB control statements are summarized below. Refer to "Control Statement Syntax Conventions" on page 513 for information on specifying control statements.

Note: PARMLIB control statements that apply only to system programmer tasks are described in this guide. These include:

- Control Data Set definition
- EXECPARM Control definition
- Journal Data Set definition
- License Key definition
- Reconfiguration definition
- Scratch Subpool definition.

The other command and control statements appear in the *HSC Operator's Guide*.

Device Allocation

Device allocation specifications are specified by the ALLOC control statement, or ALLOC operator command, to tailor HSC for influencing the operating system processing of device allocation. Refer to ''Allocation (ALLOC) Command and Control Statement'' in the *HSC Operator's Guide* for more information.

CAP Preference Definition

This control statement and operator command defines an ordered list of CAPs that is used by the library when cartridges are being entered or ejected. Refer to ''CAP Preference (CAPPref) Command and Control Statement'' in the *HSC Operator's Guide* for detailed information.

Note: The CAPPref AUTO and MANual settings should not be placed in PARMLIB. If these settings are used and the CAP is already in the selected mode, the command is rejected without changing the preference value.

Control Data Set Definition

With this control statement and operator command, you specify the control data set definitions and the number of control data sets that you want running. CDS definition information is specified in the CDSDEF control statement. Refer to "CDS Definition (CDSDEF) Control Statement" on page 89 for control statement syntax, parameter information, and example statements.

Communications Path Definition

This control statement and operator command provides you a way to set the communications path utilized in a multi-host environment. A hierarchy for communications can be established. If a communications failure occurs, the hierarchy defined ensures continued operation of HSC software and the communications path. Refer to ''Communications Path (COMMPath) Command and Control Statement'' in the *HSC Operator's Guide* for more information.

EXECPARM Control Definition

The EXECPARM control statement provides an alternative method for specifying GTF event and format IDs normally specified in the subsystem startup procedure. This control statement also provides you with the option of displaying the command prefix preceding WTO or WTOR messages. Refer to "EXECParm Control Statement" on page 92 for control statement syntax, parameter information, and example statements.

Journal Data Set Definition

In this control statement you specify the journal data set definitions. Journal information is specified in the JRNDEF control statement. Refer to "Journal Definition (JRNDEF) Control Statement" on page 94 for control statement syntax, parameter information, and example statements.

License Key Information

This control statement is used to input license key information for the HSC and LibraryStation. It is placed in a data set or Partitioned Data Set member identified by an LKEYDEF control statement in the HSC START procedure, and must be present for HSC and/or LibraryStation to initialize.

Mount/Dismount Processing Control

With the MNTD control statement and operator command, you can tailor the HSC's response to mount or dismount processing that occurs. For example, some of the functions that you can control include:

- automatic or manual dismount and/or scratch
- console message display
- maximum count for use of cleaning cartridges
- device where scratch volumes mounted in a WolfCreek LSM are to be dismounted or archived
- maximum number of pass-thrus allowed for a cartridge to be archived.

Refer to ''MNTD (Mount/Dismount Options) Command and Control Statement'' in the *HSC Operator's Guide* for control statement syntax, parameter information, and example statements.

Option Control

The general purpose OPTion control statement and operator command provides you methods to control the following:

- viewing time when using the VIew command
- issuance of a message if an attempt is made to enter duplicate volumes into a library
- display of uppercase and lowercase characters output at the system console
- maximum number of cartridges that can be ejected for one eject operation

- volume processing associated with a specific CAP when the CAP is drained or becomes unavailable before an eject operation completes.

Refer to ‘‘OPTION Command and Control Statement’’ in the *HSC Operator’s Guide* for control statement syntax, parameter information, and example statements.

Reconfiguration CDS Definition

The RECDEF control statement is used during reconfiguration to specify the new primary and secondary CDS definitions. Refer to “Reconfiguration CDS Definition (RECDEF) Control Statement” on page 100 for control statement syntax, parameter information, and example statements.

Scratch Subpool Definition

With this control statement, you can specify new scratch pools. Using this control statement is recommended over using User Exit 03 (SLSUX03). Refer to “Scratch Subpool Control Statement” on page 102 for control statement syntax, parameter information, and example statements.

User Exit Execution Control

This control statement and operator command allows you to enable or disable specified user exits. Refer to ‘‘User Exit (UEXIT) Command and Control Statement’’ in the *HSC Operator’s Guide* for control statement syntax, parameter information, and example statements.

Virtual Storage Manager (VSM) Support

VSM support has been added for certain HSC PARMLIB control statements. See the VTCS documentation for more information.

CDS Definition (CDSDEF) Control Statement

The CDSDEF control statement is required and provides static information to the HSC. This information is used by the HSC at initialization and remains for the life of the HSC execution.

The static information includes both specified and implied parameters of the CDSDEF statement. For example, if you code your CDSDEF control statements and do not include volume and unit information, the HSC determines the volume and unit from the MVS catalog at HSC startup time. You cannot change a CDS volume or unit without stopping HSC; therefore, if you

- disable a CDS
- uncatalog a CDS
- recatalog a CDS on a new VOLSER
- enable a CDS.

the HSC reallocates the original uncataloged CDS. The HSC stores the CDS volume and unit information and this information remains static for the life of the HSC execution, even though you did not explicitly specify the volume or unit parameters.

The primary, secondary, and standby control data sets are dynamically allocated. The CDSDEF PARMLIB control statement defines which copies of the control data set are used while the HSC is running.

Information used to build the SVC99 parameter lists is acquired from the parameter data set.

If journaling is active, JRNDEF statements must be used (refer to “Journal Definition (JRNDEF) Control Statement” on page 94 for more information).

Control information provided to the HSC by CDSDEF includes:

- the name(s) for HSC control data set(s)
- the DASD volume where the specified CDS resides
- the unitname for the SVC99 parameter list for CDS allocation
- switch information controlling the enabling of a standby CDS.

Note: The number of CDS copies used by the HSC is dependent on the number of CDS copies defined in the CDSDEF PARMLIB control statement. Control and journal data sets **cannot** be defined in JCL; the CDSDEF statement **must** be in the PARMLIB definitions. It is not determined by the LIBGEN SLIRCVRY macro TCHNIQE parameter.

The HSC uses all of the CDS copies defined in the CDSDEF control statement (whether this includes more or less CDS copies than are specified by the TCHNIQE parameter). However, if journaling is specified by the TCHNIQE parameter, journals must be defined for successful HSC initialization.

The HSC RECONFIG utility uses CDS copies defined by JCL DD statements. JCL must be used to define the old and new CDS copies when VIO is used to minimize

the time required to run RECONFIG. For more information about the RECONFIG utility, see “Reconfiguration Utility” on page 279.

Caution: Parameters specified for the CDS definition cannot be changed without a complete restart of the HSC on all hosts.

Syntax

```
►►──CDSDEF──DSN1(dataset.name)──┬──────────────────────────────────┬──────────►
                                └──,VOL1(volser),UNIT1(unitname)───┘

►──,DSN2(dataset.name)──────────┬──────────────────────────────────┬──────────►
                                └──,VOL2(volser),UNIT2(unitname)───┘

►──,DSN2(dataset.name)──────────┬──────────────────────────────────┬──┬──────┬──►◄
                                └──,VOL3(volser),UNIT3(unitname)───┘  └──,DISABLE──┘
```

Control Statement Name

CDSDEF
initiates the control statement.

Parameters

DSN*x*
dataset.name is the name of an HSC control data set. At least one DSN parameter must be specified, as many as three can be specified. If two data sets are specified, then the volume inventory information on both copies is kept current, and these two data sets are referred to as the primary and the secondary CDS.

If all three are specified, then two copies are kept current and the third data set is a standby CDS which is enabled as the default condition. This standby CDS can be disabled with the **DISABLE** parameter. In the case where a standby copy of the CDS is being used, you do not need to specify which two of the three CDSs are the primary and secondary copies. The HSC determines, based on last use, which two are the correct copies to use during the initialization of the Control Data Set Services.

VOL*x*
optionally, *volser* is the volume serial number of the DASD volume where the specified CDS resides. If the data set is not cataloged, this must be specified.

UNIT*x*
optionally, *unitname* is used to specify the unit parameter in the SVC99 dynamic allocation parameter list. If omitted, SYSALLDA is used.

DISABLE

optionally, disables the standby CDS. If this parameter is not specified, the default is to enable the standby CDS at HSC initialization.

If **DISABLE** is specified, initialization verifies the standby CDS by allocating, opening, and reading the data set. The standby CDS is then closed and deallocated. This process allows manual control over the use of the standby CDS during a control data set switch situation.

If the standby CDS is enabled, the HSC automatically uses it for switching. If it is disabled, it is not used. There is no enable parameter for CDSDEF, as the enable condition is the default.

Example

The following is an example of using the CDSDEF control statement.

CDSDEF Control Statement

```
CDSDEF DSN1(SLS.DBASE),VOL1(HSC101),UNIT1(501),+
       DSN2(SLS.DBSEC),VOL2(HSC102),UNIT2(502),+
       DSN3(SLS.DSTBY),VOL3(HSC103),UNIT3(503),+
       DISABLE
```

Note: Control statements can only be continued if PARMLIB begins with a /*...*/ comment statement (see “Control Statement Syntax Conventions” on page 513).

When entering a 4 digit address (MVS/ESA 5.1+), the address must be prefixed with a “/”. For example, Unit1=/1501.

EXECParm Control Statement

The EXECParm control statement is an alternative method for specifying the GTF event ID (Eid(*gtfeid*)) and GTF format ID (Fid(*gtffid*)). The EXECParm control statement also provides a parameter that enables you to control display of the system command prefix when messages are written to the operator at the system console. This parameter controls the command prefix on WTO and WTOR messages.

Refer to "Creating an HSC START Procedure" on page 159 for a description of the start procedure and how it relates to EXECParm.

Syntax

```
►►─EXECParm──┬──────────────────────────────────┬──┬──────────────────┬──┬──────────────────┬──►
             │                ┌─Yes─┐           │  └─,Eid(gtfeid)─────┘  └─,Fid(gtffid)────┘
             └─MSGPRFX(─┬─No──┴─────┬─)──────────┘
                        └─────────┘

►──┬──────────────────────────────┬──────────────────────────────────────────────────────────►◄
   └─,HOSTID(host-id)─────────────┘
```

Control Statement Name

EXECParm
initiates the control statement

Parameters

MSGPRFX
optionally, specifies control of whether the command prefix is to precede WTO or WTOR messages to the operator.

Yes
indicates that the command prefix is to display preceding WTO or WTOR messages to the operator.

No
indicates that the command prefix is not to display preceding WTO or WTOR messages to the operator.

Eid
optionally, *gtfeid* specifies a GTF event ID.

PARM='Eid(*user-specified-event-id*)' parameter is valid for use in the HSC initialization procedure as an alternative method of specifying the GTF event ID.

Fid

optionally, *gtffid* specifies a GTF format ID.

PARM='Fid(*user-specified-format-id*)' parameter is valid for use in the HSC initialization procedure as an alternative method of specifying the GTF format ID.

HOSTID

optionally, *host-id* specifies the system ID associated with the request to process the EXECParm control statement.

Note: If the *hostid* specified does not match the host executing the command, the command is ignored and no message is issued.

Example

The following example illustrates the use of the EXECParm control statement.

EXECParm Control Statement — Command Prefix Off

```
EXECP MSGPRFX(NO) E(Ø86) F(23) HOSTID(MVS1)
```

Journal Definition (JRNDEF) Control Statement

The JRNDEF control statement provides static information to the HSC. This information is used by the HSC at initialization and remains for the life of the HSC execution. Control information provided to the HSC by JRNDEF includes:

- the name for HSC journal data sets

Note: If your recovery technique involves using journals, both journal data sets are required. HSC will not initialize if only one journal data set is provided.

- the DASD volume where the specified journal resides
- the unitname for the dynamic allocation parameter list for journal allocation
- journal full options.

In a multi-host complex, a separate JRNDEF statement is required for each host. Refer to "CDS Definition (CDSDEF) Control Statement" on page 89 for information about defining CDS files.

Syntax

```
►►─JRNDEF──DSN1(dataset.name)──┬──────────────────────────────────┬──────────►
                               └──,VOL1(volser),UNIT1(unitname)───┘

►──,DSN2(dataset.name)──┬──────────────────────────────────┬──┬──────────────┬──►
                        └──,VOL2(volser),UNIT2(unitname)───┘  │              ┌Abend──┐
                                                              └──,FULL(──────┤       ├──)──┘
                                                                             └Continue─┘

►──,HOSTID(host-id)──────────────────────────────────────────────────────────►◄
```

Control Statement Name

JRNDEF
initiates the control statement.

Parameters

DSN*x*
dataset.name is the name of an HSC journal data set. If journaling is active, each HSC host that comes active must find a JRNDEF statement in PARMLIB with a HOSTID that matches the system where it is running. Each JRNDEF statement **must specify two distinct journal DSNs.**

Journal data sets cannot be shared between hosts.

VOL*x*
optionally, *volser* is the volume serial number of the DASD volume where the specified journal resides. The volume must be specified if the journal data set is not cataloged.

UNIT*x*
optionally, *unitname* is used to specify the unit parameter in the SVC99 dynamic allocation parameter list.

FULL
optionally, this parameter provides the following options:

Abend
the HSC main address space internally abends if both journals fill to capacity before a CDS backup is executed. **This parameter is the default**.

Continue
library operations in the complex continue to occur **without the benefit of journaling on any host.**

Note: Once journaling is discontinued, the data contained in **all** journals and off-loaded copies cannot be used for recovery purposes. However, by running the BACKup utility, all journals are reset and journaling automatically becomes active again.

HOSTID
host-id is the system ID associated with the journals specified with this control statement. *host-id* must match the HOSTIDs defined by the SLILIBRY macro in the LIBGEN for the subsystem.

Example

The following is an example of using the JRNDEF control statement.

JRNDEF Control Statement

```
JRNDEF DSN1(SLS.JRN01),VOL1(HSC101),UNIT1(510),+
       DSN2(SLS.JRN02),VOL2(HSC102),UNIT2(511),+
       FULL(CONTINUE),+
       HOSTID(MVS1)
```

Note: Control statements can only be continued if PARMLIB begins with a /*...*/ comment statement (see “Control Statement Syntax Conventions” on page 513).

When entering a 4 digit address (MVS/ESA 5.1+), the address must be prefixed with a “/”. For example, Unit1=/1501.

LKEYDEF Command and Control Statement

The LKEYDEF command/control statement retrieves LKEYINFO control statements containing HSC and LibraryStation license key information, and loads them into an address space where they are available for retrieval by the HSC license key validation service.

Warning: The LKEYDEF control statement **must** be present in the HSC START procedure prior to initialization.

Note: Refer to the *MVS/HSC Configuration Guide* for more information about StorageTek license keys.

The LKEYDEF operator command can be issued from the console without terminating the HSC and/or LibraryStation.

Syntax

```
►►─LKEYDEF──┬─DATASET(dataset.name)─┬──┬──────────────────────────►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)──┘

►──┬──────────────────┬──┬──────────────────────────────────────►◄
   └─UNIT(unitname)───┘  └─HOSTID(host-id)──┘
```

Command Name

LKEYDEF
initiates the LKEYDEF command or control statement.

Parameter Descriptions

DATASET or DSN
Specifies the name of the data set containing the LKEYINFO control statement(s).

dataset-name
Indicates the name of the data set.

The definition data set can be a fixed length 80-byte sequential data set, or a fixed length 80-byte member of a PDS. If the definition data set is a member of a PDS, you must enclose the PDS and member name within single quotes.

VOLume
Optionally, specifies the volume on which the data set resides. This parameter is required if the data set is not cataloged.

volser
Indicates the volume serial number.

UNIT

Optionally, specifies the unit where the definition data set resides.

unitname

Indicates the unit name. If the definition data set is not cataloged or this parameter is omitted, a unit name of SYSDA is the default.

HOSTID

Optionally, limits the execution of this command or control statement to the specified hosts.

host-id

Specifies the name of one or more hosts from which to execute this command or control statement.

Example

In the following example, the LKEYDEF control statement specifies that HSC and LibraryStation license key information is retrieved from the data set MY.LKEYINFO.FILE during initialization.

```
LKEYDEF DSN(MY.LKEYINFO.FILE)
```

License Key Information (LKEYINFO) Control Statement

The LKEYINFO control statement is used to input license key information for the HSC and LibraryStation. It is placed in a data set or Partitioned Data Set member identified by an LKEYDEF control statement in the HSC START procedure, and must be present for HSC and/or LibraryStation to initialize.

Note: Refer to the *MVS/HSC Configuration Guide* for more information about configuring your HSC and LibraryStation license keys.

Syntax

```
►►─LKEYINFO──PRODuct(product_identifier)──CUSTomer('customer_name')──────────►

►──SITEno(nnnnnnn)──EXPRdate(yyyyddd)──KEY(license_key_string)──────────────►◄
```

Parameter Descriptions

Note: All parameters must be entered exactly as received from StorageTek.

PRODuct
Specifies the product and release to which the license key applies.

product-identifier
Indicates the product identifier.

The product identifier consists of the HSC or LibraryStation product abbreviation (HSC or LS) followed by a four-character release id. i.e. HSC0500.

CUSTomer
Specifies the customer name as received from StorageTek. A maximum of 20 characters can be entered for the customer name.

customer-name
Indicates the customer name.

SITEno
Specifies the site number as received from StorageTek.

nnnnnnn
Indicates the site number.

EXPRdate
Specifies the expiration date of the license key as received from StorageTek.

yyyyddd
Indicates the expiration date.

KEY
Specifies the license key string as received from StorageTek.

license-key-string
Indicates the license key string.

Examples

In the following example, the LKEYINFO control statement is used to input HSC license key information as received from StorageTek.

```
LKEYINFO PROD(HSC0500) -
         CUST('CUSTOMER NAME') -
         SITE(111222) -
         EXPRD(2002365) -
         KEY(5IX4IX4ITE*T8M3W)
```

In the following example, the LKEYINFO control statement is used to input LibraryStation license key information as received from StorageTek.

```
LKEYINFO PROD(LS0500) -
         CUST('CUSTOMER NAME') -
         SITE(111222) -
         EXPRD(2001001) -
         KEY(RQ2KQ2KQVWT0FR3C)
```

Reconfiguration CDS Definition (RECDEF) Control Statement

The RECDEF control statement, in combination with the CDSDEF control statement (refer to "CDS Definition (CDSDEF) Control Statement" on page 89), defines which CDS copies are to be used when running the Reconfiguration utility. CDSDEF specifies the old input copies of the CDS; RECDEF the new copies.

Note: RECDEF parameters replace the DBPRMNEW and DBSHDNEW DD statements used in previous releases. A new standby CDS created by the SLICREAT program (refer to Chapter 5, ''Initializing the Control Data Sets'' in the *HSC Configuration Guide*) is not affected by reconfiguration. It becomes valid once it is enabled by the HSC.

Syntax

```
►►─RECDEF──────DSN1(dataset.name)──┬──────────────────────────────────────►
                                   └─,VOL1(volser),UNIT1(unitname)─────────┘

►──┬──────────────────────────────────────────────────────────────────────►◄
   └─,DSN2(dataset.name)──┬──────────────────────────────────────────────┬
                          └─,VOL2(volser),UNIT2(unitname)─────────────────┘
```

Control Statement Name

RECDEF
initiates the control statement.

Parameters

DSN*x*
dataset.name is the name of a newly created HSC CDS. At least one DSN parameter must be specified; as many as two can be specified. The first DSN becomes the primary CDS. If specified, the next DSN is created as an identical copy of the primary CDS.

RECDEF DSNs are input for the first HSC initialization as CDSDEF control statements. DSNs can be entered in any order whether or not this is the first initialization. Order is not important, since all copies are identical after the reconfiguration and controlling information is kept in each CDS for subsequent runs.

VOL*x*
optionally, *volser* is the volume serial number of the DASD volume where the specified CDS resides.

UNIT*x*
optionally, *unitname* is used to specify the unit parameter in the SVC99 dynamic allocation parameter list.

Example

The following is an example of using the RECDEF control statement.

RECDEF Control Statement

```
RECDEF  DSN1(SLS.DBASE),VOL1(HSC101),UNIT1(501),+
        DSN2(SLS.DBSEC),VOL2(HSC102),UNIT2(502)
```

Note: Control statements can only be continued if PARMLIB begins with a /*...*/ comment statement (see “Control Statement Syntax Conventions” on page 513).

When entering a 4 digit address, the address must be prefixed with a “/”. For example, Unit1=/1501.

Scratch Subpool Control Statement

The scratch subpool control statement provides you with control of the scratch volume activity in a library. Refer to “Scratch Subpool Management” on page 43 for more information relating to this control statement.

Syntax

```
►►─SCRPOol──NAME(subpool-name)──,RANGE(┌─,──────────┐─subpool-range─)──,LABEL(┌─SL──┐─)──►
                                       └──────────┘                            ├─NL──┤
                                                                               ├─AL──┤
                                                                               └─NSL─┘

►──┬──────────────────────────────────────────────────────────────────────────────────►◄
   │                   ┌─ALL──────────┐
   └──,HOSTID(─────┬───┼─host-id──────┼──────┘
                   │   │ ┌─,──────────┐│
                   └───└─└─host-list────┘
```

Control Statement Name

SCRPOol
control statement identifier.

Parameters

Subpool information is defined in PARMLIB as individual control statements using the following parameters.

NAME
specifies the name of the subpool. A maximum of 13 characters is allowed; blank spaces are not permitted.

Notes:

1. If scratch subpools are defined using User Exit 03 (see “Scratch Subpool User Exit (SLSUX03)” on page 420), the scratch subpool name may be omitted. If the subpool name is not provided by User Exit 03, the subpool index is used as the name. The subpool index is converted to three EBCDIC decimal digits and placed in the left most three positions of the subpool name.
2. A SCRPOol statement containing a duplicate subpool name is ignored unless it immediately follows the first statement that specifies the same subpool name. In this case, the second statement is considered to be a continuation of the first. The following example shows a valid combination:

```
SCRPOOL NAME=POOL1,RANGE=(P10000-P10199),LABEL=SL
SCRPOOL NAME=POOL1,RANGE=(P90000-P20199),LABEL=SL
SCRPOOL NAME=POOL2,RANGE=(P20000-P20199),LABEL=SL
```

In the next example, the second POOL1 statement is not valid and causes an error message to be generated.

```
SCRPOOL NAME=POOL1,RANGE=(P10000-P10199),LABEL=SL
SCRPOOL NAME=POOL2,RANGE=(P20000-P20199),LABEL=SL
SCRPOOL NAME=POOL1,RANGE=(P90000-P90199),LABEL=SL
```

RANGE

subpool-range specifies the volume serial numbers which the subpool represents. Range start and end values are separated by a single dash (-). Multiple ranges may be specified separating each range by commas.

Notes:

1. The range of volume serial numbers must be unique for each subpool; that is, a volume serial number cannot be used in more than one subpool range.
2. Make sure when you are coding multiple ranges of tapes that you do not specify the **RANGE** parameter on different SCRPOol control statements. If more than one SCRPOol statement has been specified, the HSC reads only the **last** RANGE setting it encounters and loads only that range. All other ranges are ignored.

   StorageTek recommends that you specify multiple ranges, separated by commas, on one SCRPOol control statement, if possible.

LABEL

type specifies the label type associated with the applicable subpool. Types include:

SL
standard label

NL
no label

AL
ANSI label

NSL
nonstandard label

HOSTID

optionally, defines the hosts that are valid for this subpool. Multiple *host-lists* may be specified, separating each *host-list* value with a comma. Default HOSTID is ALL.

If you need to define the same subpool name on some but not all hosts, you may duplicate the SCRPOol statement changing the HOSTID parameter as necessary (see

examples). Optionally, you may use separate PARMLIB data sets for each host, but this is not recommended.

Example

The following is an example of using the Scratch Subpool control statement.

Scratch Subpool Control Statements

```
SCRPOOL NAME(SITE1),RANGE(100000-200000,300000-400000),LABEL(SL)
SCRPO   NAME(SITE2),RANGE(500000-540072),LABEL(NL),HOSTID(MVS1)
SCRPO   NAME(SITE2),RANGE(500000-540072),LABEL(NL),HOSTID(MVS6)
SCRPO   NAME(SITE3),RANGE(540081-610094),LABEL(NSL)
SCRPO   NAME(SITE4),RANGE(AP1000-AP1999),LABEL(SL),HOSTID(MVS1,MVS6)
```

Other Methods of Controlling Scratch Subpools

There are other ways to control scratch volumes and scratch subpools in the library. The following are additional methods that may be used:

- Display SCRatch command
- Display command with THReshld parameter
- ENter command specified with SCRatch parameter
- SCREdist utility with SUBpool and BALtol parameters
- EJect command with SCRTCH SUBpool parameters
- Mount command with SCRTCH SUBpool parameters
- Warn command with SCRatch SUBpool and THREShold parameters
- Job Processing User Exit 01
- JES2 Scratch Allocation Exit 02
- Scratch Subpool User Exit 03
- JES3 Scratch Subpool User Exit 04.

Refer to the Chapter 2, ‘‘Commands, Control Statements, and Utilities’’ in the *HSC Operator’s Guide* for more information.

Definition Data Set Control Statements

Definition data sets contain the control statements used to define tape data set storage policies to the HSC. A definition data set must be sequential (it may be a partitioned data set [PDS] member) with any valid record format (RECFM). The syntax rules for the HSC PARMLIB data set designated by SLSSYS*xx* apply to the statements contained in a definition data set, except that comment statements with an asterisk in column one are not allowed. Refer to "Control Statement Syntax Conventions" on page 513 for information about PARMLIB syntax rules.

Each of the following commands cause the HSC to open a definition data set and load its specified attributes:

- LMUPDEF
- SCRPDEF
- TREQDEF (for TAPEREQs)
- UNITDEF (for UNITATTRs)
- VOLDEF (for VOLATTRs).

The user can specify LMUPDEF, SCRPDEF, TREQDEF, UNITDEF, and VOLDEF control statements either in the HSC PARMLIB data set to load the definition data sets at startup, or issue them as operator commands to dynamically load the data sets without stopping the HSC. The LMUPATH, SCRPOol, TAPEREQ, UNITATTR, and VOLATTR statements contained in a definition data set are in effect only on the host that opens the data set. They are not broadcast or propagated to other hosts, and are not maintained across HSC stops and starts. The definition data sets must be opened each time the HSC is restarted.

LMU path (LMUPATH), scratch subpool (SCRPOol), tape request attribute (TAPEREQ), unit attribute (UNITATTR), and volume attribute (VOLATTR), statements may be placed in the same definition data set or in different data sets, depending on your site requirements. Each data set may also contain an OPTion TITLE statement with an identifying string.

If the HSC encounters any other statements when it opens a definition data set, error messages are issued, the statements are ignored, **the definition data set is not loaded, and definition data set processing terminates**. The user must correct the problem statements and reload the data set.

If a single data set contains TAPEREQ, UNITATTR, and VOLATTR statements, the HSC must open the data set three times: once in response to a TREQDEF command, again in response to UNITDEF, and a third time in response to VOLDEF. Each command uses only the statements that apply.

Options Offered by Definition Data Set Control Statements

The following definition data set control statements are included in this chapter:

OPTion TITLE

This control statement allows you to specify a string that identifies a definition data set. Refer to "OPTion TITLE Control Statement" on page 115 for control statement syntax, parameter information, and example statements.

LMU Path

The LMUPATH control statement defines network LMU attachments. Refer to "LMUPATH Control Statement" on page 110 for control statement syntax, parameter information, and example statements.

LMU Parameter Definition

The LMUPDEF command and control statement identifies the definition data set where network LMU network attachment statements reside (see LMUPATH). LMUPDEF can be issued either in PARMLIB or as an operator command. Refer to "LMUPDEF Command and Control Statement" on page 112 for control statement syntax, parameter information, and example statements.

Scratch Subpool Parameter Statement Definition

The SCRPDEF command and control statement identifies the definition data set where scratch subpool parameter statements reside (see Scratch Subpool Control Statement). SCRPDEF can be issued either in PARMLIB or as an operator command. Refer to "Scratch Subpool Definition (SCRPDEF) Command and Control Statement" on page 117 for control statement syntax, parameter information, and example statements.

Tape Request

The TAPEREQ control statement specifies tape request attributes. Refer to "Tape Request (TAPEREQ) Control Statement" on page 120 for control statement syntax, parameter information, and example statements.

Tape Request Definition

The TREQDEF command and control statement identifies the definition data set where the tape request attributes reside (see TAPEREQ). TREQDEF can be issued either in PARMLIB or as an operator command. Refer to "Tape Request Definition (TREQDEF) Command and Control Statement" on page 136 for control statement syntax, parameter information, and example statements.

Unit Attribute

The UNITATTR control statement specifies unit attributes. Refer to "Unit Attribute (UNITATTR) Control Statement" on page 139 for control statement syntax, parameter information, and example statements.

Unit Attribute Definition

The UNITDEF command and control statement identifies the definition data set where the unit attributes can be found (see UNITATTR). UNITDEF can be issued either in PARMLIB or as an operator command. Refer to "Unit Attribute Definition

(UNITDEF) Command and Control Statement" on page 143 for control statement syntax, parameter information, and example statements.

Volume Attribute

The VOLATTR control statement specifies tape volume attributes. Refer to "Volume Attribute (VOLATTR) Control Statement" on page 146 for control statement syntax, parameter information, and example statements.

Volume Attribute Definition

The VOLDEF command and control statement identifies the definition data set where the tape volume attributes can be found (see VOLATTR). VOLDEF can be issued either in PARMLIB or as an operator command. Refer to "Volume Attribute Definition (VOLDEF) Command and Control Statement" on page 156 for control statement syntax, parameter information, and example statements.

Virtual Storage Manager (VSM) Support

VSM support has been added for certain definition data set control statements. See the VTCS documentation for more information.

Defining LMU Network Connections

LMUPATH statements allow users to define LMU network TCP/IP attachments. Network addresses can be specified by host name or LMU IP address.

Defining Tape Request Attributes (TAPEREQ)

TAPEREQ statements describe the media type and recording technique to be used for a particular data set.

TAPEREQ parameters are divided into selection criteria (inputs) and result criteria (outputs). Selection criteria include:

- job name
- step name
- program name (JES2 only)
- data set name
- expiration date or retention period (JES2 only)
- volume type requested (specific or nonspecific)

Result criteria include:

- media type
- recording technique
- model
- device preferencing
- subpool
- esoteric.

Collections of data sets with common characteristics can be identified in a single TAPEREQ statement by specifying wild card characters. For example, if all data sets residing on ECARTs are identified with an ‘‘L’’ as the first character of the data set name, an ‘‘L**’’ could be specified to identify all these data sets in a single TAPEREQ statement.

The TREQDEF command causes the HSC to open the definition data set containing the TAPEREQ statements. See “Tape Request Definition (TREQDEF) Command and Control Statement” on page 136 and “Tape Request (TAPEREQ) Control Statement” on page 120 for descriptions of syntax and parameters.

Defining Unit Attributes (UNITATTR)

UNITATTR statements describe the recording technique attributes of library and nonlibrary transports. Transports are described by:

- unit address
- transport model number.

To allow the HSC to operate correctly, the user must specify UNITATTR statements for all *nonlibrary* **transport models that appear to the operating system as 3490E-type and 3590-type devices.** For library devices, the model type is determined by the LMU. Refer to “Unit Attribute (UNITATTR) Control Statement” on page 139 for more information.

Collections of transports with common characteristics can be identified with a single UNITATTR statement by specifying a list of unit addresses, range of addresses, or multiple ranges of addresses.

The UNITDEF command causes the HSC to open the definition data set containing the UNITATTR statements. See “Unit Attribute Definition (UNITDEF) Command and Control Statement” on page 143 and “Unit Attribute (UNITATTR) Control Statement” on page 139 for descriptions of syntax and parameters.

Defining Volume Attributes (VOLATTR)

VOLATTR statements describe the media type and recording technique attributes of cartridge tape volumes. Volumes are described by:

- volume serial number (VOLSER)
- media type
- recording technique.

To allow the HSC to operate correctly, the user must define VOLATTR statements for all ECART, ZCART, helical, 9840/T9840B (STK1R), and T9940A (STK2) media. Volumes not defined by VOLATTRs are presumed to be standard capacity cartridges for scratch counts.

Collections of cartridges with common attributes can be identified in a single VOLATTR statement by specifying ranges and lists of VOLSERs, or using wild card characters.

Scratch counts are based entirely on VOLATTR information. Accurately defined VOLATTR control statements are critical for correct processing of nonspecific volume requests.

For specific mounts, the actual media type, as determined by the LMU, overrides what is specified in the VOLATTR.

The VOLDEF command causes the HSC to open the definition data set containing the VOLATTR statements. See "Volume Attribute Definition (VOLDEF) Command and Control Statement" on page 156 and "Volume Attribute (VOLATTR) Control Statement" on page 146 for descriptions of syntax and parameters.

Alternatives to Using TAPEREQ Control Statements

If your library contains more than one media type or device type, TAPEREQ, UNITATTR, and VOLATTR control statements can be used to manage allocation. Some alternatives to using TAPEREQ statements are:

- Create esoterics for each device type, and change the `UNIT` parameter in your JCL or DFSMS to specify the esoteric containing the devices you wish to see.
- Create scratch subpools for each media type and define and invoke User Exits 01 and 02 to direct scratch mount requests to the selected subpool.

StorageTek recommends using VOLATTRs for all installations containing mixed media types to ensure correct processing of scratch selections, and using UNITATTRs to define all nonlibrary 3490E and 3590 device types.

Identifying the Definition Data Sets (OPTION TITLE)

The OPTion TITLE control statement places an identifying string in a definition data set to describe the contents of the data set. See "OPTion TITLE Control Statement" on page 115 for descriptions of syntax and parameters.

LMUPATH Control Statement

The LMUPATH control statement allows users to define network LMU attachments. LMUPATH statements are read from the definition data set specified by the LMUPDEF command. The LMUPATH statement must be placed in the definition data set; it cannot be issued as an operator command.

Note: Users can find additional important TCP/IP-related information by referring to "Dynamic LMU Connection" on page 70. To display the LMUPDEF data set, refer to Display LMUPDEF in the *HSC Operator's Guide*.

LMUPATH Usage

LMUPATH statements define the TCP/IP addresses used to communicate between an HSC on a host and the LMU for a specific ACS. Up to two addresses can be specified for each ACS, however, a second address indicates a dual LMU environment.

Note: TCP/IP must be initialized prior to bringing the HSC to the full service level.

Syntax

```
►►─LMUPATH──ACS(aa)──LMUADDR(┌─,──────────────────┐)──────────────────►◄
                             │┌─────────────────┐│
                             └┴─lmu_hostname────┴┘
                              └─nnn.nnn.nnn.nnn──┘
```

Control Statement Name

LMUPATH
initiates the LMUPATH control statement.

Parameters

ACS
specifies the ACS name.

aa
specifies the hexadecimal ACSid value (00 through FF) to identify the LMU used to communicate with an HSC.

LMUADDR

identifies an LMU by IP address or host name for each ACS. To designate a single LMU environment, specify one IP address or host name. To specify a dual LMU environment, users can enter an additional IP address and/or host name.

Note: A maximum of two addresses can be specified.

Users can intermix host name and IP addresses in one LMUPATH control statement. Each parameter entered must represent a different IP address.

lmu_hostname

defines a host name for the TCP/IP connection. The host name can be up to 24 characters long. The first character must be alphabetic.

Note: This option is not supported in VM.

nnn.nnn.nnn.nnn

defines an IP address for the LMU.

Example

The following example shows multiple LMUADDR parameters consisting of an IP address and a hostname. In this case, the second parameter, LMU01, indicates a dual LMU environment.

```
LMUPATH ACS(ØØ) LMUADDR(123.456.789.Ø12,LMUØ1)
```

Note: The host name parameter shown in this example (LMU01) is not supported in VM.

LMUPDEF Command and Control Statement

The LMUPDEF command and control statement is used to specify the definition data set that contains network LMU attachment (LMUPATH) statements. The data set must be a sequential or a partitioned data set (PDS) with any valid record format (RECFM). Also, the data set must contain one or more LMUPATH statements.

The LMUPDEF statement can be specified in PARMLIB, or it can be issued as an operator command to dynamically load or reload LMUPATH parameters. (Refer to ‘‘PARMLIB Control Statements’’ in the *HSC Configuration Guide* for an explanation of PARMLIB.)

If a definition file is changed by a LMUPDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC. If the definition file is to be modified for a given shift or application, remember that the new definition remains in effect until another definition is loaded or the HSC is recycled. The definition file then reverts to the PARMLIB specification. Thus, LMUPDEF can be used to temporarily change a definition file.

Definition commands issued on one host are in effect only on that host. If different hosts use the same definition data set, the LMUPATH parameter statements are shared by those hosts.

Notes:

1. Users can find additional important TCP/IP-related information by referring to “Dynamic LMU Connection” on page 70. To display the LMUPDEF data set, refer to Display LMUPDEF in the *HSC Operator’s Guide*.
2. When the LMUPDEF command is issued, if the definition data set contains errors, an HSC message provides the parameter in error, a description of the problem, and the line number where the error occurred. If the definition data set contains errors, none of the attributes specified in the LMUPATH control statement(s) will be loaded (put into effect). Message SLS1627I is displayed if errors are encountered. If 50 errors are encountered, the remainder of the data set is not checked. Correct the problem and reissue the command.
3. The LMUPDEF command and control statement executes at both base and full service levels of the HSC.
4. If you issue multiple LMUPDEF commands or statements, the last one processed is currently active. You can determine which LMUPDEF statement is active by entering the Display LMUPDEF command.
5. In order for the new IP addresses to take effect, users must first establish IP addresses with the LMUPDEF command. Next, vary the ACS(s) offline and then online, using the Vary ACS operator command.

Syntax

```
►►─LMUPDEF─┬─DATASET(dataset.name)─┬─┬──────────────────────┬─┬──────────────────────┬──►
           └─DSN(dataset.name)─────┘ └─VOLume(volser)───────┘ └─UNIT(unitname)───────┘

►─┬──────────────────────────────────────────────────────────────────────────────────►◄
  │                  ┌──,──────┐
  └─HOSTID(──────────┴─host-id──┴──)──┘
```

Control Statement Name

LMUPDEF
Initiates the LMUPDEF command and control statement.

Parameters

DATASET or DSN
specifies the name of the data set containing the LMUPATH statements to be processed and, optionally, an OPTion TITLE statement.

Note: The definition data set may contain VOLATTR, UNITATTR, TAPEREQ, LMUPATH, and OPTion TITLE statements.

- Only OPTion TITLE and LMUPATH statements are processed.
- If any other statement is encountered, an error message is issued and the statement is ignored.

dataset.name
specifies the name of the data set containing the LMUPATH address parameters. If the data set name includes a member name, *dataset.name* must be enclosed in quotes. For example,

```
DATASET('YOUR.DSN(MEMBER)')
```

VOLume
specifies the serial number of the DASD volume on which the data set resides. This parameter is optional. Specify the VOLume parameter if the data set is not cataloged, or if a data set on a volume other than the volume indicated by the catalog is to be used.

Note: The volume specified must be a DASD volume.

volser
specifies the volume serial number for the definition data set.

UNIT

specifies the unit where the definition data set is located.

unitname

specifies the unit name. If the definition data set is not cataloged and this parameter is omitted, a unit name of SYSALLDA is the default.

HOSTID

(This parameter is valid only for use in PARMLIB, so that multiple systems can share a PARMLIB member containing TAPEREQ, VOLATTR, UNITATTR, or LMUPATH statements for different releases of HSC. If entered from the console, message SLS0018I is issued.)

Optionally, limits the execution of this control statement to the specified hosts. If one of the specified hostids matches the host executing this control statement, the control statement is executed for that host. Otherwise, it is ignored. If this parameter is omitted, the control statement is executed on all hosts.

host-id

specifies the name of one or more hosts from which to execute this control statement. Multiple hosts must be separated by commas.

Examples

The following examples illustrate the use of the LMUPDEF statement.

Load the LMUPATH Parameters From YOUR.DSN(MEMBER)

```
LMUPDEF DSN('YOUR.DSN(MEMBER)')
```

Load the LMUPATH Parameters From DASD Volume DISK03

```
LMUPDEF DSN(YOUR.DSN2) VOLUME(DISKØ3)
```

OPTion TITLE Control Statement

The OPTion TITLE statement is used to specify an identifying string for a definition data set. The identifying string can be any information that helps the user describe the contents of the definition data set.

The OPTion TITLE statement must be placed in the definition data set; it cannot be issued as an operator command. If more than one OPTion statement is specified in the definition data set, only the identifying string of the last OPTion statement encountered is retained.

The identifying string can be displayed with HSC Display commands. Refer to ‘‘DISPLAY Command’’ in the *HSC Operator’s Guide* for descriptions of command syntax and parameters.

Syntax

```
►►─OPTion──TITLE(identifying-string)──┬──────────────────────────────────►◄
                                      ├─TRACE──────────┤
                                      └─TRACEF─────────┘
```

Control Statement Name

OPTion
initiates the OPTion control statement.

Parameters

TITLE
specifies an identifying string for the definition data set. If this statement is omitted, the definition data set has no identifying string associated with it.

identifying-string
specifies the identifying string. The maximum length of the identifying string is fifty characters. If the identifying string includes one or more spaces, or any characters other than alphabetic, numeric, or national (i.e., $, @, #), it must be enclosed in quotes.

TRACE or TRACEF
used to control internal tracing of HSC table lookups. During problem resolution, Software Support may request that you specify one of these parameters.

Example

The following example illustrates the use of the OPTion TITLE control statement.

Specify an Identifying String For a Definition Data Set

```
OPTION TITLE(‘SAMPLE IDENTIFYING STRING’)
```

Scratch Subpool Definition (SCRPDEF) Command and Control Statement

The SCRPDEF command and control statement is used to specify the definition data set that contains scratch subpool (SCRPOol) parameter statements. (Refer to "Scratch Subpool Control Statement" on page 102 for details on syntax and parameters.) The data set must be a sequential or a partitioned data set (PDS) with any valid record format (RECFM). Also, the definition data set must contain one or more SCRPOol statements.

The SCRPDEF statement may be specified in the HSC PARMLIB, or it may be issued as an operator command to dynamically load or reload scratch subpool parameters. (Refer to "PARMLIB Control Statements" on page 83 for an explanation of PARMLIB.) If a definition file is changed by a SCRPDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC.

Caution: If SCRPOol parameter statements are specified in PARMLIB or are loaded from User Exit 03, SCRPDEF is disabled and dynamic scratch pool reload is not allowed.

If a definition file is changed by a SCRPDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC. If the definition file is to be modified for a given shift or application, remember that the new definition remains in effect until another definition is loaded or the HSC is recycled. The definition file then reverts to the PARMLIB specification. Thus, SCRPDEF can be used to temporarily change a definition file.

Definition commands issued on one host are in effect only on that host. If different hosts use the same definition data set, then the tape request parameter statements are shared by those hosts.

Notes:

1. When the SCRPDEF command is issued, if the definition data set contains errors, an HSC message provides the parameter in error, a description of the problem, and the line number where the error occurred. If the definition data set contains errors, none of the attributes specified in the SCRPOol control statement(s) will be loaded (put into effect), which may cause data sets to be created on the wrong type of media and incorrect devices to be allocated. Message SLS1627I is displayed if errors are encountered. If 50 errors are encountered, the remainder of the data set is not checked. Correct the problem and reissue the command.
2. The SCRPDEF command and control statement executes at both base and full service levels of the HSC.
3. If you issue multiple SCRPDEF statements, the last one processed is currently active. You can determine which SCRPDEF statement is active by entering the Display SCRPDEF command.
4. For additional information about syntax, refer to "Control Statement Syntax Conventions" on page 513.

Syntax

```
►►─SCRPDEF─┬─DATASET(dataset.name)─┬─┬──────────────────────────┬─┬──────────────────────────┬──►
           └─DSN(dataset.name)─────┘ └─VOLume(volser)─────────┘ └─UNIT(unitname)──────────┘

►─┬──────────────────────────────────────────────────────────────────────────────────────────►◄
  │                  ┌──,──────┐
  └─HOSTID(──────────┴─host-id──┴──────────)──┘
```

Control Statement Name

SCRPDEF
initiates the SCRPDEF command and control statement.

Parameters

DATASET or DSN
specifies the name of the data set containing the SCRPOol statements to be processed and, optionally, an OPTion TITLE statement. (Refer to “Scratch Subpool Control Statement” on page 102 and “OPTion TITLE Control Statement” on page 115 for details on syntax and parameters).

Note: The definition data set may contain SCRPOol, TAPEREQ, UNITATTR, VOLATTR, and OPTion TITLE statements. Only OPTion TITLE and SCRPOol statements are processed. If any other statement is encountered, an error message is issued and the statement is ignored.

dataset.name
specifies the name of the data set containing scratch subpool parameters. If the data set name includes a member name, *dataset.name* must be enclosed in quotes. For example,

```
DATASET('YOUR.DSN(MEMBER)')
```

VOLume
specifies the serial number of the DASD volume on which the data set resides. This parameter is optional. Specify the VOLume parameter if the data set is not cataloged, or if a data set on a volume other than the volume indicated by the catalog is to be used.

Note: The volume specified must be a DASD volume.

volser
specifies the volume serial number for the definition data set.

UNIT

specifies the unit where the definition data set is located.

unitname

specifies the unit name. If the definition data set is not cataloged and this parameter is omitted, a unit name of SYSALLDA is the default.

HOSTID

(This parameter is valid only for use in PARMLIB, so that multiple systems can share a PARMLIB member containing SCRPOol, TAPEREQ, VOLATTR, or UNITATTR statements for different releases of HSC. If entered from the console, message SLS0018I is issued.)

Optionally, the HOSTid parameter limits the execution of this control statement to the specified hosts. If one of the specified hostids matches the host executing this control statement, the control statement is executed for that host. Otherwise, it is ignored. If this parameter is omitted, the control statement is executed on all hosts.

host-id

specifies the name of one or more hosts from which to execute this control statement. Multiple hosts must be separated by commas.

Examples

The following examples illustrate the use of the SCRPDEF statement.

Load the SCRPOol Parameters From YOUR.DSN(MEMBER)

```
SCRPDEF DSN('YOUR.DSN(MEMBER)')
```

Load the SCRPOol Parameters From DASD Volume DISK01

```
SCRPDEF DSN('YOUR.DSN(MEMBER)') VOLUME(DISKØ1)
```

Tape Request (TAPEREQ) Control Statement

The TAPEREQ control statement is used to specify tape request attributes. TAPEREQ statements are read from the definition data set specified by the TREQDEF command. (Refer to "Tape Request Definition (TREQDEF) Command and Control Statement" on page 136 for details on syntax and parameters.) The TAPEREQ statement must be placed in the definition data set; it cannot be issued as an operator command.

Notes:

1. TAPEREQ statements influence SMC allocation. Refer to the *SMC Configuration and Administration Guide* for more information.
2. Specifications for recording technique and media type are ignored on TAPEREQ control statements if the SMC/DFSMS interface is enabled and data class specifications for media type and recording technique exist. Refer to the *SMC Configuration and Administration Guide* for more information.
3. If your library contains more than one media type or device type, enter TAPEREQ, VOLATTR, and UNITATTR control statements to manage allocation of mixed media and/or devices. Refer to "Alternatives to Using TAPEREQ Control Statements" on page 109 for options to using these control statements.
4. If your environment contains multiple types of 36-track drives (recording technique 36Atrack, 36Btrack, or 36Ctrack), StorageTek recommends you use device preferencing to manage device allocation. Entering specific 36-track device types in TAPEREQ statements (i.e., 36A, 36B, 36C) causes the SMC to break unit affinity chains based on incompatible device types; using device preferencing allows the affinity chains to be maintained.

TAPEREQ Usage

As the HSC processes each allocation request, it searches the TAPEREQ statements in the order that they appear in the definition data set to determine the media type, recording technique or model, device preferencing, subpool, and esoteric parameters to assign to the request. One or more TAPEREQ statements may match the request's input criteria.

When there are multiple matching TAPEREQ statements containing different parameters, the HSC merges the parameters from the matching statements. Each parameter value is searched for independently, and for each, the first matching TAPEREQ statement is used.

For this reason, StorageTek recommends that you:

- order the TAPEREQ statements from most specific to most general
- specify all applicable parameters on all TAPEREQ statements.

Conflicting parameter assignment can result when multiple TAPEREQ statements are found and their parameters merged. For example, assuming the subpool REDWOOD

contains only HELical (Redwood) cartridges, the following TAPEREQs produce inconsistent parameter assignment:

```
    .
    .
    .
TAPEREQ JOBNAME(ABC) SUBPOOL(REDWOOD)
    .
    .
TAPEREQ JOBNAME(**) MEDIA(S)
    .
    .
    .
```

These statements cause the HSC to attempt to select a Standard scratch cartridge from a subpool that contains only helical cartridges.

To avoid such scenarios, StorageTek recommends that all applicable parameters be coded on each TAPEREQ and that parameters such as SUBPool and ESOTeric not be specified on generic TAPEREQ statements.

That is, MEDia and RECtech should be specified on the same TAPEREQ statement as SUBPool. Similarly, specifying MEDia or RECtech on the same TAPEREQ as ESOTeric can avoid assignment of a conflicting MEDia or RECtech from a TAPEREQ other than the one specifying ESOTeric. Substitution may be denied if the MEDia or RECtech causes esoteric substitution rules to be violated (refer to the *SMC Configuration and Administration Guide*). After searching the TAPEREQ statements, the SMC

- selects the appropriate devices
- mounts cartridges that are the right media type.

The TAPEREQ parameters are divided into selection criteria (i.e., input) parameters, and media and recording technique or model (i.e., output or result) parameters. The selection criteria are used to locate the first TAPEREQ statement that matches the request under consideration. Media and recording technique (or model) provide information that is used to modify the request. The TAPEREQ statement is in essence an IF-THEN statement: IF the selection criteria parameters (ANDed together) match the current tape request variables, THEN the media and recording technique parameters apply.

Disabling a TAPEREQ Definition

Use the following procedure to disable a TAPEREQ definition.

1. Edit the definition data set containing the current TAPEREQ statements.
2. Delete the parameters of the TAPEREQ statement you want to disable, or delete or comment out the TAPEREQ statement.
3. Issue the TREQDEF command to reload the definition data set.

With the modified definition data set in effect, the HSC searches the remaining TAPEREQ statements to determine the media type and recording technique (or model) to assign to a request.

To disable all TAPEREQ definitions, load a definition data set that contains only one TAPEREQ statement with no parameters. Refer to Table 5 on page 127 and Table 6 on page 130 to see a list of TAPEREQ media and recording technique (or model) default values.

Syntax

```
►►─TAPEREQ──┬──────────────────────────────────────────────────────────────────────────────────►
            │                   ┌─*─────────┐                   │   │                   ┌─*─────────┐
            └─JOBname(──┬─────────┴─jobname───┴──)──┘   └─STEPname(──┬─────────┴─stepname───┴──)──┘
                        │                   │                   │   │                   │
►───┬──────────────────────────────────────────────────────────────────────────────────────────►
    │                   ┌─*─────────┐                   │   │                   ┌─**────────┐
    ├─PROGram(──┬─────────┴─program-name──┴──)──┤   ├─DATASET(──┬─────────┴─dataset-name──┴──)──┤
    │           │                   │                   │   │           │                   │
    └─PGMname(program-name)─────────┘   └─DSN(dataset-name)─────────┘
                                        │                   │
►───┬──────────────────────────────────────────────────────────────────────────────────────────►
    │                                   │                   │
    └─DDName(DD-name)───┘   ├─RETPD(──┬─GE──┬──┬──────────────────┬──)──┤
                                        │       ├─EQ──┤  ,retention-period-  │   │
                                        │       ├─NE──┤                      │   │
                                        │       ├─GT──┤                      │   │
                                        │       ├─LT──┤                      │   │
                                        │       └─LE──┘                      │   │
                                        │                   │   │
                                        └─EXPDT(──┬─GE──┬──┬──────────────────┬──)──┘
                                                  ├─EQ──┤  ,expiration-date-  │
                                                  ├─NE──┤                      │
                                                  ├─GT──┤                      │
                                                  ├─LT──┤                      │
                                                  └─LE──┘
                                                  │
►───┬──────────────────────────────────────────────────────────────────────────────────────────►
    │                   ┌─*─────────┐   │
    └─VOLType(──┬─────────┴─Specific──┴──)──┘
                │       │   │
                └─Nonspec─┘
```

Syntax (continued)

```
MEDia( LONGItud | Standard | CST | MEDIA1 | STD | 1 | 3480 | ECART | E | ECCST | ETAPE | Long | MEDIA2 | 3490E | ZCART | Z | HELical | DD3 | DD3A | DD3B | DD3C | STK1 | STK1R | R | STK2 | STK2P )

RECtech( LONGItud | 18track | 36track | 36Atrack | 36Btrack | 36Ctrack | HELical | DD3 | STK1R | STK1R34 | STK1R35 | STK1RA | STK1RA34 | STK1RA35 | STK1RB | STK1RB34 | STK1RB35 | STK2P | STK2P34 | STK2P35 | STK2PB | STK2PB34 | STK2PB35 )

MODel( 4480 | 4490 | 9490 | 9490EE | SD3 | 9840 | 98403 5 | T9840B | T9840B35 | T9940A | T9940A35 | T9940B | T9940B35 )

DEVTpref(-model1 [,model2 [,model3]] )

SCOPE( LIBrary | LSM )

SUBPool(subpool-name)

ESOTeric(esoteric-name)
```

Control Statement Name

TAPEREQ
initiates the TAPEREQ control statement. If any of the following apply:

- there is no TAPEREQ statement specified in the definition data set to match a request, or
- no matching TAPEREQ statement specifies either MEDia or RECtech, or
- no definition data set is loaded,

then MEDia and RECtech are set to undefined, which matches all requests. Any available device is eligible for allocation.

After allocation, MEDia defaults to Standard if an 18-track device is selected. Standard and ECART media types are eligible if a 36-track device is selected. Standard, ECART, and ZCART media types are eligible if a 36Ctrack device is selected. If a helical device is selected, HELical is eligible. If a 9840 device is selected, STK1 is eligible. Table 5 on page 127 shows default values used if the media type is omitted.

Parameters

The TAPEREQ selection criteria parameters are shown below. The JOBname, STEPname, PROGram, and DATASET parameters can have values that include the following wildcard characters:

% or ?	any single non-blank character.
*	any character string (length zero to 8) not to exceed one qualification level. For example, A.B.* matches A.B and A.B.C, but does not match A.B.C.D.
**	used only in DATASET. Indicates any number of qualifiers (zero or more). Cannot be used with any other characters within a qualifier. For example, A.B.** matches A.B, A.B.C, A.B.C.D, A.B.C.D.E, and so forth.

JOBname
optionally, identifies the job name. If JOBname is not specified, the default value is *.

Note: If you are coding a TAPEREQ statement for DFHSM, you must specify JOBname as a selection criterion. Using DATASET (DSN) can cause unpredictable results.

job-name
specifies the job name. The TAPEREQ statement is used only when the specified *job-name* matches the job name in the request.

STEPname
optionally, specifies the step name. If the STEPname parameter is not specified, the default value is *.

step-name

specifies the step name. This parameter cannot be more than eight characters long, and periods are not allowed within *step-name*. The TAPEREQ statement is used only when the specified *step-name* matches the step name in the request.

PROGram or PGMname

optionally, specifies the program name. If PROGram is not specified, the default value is *. The program name used is the job step program name. **This parameter is not supported in JES3 environments.**

program-name

specifies the program name. The TAPEREQ statement is used only when the specified *program-name* matches the program name in the request.

DATASET or DSN

optionally, specifies the data set name. If DATASET (or DSN) is not specified, the default value is **. The rules of SMS and RACF generics are followed for this parameter.

Notes:

1. If you are coding a TAPEREQ statement for DFHSM, you must specify JOBname as a selection criterion. Using DATASET (DSN) can cause unpredictable results.
2. The name you specify for this parameter may be different from the value coded in the DSN parameter on a DD statement. For example,

   ```
   DSN=&&ABC
   ```

   may be coded on a DD statement if a data set is temporary. However, the actual data set name is not &&ABC. Similarly, if the DSN parameter refers back to a previous DD statement, the data set name is resolved to the referred to data set. Thus, the data set referred to must be coded on the DATASET parameter in order for the TAPEREQ control statement to be processed.

dataset.name

specifies the data set name. The TAPEREQ statement is used only when the specified *dataset.name* matches the data set name in the request.

DDName

optionally, specifies the DDname. If DDName is not specified, the default value is *.

DD-name

specifies the DDname. The TAPEREQ statement is used only when the specified *DD-name* matches the DDname in the request.

RETPD

optionally, specifies the retention period and the relationship that must exist. If you do not specify either RETPD or EXPDT, the default value is RETPD(GE,0) (any expiration date will match this criterion). **This parameter is not supported in JES3 environments.**

EQ equal to

NE not equal to

GT greater than

GE greater than or equal to

LT less than

LE less than or equal to.

retention-period

specifies the retention period in days for the data set. Specify the number of days as a 1- to 4-digit decimal number.

EXPDT

optionally, specifies the expiration date and the relationship that must exist. **This parameter is not supported in JES3 environments.**

EQ equal to

NE not equal to

GT greater than

GE greater than or equal to

LT less than

LE less than or equal to.

expiration-date

specifies the expiration date of the data set in *yyddd* or *yyyy*/*ddd* format.

VOLType

optionally, indicates whether or not a nonspecific volume was requested. If VOLType is omitted, the default value is * (either scratch or specific will match).

Specific

specifies that a specific volume was requested. The TAPEREQ statement is used only for a request where a specific volume is specified.

Note: TAPEREQ never overrides the actual media type of the specified volume if it is taken from the media label or VOLATTR.

Nonspec
specifies that a nonspecific (scratch) volume was requested. The TAPEREQ statement is matched only when no VOLSER is specified (a scratch request).

The TAPEREQ media and recording technique parameters are as follows:

MEDia
optionally, specifies the type of media for a data set being created. You can enter a list of media types, but they must be separated by commas.

Note: A list specifies a generic pool from which a selection is made. There is no implied priority.

This parameter is ignored for an existing data set if the media characteristics are determined by the volume.

If this parameter is not specified on any matching TAPEREQs, a default is chosen based on the value of the RECtech parameter of the first matching TAPEREQ. Table 5 on page 127 shows default values used if MEDia is omitted.

To avoid problems, StorageTek recommends that all TAPEREQ statements specify MEDia and RECtech consistently. Make sure to include either one or both parameters on each statement. If both media type and recording technique are omitted, all available devices are eligible for allocation.

Table 5. TAPEREQ MEDia Default Values

RECtech Entered:	MEDia Default:
18track	Standard
36track, 36Atrack, 36Btrack	LONGItud
36Ctrack	ZCART
LONGItud	LONGItud
DD3, HELical	DD3
STK1R, STK1R34, STK1R35, STK1RA, STK1RA34, STK1RA35, STK1RB, STK1RB34, STK1RB35	STK1R
STK2P, STK2P34, STK2P35, STK2PB, STK2PB34, STK2PB35	STK2P

Valid media types are:

LONGItud
indicates any Standard, ECART, or ZCART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480.

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E.

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R
indicates a T9840, 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R).

Note: STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
optionally, specifies the method used to record data tracks on the tape surface for the desired data set. You can enter a list of recording techniques, but they must be separated by commas.

Note: A list specifies a generic pool from which a selection is made. There is no implied priority.

RECtech and MODel are mutually exclusive.

If this parameter is not specified on any matching TAPEREQ, a default is chosen based on the value of the MEDia parameter on the first matching

TAPEREQ. Table 6 on page 130 shows default values used if RECtech is omitted.

To avoid problems, StorageTek recommends that all TAPEREQ statements specify MEDia and RECtech consistently. Make sure to include either one or both parameters on each statement.

If both media type and recording technique are omitted, all available devices are eligible for allocation.

Table 6. TAPEREQ RECtech Default Values

MEDia Entered:	RECtech Default:
LONGItud	LONGItud
Standard	LONGItud
ECART	36track
ZCART	36Ctrack
DD3, DD3A, DD3B, DD3C	DD3
STK1, STK1R	STK1R
STK2, STK2P	STK2P

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 transport.

36Btrack
indicates a 9490 transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates a 3490E-image 9840 or T9840B transport.

STK1R35
indicates a 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

MODel
optionally, specifies the model number of a transport. You can enter a list of models, but they must be separated by commas.

Note: A list specifies a generic pool from which a selection is made. There is no implied priority.

MODel provides the same type of information as RECtech, but a user may find it more convenient to specify a transport model than a recording technique.

MODel and RECtech are mutually exclusive. Also, MODel and DEVTpref are mutually exclusive.

4480
indicates a 4480 (18-track) transport.

4490
indicates a 4490 (36-track Silverton) transport.

9490
indicates a 9490 (36-track Timberline) transport.

9490EE
indicates a 9490EE (36-track Timberline EE) transport.

SD3
indicates an SD-3 (RedWood) transport.

9840
indicates a 3490E-image 9840 transport.

984035
indicates a 3590-image 9840 transport.

T9840B
indicates a 3490E-image T9840B transport.

T9840B35
indicates a 3590-image T9840B transport.

T9940A
indicates a 3490E-image T9940A transport.

T9940A35
indicates a 3590-image T9940A transport.

T9940B
indicates a 3490E-image T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

T9940B35
indicates a 3590-image T9940B transport.

DEVTpref

requests device preferencing for a particular allocation request. The use of device preferencing is restricted to StorageTek's 36-track class transport models: 4490, 9490, and 9490EE.

DEVTpref is valid only when RECtech(36track) applies to the allocation request. Specifying DEVTpref and a recording technique other than ''36track'' in the same TAPEREQ statement results in a syntax error, and the entire TAPEREQ statement is ignored.

Note: Device preferencing is managed by the SMC. If DEVTpref is specified and the list of devices includes 36-track and other devices (e.g., 18-track) the SMC preferences 36-track drives first, followed by other types in the list. Refer to the *SMC Configuration and Administration Guide* for more information.

model1

specifies the transport model number of the preferred device. These transports are given a higher selection probability than the alternate transport models.

model2

optionally, specifies the transport model number of the first alternate device. It must be separated from *model1* by either a comma or a blank.

If *model2* is omitted, the transport model numbers not specified by *model1* are assumed to be the alternate devices.

model3

optionally, specifies the transport model number of the second alternate device. It must be separated from *model2* by either a comma or a blank.

If *model3* is omitted, the transport model number not specified by *model1* or *model2* is assumed to be the second alternate device.

Table 7 shows the alternate device order if only *model1* is entered.

Table 7. Alternate Device Default Values

Preferred Device (model1):	First Alternate Device (model2):	Second Alternate Device (model3):
4490	9490	9490EE
9490	4490	9490EE
9490EE	4490	9490

Entering DEVTpref(9490,4490) is functionally equivalent to DEVTpref(9490,4490,9490EE).

SCOPE

optionally, indicates whether device preferencing should be performed across the entire library complex (single or multiple-ACS), or be performed at the individual LSM level. The SCOPE parameter may be used to attempt to reduce pass-thru

events. SCOPE is valid only when the DEVTpref parameter is specified on the same TAPEREQ statement.

LIBrary

specifies that all of the preferred transport models are to be given a higher selection probability than all of the alternate models, while maintaining the ability to automate tape mounts. LIBrary is the default value.

In a multiple-ACS configuration, the manner in which the HSC applies SCOPE(LIBrary) depends on the following:

- the ability to automate the mount
- the type of request; specific versus scratch.

A specific volume request is confined to the ACS where the volume resides so that the mount can be automated. The transports in all other ACSs, and all nonlibrary transports, are marked ineligible for selection. The HSC then applies SCOPE(LIBrary) to one ACS, giving all of the preferred models in that ACS a higher selection probability.

A scratch request can be directed to any ACS, whether or not it contains scratch volumes. In this case, the HSC applies SCOPE(LIBrary) to all ACSs, giving all of the preferred models in all ACSs a higher selection probability.

Note: To prevent a scratch request from being directed to an ACS that does not contain scratch volumes, use the ALLOC Zeroscr(ON) command. Refer to the *HSC Operator's Guide* for a complete description of the ALLOC command.

LSM

specifies that all of the preferred models within an LSM are to be given a higher selection probability than all of the alternate models within that same LSM, while maintaining the ability to automate tape mounts.

Each LSM is processed individually without regard to the transport models attached to the other LSMs in the ACS. This means that if the preferred model is not available in the LSM where the volume resides, an alternate model in the same LSM is allocated, preventing a pass-thru of the volume to a different LSM.

SCOPE(LSM) should be requested if reducing pass-thru events is more important than allocating a preferred transport in another LSM.

SUBPool

optionally, specifies the subpool used to satisfy a scratch request. If specified, this parameter takes precedence over a subpool specification in User Exits 01, 02, or 04. Refer to Chapter 9, "User Exits" on page 397 for information about these user exits.

subpool-name

specifies the subpool name.

Note: Refer to "TAPEREQ Usage" on page 120 for information about avoiding assignment of inconsistent parameters when using SUBPool.

ESOTeric
optionally, specifies the esoteric defining the list of eligible transports to be used to satisfy a tape request. Refer to the *SMC Configuration and Administration Guide* for more information.

esoteric-name
specifies the esoteric name. The name specified can consist of one to eight alphanumeric or national (#, @, $) characters. A slash (/) or hypen (-) is also valid.

Examples

The following examples illustrate how to use TAPEREQ statements to specify tape request attributes

Set Tape Request Attributes.

```
TAPEREQ DSN(BACKUP.**)  MEDIA(ECART) RECTECH(36TRACK) ESOTERIC(LIB36)
TAPEREQ DSN(PAYROLL.**) MED(DD3A) RECTECH(DD3) SUBPOOL(PAYROLL)
TAPEREQ DSN(**)         MED(STANDARD) RECTECH(36TRACK)
```

Notes:

1. In the example above, the last TAPEREQ statement specifies a user-defined default for all data sets that do not match one of the first two statements.
2. Normally, ESOTeric or SUBPool should not be specified on a default TAPEREQ statement unless all preceding TAPEREQ statements also include ESOTeric or SUBPool parameters.

The following example illustrates how to specify device preferencing attributes.

Setting Device Preferencing Attributes

```
TAPEREQ JOBNAME(YOURJOB1) -
        DSN(YOUR.DSN1) -
        MEDIA(LONG) -
        RECTECH(36TRACK) -
        DEVTPREF(9490,4490) -
        SCOPE(LIBRARY)
TAPEREQ JOBNAME(YOURJOB2) -
        DSN(YOUR.DSN2) -
        MEDIA(STANDARD) -
        RECTECH(36TRACK) -
        DEVTPREF(4490,9490) -
        SCOPE(LSM)
```

Tape Request Definition (TREQDEF) Command and Control Statement

The TREQDEF command and control statement is used to specify the definition data set that contains tape request (TAPEREQ) parameter statements. (Refer to "Tape Request (TAPEREQ) Control Statement" on page 120 for details on syntax and parameters.) The data set must be a sequential or a partitioned data set (PDS) with any valid record format (RECFM). Also, the definition data set must contain one or more TAPEREQ statements.

The TREQDEF statement may be specified in the HSC PARMLIB, or it may be issued as an operator command to dynamically load or reload tape request parameters. (Refer to "PARMLIB Control Statements" on page 83 for an explanation of PARMLIB.) If a definition file is changed by a TREQDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC.

If the definition file is to be modified for a given shift or application, remember that the new definition remains in effect until another definition is loaded or the HSC is recycled. The definition file then reverts to the PARMLIB specification. Thus, TREQDEF can be used to temporarily change a definition file.

Definition commands issued on one host are in effect only on that host. If different hosts use the same definition data set, then the tape request parameter statements are shared by those hosts.

Notes:

1. When the TREQDEF command is issued, if the definition data set contains errors, an HSC message provides the parameter in error, a description of the problem, and the line number where the error occurred. If the definition data set contains errors, none of the attributes specified in the TAPEREQ control statement(s) will be loaded (put into effect), which may cause data sets to be created on the wrong type of media and incorrect devices to be allocated. Message SLS1627I is displayed if errors are encountered. If 50 errors are encountered, the remainder of the data set is not checked. Correct the problem and reissue the command.
2. The TREQDEF command and control statement executes at both base and full service levels of the HSC.
3. If you issue multiple TREQDEF statements, the last one processed is currently active. You can determine which TREQDEF statement is active by entering the Display TREQDEF command.
4. For additional information about syntax, refer to "Control Statement Syntax Conventions" on page 513.

Syntax

```
►►─TREQDEF──┬─DATASET(dataset.name)─┬──┬─────────────────────┬──┬──────────────────────┬──►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)──────┘  └─UNIT(unitname)───────┘

►──┬──────────────────────────────────────────────────────────────────────────────────►◄
   └─HOSTID(──┬──host-id──┬──)──┘
              └──────────┘
              ↓ ,
```

Control Statement Name

TREQDEF
initiates the TREQDEF command and control statement.

Parameters

DATASET or DSN
specifies the name of the data set containing the TAPEREQ statements to be processed and, optionally, an OPTion TITLE statement. (Refer to “Tape Request (TAPEREQ) Control Statement” on page 120 and “OPTion TITLE Control Statement” on page 115 for details on syntax and parameters).

Note: The definition data set may contain SCRPOol, TAPEREQ, UNITATTR, VOLATTR, and OPTion TITLE statements. Only OPTion TITLE and TAPEREQ statements are processed. If any other statement is encountered, an error message is issued and the statement is ignored.

dataset.name
specifies the name of the data set containing tape request parameters. If the data set name includes a member name, *dataset.name* must be enclosed in quotes. For example,

```
DATASET('YOUR.DSN(MEMBER)')
```

VOLume
specifies the serial number of the DASD volume on which the data set resides. This parameter is optional. Specify the VOLume parameter if the data set is not cataloged, or if a data set on a volume other than the volume indicated by the catalog is to be used.

Note: The volume specified must be a DASD volume.

volser
specifies the volume serial number for the definition data set.

UNIT

specifies the unit where the definition data set is located.

unitname

specifies the unit name. If the definition data set is not cataloged and this parameter is omitted, a unit name of SYSALLDA is the default.

HOSTID

(This parameter is valid only for use in PARMLIB, so that multiple systems can share a PARMLIB member containing SCRPOol, TAPEREQ, VOLATTR, or UNITATTR statements for different releases of HSC. If entered from the console, message SLS0018I is issued.)

Optionally, the HOSTid parameter limits the execution of this control statement to the specified hosts. If one of the specified hostids matches the host executing this control statement, the control statement is executed for that host. Otherwise, it is ignored. If this parameter is omitted, the control statement is executed on all hosts.

host-id

specifies the name of one or more hosts from which to execute this control statement. Multiple hosts must be separated by commas.

Examples

The following examples illustrate the use of the TREQDEF statement.

Load the TAPEREQ Parameters From YOUR.DSN(MEMBER)

```
TREQDEF DSN('YOUR.DSN(MEMBER)')
```

Load the TAPEREQ Parameters From DASD Volume DISK01

```
TREQDEF DSN(YOUR.DSN1) VOLUME(DISKØ1)
```

Unit Attribute (UNITATTR) Control Statement

The UNITATTR statement specifies unit attributes and allows the user to define the model number of transports. A series of UNITATTR statements can be specified and are contained in the definition data set named in the UNITDEF statement. The first statement that matches the requested attributes is used. (Refer to "Unit Attribute Definition (UNITDEF) Command and Control Statement" on page 143 for details on syntax and parameters.) The UNITATTR statement must be placed in the definition data set; it cannot be issued as an operator command.

UNITATTR Usage

UNITATTRs are used to distinguish between devices that are configured as either 3490E or 3590 device types:

- 3490E-type
  - 4490
  - 9490
  - 9490EE
  - SD-3
  - 9840
  - T9840B
  - T9940A
  - T9940B.
- 3590-type
  - SD-3
  - 9840
  - T9840B
  - T9940A
  - T9940B.

Note: SD-3s, 9840s, T9840Bs, T9940As, and T9940Bs can be defined as either 3490E or 3590. 3490E-type transports not defined by UNITATTRs are presumed to be 4490 transports; 3590-type transports are presumed to be 9840 transports.

To allow the HSC to operate correctly, the user must specify UNITATTR statements for all *nonlibrary* transport models that appear to the operating system as 3490E-type and 3590-type devices. For library devices, the model type is determined by the LMU. For newly defined drives, if the LSM has not been online, the model has not been reported by the LMU. Because of this, StorageTek recommends that UNITATTRs be defined for both library and nonlibrary devices.

Note: If you change your transport configuration, you may need to edit the definition data set containing the UNITATTR statements and reload it by issuing the UNITDEF command.

If devices are included in the nonlibrary esoteric (NNLBDRV) that do not physically exist, users should specify MODel(IGNORE) on their UNITATTR statements to indicate these devices are incompatible with all media types.

Note: If nonexistent drives are included in the ACS esoteric (ACSDRV) and are also defined by the SLIDRIVS LIBGEN macro (or the SET SLIDRIVS utility), they are automatically set to model IGNORE.

Syntax

```
►►─UNITATTR──ADDRess(┬─unit-address──────────┬)──┬──────────────────────────────►
                     ├─unit-address-range────┤    └─MODel(┬─4480──────┬)┘
                     └─┬──,──────────────┬─┘            ├─4490──────┤
                       └─►unit-address-list─┘            ├─9490──────┤
                                                         ├─9490EE────┤
                                                         ├─SD3───────┤
                                                         ├─9840──────┤
                                                         ├─984035────┤
                                                         ├─T9840B────┤
                                                         ├─T9840B35──┤
                                                         ├─T9940A────┤
                                                         ├─T9940A35──┤
                                                         ├─T9940B────┤
                                                         ├─T9940B35──┤
                                                         └─IGNORE────┘

►──┬──────────────────────────────┬──────────────────────────────────────────►◄
   └─NETHOST(host-id)─────────────┘
```

Control Statement Name

UNITATTR
initiates the UNITATTR control statement.

Parameters

ADDRess
specifies the unit address to which this definition applies.

unit-address
indicates a single unit address, multiple addresses, a range of addresses, or multiple ranges of addresses. A unit address can be specified by more than one UNITATTR statement. In this case, the first UNITATTR statement specified for a unit is used.

Note: The HSC does not allow duplicate or overlapping ranges of addresses to be processed. If duplicates are encountered, the HSC issues an error message and does not load any UNITATTRs.

MODel
optionally, specifies the model number of a tape transport.

Note: If the model specified does not match that reported by the LMU, an error results which causes all UNITATTRs to be rejected.

4480
indicates a 4480 (18-track) tape transport.

4490
indicates a 4490 (36-track Silverton) tape transport.

9490
indicates a 9490 (36-track Timberline) tape transport.

9490EE
indicates a 9490EE (36-track Timberline EE) transport.

SD3
indicates an SD-3 (RedWood) tape transport.

9840
indicates a 3490E-image 9840 transport.

984035
indicates a 3590-image 9840 transport.

T9840B
indicates a 3490E-image T9840B transport.

T9840B35
indicates a 3590-image T9840B transport.

T9940A
indicates a 3490E-image T9940A transport.

T9940A35
indicates a 3590-image T9940A transport.

T9940B
indicates a 3490E-image T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

T9940B35
indicates a 3590-image T9940B transport.

IGNORE
indicates a nonexistent physical transport.

Note: IGNORE cannot be specified for a device that actually exists inside the library. HSC validates that UNITATTR models, if specified, match those reported by the LMU. If they do not, all UNITATTRs are rejected.

NETHOST
optionally, indicates a parameter used by LibraryStation. If this parameter is specified, the HSC ignores the entire UNITATTR statement. Conversely, LibraryStation ignores the statement unless NETHOST is specified.

Example

The following example illustrates the use of the UNITATTR control statement.

Specify Unit Attribute Statements

```
UNITATTR ADDRESS(A90-A9F) MODEL(9490)
UNITATTR ADDR(B90,B92,B94) MOD(SD3)
```

Unit Attribute Definition (UNITDEF) Command and Control Statement

The UNITDEF command and control statement allows the user to specify the data set that contains the unit attribute (UNITATTR) statements.

The UNITDEF statement can be specified in PARMLIB, or it can be issued as an operator command to dynamically load or reload unit attribute parameters. (Refer to ‘‘PARMLIB Control Statements’’ in the *HSC Configuration Guide* for an explanation of PARMLIB.) The definitions are only in effect for the host where UNITDEF is issued.

If a definition file is changed by a UNITDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC. If the definition file is to be modified for a given shift or application, remember that the new definition remains in effect until another definition is loaded or the HSC is recycled. The definition file then reverts to the PARMLIB specification. Thus, UNITDEF can be used to temporarily change a definition file.

Notes:

1. When the UNITDEF command is issued, if the definition data set contains errors, an HSC message provides the parameter in error, a description of the problem, and the line number where the error occurred. If the definition data set contains errors, none of the attributes specified in the UNITATTR control statement(s) will be loaded (put into effect), which may cause the wrong transport to be allocated for a volume. Message SLS1627I is displayed if errors are encountered. If 50 errors are encountered, the remainder of the data set is not checked. Correct the problem and reissue the command.

2. If you issue multiple UNITDEF statements, the last one processed is currently active. You can determine which UNITDEF statement is active by entering the Display UNITDEF command.

3. For additional information about syntax, refer to “Control Statement Syntax Conventions” on page 513.

Syntax

```
►►─UNITDEF──┬─DATASET(dataset.name)─┬──┬──────────────────────┬──┬──────────────────────┬──►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)───────┘  └─UNIT(unitname)───────┘

►──┬──────────────────────────────────────────────────────────────────────────────────►◄
   └─HOSTID(──┬─host-id──┬──)──┘
              └──────────┘
              ↓ ,
```

Control Statement Name

UNITDEF
initiates the UNITDEF control statement.

Parameters

DATASET or DSN

specifies the name of the data set containing the UNITATTR statements to be processed and, optionally, an OPTion TITLE statement. (Refer to "Unit Attribute (UNITATTR) Control Statement" on page 139 and "OPTion TITLE Control Statement" on page 115 for details on syntax and parameters.) The data set may contain other statements, but they will be ignored.

dataset.name

specifies the name of the data set containing UNITATTR parameters. If the dataset name includes a member name, *dataset.name* must be enclosed in quotes. For example,

```
DATASET('YOUR.DSN(MEMBER)')
```

VOLume

optionally, specifies the serial number of the volume where the data set resides. If this parameter is omitted, the data set must be cataloged.

Note: The volume must be a DASD volume.

volser

specifies the volume serial number for the definition data set.

UNIT

specifies the unit where the definition data set is located.

unitname

specifies the unit name. If the definition data set is not cataloged and this parameter is omitted, a unit name of SYSALLDA is the default.

HOSTID

(This parameter is valid only for use in PARMLIB, so that multiple systems can share a PARMLIB member containing SCRPOol, TAPEREQ, VOLATTR, or UNITATTR statements for different releases of HSC. If entered from the console, message SLS0018I is issued.)

Optionally, limits the execution of this control statement to the specified hosts. If one of the specified hostids matches the host executing this control statement, the control statement is executed for that host. Otherwise, it is ignored. If this parameter is omitted, the control statement is executed on all hosts.

host-id

specifies the name of one or more hosts from which to execute this control statement. Multiple hosts must be separated by commas.

Examples

The following example illustrates the use of the UNITDEF command and control statement.

Specify a Data Set Containing UNITATTR Statements

```
UNITDEF DSN(‘HSC.DEF(UNITDEF)’)
UNITDEF DATASET(‘HSC.PARMLIB(MVSUNITS)’) VOLUME(MVSA01)
UNITDEF DATASET(SYSB.UNITDEFS) UNIT(A90)
```

Volume Attribute (VOLATTR) Control Statement

The VOLATTR control statement is used to specify tape volume attributes. VOLATTR statements are read from the definition data set specified by the VOLDEF command. (Refer to "Volume Attribute Definition (VOLDEF) Command and Control Statement" on page 156 for details on syntax and parameters.) The VOLATTR statement must be placed in the definition data set; it cannot be issued as an operator command.

Notes:

1. You must enter a VOLATTR statement for each media type so that the HSC can correctly determine scratch counts and preferencing for scratch allocation. **It is important that all VOLATTR control statements be accurate if you rely on precise scratch counts.** Refer to "Alternatives to Using TAPEREQ Control Statements" on page 109 for options to using these control statements.
2. A VOLATTR must exist for ECARTs that do not have a media label so that the HSC can distinguish ECARTs from standard cartridges.

VOLATTR Usage

When the HSC needs to determine the attributes for a volume, it searches the VOLATTR statements in the order that they appear in the definition data set. The first statement that matches the requested volume is used to determine the attributes that are specified on that VOLATTR statement. The search continues for any attributes that are not specified on the first matching VOLATTR statement. These attributes are supplied by the next matching VOLATTR that specifies the attribute(s).

For example, if MEDia is provided but RECtech is not, RECtech takes a default value based upon the MEDia parameter. The same situation occurs if a RECtech value is present but MEDia is not. Thus, StorageTek recommends that users:

- order the VOLATTR statements from most specific to most general
- specify only MEDia on all VOLATTR statements and let RECtech default, or specify both MEDia and RECtech on all VOLATTR statements.

The HSC always selects a RECtech compatible with the volume's media type; it is not necessary to specify RECtech on VOLATTR statements unless a specific RECtech is desired.

If RECtech is specified for any default VOLATTRs, however, it should be specified for all VOLATTRs to avoid obtaining MEDia from one VOLATTR and RECtech from another.

Note: Run the Volume Report utility using the NONMEDEQ option to verify that your VOLATTRs are in agreement with the CDS volume attribute record (VAR). The VAR reflects volume information from the LMU and can be compared to the VOLATTRs.

StorageTek recommends that the volume attribute statements in effect be the same on all processors; if not, results are unpredictable. This is especially true in a JES3 system, since

the processor that performs JCL conversion may not be the same processor on which the job is executed.

If you enter any VOLATTR statement that globally defaults to all volumes (i.e., VOLATTR SER(*) REC(18)), you **must** precede this statement with VOLATTRs specifying the cleaning cartridges for each type of transport defined in the ACS. Cleaning cartridges for longitudinal drives should be defined as MEDia(S); for helical drives, MEDia(DD3D); for 9840 and T9840B drives, MEDia(STK1U); and for T9940A and T9940B drives, MEDia(STK2W).

If global defaults are used to specify RECtech for large ranges of volumes, specify both MEDia and RECtech on all preceding VOLATTR statements. Otherwise, for a given VOLSER, the MEDia may be obtained from an earlier statement.

In the following example, the media type obtained from an earlier statement results in a default RECtech of STK1R. Then, the global statement that follows specifies a global RECtech of 36track, which is incompatible with the earlier statement.

```
VOLATTR SERIAL(EAG000-EAG999) MEDIA(STK1R)
VOLATTR SERIAL(*) RECTECH(36TRACK)
```

Disabling a VOLATTR Definition

Use the following procedure to disable a VOLATTR definition.

1. Edit the definition data set containing the current VOLATTR statements.
2. Delete the parameters of the VOLATTR statement you want to disable, or delete or comment out the VOLATTR statement.
3. Issue the VOLDEF command to reload the definition data set.

With the modified definition data set in effect, the HSC searches the remaining VOLATTR statements to determine the media type and recording technique for a volume.

To disable all VOLATTR definitions, load a definition data set that contains only the statement VOLATTR SERIAL(*). Refer to Table 8 on page 151 and Table 9 on page 153 to see a list of VOLATTR media and recording technique default values.

Syntax

```
►►─VOLATTR──SERial(─┬─volser──────────┬─)──┬──────────────────────────────►
                    ├─vol-range───────┤    │
                    └─┬─,─┐──────────┘    │
                      ▼   │               │
                      └─vol-list──────────┘
                                           └─MEDia(─┬─Standard──┬─)──┘
                                                    ├─CST───────┤
                                                    ├─MEDIA1────┤
                                                    ├─STD───────┤
                                                    ├─1─────────┤
                                                    ├─3480──────┤
                                                    ├─ECART─────┤
                                                    ├─E─────────┤
                                                    ├─ECCST─────┤
                                                    ├─ETAPE─────┤
                                                    ├─Long──────┤
                                                    ├─MEDIA2────┤
                                                    ├─3490E─────┤
                                                    ├─ZCART─────┤
                                                    ├─Z─────────┤
                                                    ├─DD3A──────┤
                                                    ├─DD3B──────┤
                                                    ├─DD3C──────┤
                                                    ├─DD3D──────┤
                                                    ├─STK1R─────┤
                                                    ├─STK1U─────┤
                                                    ├─R─────────┤
                                                    ├─U─────────┤
                                                    ├─STK2──────┤
                                                    ├─STK2P─────┤
                                                    └─STK2W─────┘
```

Syntax (continued)

```
──┬──────────────────────────────────────────────────────────────────────┬──────────────────────────────────────────────────────────────────────┬──►◄
  │                                                                      │                                                                      │
  └─RECtech(─┬─LONGItud──────┬─)─┘                                        └─MAXclean(use-limit)─┘
             ├─18track───────┤
             ├─36track───────┤
             ├─36Atrack──────┤
             ├─36Btrack──────┤
             ├─36Ctrack──────┤
             ├─HELical───────┤
             ├─DD3───────────┤
             ├─STK1R─────────┤
             ├─STK1R34───────┤
             ├─STK1R35───────┤
             ├─STK1RA────────┤
             ├─STK1RA34──────┤
             ├─STK1RA35──────┤
             ├─STK1RB────────┤
             ├─STK1RB34──────┤
             ├─STK1RB35──────┤
             ├─STK2P─────────┤
             ├─STK2P34───────┤
             ├─STK2P35───────┤
             ├─STK2PB────────┤
             ├─STK2PB34──────┤
             └─STK2PB35──────┘
```

Control Statement Name

VOLATTR
initiates the VOLATTR control statement. This statement applies to all cartridges including all types of cleaning cartridges.

Note: Standard cleaning cartridges that do not match the cleaning prefix established in the LIBGEN may be treated as scratch cartridges.

Parameters

SERial
specifies one or more volume serial numbers (VOLSERs) to which this definition applies.

volser or vol-range or vol-list

identifies a single VOLSER, a VOLSER range, or a list of VOLSERs and/or VOLSER ranges in any combination. This parameter may include the following wildcard characters:

% or **?**	any single non-blank character
*****	any character string (length 0 to 6).

The wildcard characters shown above may not be used in a range.

Notes:

1. On a single VOLATTR statement, all volumes specified in a list or range must be the same media type (e.g., a Standard cartridge cannot be included in a range of VOLSERs that also contains an ECART or DD3A cartridge).
2. If a given VOLSER is not included in any VOLATTR statement, the MEDia value defaults to Standard; thus, RECtech defaults to LONGitud.

MEDia

optionally, specifies the type of media (cartridge) for the VOLSER designated in the SERial parameter.

Only specific media types can be entered. Generic media types, that is, LONGItud and HELical, cannot be specified. Refer to the syntax for this control statement to see the parameters available to you.

If this parameter is not specified by any matching VOLATTR statement, a default is chosen based on the value of the RECtech parameter. Table 8 shows default values used if MEDia is omitted.

If both media type and recording technique are omitted, all media types and recording techniques are assumed to be eligible. StorageTek recommends that MEDia always be specified on all VOLATTR statements.

Table 8. VOLATTR MEDia Default Values

RECtech Entered:	MEDia Default:
18track	Standard
36track, 36Atrack, 36Btrack	Standard
36Ctrack	ZCART
LONGItud	Standard
DD3, HELical	DD3A
STK1R, STK1R34, STK1R35, STK1RA, STK1RA34, STK1R35, STK1RB, STK1RB34, STK1RB35	STK1R
STK2P, STK2P34, STK2P35, STK2PB, STK2PB34, STK2PB35	STK2P

Valid media types are:

Standard
indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART
indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART
indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3A, DD3B, DD3C, DD3D
indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, C, or D).

Note: DD3A, DD3B, DD3C, or DD3D can be abbreviated to A, B, C, or D, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB
- D – cleaning cartridge.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

Note: Cleaning cartridges that do not match the cleaning prefix established in the LIBGEN may not be selected as valid cleaners.

STK1R
indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK1U
indicates a T9840 cleaning cartridge. STK1U can be abbreviated to U.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P, STK2W
indicates a T9940 cartridge. The media indicator in the external label is encoded with the cartridge type (P or W).

Note: STK2P or STK2W can be abbreviated to P or W, respectively.

Types of T9940 cartridges, along with their associated media capacities are:

- STK2P — 60GB (T9940A) or 200GB (T9940B)
- STK2W — cleaning cartridge.

RECtech
optionally, specifies the method used to record data tracks on the tape surface for the VOLSER designated in the SERial parameter.

If this parameter is not specified on any matching VOLATTR statement, a default is chosen based on the value of the MEDia parameter. Table 9 shows default values used if RECtech is omitted.

Table 9. VOLATTR RECtech Default Values

MEDia Entered:	RECtech Default:
Standard	LONGItud
ECART	36track
ZCART	36Ctrack
DD3A, DD3B, DD3C, DD3D	DD3
STK1, STK1R, STK1U	STK1R
STK2, STK2P, STK2W	STK2P

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

MAXclean

optionally, specifies a maximum cleaning cartridge usage for the VOLSER or range of VOLSERs (1 to 32767) associated with the SERial parameter. Do not specify values that exceed the manufacturer's recommendation for usage. MAXclean applies to all types of cleaning cartridges.

If this parameter is specified, the VOLSER(s) indicated in the SERial parameter must begin with the cleaning cartridge prefix established in the LIBGEN.

use-limit

indicates the maximum number of times a cleaning cartridge should be used. Refer to "Tape Transport Cleaning" on page 36 for additional details.

Notes:

1. If MAXclean is not specified in the VOLATTR statement, the value or default of the MAXclean parameter in the MNTD operator command is used for all cleaning cartridge counts.
2. If MAXclean is specified, the MEDia setting must be Standard, DD3D, or STK1U.

Example

The following example illustrates how to use VOLATTR statements to specify volume attributes for particular VOLSERs.

Set Volume Attributes

```
VOLATTR SERIAL(L*,AA9*) MEDIA(ECART) RECTECH(36)
VOLATTR SER(S*,PRD000-PRD499,BY*) MED(S) REC(36)
VOLATTR SER(CLN200-CLN299) MED(DD3D) REC(HEL) MAXCLEAN(50)
VOLATTR SER(CLN300-CLN599) MED(S) REC(LONGI)
VOLATTR SER(*) MED(S) REC(18)
```

Notes:

1. Ask your StorageTek CSE about recommended MAXCLEAN values for specific types of cleaning cartridges.
2. In the example above, the last VOLATTR statement specifies a user-defined default for all volumes that do not match any of the previous statements.
3. Note that recording technique is specified on all VOLATTR statements in the preceding examples, since the last statement specifies a RECtech(18), which is not the default (LONGI). If RECtech were omitted from the previous MED(S) VOLATTR statements, the REC(18) from the last VOLATTR statement would be used.

Volume Attribute Definition (VOLDEF) Command and Control Statement

The VOLDEF command and control statement is used to specify the definition data set that contains volume attribute (VOLATTR) statements. (Refer to "Volume Attribute (VOLATTR) Control Statement" on page 146 for details on syntax and parameters.) The data set must be a sequential or a partitioned data set (PDS) with any valid record format (RECFM). Also, the data set must contain one or more VOLATTR statements.

The VOLDEF statement can be specified in PARMLIB, or it can be issued as an operator command to dynamically load or reload volume attribute parameters. (Refer to ''PARMLIB Control Statements'' in the *HSC Configuration Guide* for an explanation of PARMLIB.)

If a definition file is changed by a VOLDEF operator command, and if the change is to be permanent, you must update PARMLIB before restarting the HSC. If the definition file is to be modified for a given shift or application, remember that the new definition remains in effect until another definition is loaded or the HSC is recycled. The definition file then reverts to the PARMLIB specification. Thus, VOLDEF can be used to temporarily change a definition file.

Definition commands issued on one host are in effect only on that host. If different hosts use the same definition data set, the volume attribute parameter statements are shared by those hosts.

Notes:

1. StorageTek recommends that volume attributes be the same on all processors. This can be assured by defining the same volume attribute definition data set to all hosts.
2. When the VOLDEF command is issued, if the definition data set contains errors, an HSC message provides the parameter in error, a description of the problem, and the line number where the error occurred. If the definition data set contains errors, none of the attributes specified in the VOLATTR control statement(s) will be loaded (put into effect), which may cause the wrong scratch media to be mounted on a transport or the wrong transport to be allocated for a volume. Message SLS1627I is displayed if errors are encountered. If 50 errors are encountered, the remainder of the data set is not checked. Correct the problem and reissue the command.
3. The VOLDEF command and control statement executes at both base and full service levels of the HSC.
4. If you issue multiple VOLDEF statements, the last one processed is currently active. You can determine which VOLDEF statement is active by entering the Display VOLDEF command.
5. For additional information about syntax, refer to "Control Statement Syntax Conventions" on page 513.

Syntax

```
►►─VOLDEF──┬─DATASET(dataset.name)─┬──┬─────────────────────┬──┬──────────────────────┬──►
           └─DSN(dataset.name)─────┘  └─VOLume(volser)──────┘  └─UNIT(unitname)───────┘

►──┬──────────────────────────────────────────────────────────────────────────────────►◄
   │                  ┌──,──────┐
   └─HOSTID(──────────┴─host-id──┴──)──┘
```

Control Statement Name

VOLDEF
initiates the VOLDEF command and control statement.

Parameters

DATASET or DSN
specifies the name of the data set containing the VOLATTR statements to be processed and, optionally, an OPTion TITLE statement. (Refer to “Volume Attribute (VOLATTR) Control Statement” on page 146 and “OPTion TITLE Control Statement” on page 115 for details on syntax and parameters).

Note: The definition data set may contain SCRPOol, VOLATTR, UNITATTR, TAPEREQ, and OPTion TITLE statements.

- Only OPTion TITLE and VOLATTR statements are processed.
- If any other statement is encountered, an error message is issued and the statement is ignored.

dataset.name
is the name of the data set containing volume attribute parameters. If the data set name includes a member name, *dataset.name* must be enclosed in quotes. For example,

```
DATASET(‘YOUR.DSN(MEMBER)’)
```

VOLume
specifies the serial number of the DASD volume on which the data set resides. This parameter is optional. Specify the VOLume parameter if the data set is not cataloged, or if a data set on a volume other than the volume indicated by the catalog is to be used.

Note: The volume specified must be a DASD volume.

volser
specifies the volume serial number for the definition data set.

UNIT
specifies the unit where the definition data set is located.

unitname
specifies the unit name. If the definition data set is not cataloged and this parameter is omitted, a unit name of SYSALLDA is the default.

HOSTID

(This parameter is valid only for use in PARMLIB, so that multiple systems can share a PARMLIB member containing SCRPOol, TAPEREQ, VOLATTR, or UNITATTR statements for different releases of HSC. If entered from the console, message SLS0018I is issued.)

Optionally, limits the execution of this control statement to the specified hosts. If one of the specified hostids matches the host executing this control statement, the control statement is executed for that host. Otherwise, it is ignored. If this parameter is omitted, the control statement is executed on all hosts.

host-id
specifies the name of one or more hosts from which to execute this control statement. Multiple hosts must be separated by commas.

Examples

The following examples illustrate the use of the VOLDEF statement.

Load the VOLATTR Parameters From YOUR.DSN(MEMBER)

```
VOLDEF DSN('YOUR.DSN(MEMBER)')
```

Load the VOLATTR Parameters From DASD Volume DISK02

```
VOLDEF DSN(YOUR.DSN2) VOLUME(DISKØ2)
```

HSC Start Procedure

Starting HSC execution requires two basic tasks:

- creating an HSC START Procedure
- executing the HSC START Procedure.

Creating an HSC START Procedure

A procedure must be created in the cataloged procedure library of the host system. The START command invokes the cataloged procedure. The procedure loads the nucleus of the HSC into main storage, instructs the operating system to allocate data sets, and invokes the library host software initialization routine.

Note: Refer to "EXECParm Control Statement" on page 92 for an alternative method of specifying GTF Eid and Fid parameters.

This section describes how to create the procedure. A typical syntax for the EXEC statement and full descriptions of each of the parameters follows.

EXEC Statement Syntax

```
►►─//stepname EXEC──PGM=SLSBINIT──┬──────────────────────────────────────────────────────────┬──►◄
                                  │                                                          │
                                  └─,PARM='──┬─┬──────────────────────────────────────┬─┬─'─┘
                                             │ │                                      │ │
                                             │ ├─BASE──────────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─SSYS(subsystem)───────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─INIT──────────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─COLD──────────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─RESET─────────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─Eid(xxxx)─────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─Fid(xx)───────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ ├─Member(xx)────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ │          ┌─Both────┐                  │ │
                                             │ ├─Dialog(──┼─Off─────┼──)──────────────┤ │
                                             │ │          │─Console─│                  │ │
                                             │ │          └─Log─────┘                  │ │
                                             │ │                                      │ │
                                             │ ├─RECONFIG──────────────────────────────┤ │
                                             │ │                                      │ │
                                             │ │  ┌─AMPND──┐                          │ │
                                             │ └──┴─NOAMPND┴──────────────────────────┘ │
```

EXEC Statement Parameters

PARM=
defines the list of parameters passed to the HSC initialization routine.

Note: If you enter more than one of the following parameters, you must separate them with a blank space (e.g., BASE SSYS(subsystem) RESET).

BASE

specifies that the HSC initialize and execute at the base service level.

SSYS

specifies that HSC initialization search for the *subsystem* name specified. If the name is not found or is not a valid name, the subsystem terminates. *subsystem* must be a 1- to 4-character name or problems can occur when initializing the HSC.

This parameter permits you to symbolically specify the subsystem and retain the same startup procedure whether starting the HSC before or after JES.

INIT

specifies that only preinitialization of the HSC occur. See "Preinitializing the HSC as an MVS Subsystem" on page 167.

Note: If PARM=INIT is specified, the HSC subsystem is only initialized. It is still necessary to issue an HSC Start command to start the HSC. If any other parameters are specified with INIT (except for SSYS), they are ignored.

COLD

specifies that any permanent in-memory data structures previously allocated by HSC are reallocated and reinitialized.

On the first startup of the HSC after an IPL, this option is meaningless. If the HSC has been brought up previously for this IPL, use of this option results in the loss of a system linkage index for Program Call (PC) instructions. There are a limited number of system linkage indexes. Once exhausted, they can only be restored by IPLing. If COLD is not specified, the linkage index used previously by the HSC is reused.

This parameter should be used only when absolutely necessary. (The installation instructions for some HSC maintenance may direct you to perform a COLD start.)

Note: You do **not** need to include the COLD parameter when you are initializing an HSC that is at a different release level than the HSC that was previously running on a host. When an initializing HSC detects a release level difference, it performs an automatic internal cold start. For an automatic cold start, PC system linkage indexes are reused by the HSC.

Contact StorageTek Software Support before using this parameter (see the guide *Requesting Help from Software Support for more information*).

RESET

specifies that all subsystem status flags in the MVS Subsystem Communications Vector Table (SSCVT) for the HSC are unconditionally reset. Use of this option may correct a situation in which the HSC was terminated abnormally without resetting the status flags; for example, if the HSC was terminated with the MVS FORCE command.

These messages are possible symptoms of this situation:

```
... ACS subsystem CCCC is ACTIVE
```

or

```
... ACS subsystem CCCC is TERMINATING
```

or

```
... ACS subsystem CCCC is INITIALIZING
```

at HSC startup, when a display of active jobs indicates that the subsystem is not, in fact, active.

This parameter should only be used in extreme situations and may not correct all error conditions. Contact StorageTek Software Support before using this parameter.

Eid

xxxx is 1 to 4 hex characters specifying the GTF event ID used for the duration of this subsystem. ‘‘E’’ is the abbreviation for this parameter. The default Eid value is **E086**.

Fid

xx is 1 to 2 hex characters specifying the GTF format ID used for the duration of this subsystem. ‘‘F’’ is the abbreviation for this parameter. The default Fid value is **17**.

Note: Refer to “EXECParm Control Statement” on page 92 for an alternative method of specifying GTF Eid and Fid parameters.

Member

For MVS, *xx* is the suffix of the SLSSYS*xx* member in SYS1.PARMLIB, or an SLSSYS*xx* DD statement in the startup procedure used as the automatic commands (PARMLIB control statements) data set. ‘‘M’’ is the abbreviation for this parameter.

Dialog

specifies that messages can be displayed on the operator console and/or written to the system log. This option can be used to further restrict where messages are displayed based on the ROUTCDE. These messages indicate that the HSC is waiting for an active task to complete before the HSC terminates.

If Dialog is specified, one of the options must be selected. The options for Dialog include:

Off
specifies that you do not want active task termination messages displayed on the operator console or written to the system log.

Both
specifies that messages are displayed on the operator console and written to the system log. If Dialog is not specified, Both is the default. For more information on Dialog, see ‘‘OPTION Command and Control Statement’’ in the *HSC Operator’s Guide*.

Console
specifies that messages are displayed on the operator console only.

Log
specifies that messages are written to the system log only.

RECONFIG
specifies this execution of the HSC will only run the Reconfiguration utility.

AMPND
specifies to automate pending mounts during initialization. This setting is the default and need not be entered.

NOAMPND
specifies to disable pending mount automation during initialization. If this parameter is entered, an HSC Mount command must be issued to complete any mounts that are pending when the HSC is started.

Example

The following listing is an example PROC for the START command. This sample is also included in the HSC SAMPLIB as member JCLPROC.

Example PROC for START Command

```
//SLSØ     PROC PROG=SLSBINIT,PRM=’ ‘
//*
//IEFPROC  EXEC PGM=&PROG,TIME=144Ø,
//   PARM=’&PRM E(EØ86) F(23) M(ØØ) SSYS(SLSØ)’,REGION=4M
//*
//STEPLIB  DD DSN=SLS.SLSLINK,DISP=SHR
//*
//SLSUEXIT DD DSN=load.module.library,DISP=SHR
//SLSSYSØØ DD DSN=SLS.PARMS,DISP=SHR
```

In the example PROC shown above, SLS0 is used as both the name of the started task procedure (line 1) and as the subsystem name defined in the SSYS parameter ‘‘SSYS(SLS0)’’ in line 4. Your site is not required to use these values. You can replace

either or both of these values with more meaningful or useful names pertaining to your site specific needs. However, you must keep in mind the following:

1. HSC subsystem names must be cataloged in your IEFSSN*xx* member.
2. The subsystem name must be 4 characters in length.
3. If the started task procedure name and the subsystem name are identical, the SSYS parameter is not necessary in the started task procedure. If the started task procedure name is not identical to the subsystem name, then the SSYS parameter must be used to point the started task procedure to the required HSC subsystem.

For more information on using the SSYS parameter, refer to "SSYS" on page 160 and "Starting the HSC using the SSYS Parameter" on page 168.

Notes:

1. Control data sets are defined using the CDSDEF control statement. The CDSDEF statement **must** be present in your PARMLIB definitions. Control and journal data sets may no longer be defined in JCL. Refer to "CDS Definition (CDSDEF) Control Statement" on page 89 for more information.
2. The number of CDS copies used by the HSC is dependent on the number of CDS copies defined in the CDSDEF PARMLIB control statement. It is not determined by the TCHNIQE parameter of the LIBGEN SLIRCVRY macro. The HSC uses all of the CDS copies defined in the CDSDEF control statement (whether this includes more or less CDS copies than are specified by the TCHNIQE parameter).
3. Journals are defined using the JRNDEF control statement. The JRNDEF statement must be present in your PARMLIB definitions if you want to use journaling. Journal data sets may no longer be defined in JCL. Refer to "Journal Definition (JRNDEF) Control Statement" on page 94 for more information.
4. If journaling is specified by the TCHNIQE parameter of the LIBGEN SLILIBRY macro, journals must be defined in your PARMLIB definitions for successful HSC initialization.
5. TIME=1440 or TIME=NOLIMIT should be coded to ensure that the HSC does not time out and terminate.

Descriptions of DD Statements

The following are descriptions of the JCL DD statements used in the example PROC for the START command.

SLSSYS*xx*
: statement that defines the data set containing the HSC PARMLIB. In the example procedure above, xx is replaced by the suffix ''00''. The SLSSYS00 DD statement matches the M(00) declaration and points to the PARMLIB member ''00'' that contains your start-up parameters.

SLSUEXIT
: statement that defines the data set containing HSC user exits.

Starting HSC Execution

The HSC cataloged procedure is invoked by issuing the MVS START command. Refer to "Issuing the START Command" on page 166 for information about the MVS START command, syntax, and parameter descriptions.

When phases of HSC initialization are completed, messages are displayed on the system console indicating completion of the initialization phases. Messages inform you when HSC base service level and when HSC full service level initialization is completed.

Notes:

1. **An SMC subsystem must be active for the HSC to initialize. Refer to the "Starting SMC" chapter in the *SMC Configuration and Administration Guide* for more information.**
2. **The HSC requires a valid license key for initialization. Refer to the HSC Configuration Guide for more information.**
3. When it is initialized, the HSC determines whether this HSC release differs from the release level of the previous HSC subsystem. If there is a difference, an internal cold start is invoked.

   Before starting the internal cold start processing, however, the Program Call system linkage indexes are saved, and the HSC's main in-memory data structure is freed. This reduces the resources lost due to the cold start.

If your SMF options for the HSC did not specify the SUBTYPE parameter, the HSC issues a message that SMF record subtypes 1 through 6 are being recorded.

If you did not specify GTF Eid and Fid parameters on the PARM operand in the HSC start procedure, the HSC issues a message indicating that default Eid and Fid values are being used.

The HSC may be started prior to hardware arrival to ensure that it has been installed properly. The HSC subsystem comes up with the LMU stations offline. HSC operator commands may be entered, but any functions requiring interaction with the ACS hardware result in error messages.

Modifying LSMs ONLINE

When the CDS is initialized, the status of all LSMs defined in the LIBGEN is OFFLINE. You must issue the HSC MODify ONline command to bring all of your LSMs online.

For subsequent executions of HSC, the last recorded status of the LSMs is obtained from the control data set.

Specifying CAP Preferences

When the CDS is initialized, all CAP preferences are zero (never selected). You must issue the CAPPREF command and control statement to establish a preference value for a CAP. The HSC selects CAPs based on the preference value. Refer to ‘‘CAP Preference (CAPPref) Command and Control Statement’’ in the *HSC Operator’s Guide* for more information.

Configuration Mismatches

During HSC initialization, the HSC remains active if LSM or panel type configuration mismatches occur between the CDS and LMU. Specifically, these mismatches include:

- different numbers of LSMs
- different or unknown types of LSMs
- different or unknown panel types in an LSM.

In these cases, the affected ACS(s) is forced offline. The HSC continues to support the unaffected ACS(s).

While the unaffected ACS(s) remains online, the mismatched configuration can be corrected. If the hardware configuration is incorrect, the affected ACS(s) can then be brought online. Otherwise, the configuration can be changed through the LIBGEN/SLICREAT/MERGEcds or Reconfiguration process at your convenience.

Multiple Hosts Startup Considerations

In a multiple-host configuration, start one host at a time. **Do not bring up multiple hosts simultaneously.**

Issuing the START Command

The HSC software is initialized by issuing the MVS START command. Parameters associated with PARM= on the EXEC statement of the HSC cataloged procedure (see "Creating an HSC START Procedure" on page 159) can also be supplied via PARM= on the START command. The PARM= specification on the START command overrides the PARM= specification in the HSC cataloged procedure. Examples in this section relevant to single PARM= parameters may need to be accompanied by other parameters present in the HSC cataloged procedure.

Alternately, a JCL substitution symbol may be specified in the HSC cataloged procedure, and additional parameters passed via the START command using the substitution symbol.

The HSC can be initialized to a full or base service level by issuing the MVS START command. The HSC can also be preinitialized or initialized under the MVS Master subsystem (MSTR) through the START command.

Table 10 shows examples of the START command options introduced in this section. For further information about these options, refer to the paragraphs following the table.

Table 10. HSC Initialization

HSC Start Command	Proc Name Same as IEFSSN*xx* Entry	SLSBPREI in IEFSSN*xx* or Previous HSC Start With PARM='INIT'
HSC Started Under MSTR and PROC in SYS1.PROCLIB		
S SLS0	Yes	No
S SLS0,SUB=MSTR	Yes	Ignored
S SLS0,PRM='SSYS(SLS0)',SUB=MSTR	No	Ignored
HSC Started Under JES and PROC in Any PROCLIB		
S SLS0	Yes	Yes
S SLS0,PARM='INIT' S SLS0	Yes	No
S SLS0,PARM='SSYS(SLS0)'	No	Yes
S SLS0,PARM='INIT,SSYS(SLS0)' S SLS0,PARM='SSYS(SLS0)'	No	No

Preinitializing the HSC as an MVS Subsystem

The HSC must first be initialized as an MVS Subsystem before it can perform any services such as mount/dismount of cartridges, etc.. There are two valid ways to preinitialize the HSC:

- specifying SLSBPREI as the HSC subsystem initialization routine in the IEFSSN*xx* member of the system PARMLIB and IPLing MVS as follows:

```
SUBSYS SUBNAME(SLSØ) INITRTN(SLSBPREI)     /* keyword format */
```

Note: SLSBPREI must reside in SYS1.LINKLIB or its link list. After installation, copy the SLSBPREI module from HSC SLSLINK to a library in the MVS link list.

- starting the HSC with PARM='INIT'.

Starting the HSC with PARM='INIT'

An alternative method to the SLSBPREI subsystem initialization routine is to specify PARM='INIT' in a START command for a preinitialization startup followed by a START command for the actual startup of the HSC.

The need for the HSC's subsystem Master Subsystem Initialization (MSI) routine is eliminated. MSI functions are taken over by the main HSC address space initialization routines. The use of any subsystem MSI exit routine imposes a restriction that it must be in a data set that is cataloged in the master catalog, and included in the LNKLST. Previous HSC versions have distributed this module to install in SYS1.LINKLIB.

The first example is the START command for preinitializing the HSC; the second example is the START command for actual startup of the HSC. The first START command performs only the preinitialization and must be followed by the second command to startup the HSC. The example command is:

Preinitialization of HSC

```
S SLSØ,PARM='INIT'
```

The second START command performs actual HSC startup. The example command is:

Actual HSC Startup

```
S SLSØ
```

The startup procedure can be a normal procedure with the exception of using the INIT parameter or it can be specified separately.

Note: This preinitialization of the HSC is for initializing the HSC under the primary Job Entry Subsystem (JES).

Initializing the HSC Under the Master Subsystem

If you want to initialize the HSC under the Master subsystem (MSTR), the following circumstances must be considered:

- If SLSBPREI is not part of the subsystem definition in IEFSSN*xx* or a prior execution of the subsystem using the INIT parameter was done, then the MVS subparameter SUB=MSTR must be appended to the START command.

  For example:

SLSBPREI Defined in IEFSSN*xx* or Prior execution Using INIT

```
S SLSØ,SUB=MSTR
```

This command starts the HSC under Master subsystem control.

- If SLSBPREI is not part of the subsystem definition in IEFSSN*xx* and the subsystem name is the same as the start procedure name, then no preinitialization or SUB=MSTR is necessary. For example:

Subsystem Name is Same as Start Procedure Name

```
S SLSØ
```

Note: When running the HSC under the Master subsystem, JES services are not used. It is also possible to receive duplicate messages in the system log.

If you want to initialize the HSC under JES later, the INIT parameter may be used to do the preinitialization when necessary.

Starting the HSC using the SSYS Parameter

The HSC can be started against a particular subsystem by specifying the SSYS PARM. Refer to “Creating an HSC START Procedure” on page 159 for a description of the parameter.

Note: When using PARM, be sure to specify **all** applicable parameters.

Starting HSC Against a Subsystem Named SLS0

```
S SLSØ,PARM='SSYS(SLSØ)'
```

Starting the HSC at the Full Service Level

Normally, HSC software is initialized to the full service level when it is started. The syntax for the START command to initialize the HSC to the full service level is:

Starting to Full Service Level

```
S SLSØ
```

Starting the HSC at the Base Service Level

HSC software can be started only to the base service level by coding the BASE parameter in the PARM field of the MVS START command. The syntax for the START command to initialize the HSC to the base service level is:

Starting to Base Service Level

```
S SLSØ,PRM='BASE'
```

Note: PRM adds the parameter BASE to the startup PARMs.

The BASE parameter should be used with other parameters in the START command since these parameters override whatever is specified in the HSC START Procedure. A sample START command with parameters is:

```
S SLSØ,PARM='BASE E(Ø86) F(23) M(ØØ) SSYS(SLSØ)'
```

In this case, PARM overrides **all** parameters in the PARM field.

Refer to "Creating an HSC START Procedure" on page 159 for a description of these and other related parameters.

After initializing to this point, the SRVlev command can be used to bring the subsystem up to full function.

Chapter 4. JES3 Support

Overview

This chapter describes HSC operations in a JES3 environment. The following topics are discussed:

- "Running the HSC on a JES3 System (No SETUP Processing)" on page 172 describes how the HSC operates on a JES3 system that does not utilize SETUP processing (SETUP=NONE).
- "Running the HSC on a JES3 System (SETUP Processing)" on page 173 describes how the HSC operates on a JES3 system that utilizes SETUP processing.
- "Configuring HCD and LIBGEN Unit Addresses and Esoterics" on page 175 describes defining unit addresses, and library and nonlibrary esoterics to MVS and the HSC.

Running the HSC on a JES3 System (No SETUP Processing)

If you run the HSC in a JES3 environment without SETUP processing (SETUP=NONE specified on the JES3 STANDARDS initialization statement), the HSC operates the same as it does in a JES2 environment.

Running the HSC on a JES3 System (SETUP Processing)

The HSC supports JES3-managed cartridge transports.

Note: JES3 allocation is managed through the SMC. Refer to the *SMC Configuration and Administration Guide.*

The following sections describe how the HSC operates on a JES3 system that utilizes SETUP processing.

User-Directed Drive Exclusion

The HSC provides user exits, ALLOC command parameters and control statements, which let you influence drive exclusion. The following sections briefly describe these methods of influencing drive exclusion.

Invoking User Exits

The HSC provides the SLSUX13, SLSUX04, and SLSUX12 user exits to influence drive exclusion. SLSUX13, SLSUX04, and SLSUX12 allow replacement of unit names specified in your JCL with esoterics defined in these user exits.

SLSUX13 directs specific volume requests to a device included within the specified esoteric group. SLSUX04 directs scratch volume requests to a device included within the specified esoteric group. You can also use these user exits to direct the allocation of transports to a remote location. For more information about the SLSUX13 and SLSUX04 user exits, see “JES3 Specific Volume Allocation User Exit (SLSUX13)” on page 476 and “JES3 Scratch Allocation User Exit (SLSUX04)” on page 424.

SLSUX12 lets you override default settings based on unit affinity and GDG chain separations. SLSUX12 lets you request that unit affinity chains and GDG chains be broken, thus transports are allocated based on the physical location of a volume.

SLSUX12 also lets you specify an esoteric for use in device allocation of unit affinity and GDG chains that remain unbroken. For more information about SLSUX12, see “JES3 Unit Affinity Separation User Exit (SLSUX12)” on page 469.

Defining Control Statements

The HSC provides parameters for the SCRPOOL, TAPEREQ, and VOLATTR control statements, which let you influence drive exclusion. For information about these control statements, see Chapter 3, “HSC Control Statements and HSC Start Procedure”.

User-Directed Drive Prioritization

The following parameters, control statements, and user exits affect HSC drive prioritization:

- The LOWSCR, LSMPREF, and SCRTECH parameters on the ALLOC command For information about these parameters, see Chapter 2, ‘‘Commands, Control Statements, and Utilities’’ in the *HSC Operator’s Guide*.

- The SCRPOOL, TAPEREQ, and VOLATTR control statements For information about these control statements, see Chapter 3, “HSC Control Statements and HSC Start Procedure”.
- The SLSUX04 user exit.

Note: SLSUX04 is used only to obtain scratch subpool information and to override the LSMPREF and LOWSCR parameters on the ALLOC command for drive prioritization.

For information about the SLSUX04 user exit, see “JES3 Scratch Allocation User Exit (SLSUX04)” on page 424.

Configuring HCD and LIBGEN Unit Addresses and Esoterics

In addition to defining esoterics in the JES3 initialization deck (refer to the *SMC Configuration and Administration Guide* to see how to do this), you must also define unique esoterics for library and nonlibrary cartridge transports in both the Hardware Configuration Definition (HCD) and LIBGEN for each potential global processor. Defining the esoterics in the HCD and LIBGEN allows the HSC to operate effectively on all processors.

The library esoterics defined in the HCD and LIBGEN must include all library cartridge transports in the JES3 environment, and the nonlibrary esoterics must include all nonlibrary cartridge transports in the JES3 environment.

Defining HCD and LIBGEN

For each host, the unit addresses for all library-attached cartridge transports and for all nonlibrary cartridge transports are defined to MVS using the UNIT parameter on UNITNAME. The esoteric name for all library-attached cartridge transports and for all nonlibrary cartridge transports is defined using UNITNAME.

For each host, the unit addresses for all library-attached cartridge transports is defined to the HSC using the ADDRESS parameter on the SLIDRIVS macro. The esoteric name for all library-attached cartridge transports attached to an ACS is defined using the ACSDRV parameter on the SLIACS macro. The esoteric name for all nonlibrary cartridge transports is defined using the NNLBDRV parameter of the SLILIBRY macro.

Note: If the NNLBDRV parameter is not specified, either because a unique esoteric is not defined, or nonlibrary transports do not exist, all cartridge tape requests are directed to use the library transports.

If a cartridge transport is not mapped by one of the esoterics defined in LIBGEN, the transport cannot be allocated by specifying a generic unit name (3480, 3490, etc.) while the HSC is operating.

Sample Library Configuration

This section describes coding the LIBGEN for a library configuration that contains one ACS (ACS0) with four LSMs.

Note: Refer to the *SMC Configuration and Administration Guide* for information about the JES3 initialization deck.

ACS0 is connected to two hosts (MVS1 and MVS2) and contains 4480, 4480X, 4490, 9490, 9490EE, SD-3, 9840, T9940A, and T9940B library-attached cartridge transports. This installation also includes the following manual cartridge transports:

- 3480
- 3480X
- 3490
- 4480
- 4480X
- 4490
- 9490
- 9490EE
- SD-3
- 9840
- T9840B
- T9940A
- T9940B.

Note: The device addresses in the following examples are not meant to be taken literally but are intended to show how a wide variety of device types can be defined to a customer site using JES3. Exact statements both in the LIBGEN and JES3 initialization deck are configuration dependent.

In this example, the user-assigned esoteric names for each device type in ACS0 and for nonlibrary device types are:

Name	Devices
CART	170-177,180-183,190-19B,1A0-1AF,1B0-1B3,1B4-1B7,1B8-1CF A10-A13,A20-A23,A30-A33,A40-A43,A50-A53,B10,B12,C40, C42 CART represents all library-attached cartridge transports in ACS0 and all nonlibrary cartridge transports.
ACS0	170-177,180-183,190-19B,1A0-1AF,1B0-1B3,1B4-1B7,1B8-1CF, 1D0-1D3, 1D4-1D7 ACS0 represents only 4480, 4480X, 4490, 9490, 9490EE, SD-3, 9840, T9940A, and T9940B library-attached cartridge transports in ACS0.
ACS080	170-177 ACS080 represents only 4480 library-attached cartridge transports in ACS0.

ACS08X	180-183 ACS08X represents only 4480X library-attached cartridge transports in ACS0.
ACS090	190-19B,1A0-1AF,1B0-1B3 ACS090 represents only 4490, 9490, and 9490EE library-attached cartridge transports in ACS0.
ACS0SD3	1B4-1B7 ACS0SD3 represents only SD-3 library-attached cartridge transports in ACS0.
ACS040	1B8-1CF ACS040 represents only 9840 library-attached cartridge transports in ACS0.
ACS050	1D0-1D3 ACS050 represents only T9940A library-attached cartridge transports in ACS0.
NONLIB	A10-A13,A20-A23,A30-A33,A40-A43,A50-A53,B10,B12,C40, C42, D10, D12, D40-D43 NONLIB represents all 3480, 3480X, 3490, 4480, 4480X, 4490, 9490, 9490EE, SD-3, 9840, T9940A, and T9940B nonlibrary cartridge transports.
NL3480	A10-A13 NL3480 represents only 3480 and 4480 nonlibrary cartridge transports.
NL3480X	A20-A23 NL3480X represents only 3480X and 4480X nonlibrary cartridge transports.
NL3490	A30-A33,A40-A43,A50-A53 NL3490 represents only 3490, 4490, 9490, and 9490EE nonlibrary cartridge transports.
NLSD3	B10,B12 NLSD3 represents only SD-3 nonlibrary cartridge transports.
NL9840	C40,C42 NL9840 represents only 9840 nonlibrary cartridge transports.
NLT9940A	D10, D12 NLT9940A represents only T9940A nonlibrary cartridge transports.
NLT9940B	D40-D43 NLT9940B represents only T9940B nonlibrary cartridge transports.

Sample LIBGEN

Figure 9 shows the sample LIBGEN that corresponds to this installation.

```
LIBGEN    SLIRCVRY TCHNIQE=STANDBY

          SLILIBRY HOSTID=(MVS1,MVS2),                          X
                ACSLIST=ACSNAME,                                X
                NNLBDRV=(NONLIB,NONLIB),                        X
                DELDISP=NOSCRTCH
 .
 .
 .

*
ACSNAME   SLIALIST ACS0
*
ACS0      SLIACS ACSDRV=(ACS0,ACS0),                            X
                 STATION=(STN0,STN1),                           X
                 LSM=(LSM0,LSM1,LSM2,LSM3)
*
STN0      SLISTATN ADDRESS=(0A0,0A1)
STN1      SLISTATN ADDRESS=(0A2,0A3)
*
LSM0      SLILSM DRIVE=(1,2,9,10),                              X
                DRVELST=(PANEL001,PANEL002,PANEL009,PANEL010),  X
                PASTHRU=((5,M),(7,S)),                          X
                ADJACNT=(LSM1,LSM2),                            X
                TYPE=4410,                                      X
                DOOR=STD
*
PANEL001    SLIDLIST HOSTDRV=(DRV0,DRV0)
DRV0        SLIDRIVS ADDRESS=(170,171,172,173)
*
PANEL002    SLIDLIST HOSTDRV=(DRV1,DRV1)
DRV1        SLIDRIVS ADDRESS=(174,175,176,177)
*
PANEL009    SLIDLIST HOSTDRV=(DRV2,DRV2)
DRV2        SLIDRIVS ADDRESS=(1A0,1A1,1A2,1A3)
*
PANEL010    SLIDLIST HOSTDRV=(DRV3,DRV3)
DRV3        SLIDRIVS ADDRESS=(1A4,1A5,1A6,1A7)
*
```

Figure 9. Sample LIBGEN for JES3 (1 of 3)

```
LSM1      SLILSM DRIVE=(7,8,9,10),                                  X
                 DRVELST=(PANEL107,PANEL108,PANEL109,PANEL110),     X
                 PASTHRU=((1,M) (3,M),(5,S)),                       X
                 ADJACNT=(LSM0,LSM2,LSM3),                          X
                 TYPE=4410,                                         X
                 DOOR=STD                                           X
*
PANEL107  SLIDLIST HOSTDRV=(DRV4A,DRV4A)
DRV4A     SLIDRIVS ADDRESS=(1B1,1B3)
*
PANEL108  SLIDLIST HOSTDRV=(DRV4B,DRV4B)
DRV4B     SLIDRIVS ADDRESS=(180,181,182,183)
*
PANEL109  SLIDLIST HOSTDRV=(DRV6,DRV6)
DRV6      SLIDRIVS ADDRESS=(198,199,19A,19B)
*
PANEL110  SLIDLIST HOSTDRV=(DRV7,DRV7)
DRV7      SLIDRIVS ADDRESS=(1A8,1A9,1AA,1AB)
*
LSM2      SLILSM DRIVE=(7,8,9,10),                                  X
                 DRVELST=(PANEL207,PANEL208,PANEL209,PANEL210),     X
                 PASTHRU=((1,M),(3,S),(7,M),(5,S)),                 X
                 ADJACNT=(LSM0,LSM1,LSM3),                          X
                 TYPE=4410,                                         X
                 DOOR=STD
*
PANEL207 SLIDLIST HOSTDRV=(DRV8,DRV8)
DRV8 SLIDRIVS ADDRESS=(190,191,192,193)
*
PANEL208 SLIDLIST HOSTDRV=(DRV9,DRV9)
DRV9 SLIDRIVS ADDRESS=(194,195,196,197)
*
PANEL209 SLIDLIST HOSTDRV=(DRV10,DRV10)
DRV10 SLIDRIVS ADDRESS=(1AC,1AD,1AE,1AF)
*
PANEL210 SLIDLIST HOSTDRV=(DRV11,DRV11)
DRV11 SLIDRIVS ADDRESS=(1B0,1B2)
*
```

Figure 59. Sample LIBGEN for JES3
(2 of 3)

```
LSM3      SLILSM DRIVE=(1,2,9,1Ø),                                    X
                 DRVELST=(PANEL3Ø1,PANEL3Ø2,PANEL3Ø9,PANEL31Ø),       X
                 PASTHRU=((5,M),(7,S)),                               X
                 ADJACNT=(LSM1,LSM2),                                 X
                 TYPE=441Ø,                                           X
                 DOOR=STD
*
PANEL3Ø1  SLIDLIST HOSTDRV=(DRV12,DRV12)
DRV12     SLIDRIVS ADDRESS=(1B8,1B9,1BA,1BB,1BC,1BD,1BE,1BF,1CØ,1C1)
*
PANEL3Ø2  SLIDLIST HOSTDRV=(DRV13,DRV13)
DRV13     SLIDRIVS ADDRESS=(1C2,1C3,1C4,1C5,1C6,1C7,1C8,1C9,1CA,1CB)
*
PANEL3Ø9  SLIDLIST HOSTDRV=(DRV14,DRV14)
DRV14     SLIDRIVS ADDRESS=(1CC,1CD,1CE,1CF)
*
PANEL31Ø  SLIDLIST HOSTDRV=(DRV15,DRV15)
DRV15     SLIDRIVS ADDRESS=(1B4,1B5,1B6,1B7)
*

          SLIENDGN
```

Figure 59. Sample LIBGEN for JES3
(3 of 3)

Chapter 5. Utility Functions

Overview of Library Utilities

The HSC contains utility functions that provide you with ways to manage library resources. Primary utility functions include:

- library CDS maintenance
- control of library cartridges
- control of scratch volumes
- preparation of reports covering library activity.

Table 11. Utilities Overview

Function	Utility
Library Control Data Set Maintenance	AUDIt BACKup Database Decompile (LIBGEN) Directory Rebuild (DIRBLD) Journal Offload (OFFLoad) MERGEcds RESTore SET
Cartridge Control	Initialize Cartridge (INITialize) Eject Cartridge (EJECt) MOVe UNSElect
Scratch Volume Control	Scratch Conversion (SLUCONDB) Scratch Redistribution (SCREdist) Scratch Update (SCRAtch, UNSCratch, and REPLaceall)
Reporting	Activities Report (ACTIvities) Performance Log Reblocker (SLUPERF) POST VOLSER to Location Volume Report (VOLRpt)

Selecting a Utility

There are many utilities described within this chapter. If you know what function you want to perform, find that function in Table 12. The applicable utility for each specific function is contained in the table.

Table 12. HSC Utilities and Functions

Function	Utility to Use
Add a volume (or list of volumes) to the existing scratch list contained in the CDS	SCRAtch
Backup the library CDS	BACKup
Balance the number of scratch volumes across the library	Scratch Redistribution (SCREdist)
Clear (delete) the scratch list in the CDS and optionally replace it with a new list	Replace (REPLaceall)
Delete a volume (or volumes) from the scratch list contained in the CDS	UNSCratch or Replace (REPLaceall)
Eject one or more cartridges from an ACS in batch mode	EJECt
Force unselection of a volume selected by the HSC	UNSElect
Generate scratch transactions from tape management systems	Scratch Conversion (SLUCONDB)
Inventory cartridges in the library	AUDIt
Label cartridges through the CAP	Initialize Cartridge (INITialize)
Locate volumes containing system-critical data sets within an LSM (with HSC inoperative)	POST VOLSER to Location
Merge volume information from one CDS into another	MERGEcds
Move or relocate a volume (or volumes) within an ACS	MOVe
Off-load one or both of the journals	Journal Offload (OFFLoad)
Prepare the SCP-generated performance log (SMF data) for use by the Activities Report utility	Performance Log Reblocker (SLUPERF)
Print a listing of volumes and locations residing in an LSM	Volume Report (VOLRpt)
Print an activities report listing library activity statistics	Activities Report (ACTIvities)

Table 12. HSC Utilities and Functions

Function	Utility to Use
Rebuild the database directory if the CDS becomes corrupted	Directory Rebuild (DIRBLD)
Recreate the library LIBGEN from the existing CDS	Database Decompile (LIBGEN)
Restore or recreate the library CDS	RESTore
Set or change library configuration information, including: - ACS esoteric - CDS level - cleaning prefix - delete disposition - device numbers for drives - eject password - host identification - HSC command prefix - HSC level - library station device numbers - MAJNAME (QNAME) - nonlibrary esoteric - scratch label type - SMF record type - recovery technique	SET

Note: If you are running a mixed multi-host complex of HSC 4.0, 4.1, 5.0, and 5.1 systems, refer to Appendix D, ‘‘Migration and Coexistence Processes’’ in the *HSC Configuration Guide* for the proper utility release level.

Typical Use of Utilities

A typical use of utility functions might be, for example, invoking both the Scratch Update utility and an Activities Report. In the following example

- volumes A1B1C1 through A1B1C4 have been designated as scratch volumes
- an activities report is to be produced starting on 1/23/93 at 12:00:00. Data in the report will contain uppercase and lowercase characters.

Note: PARM=MIXED in the JCL specifies mixed characters.

The JCL for invoking these utilities is:

JCL for Scratch Update and Activities Report

```
//JOB1           job (account),programmer
//STEP1         EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL   DD DSN=control.dataset.name,DISP=SHR
//SLSSMF      DD DSN=smf.history,UNIT=TAPE,DISP=OLD
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
    SCRATCH VOLSER(A1B1C1,A1B1C2,A1B1C3,A1B1C4)
    ACTI BEGIN(01/23/93,12:00:00)
/*
//
```

Refer to “Activities Report Utility” on page 192 and “Scratch Update Utilities” on page 313 for detailed descriptions of these utilities.

It is only necessary to supply those statements required by the particular utility function(s) being invoked. Utility functions can also share data sets represented by the same statement.

Control Statement Syntax Conventions

The control statement for each utility program consists of a command (indicating the utility function) followed by parameters, as applicable, in 80-character card-image records. For more information about this syntax, see Appendix A, “Macros, Control Statements, Utilities, and Commands Syntax Reference” on page 503.

Utility Syntax Conventions

Utility syntax is illustrated using syntax flow diagrams. For a complete description of this syntax convention, refer to Appendix A.

Utility Administrator (SLUADMIN)

The SLUADMIN program operates as a batch job and controls initialization processing for most utility functions. The utility administrator (SLUADMIN) can accept multiple control statements which are handled as serial requests for multiple utilities. If all requirements needed to execute the utility function are met, control is passed to the appropriate program which handles the actual processing.

Utility functions represented by additional control statements are not started until the prior utility function stops and control is returned to the SLUADMIN program.

How to Invoke SLUADMIN

The following is a generic example of JCL that can be modified to execute SLUADMIN. Where ‘‘utility statements’’ appears in this sample JCL, enter the utilities you want to execute.

For example:

```
SET HOSTID(HSC2) FORHOST(HSCB)
OFFLoad
SCREdist ACS(Ø1)
```

JCL to Invoke SLUADMIN

```
//JOBname    job (account),programmer
//S1                EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
  utility statements
          .
          .
          .
/*
//
```

How to Invoke Utility Programs

For convenience, most utility programs are packaged to appear as a single, user-invoked program. Exceptions include:

- POST VOLSER to Location program
- scratch Conversion.

All other utility functions are invoked as a normal batch job using the SLUADMIN program and user-specified control statements needed to invoke the required utility function.

Utility functions represented by additional control statements are not started until the prior utility function stops and control is returned to the SLUADMIN program.

Authorization to Use Utility Functions

For SLUADMIN to run as an APF-authorized program, it must reside in an authorized library.

A copy of SLUADMIN can be placed in a non-APF authorized library whose access is restricted to those personnel authorized to print reports. Only the Activities Report utility can execute from a non-APF authorized library.

Another copy of SLUADMIN can be placed in an APF-authorized library whose access is restricted to personnel authorized to run all the utilities.

It may be desirable to further restrict access to individual utility functions. Table 13 lists each utility command and the applicable load module that is invoked to process the utility. By restricting access to any of the load modules with an appropriate security package, it is possible to restrict access to the specified utility function.

Table 13. Load Modules for Utilities

Utility	Load Module
ACTIVITIES (Activities Report)	SLUACTV
AUDIT	SLUAUDT
BACKUP	SLUBKUP
DIRBLD (Directory Rebuild)	SLUDRDIR
EJECT	SLUEJCT
INITIALIZE (Initialize Cartridge)	SLUINCT
LIBGEN (Database Decompile)	SLUDBMAP
MERGEcds	SLUMERGE
MOVE	SLUMOVE
OFFLOAD (Journal Offload)	SLUOFFLD
Performance Log Reblocker *	SLUPERF
Reconfiguration*	SLURECON
REPLACEALL (Replace)	SLUSCUP
RESTORE	SLURSTR *
SCRATCH	SLUSCUP
SCRATCH CONVERSION	SLUCONDB
SCREDIST (Scratch Redistribution)	SLUSCRD
SET	SLUSET
UNSCRATCH	SLUSCUP
UNSELECT	SLUNSEL

Table 13. Load Modules for Utilities

Utility	Load Module
VOLRPT (Volume Report)	SLUVOLR

* Not invoked by command.

SLUADMIN Program Return Codes

The SLUADMIN program sets a return code for the execution of the job step as defined in Table 14.

Table 14. SLUADMIN Return Codes

Return Code	Description
0	All utility functions requested via control statements completed normally.
4	At least one utility function encountered an abnormal situation, but it did not cause termination of that utility function or any subsequent utility functions.
8	At least one utility function encountered an error condition that prevented continuation of that utility function, but any subsequent utility functions represented by control statements were attempted.
12	An error condition was detected that either prevented the start of any utility functions, or terminated the active utility function and prevented processing of subsequent utility functions. **Note**: If the return code occurred because of a problem with the HSC CDS or journal files, the problem must be resolved before the HSC can be initialized safely.

The return code for each utility function is listed in a message. For return codes other than 0, additional messages are listed providing more information and description of the error condition. Refer to the *HSC Messages and Codes Manual* for any messages encountered.

Examples of utility program outputs, including messages indicating the return codes, are provided throughout this chapter.

Reports Created By Utilities

Several utilities produce reports when executed. The reports are in addition to the utility function. Utilities that produce reports include:

- Activities Report
- AUDit
- BACKup
- MOVe
- POST VOLSER To Location
- Volume Report.

A description of each utility and resulting report is contained in this chapter.

Report Headings

Utilities provide reports at the end of execution. Report headings include the following information:

- date/time of the report
- page number(s)
- host software version number
- name of the utility function executed.

Parameters Controlling Report Headings

There are two optional parameters that change the format of output reports.

Parameter	Description
NOHDR	Suppresses printing of report headings (error messages still can be written to the report file). This can be useful when running the Volume Report utility with the VOLDATA parameter specified, which produces a raw volume (flat) data file. This parameter can be used only with the Activities Report, MOVe, POST VOLSER To Location, and Volume Report utilities. NOHDR and LINECNT are mutually exclusive. If NOHDR is not specified, the default is to print headings containing the following information: - date/time of the report - page number(s) - host software version number - name of the utility function executed.
MIXED	Prints all report headings and messages in mixed case. The default is uppercase.

LINECNT=*nn*	Specifies the number of lines per page for the SLUADMIN report. Allowable values are 10 through 99; the default is 60 lines per page. LINECNT and NOHDR are mutually exclusive.
DATE=2YR	Specifies that all dates displayed in report detail lines are in the "*mm*/*dd*/*yy*'' format. A *yy* value of 71 or greater indicates a 20th century (19*xx*) date. A *yy* value of 70 or less indicates a 21st century (20*xx*) date. To avoid confusion, you are encouraged to use the DATE=4YR parameter setting described below.
DATE=4YR	Specifies that all dates displayed in report detail lines are in the "*yyyymmdd*'' format. This is the default.

Note: The DATE parameter does not control report header date formats, which are displayed as *yyyy-mm-dd*. See Figure 10 on page 201 for an example of this format.

Example

Several JCL examples using the options for report headings follow:

Example of JCL Using Report Heading Options

```
//STEP1 EXEC PGM=SLUADMIN,PARM='NOHDR,MIXED'
//STEP1 EXEC PGM=SLUADMIN,PARM='LINECNT=55'
//STEP1 EXEC PGM=SLUADMIN,PARM='MIXED'
//STEP1 EXEC PGM=SLUADMIN,PARM='DATE=4YR'
```

Stand-alone Utilities

Most of the utility functions require the Host Software Component (HSC) to be up and functional. Some utilities run stand-alone, in the sense that they perform no dialogues with other HSC components, but they do require the MVS Operating System to be available. These stand-alone utilities are:

- Activities Report
- BACKup
- Database Decompile
- Directory Rebuild
- Journal Offload
- POST VOLSER to Location, which is the only IPLable utility since POST can be IPLed on any MVS, MVS/XA, MVS/SP, MVS/ESA SP or OS/390 capable processor
- RESTore, which requires the HSC to be quiesced
- Scratch Conversion, unless LIBONLY is specified as an option (see "Scratch Conversion (SLUCONDB) Utility" on page 293) If LIBONLY is not specified, the SLUADMIN SCRATCH UPDATE utility that performs the actual scratch operation requires the HSC to be at BASE service level or higher.
- SET
- Volume Report.

Activities Report Utility

The Activities Report utility provides you with information to analyze library resource loading by volume groups (for example, scratch compared to nonscratch, mounted, dismounted, entered, and ejected). This report provides the information necessary for analyzing and possibly redistributing library resources. You specify the time period to be reported against.

The utility also requires the SMF data for the time period requested (see the SET utility, SMF parameter in "SET SMF Record Type" on page 334). It is assumed that you elect to have cartridge movement SMF records recorded in the time period specified. It is also assumed that the SMF records are in sequence by:

- SMF ID
- date
- time, from earliest to latest.

Duplicate or out of sequence records cause the utility to terminate and to display a message indicating that the SMF records are not sorted. Refer to "JCL Requirements" on page 194 to see sort statements you can specify to avoid this situation.

Syntax

```
►►─ACTIvities──┬──────────────────────────────────────────────────────────►◄
               └─┤ Optional Parameters ├─┘
```

Optional Parameters:

```
├──┬──────────────────────────────────────────────────────────────────────►
   │          ┌─TODAY──────┐      ┌─00:00:00──────┐
   └──BEGIN(──┴─begin-date─┴──,───┴─begin-time─────┴──)──┘

►──┬──────────────────────────────────────────────────────────────────────┤
   │          ┌─TODAY──────┐      ┌─23:59:59──────┐
   └──END(────┴─end-date───┴──,───┴─end-time───────┴──)──┘
```

Utility Name

ACTIvities
specifies that an activities report is to be produced.

Parameters

BEGIN
optionally specifies the beginning of the period for the activities analysis.

begin-date

begin-date specifies the starting date of the analysis, expressed in *mm*/*dd*/*yy* or *yyyymmdd* format.

Note: When using the *mm*/*dd*/*yy* format, specify a *yy* value of 71 or greater to indicate a 20th century (19*xx*) date. Specify a *yy* value of 70 or less to indicate a 21st century (20*xx*) date. To avoid confusion, you are encouraged to use the *yyyymmdd* date format.

TODAY

is default date.

begin-time

begin-time is the beginning time-of-day (24-hour value), expressed in *hh*:*mm*:*ss* format.

The allowable range for the begin-time and end-time parameters is 00:00:00 to 24:00:00.

00:00:00

The default value is **00:00:00**.

Examples:

In each of the following examples, activity reporting begins on October 27, 1997 at midnight.

```
BEGIN(10/27/97,00:00:00)
BEGIN(19971027,00:00:00)
BEGIN(TODAY,00:00:00)
BEGIN(,00:00:00)
```

END

optionally specifies the end of the period for the activities analysis.

end-date

end-date specifies the ending date of the analysis, expressed in *mm*/*dd*/*yy* or *yyyymmdd* format. If *begin-date* is specified, *end-date* must be in the same format.

Note: When using the *mm*/*dd*/*yy* format, specify a *yy* value of 71 or greater to indicate a 20th century (19*xx*) date. Specify a *yy* value of 70 or less to indicate a 21st century (20*xx*) date. To avoid confusion, you are encouraged to use the *yyyymmdd* date format.

TODAY

is the default date.

end-time
end-time is the ending time-of-day (24-hour value), expressed in *hh*:*mm*:*ss* format.

The allowable range for the begin-time and end-time parameters is 00:00:00 to 24:00:00.

23:59:59
The default value is **23:59:59**.

Examples:

```
END(10/27/93,18:00:00)
END(19960501,11:30:00)
END(TODAY,23:29:00)
END(,23:59:59)
```

JCL Requirements

The following definitions apply to the Activities Report utility JCL:

SLSCNTL
the primary control data set. This is required so that the SMF record type code may be retrieved.

SLSPRINT
output messages and report from the utility.

SLSSMF
SMF data which the utility reports against. This may be a number of data sets concatenated from oldest to newest. This is an off-loaded copy of the active SMF data sets, created by the SMF dump utility IFASMFDP.

SLSIN
input to the utility in the form of a control statement card image.

The user must specify several additional control cards in the SYSIN portion of the SYNCSORT JCL to ensure SMF records are sorted.

Additional Sort Control Cards

```
//SYSIN DD *
  INCLUDE COND=(6,1,BI,EQ,X'xx')
  SORT FIELDS=(15,4,CH,A,11,4,PD,A,7,4,BI,A)
  SUM FIELDS=NONE
```

Note: In the ‘‘INCLUDE COND’’ statement, the SMF type setting, shown as ‘‘X’xx’’’ above, is supplied by the user. The default setting is ‘‘FF’’ (SMF type 255).

JCL Example

The following example shows JCL for producing an Activities report beginning on December 2, 1993 at noon. Since the END parameter is not specified, all activity up to the last record in the SLSSMF data set is reported. (This assumes that all SMF data is after the start time.)

JCL to Produce an Activities Report

```
//JOBACTV    job (account),programmer
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL    DD DSN=control.data set.name,DISP=SHR
//SLSPRINT   DD SYSOUT=A
//SLSSMF       DD DSN=SMF.HISTORY,DISP=OLD
//SLSIN           DD *
  ACTIVITIES  BEGIN(12/02/93,12:00:00)
/*
//
```

Output Description

There are two types of output contained in the Activities report:

- statistics on cartridge movements (the first section of the report; called the Move section of the report)
- statistics on overall ACS activity (the second section of the report, called the ACS section of the report).

Cartridge Movement Statistics - Move Section of the Report

In the first section of the report, the Move section, the HSC provides two summary lines:

- The first summary line lists from 1 to 16 SMF system IDs found in the SMF records input to the utility.
- The second summary line lists the SMF record type being reported, the total number of SMF records, and the date (*mm*/*dd*/*yy* or *yyyymmdd*) and time (*hh*:*mm*:*ss*) of the earliest and latest SMF record found matching the duration criteria.

  The HSC SMF record type can be changed. When changed, the data extracted from SMF represents the most recent SMF record type, and records with prior SMF record types are ignored.

  The duration criteria are specified in the Activities Report utility syntax as input via the SLSIN parameters.

For the Move section of the Activities Report, every move type is reported under the following headings:

Total

is the count of all operations for the move category listed found in the SMF input matching the duration criteria. This is calculated as the sum of the number of operations found in the SMF records for the move category.

The value is reported as a count of moves and can range from 0 to 99,999,999,999 moves.

The major move categories are:

- all mounts (includes cleaning mounts)
- all dismounts (includes cleaning dismounts)
- all enters
- all ejects.

Subcategories for mount/dismounts are:

- scratch - same LSM
- scratch - diff LSM
- nonscratch - same LSM
- nonscratch - diff LSM.

Subcategories for enter/ejects are:

- ejects-same LSM
- ejects-diff LSM
- enters-same
- enters-diff LSM.

All ‘‘-same LSM’’ subcategories report moves which have the source and destination of the move in the same LSM. All ‘‘-diff LSM’’ subcategories report moves which have the source and destination of the move in different LSMs.

% of all

is the percent of move operations represented by the category or subcategory found in SMF input matching the duration criteria.

This percentage is calculated as the number of operations in the category or subcategory divided by the number of operations in the major category.

The value is reported as a percent and can range from 0 to 100 percent.

Ave. time

is the mean elapsed time from the issuance of the move request by the HSC until the HSC receives an acknowledgment that the cartridge has been moved.

It is calculated as the sum of the elapsed time for operations in the category divided by the number of operations in the category. The elapsed time is an HSC determined response time for a move request.

The value is reported as seconds and can range from 0.0 to 9,999.9 seconds. A value of ‘‘N/A’’ indicates no SMF records were found for the move category or no library hardware existed which matched the requested duration criteria.

For dismounts, this includes time for the transport to rewind and unload the cartridge. For mounts, this includes time the transport takes to load and spin the tape to load point. For mounts and dismounts, this **excludes** HSC queueing incurred when the HSC delays sending a mount request to the LMU until a previous tape has been rewound, unloaded, and put away.

Temporary enters are counted in the enter category. Ejects of temporarily entered volumes are counted in the eject category. For temporary enter/ejects, transport load and unload times are included in the elapsed time.

For enters and ejects, this only includes time it takes to move a cartridge from the CAP to a cell or from a cell to the CAP. It does NOT include time it takes for an operator to service the CAP or for the LSM to scan the CAP. It also **excludes** HSC queueing done to manage the CAP activity.

Ave. pass-thrus

is the mean number of pass-thrus for a move category.

This is calculated as the sum of the number of pass-thrus divided by the number of operations in the category.

The value is reported as the mean number of pass-thrus and can range from 0.0 to 99.9 pass-thrus.

This is only reported for the major and the ‘‘-diff LSM’’ move subcategories. A value of ‘‘N/A’’ is reported for the ‘‘-same LSM’’ subcategories.

Earliest

is the date (*mm*/*dd*/*yy* or *yyyymmdd*) and time (*hh*:*mm*:*ss*) of the earliest SMF record found matching the category being reported for the duration requested.

Latest

is the date (*mm*/*dd*/*yy* or *yyyymmdd*) and time (*hh*:*mm*:*ss*) of the last SMF record found matching the category being reported for the duration requested.

Usage Notes

1. Only cartridge moves involving a CAP or a transport are reported. Cell to cell moves such as those used by the Scratch Redistribution utility are not reported.
2. Only moves which complete successfully are reported in the statistics. Moves which incur HSC or LMU errors are not reported.
3. Other products exist which report mount pending time, but fail to consider dismount as a separate activity. To compare the Activities Report values to other products' ''mount pending'' time, it may be necessary to add HSC reported mount and dismount times.
4. Other LSM operations besides cartridge moves consume ACS resources (e.g., CAP and audit scans probably take the next highest amount of LSM activity depending on frequency). Scans are not reported specifically, except as they impact cartridge movement time and increase LSM ARM USE (see "Overall ACS Statistics - ACS Section of the Report" on page 199).
5. The LSM may move more than one cartridge at a time and often interleaves moves when busy. The HSC reported response time is an elapsed time which does not consider overlapped operations. When attempting to determine how the LSM is capable of mounting 10 cartridges in 125 wall clock seconds when the HSC reports average mount time of 25 seconds, LSM interleave must be considered.
6. Dismount scratch categories depend on the LIBGEN SLILIBRY macro DELDISP parameter. A scratch dismount occurs whenever the HSC detects a ''delete'' dismount and the library is LIBGENed with SLILIBRY macro parameter DELDISP=SCRTCH. If this defaults to or specifies DELDISP=NOSCRTCH, then there are no scratch dismounts.
7. As the HSC attempts to float dismounts to a nearby LSM, there should be less pass-thru activity on dismounts than on mounts. However, to float cartridges, free cells must be available. Ejects also may incur more pass-thru activity than enters because the HSC attempts to place entered cartridges into the same LSM as the entry CAP. Ejected cartridges may take numerous pass-thru operations to move from their home cell to the preferred CAP.
8. The Activities Report summarizes information contained in SMF input. Two types of SMF records are written every HSC SMF interval:
   - LSM operating statistics record, (subtype 1), and
   - LMU statistics buffer data block records (subtype 4).

The Move section of the Activities Report only processes the LSM operating statistics records. LSM operating statistic records contain information describing moves which complete during an HSC SMF interval. When attempting to understand ACS performance it may be worthwhile to decrease the HSC SMF interval so the HSC SMF records describe finer intervals of time (see the post-installation tasks information in the in the *NCS Installation Guide*).

For the ACS section of the Activities Report, output is based on an LMU interval. In a single host environment, the LMU interval is equivalent to the customer-defined HSC SMF interval.

In a multi-host environment, the LMU interval for each host is equivalent to the customer-defined HSC SMF interval for the host on which the HSC is running. In this case, data from all hosts must be combined to get an accurate picture of HSC activity. Combining data is necessary because the LMU's reports of robotic motions and temporary error counts are not separated by the requesting host. Robotic motions and temporary error counts attributed to all hosts are combined and sent to the host that is currently requesting ACS statistics.

In addition, in a multi-host environment, cartridge motions initiated for one host may be accounted for in another host's SMF data, depending on the relative length and timing of the SMF reporting intervals on the various hosts. This is true for data that appears in PM2 and CA-9 Reliability Plus (R+) reports, as well as in this report. The SMF subtype 7 records generated for each motion request are reported only by the host that initiated the request.

Note: For this report and for the CA-9 (R+) report, it is better to combine data from multiple hosts prior to generating the report so that the data from all sources will be reported and the totals and averages listed will be as accurate as possible.

Overall ACS Statistics - ACS Section of the Report

For the ACS section of the Activities report, ACS statistics are reported under the following report headings:

ACS ID
is the ACS number of the ACS being reported, the number of SMF records, and the earliest and latest SMF record date (*mm*/*dd*/*yy* or *yyyymmdd*) and time (*hh*:*mm*:*ss*) found matching the Activities Report verbs duration specification.

LSM
the LSM numbers are listed across the page.

ARM USE
is the mean percent LMU calculated LSM arm busy found in the SMF input matching the duration criteria.

The LMU calculates this value as the amount of time since start of an LMU interval the LSM arm has been in motion divided by the total time in the LMU interval. This value is then summed for all SMF records and divided by the number of SMF records found matching the duration criteria.

The value is reported as a percent and may range from 0 to 100 percent. A value of ''N/A'' indicates the LSM is not configured. A value of ''X percent'' indicates that the LSM is configured, but no SMF records matched the duration criteria.

LSM arm motion is used for CAP and audit scans as well as general cartridge movement. This does not include pass-thru port rotation time, but does include time

to place the cartridge into the pass-thru port or to remove a cartridge from the pass-thru port.

P-THRU
is the LMU calculated number of master pass-thru operations found in the SMF records matching the duration criteria.

This is recorded by the LMU every LMU interval and is summed by the Activities Report.

The value is reported as a count of pass-thrus and can range from 0 to 99,999 pass-thrus. A value of ‘‘N/A’’ indicates the LSM is not configured. A value of ‘‘X’’ indicates that the LSM is configured, but no SMF records matched the duration criteria.

Each pass-thru port has both a master and a slave LSM. A pass-thru operation involves placing a cartridge into one side of a pass-thru port, rotating the pass-thru port, and removing the cartridge from the other side of the pass-thru port. Each pass-thru operation is counted one time and is only counted by the master side LSM for the pass-thru port.

Usage Notes

1. Merging multi-host HSC SMF records impacts the LSM ARM USE statistic as described above. However, not merging multi-host HSC SMF records affects the number of pass-thrus reported, as this is only the number of pass-thru operations occurring during the hosts LMU interval.
2. LSM ARM USE should never be reported higher than 100 percent. If the LSM is overlapping operations the arm is still only busy for 1 second even though it may be moving two cartridges during that 1 second time period.
3. The raw SMF record contains counts of pass-thru operations for each master pass-thru port of an LSM. The ACS section totals this information for its pass-thru count.
4. The ACS section of the Activities Report only processes the LMU statistics buffer data block SMF record (subtype 4). LMU statistics buffer records contain information calculated and returned by the LMU every HSC SMF interval. When attempting to understand ACS performance it may be worthwhile to decrease the HSC SMF interval so the HSC SMF records describe finer intervals of time (refer to the post-installation tasks information in the *NCS Installation Guide*).
5. Depending on the 9740 microcode level, 9740 LSMs may display zeroes for LSM arm use percentage and pass-thru statistics. Additionally, the SLSSLSB SMF record (refer to “SLSSLSB” on page 469) will contain zeroes in the LMU ATHS Statistics Buffer entries, and the SLSSLLG6 LOGREC record (refer to “SLSSLLG6” on page 504) will not write robotics motion and soft fail counts for 9740s.

Figure 10 on page 201 is an example of a typical Activities report.

```
SLUADMIN  (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0001
TIME hh:mm:ss                                  Control Card Image Listing                        DATE  yyyy-mm-dd

 ACTIVITIES BEGIN   yyyy-mm-dd
```

```
SLUADMIN  (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0002
TIME hh:mm:ss                                Activities Begin yyyy-mm-dd                         DATE  yyyy-mm-dd


SYSTEM IDS:  HSCI  HSCH  HSCF  HSCE  HSC6  HSC1
SMF RECORD TYPE: 245  TOTAL RECORDS:   1,580    EARLIEST:  09/12/91 11:54:12            LATEST:  09/16/91  05:12:25
                          TOTAL      % OF ALL       AVE. TIME       AVE. PASS-THRUS          EARLIEST              LATEST
ALL MOUNTS:               346        100 %          22.4 SEC.            0.0            09/12/91 11:54:12    09/16/91 05:12:23
SCRATCH     -SAME LSM      10          0 %          19.7 SEC.            N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM       0          0 %             N/A               0.0            09/12/91 11:54:12    09/16/91 05:12:23
NONSCRATCH-SAME LSM       336         97 %          22.5 SEC.            N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM       0          0 %             N/A               0.0            09/12/91 11:54:12    09/16/91 05:12:23
                          TOTAL      % OF ALL       AVE. TIME       AVE. PASS-THRUS          EARLIEST              LATEST
ALL DISMOUNTS:            345        100 %          19.9 SEC.            0.0            09/12/91 11:54:12    09/16/91 05:12:23
SCRATCH     -SAME LSM       0          0 %             N/A               N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM       0          0 %             N/A               0.0            09/12/91 11:54:12    09/16/91 05:12:23
NONSCRATCH-SAME LSM       345        100 %          19.9 SEC.            N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM       0          0 %             N/A               0.0            09/12/91 11:54:12    09/16/91 05:12:23
                          TOTAL      % OF ALL       AVE. TIME       AVE. PASS-THRUS          EARLIEST              LATEST
ALL ENTERS:               338        100 %          12.2 SEC.            0.0            09/12/91 11:54:12    09/16/91 05:12:23
            -SAME LSM     338        100 %          12.2 SEC.            N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM       0          0 %             N/A               0.0            09/12/91 11:54:12    09/16/91 05:12:23
                          TOTAL      % OF ALL       AVE. TIME       AVE. PASS-THRUS          EARLIEST              LATEST
ALL EJECTS:               338        100 %          13.2 SEC.            0.0            09/12/91 11:54:12    09/16/91 05:12:23
            -SAME LSM     326         96 %          12.5 SEC.            N/A            09/12/91 11:54:12    09/16/91 05:12:23
            -DIFF LSM      12          4 %          32.7 SEC.            1.0            09/12/91 11:54:12    09/16/91 05:12:23

ACS ID : 00        USAGE RECORDS:        690        EARLIEST: 09/12/91 11:54:13    LATEST: 09/16/91 05:12:25
LSM:          0     1     2     3     4     5     6     7     8     9     A     B     C     D     E     F
ARM USE:     0%    0%   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A
P-THRU:      31    0%   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A
ACS ID : 01        USAGE RECORDS:        195        EARLIEST: 09/12/91 11:54:15    LATEST: 09/16/91 05:12:24
LSM:          0     1     2     3     4     5     6     7     8     9     A     B     C     D     E     F
ARM USE:     8%   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A
P-THRU:       0   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A   N/A
SLSO1551 CONDITION CODE FOR UTILITY FUNCTION IS 0.
```

C29361

Figure 10. Activities Report Utility Sample Output

AUDIt Utility

The Audit utility provides the user the ability to perform a physical inventory of library volumes and to optionally update the library control data set to reflect all observed changes in cell storage for the specified component(s). Identification of the library components to be audited may include:

- the entire library
- an ACS
- LSMs (or a single LSM) within a specified ACS
- certain panels within a specified LSM
- certain rows within a specified panel
- certain columns (cells) within a specified row
- empty cells only
- diagnostic cells
- in-transit cartridges.

The AUDIt utility does not audit the enhanced CAP panel (panel 11 on the 4410 and 9310 LSMs) because the panel contains no storage cells. Audit processing preserves, whenever possible, the volume history/usage information and scratch status.

9360 (WolfCreek) LSMs perform an internal audit when the LSM access door is closed. This takes only a few minutes. To move volume data into the CDS, the user must run an HSC external audit.

Audits are lengthy because the LSM hardware physically scans the library elements identified in the audit. The Audit utility validates the contents of cell storage locations on a cell-by-cell basis across each specified LSM panel, then proceeds on a panel-by-panel basis regardless of whether an entire LSM or an ACS is being audited.

Usually you invoke this utility after detecting a possible loss of library integrity. Such events can include LSM access door opening or a volume not found at the data set location. To minimize processing time, each LSM engaged in the audit process is managed by an independent task attached in the HSC address space.

- If a loss of control data set integrity is suspected in an operating Automated Cartridge System, specification of optional parameters restricts audit processing to only those library elements where an integrity loss is suspected. Because selective or restrictive audits take less time, you are encouraged to run these types of audits if the library elements which experienced the loss of integrity are known.

- On the other hand, a total library audit is an acceptable method to use to initialize the control data sets when the LSMs in a library have been opened and manually loaded. In order to initialize the control data set for a total library audit, you must have a control data set with a valid configuration. This can be obtained from any previous backup of the control data set or from a new execution of data set initialization (SLICREAT is used to create the control data set during installation).

Depending on the size of the library elements and installation conventions, you may choose to code **TIME=1440** on the utility job card. Setting this parameter allows you to override the default execution time limit. TIME=1440 specifies that no time checking is

done at all, which allows a job to execute indefinitely (1440 is the number of minutes in 24 hours).

You can specify whether or not the library control data set is updated as a result of audit, or if only the discrepancy listing is produced by the parameters chosen.

- If the APPly(YES) is specified, the library control data set is updated to reflect all observed contents in cell storage. A discrepancy listing is also produced. Duplicate VOLSERs and cartridges with unreadable or illegal external labels are ejected from the LSM. Cartridges that are not recorded in the CDS that have external media labels that are unreadable are also ejected.

Note: The discrepancy list identifies differences between the CDS and the physical inventory. APPly(YES) is the default setting.

- If APPly(NO) is specified, duplicate VOLSERs and cartridges with unreadable/illegal external labels are not ejected, the library control data set is not updated, and a discrepancy listing is produced.

Media Type Mismatch Conditions

The Audit utility can address a mismatch condition if the LMU reports a different media type than the CDS contains. In this case, an unreadable external media label exists, and the vision system cannot determine the media type.

Note: CDS media information is updated when the volume external label is read by the robotic vision system and is transmitted back to the HSC through the LMU.

It is recommended that users provide an external media label for all cartridges.

Depending on the parameters input by the user, the following actions occur:

1. If APPLY(YES) is specified (or defaulted to):
   - If the LMU and a VOLATTR are mismatched, the VOLATTR is incorrect, and the HSC issues a warning message.
   - If the media values for the LMU and the VAR do not agree, the HSC issues a warning message, and the CDS is updated to reflect the value reported by the LMU.
   - If the media value is unreadable by the LMU (for a cartridge recorded in the CDS), the HSC issues a warning message, and the CDS is updated to indicate that the media value of this volume is unreadable.
   - If the media value is unreadable by the LMU (for a cartridge not recorded in the CDS), the HSC issues a warning message, and the volume is ejected.
2. If APPLY(NO) is specified:
   - If the LMU and a VOLATTR are mismatched, the VOLATTR is incorrect, and the HSC issues a warning message.

- If the media values for the LMU and the VAR do not agree, the HSC issues a warning message.
- If the media value is unreadable by the LMU (recorded in the CDS), the HSC issues a warning message.
- If the media value is unreadable by the LMU (not recorded in the CDS), the HSC issues a warning message.

In both of these cases (APPLY(NO) or APPLY(YES)), the audit continues.

Actions Permitted During an Audit

During execution, AUDIt permits any of the following actions to occur within any LSM in which an audit is being conducted:

- mounts
- dismounts to the same or another LSM (if the home location exists prior to the start of the audit)
- ejects
- pass-thru events.

No new cartridge cell allocations can occur during audit processing within those LSMs being audited, so cartridge enters and pass-thrus with MNTD Float(ON) are not allowed in ACSs or LSMs involved in the audit. In addition, cartridge initialization and scratch redistribution is not allowed in an ACS being audited.

How the AUDIt Utility Functions

Each LSM element to be audited is scanned, cell by cell, and compared with the volume and cell information for the corresponding entries in the library control data set. If the APPly(YES) parameter is specified, the control data set is corrected to reflect the current contents of the inspected cell. If duplicate volumes are found in either a previously audited cell in the LSM currently being audited or another LSM, the last volume scanned is physically ejected.

Volumes which are to be ejected are moved to the CAP identified in the invoking control statement or to the highest-priority, available CAP. The CAP is not allocated until the Audit utility requires it.

If, during the Audit operation, a CAP is required and the scope of the Audit is a row or column level Audit, the CAP remains allocated until the Audit completes. If the scope of the Audit is for multiple panels or larger (such as an LSM or ACS level Audit), the operator is given the opportunity to release the CAP or have it remain allocated for the duration of the Audit.

Note: The opportunity to release the CAP is presented only after each full panel audit completes. An audit consisting of only one panel is not presented with the choice to reserve or release the CAP. The same logic applies to the last panel of a multiple-panel audit.

After the Audit ejects volumes from the current panel, a write-to-operator with reply (WTOR) is issued allowing the operator to keep or release the CAP. If the operator responds with a ‘‘K’’, the CAP remains allocated for the duration of the Audit. If the operator responds ‘‘R’’, the CAP is released so that it may be allocated to another operation. If another volume is to be ejected, the Audit again acquires the CAP and the keep/release dialog is repeated. If the operator does not reply to the message within a 5-minute time period (unattended operations, nighttime Audits), the default is ‘‘K’’. The CAP remains allocated, and the Audit continues.

Scratch status of some volumes may be lost after an audit; therefore, it is recommended that the installation run the Volume Report utility, and possibly the Scratch Update utility, after an audit. You are also encouraged to back up the library control data sets after completing an audit.

On a frozen panel, if cartridges are encountered that have not been recorded in the CDS and APPly(YES) is specified, these cartridges will then be recorded in the CDS. The panel free cell counts are updated. LSM free cell counts are not updated, since the LSM free cell count does not include free cells on frozen panels.

Concurrent Audits

Concurrent Audit utilities (from the same or different MVS systems) are allowed and can usually improve the performance of the selective/restrictive audits in different LSMs. Concurrent audits are not recommended when duplicate volumes are suspected.

In some cases, running concurrent audits may compromise the accuracy of the audits. For example, two concurrent audits running on different MVS systems may not detect duplicate volumes if both utilities audit separate library elements containing duplicate volumes.

Note: Concurrent APPly(YES) and APPly(NO) audits or audits of overlapping elements are disallowed. In addition, audits are prohibited from running concurrently with the Initialize Cartridge or Scratch Redistribution utilities within the same ACS. An HSC message is generated and the utility must be resubmitted or its parameters changed so no conflict exists.

If concurrent audits are running on multiple LSMs, and an audit is canceled and restarted, a conflicting audit message is generated. If the restarted audit were to be run, inappropriate duplicate VOLSERs may be detected and these volumes may be ejected from the LSM. All audits must be completed before any can be restarted.

Syntax

```
►►─AUDIt─┬─ALL──────────────────────────────────────────────────────────────►◄
         └─ACS(acs-id)─┬──────────────────────────────────────────────┬──┬──┬──
```

as running the AUDIT utility with the ALL parameter. To audit only certain LSMs within an ACS, you must code the LSM parameter with the LSM or list of LSMs.

LSM

optionally specifies that only certain LSMs within the specified ACS are to be audited.

(lsm-list)

An *lsm-list* can be a single LSMid or a list of LSMids. An LSMid is a single hexadecimal digit. An LSM range is not allowed. If a list is specified, the elements must be separated by blanks or commas, and the entire list enclosed in parentheses.

PANel

optionally specifies that only certain panels within an LSM are to be audited.

(panel-list)

panel-list may be a single panel or a list of panels. Panel ranges are not allowed. If a list is specified, the elements must be separated by blanks or commas, and the entire list enclosed in parentheses.

Refer to the appropriate ACS hardware document for information about LSM outer and inner wall panel layouts.

Note: If this parameter is specified, the LSM parameter may contain only one LSM number.

A *panel-list* element is a one or two digit decimal number. For 4410 and 9310 LSMs, valid panel entries are 0 through 11, identifying the outer LSM wall panels, and 12 through 19, identifying the inner panels. For 9360 (WolfCreek) LSMs, panels 0 through 4 can be specified. For 9740 LSMs, valid panel entries are 0 through 3.

ROW

optionally specifies that only certain rows within the specified LSM panel are to be audited.

(row-list)

row-list may be a single row or a list of rows. Ranges are not allowed. If a list is specified, the elements must be separated by blanks or commas, and the entire list enclosed in parentheses.

If this parameter is specified, the LSM and PANel parameters may contain only one element.

A *row-list* element is a one or two digit decimal number. For 4410 and 9310 LSMs, valid row entries are 0 through 14 (0 indicates the top row and 14 indicates the bottom row). For 9360 (WolfCreek) LSMs, rows 0 through 41 can be specified with the exception of panel 1, which contains only four usable cells (rows 35 through 38). For 9740 LSMs, valid row entries are 0 through 41 on panels 0, 2, and 3; and 36 through 41 on panel 1.

Notes:

1. On 9740s, column 3 on panel 2 allows row entries only on rows 28 through 41.
2. On 9740s, the cells on panel 3 are optional.

COLumn

optionally specifies that only certain columns (cells) within an LSM panel row are to be audited.

(column-list)

column-list may be a single column, or a list of columns. Ranges are not allowed. If a list is specified, the elements must be separated by blanks or commas, and the entire list enclosed in parentheses.

If this parameter is specified, the LSM, PANel, and ROW parameters may contain only one element.

A *column-list* element is a one or two digit decimal number. For 4410 and 9310 LSMs, valid column entries are 0 though 23, left to right, for outside wall panel columns. Inner wall panels are numbered 0 through 19, right to left. For 9360 (WolfCreek) LSMs, columns 0 through 5 can be specified. For 9740 LSMs, valid column entries are 0 through 3 for panels 0, 2, and 3 (if the optional cells are present); 0 through 2 for panel 1.

CAP

CAP optionally specifies a particular Cartridge Access Port to be used for any required cartridge ejections during the Audit operation.

(cap-id)

The Cartridge Access Port identifier. The format for *cap-id* is *AAL*:*CC* where *AA* is the ACS number, *L* is the LSM number, and *CC* is the CAP number.

Allowable values for *CC* are:

00

standard 21-cell CAP; or the right-hand 40-cell enhanced CAP; or the 20-cell WolfCreek CAP; or the 9740 fixed rack 14-cell or 10-cell removable magazine CAP.

Note: 000 is also an allowable entry for this CAP type.

01

left-hand 40-cell enhanced CAP or the 30-cell WolfCreek optional CAP.

02

priority CAP (PCAP) for an enhanced CAP or WolfCreek CAP.

03

standard fixed rack 14-cell CAP or the 10-cell removable magazine. The LMU recognizes the configuration when the ACS or LSM is varied online.

Note: If a CAP is not specified, a CAP in the identified ACS is selected based on the CAPPref operator command (refer to the "CAP Preference (CAPPref) Command and Control Statement'' in the *HSC Operator's Guide*).

Multi-ACS audits cannot specify the CAP parameter. A CAP is chosen for each ACS based upon CAP preference values.

EMPTYCel

optionally specifies that only empty cells are to be audited. **This parameter can be used in combination with all other AUDIt parameters except DIAGScan(ONLY)**.

The main benefit provided by auditing only empty cells is reducing the time required to run an audit. Typically, users will want to specify this parameter when:

- they have entered an LSM and placed new cartridges in empty cells, or
- they need to correct cartridge location information for library volumes that have been manually moved to empty cells.

In either case, if APPLy(YES) is specified, the CDS is updated to reflect that these cells are no longer empty.

Note: In some cases, running an empty cell only audit may compromise the accuracy of the audit.

DIAGScan

optionally specifies that diagnostic cells are to be scanned. The HSC scans these cells one at a time and displays the contents of each cell in the AUDIt utility report.

Notes:

1. **DIAGScan is mutually exclusive with the ROW and COLumn parameters.** It can be used in combination with all other AUDIt parameters.
2. Cartridge movement between diagnostic cells and regular storage or CAP cells is not supported by the LMU, so diagnostic cell contents can only be reported.

ONLY

specifies that only diagnostic cells should be scanned. **This parameter cannot be specified in combination with the EMPTYCel parameter.**

ALSO

specifies that diagnostic cells should also be scanned along with the normal AUDIt utility operations.

INTRANs
optionally specifies that in-transit cartridges in an LSM are to be processed. All in-transit cartridges, except those identified in the note below, are read and ejected as part of an AUDIt utility operation.

Notes:

1. **INTRANs is mutually exclusive with the APPLY(NO) parameter.** It can be used in combination with all other AUDIt parameters.
2. Only the first two cells (columns 0 and 1) in a 9310 playground are accessible to an in-transit audit. Cartridges in other cell positions in a 9310 playground (columns 2 through 5) cannot be ejected by an in-transit operation.
3. 9740 diagnostic cells cannot be scanned by an audit.

JCL Requirement

The following definitions apply to Audit utility JCL:

SLSPRINT
output messages from the utility program.

SLSIN
input to the utility in the form of control cards.

JCL Examples

The following example shows JCL for auditing an entire library (all ACSs).

JCL for Audit of Entire Library (all ACSs)

```
//JOBAUDT     job (account),programmer,TIME=1439
//S1          EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSIN       DD *
  AUDIT ALL
/*
//
```

The following example shows JCL for a selective audit of a single ACS and two LSMs. The CAPid where the cartridges are to be ejected is also specified.

JCL for Selective Audit (1 ACS, 2 LSMs, with CAPid)

```
//JOBAUDT     job (account),programmer
//S1          EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSIN       DD *
  AUDIT ACS(Ø1) LSM(1,2) CAP(ØØ)
/*
//
```

The following example shows JCL for a selective audit specifying a panel-list and producing a discrepancy list if duplicate VOLSERs or unreadable/illegal cartridge labels are encountered.

JCL for Selective Audit (with panel-list and discrepancy list)

```
//JOBAUDT     job (account),programmer
//S1          EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSIN       DD *
  AUDIT ACS(Ø1) LSM(4) PANEL(6,12) APPLY(NO)
/*
//
```

JCL for Selective Audit of Empty Cells

```
//JOBAUDT     job (account),programmer
//S1          EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSIN       DD *
  AUDIT ACS(ØØ) LSM(1) EMPTYCELL
/*
//
```

JCL for Selective Audit of Diagnostic Cells Only

```
/JOBAUDT     job (account),programmer
//S1         EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN      DD *
  AUDIT ACS(ØØ) LSM(2) DIAGSCAN(ONLY)
/*
//
```

JCL for Selective Audit that Includes Diagnostic Cells

```
/JOBAUDT     job (account),programmer
//S1         EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN      DD *
  AUDIT ACS(00) LSM(2) PANEL(6,7,8) DIAGSCAN(ALSO)
/*
//
```

Output Description

Output resulting from the execution of the Audit utility includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute audit processing
- messages indicating anomalies observed and/or actions occurring during processing (see Figure 11)
- updated and validated library control data set with respect to the library elements that have been audited (if APPly(YES) is specified).

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                              Control Card Image Listing                  DATE yyyy-mm-dd

 AUDIT ACS(0) LSM(0) PANEL(00) CAP(000)                          00100004
```

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                                   Audit Utility                          DATE yyyy-mm-dd

SLS0231I *** Audit phase 1 (Registration) completed.

SLS0232I *** Audit phase 2 (Volumes Check) completed.
SLS0199I Volume AP0038 in CELL 000:0:0:2:1 is in Control Dataset at CELL 000:1:0:1.
SLS0201I Cartridge in CELL 000:0:2:4 has an unreadable external label.
SLS0200I Volume A03HA6 in CELL 000:0:1:0:6 is not in Control Database.

SLS0233I *** Audit phase 3 (Cell Scan) completed.
SLS0213I Volume AP0025 not located by Audit.

SLS0234I *** Audit phase 4 (Finish) completed.

SLS0155I Condition Code for Utility Function is 0.
```

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Figure 11. AUDIt Utility Sample Output

BACKup Utility

The BACKup utility allows you to back up the library control data set. The control data set is the single most important resource required in the operation of the HSC. Various controls and services are available to keep the control data set intact and to enable you to recover the data set from a total failure. Features such as shadowing, journaling, backup, and restore, are all intended to provide for the integrity of the control data set. A library can have the following control data sets:

- **Primary control data set.** Every installation must have this data set. It contains the inventory of all cartridges in the library, the library configuration, information about library hardware and resource ownership across multiple processors, and serves as a vehicle of communication between the HSCs running on multiple processors.
- **Secondary control data set.** This optional data set is a duplicate copy of the primary control data set.
- **Standby control data set.** This data set is optional. It is a formatted control data set with only one valid record, the Database Heartbeat (DHB). It is highly recommended that a standby control data set be created and initialized in your installation. This database is used primarily for control data set recovery.

Prerequisites

The BACKup utility can be executed with or without functioning library host software.

Note: Backup to tape is not supported.

Reasons for Running the BACKup Utility

The following items justify running the BACKup utility:

- regularly scheduled backups can be run to prevent inadvertent loss of information
- the primary and/or secondary copy of the control data set for your library has been deleted or corrupted
- in a multiprocessor environment, due to a CDS switch on one processor, the primary and secondary CDS might run independently and become unsynchronized. In such a situation, you must determine which of two nonidentical control data sets is the correct copy; the BACKup utility assists you in recovery.
- to choose the CDS with the most current updates if a database mismatch is detected.

Refer to “When CDS Copies Are Split Among Hosts After an Error” on page 216 for the procedure to recover control data sets in remote-linked libraries.

How the BACKup Utility Functions

The BACKup utility performs extensive error checking on CDS records, as well as comparison checking between primary and secondary copies of the CDS.

Notes:

1. In order to run a back up correctly, all data sets currently defined to the HSC should be specified. This ensures that proper CDS selection and reservation occurs.
2. The backup data set is formatted as RECFM=F, BLKSIZE=4096. The logical record length may be LRECL=0. In this case, LRECL=0 indicates to default to the block size, so you should not construe this as a problem.

If both copies of the data set are available and an I/O error occurs during the analysis phase of backup, the utility attempts to continue backup on the other copy unless the CDS keyword specifies the CDS that contains the error. If the CDS keyword specifies the control data set containing the error, the utility terminates.

Depending upon the option that you select with the keyword OPTion,

- a straight copy is made
- a detailed block analysis is performed
- a restart of the utility is performed.

Copy data sets are made for use as analysis data sets to limit the hardware reserve placed on the control data set to an absolute minimum. Depending upon options selected, analysis of data blocks can be performed and block information modified before the data is written to the backup data set (SLSBKUP).

A return code of eight (RC=8) can be expected if shadowing (a secondary CDS) is enabled and the secondary DD statement is not provided. A backup of the primary control data set will not be taken.

If for any reason, a return code of eight (RC=8) occurs, the utility may be able to be restarted (refer to “How to Restart Backup” on page 226).

The RESTore utility works in conjunction with BACKup by formatting the discrepancy blocks into control card statements and outputting them to the SLSAUDIT data set. When the HSC is reactivated after a backup and restore, the discrepancy control statements are input to the SLUADMIN program and AUDIt, UNSCratch, and UNSElect are performed to resolve discrepancies.

Refer to “RESTore Utility” on page 285 for detailed information on the RESTore utility.

Backup Procedure

Backup of the control data set may be performed using conventions for specifying the secondary control data set and with copy data sets to enable block analysis, if desired. The following procedure describes steps for performing backups (see the examples in "JCL Examples" on page 210 for each step).

1. If OPTion(Analyze) is specified, allocate the SLSCOPY1 and SLSCOPY2 data sets. This step is not necessary if you specify OPTion(Copy). These data sets must be the size of the current control data set.

2. Allocate the SLSBKUP data set. It should be slightly larger than the control data sets. The size depends upon the number of discrepancies found. However, a recommended size is five percent larger than the current control data set.

3. Run the BACKup utility.

   If backup options requiring copy data sets are specified, the control data set is placed in a reserve state only long enough for the data to be copied to the SLSCOPYn data sets. The resident-host cannot access either control data set except for backup processing.

   The library control data set is backed-up to the user-specified DASD data set. If journaling is enabled, all specified journals are reset when the backup is completed.

   Note: Up to 99 journals can be specified per run.

   Finally, the control data set is returned to a state where it can support normal library processing. If Analyze is specified, the SLSCOPYn data sets are processed using unreserved READs; otherwise, the utility ends.

4. If SLSCOPYn data sets are used and a return code of less than RC=8 (i.e., backup successful) is achieved, these data sets may be deleted or reused when the backup is restarted due to a failure.

When CDS Copies Are Split Among Hosts After an Error

Special precautions should be taken for running BACKup and RESTore when local/remote-linked libraries run control data sets independent of each other. In this situation, the primary and secondary control data sets are being updated by the HSC on their respective sides of the link. If remote communication is lost, the two control data sets become unsynchronized.

Precautions also should be followed when the link connecting the local and remote libraries is disrupted.

Special considerations while the link is down include:

- Keep enters and ejects of cartridges to a minimum. This practice reduces the number of AUDIT statements produced.
- Enter MNTD Float(OFf). This generates more pass-thrus, but less AUDIT statements.

- Enter MNTD SCRDISM(CURRENT) to avoid cartridge movement.
- Avoid running the SET utility.
- Avoid running the Scratch Update and Scratch Redistribution functions during this time.
- Take all HSCs down prior to the link being restored.

Special considerations after the link is restored include:

- Avoid restoring CDS copies from backups taken while the link is down. If a restore of the CDS(s) is necessary only on one side of the link, make sure that only the CDS(s) on that side is restored.

  Do this by including **only** DD statements for the data sets on the side of the link to be restored. Do **not** restore **all** CDS copies from a backup taken while the link is down.
- After the link is restored, **all** HSCs should remain down for backup/restore.
- Run BACKup. OPTion(Analyze) must be used.
- If you know which CDS has had the most processing occur after the link was disrupted, use the CDS keyword to select that CDS for backup.
- Once backup is completed, restore the control data sets. Do not apply journals.
- Reinitialize the HSCs.
- When the ACSs are available, start the SLUADMIN program using the SLSAUDIT data set from the restore as input.

Syntax

```
►►─BACKup──┬──────────────────────────────┬──┬──────────────────────────────┬──►◄
           └─CDS(─┬──────────────────────┬─)─┘  │                              │
                  ├─Primary──────────────┤      │                ┌─Copy───────┐│
                  ├─Secondary────────────┤      └─OPTion(─┬───────┼─Analyze────┼┼─)─┘
                  └─STandby──────────────┘                │       └─Restart────┘│
```

Utility Name

BACKup
specifies that a backup operation is to be performed.

Parameters

CDS

optionally, specifies that a backup is to be run on a control data set. If CDS is not specified, the BACKup utility backs up the CDS containing the most updates.

For regularly scheduled backups of HSC control data sets, do **not** specify the CDS keyword when each CDS copy is not being backed up individually in the same time frame. The reason for not specifying the CDS keyword is that a CDS switch(es) may have taken place.

(Primary)

specifies that the primary control data set is to be copied to the SLSBKUP data set.

(Secondary)

specifies that the secondary control data set is to be copied to the SLSBKUP data set.

(STandby)

specifies that the standby control data set is to be copied to the SLSBKUP data set.

Notes:

1. The CDS parameter specifies the CDS currently in that position. For example, if the primary CDS is disabled and the secondary CDS is running as the primary, specify Primary (**not** Secondary) to back up the secondary CDS.
2. Using the CDS parameter is especially useful for libraries operating through a remote link, such as channel extenders. Should the link drop and the primary CDS and the secondary CDS complete processing separately, you may bypass the programmatic algorithm that normally determines the control data set to be backed up. If you know which data set (primary or secondary) had the most cartridge processing, then you can select that data set to be processed by the utility.

OPTion

optionally, allows you to select one of three backup options.

(Copy)

if this parameter is specified, NO block analysis is performed. The backup is taken from one of the control data sets. This function is a straight copy to the SLSBKUP data set. It emulates the last backup; therefore, the DD SLSCOPYx statements are not required in the JCL for this option.

OPTion(Copy) is the default and should be used or defaulted to for regularly scheduled backups of the HSC control data set.

OPTion(Copy) determines which copy of the CDS is the most current and copies that CDS copy to the SLSBKUP data set. This dynamic determination of the current primary CDS is disabled if the CDS keyword is specified.

(Analyze)

this option allows detailed analysis of individual blocks to occur. A reserve is held against the control data set until the SLSCOPY data sets are made and the journals are reset. An analysis is made and discrepancies are output to a summary report and to the SLSBKUP data set. Refer to Figure 13 on page 225 to see a sample discrepancy report. An errant and in-transit destination report, followed by a block processing report, also is produced in this case. Figure 12 on page 224 shows these reports.

> **Note:** The VOLSERs and cell locations that are discrepant are sorted into an incremental stack to reduce the amount of robotic movement.

Up to 10,000 discrepancies can be recorded for the Scratch and Select discrepancy types; 96,000 discrepancies or one ACS can be recorded for the Audit discrepancy type. Once these limits have been reached, discrepancy saving is discontinued. Discrepancies saved prior to reaching the limits are retained and output.

If you specify this option, normally SLSCNTL represents the current primary data set; SLSCNTL2 specifies the current secondary data set. However, if you are recovering from a link down or multi-host switch situation, SLSCNTL should remain the current primary CDS on one side of the link while SLSCNTL2 should be specified as the current primary CDS on the other side of the link. If you are sure which two CDSs should be compared, do **not** specify SLSSTBY.

Upon restore, the discrepancy blocks are used to generate UNSCratch, UNSElect, and AUDIt statements to the SLSAUDIT data set.

Notes:

1. Specify a region size of 2000K (REGION=2000K) on the EXEC statement.
2. It is better to use OPTion(Copy) for regularly scheduled backups of the HSC CDS. OPTion(Analyze) is designed to backup the CDSs when there may be discrepancies between copies of the CDS.

(Restart)

specifies to bypass the initial copy of the control data sets to the SLSCOPY data sets. This option is used when a system outage or job failure has occurred after the control data sets have been copied to the SLSCOPY data sets. Analysis of the previous backup run-time report indicates the successful copies.

If you have journals, the report should be inspected to determine if the journals were **successfully** reset. If they have not been reset, a backup should be taken again to obtain the most current control data sets prior to doing the journal resets.

If the journals have been reset, OPTion(Restart) should be used to obtain the information from the SLSCOPY data sets.

JCL Requirements

The following definitions apply to the BACKup utility JCL:

SLSPRINT
the message output data set.

SLSCNTL
the primary control data set. This statement must be provided.

SLSCNTL2
the secondary control data set. If a secondary CDS exists, it should be specified so that if a switch occurs and the secondary data set is now active, the CDSs can be reordered to maintain database integrity.

Note: The logical record length of the backup data set may be LRECL=0. This is not an indication of a problem. In this case, the LRECL for the backup data set defaults to BLKSIZE=4096.

SLSBKUP
the created backup data set.

SLSSTBY
the standby data set. If a standby exists, it should be specified so that if a switch occurs and the standby data set is now active, the CDSs can be reordered to maintain database integrity.

SLSCOPY1
the data set to which the primary control data set (specified by the DD SLSCNTL statement) is copied. This statement is not required when you specify OPTion(Copy).

SLSCOPY2
the data set to which the secondary control data set (specified by the DD SLSCNTL2 statement) is copied. This statement is not required when you specify OPTion(Copy).

SLSJRN*nn*
if journaling is enabled, these statements define the library journal data sets (two per host, up to 16 hosts). All journals must be specified. Up to 99 journals can be specified. **Allowable values for *nn* are decimal 01 to 99, but numbers cannot be skipped.**

SLSIN
input to the utility in the form of control statement card images.

JCL Examples

Various examples showing JCL for running the BACKup utility are presented. Select an appropriate example matching the control statement conventions that you have used for specifying data sets.

JCL for Running Backup

The first example shows JCL for backup with the primary, secondary, and standby control data sets, copy data sets (SLSCOPY1 and SLSCOPY2), and journals. The JCL to perform a backup contains the following statements:

Run Backup Utility

```
//JOBBKUP    job (account),programmer
//S2                  EXEC PGM=SLUADMIN,PARM=MIXED,REGION=2000K
//SLSCNTL    DD DSN=primary.dataset.name,DISP=SHR
//SLSCNTL2  DD DSN=secondary.dataset.name,DISP=SHR
//SLSSTBY    DD DSN=standby.dataset.name,DISP=SHR
//SLSBKUP   DD DSN=backup.dataset.name,DISP=(NEW,CATLG),
//             UNIT=dasd-name,SPACE=
//SLSJRN01   DD DSN=journal1.dataset.name,DISP=SHR
//SLSJRN02   DD DSN=journal2.dataset.name,DISP=SHR
//SLSCOPY1  DD DSN=copy1.dataset.name,DISP=(NEW,CATLG),UNIT=,SPACE=
//SLSCOPY2  DD DSN=copy2.dataset.name,DISP=(NEW,CATLG),UNIT=,SPACE=
//SLSPRINT  DD SYSOUT=*
//SLSIN     DD *
  Backup OPTion(Analyze) CDS(Primary)
/*
//
```

JCL for Running a Copy Backup

The following examples show JCL for running a straight copy backup of the control data set.

This example specifies BACKup utilizing OPTion(Copy) with shadowing (a secondary CDS) and journaling enabled. The SLSCNTL statement identifies the primary control data set. Backup is processed with journals. If the DD SLSCNTL2 statement is not provided, a return code of four (RC=4) is generated, and a backup of the primary is taken.

JCL for Backup of Primary or Secondary CDS with Journals

```
//JOBBKUP    job (account),programmer
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSBKUP    DD DSN=backup.dataset.name,DISP=(NEW,KEEP),
//             UNIT=unit-number,SPACE=
//SLSCNTL    DD DSN=primary.dataset.name,DISP=SHR
//SLSCNTL2  DD DSN=standby.dataset.name,DISP=SHR
//SLSJRN01   DD DSN=journal1.dataset.name,DISP=SHR
//SLSJRN02   DD DSN=journal2.dataset.name,DISP=SHR
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
  BACKUP OPTION(COPY)
/*
//
```

This example specifies BACKup with the SLSCNTL statement to identify the primary control data set. Backup is processed without a secondary control data set and journals.

JCL for Backup of the Primary CDS without Secondary and Journals

```
//JOBBKUP   job (account),programmer
//S1                 EXEC PGM=SLUADMIN,PARM=MIXED
//SLSBKUP   DD DSN=backup.dataset.name,DISP=(NEW,KEEP),
//             UNIT=unit-number,SPACE=
//SLSCNTL   DD DSN=primary.dataset.name,DISP=SHR
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
  BACKUP
/*
//
```

Output Description

Output resulting from the execution of the BACKup utility includes:

- the following data sets:
  - backup of the library control data set
  - copies of the primary and secondary control data sets
  - reset of the control data set journals.
- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with backup processing

  Note: These messages may include error conditions.

- an ‘‘Errant and In-transit Location Report’’ (refer to Figure 12 on page 224)

Note: This report is normal. In-transit and possibly errant VOLSERs are normal when the HSC is active.

- a ‘‘Block Processing Report,’’ which may include reports of mismatches between the primary and secondary CDS (refer to Figure 13 on page 225)
- a ‘‘Block Record Element Discrepancy Report’’ (refer to Figure 13 on page 225)

Note: Unselect cards may be generated during a good backup of a primary and secondary CDS that match.

- a condition code from backup processing:

0	no errors and no SLUADMIN control cards generated
4	warning MESSAGES --- Backup successful
8	a system failure occurred. Restart or rerun backup.

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                  DATE yyyy-mm-dd
 BACKUP OPT(ANA)
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                              Backup Utility                     DATE yyyy-mm-dd
                                           General Report

SLS1212I JCL has been verified for the BACKUP utility.
SLS1216I SLSCNTL2 was selected as the control dataset to output.
SLS1215I SLSCNTL was successfully copied to SLSCOPY1.
SLS1215I SLSCNTL2 was successfully copied to SLSCOPY2.
SLS0191I Journal at DDname SLSJRN01 successfully reset.
SLS0191I Journal at DDname SLSJRN02 successfully reset.
                              •
                              •
                              •
SLS0191I Journal at DDname SLSJRN30 successfully reset.
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0003
TIME hh:mm:ss                              Backup Utility                     DATE yyyy-mm-dd

                                   Errant and Intransit Location Report
          |---Volser---|   |---Source location---|   |---Destination location---|

              EVT180              Cell  010:04:04:01              Driveid  010:07
              EVT181              Cell  010:15:14:14              Driveid  010:00
                                                •
                                                •
                                                •
              EVT194              Cell  010:19:02:14              Driveid  010:06
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0004
TIME hh:mm:ss                              Backup Utility                     DATE yyyy-mm-dd

                                           Block Processing Report

SLS1210I Processing has started for the DHB block.
SLS1194I A DHB mismatch occurred in block 0000 at offset 0551.
SLS1211I Processing complete for the DHB block.

SLS1210I Processing has started for the DPV block.
SLS1211I Processing complete for the DPV block.

SLS1210I Processing has started for the LCT block.
SLS1211I Processing complete for the LCT block.

SLS1210I Processing has started for the LCTA block.
SLS1211I Processing complete for the LCTA block.

SLS1210I Processing has started for the LCHA block.
SLS1211I Processing complete for the LCHA block.

SLS1210I Processing has started for the LATH block.
SLS1194I A LATH mismatch occurred in block 0023 at offset 0FF3.
SLS1194I A LATH mismatch occurred in block 0024 at offset 0FF3.
SLS1211I Processing complete for the LATH block.

SLS1210I Processing has started for the VSLB block.
SLS1194I A VSLB mismatch occurred in block 0025 at offset 0029.
SLS1194I A VSLB mismatch occurred in block 0025 at offset 0029.
SLS1194I A VSLB mismatch occurred in block 002F at offset 0029.
SLS1194I A VSLB mismatch occurred in block 0039 at offset 0027.
SLS1211I Processing complete for the VSLB block.

SLS1210I Processing has started for the DITR block.
SLS1194I A DITR mismatch occurred in block 0048 at offset 002C.
SLS1211I Processing complete for the DITR block.

SLS1210I Processing has started for the DVAR block.
SLS1194I A DVAR mismatch occurred in block 0063 at offset 0A46.
                                  °
                                  °
                                  °
SLS1211I Processing complete for the DVAR block
```

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Figure 12. BACKup Utility Sample Output

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                  DATE yyyy-mm-dd
 BACKUP OPT(ANA)
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                             Backup Utility                      DATE yyyy-mm-dd

                                          General Report

SLS1315I SLS.DBASE was selected as the primary control dataset
SLS1315I SLS.OUTPUT was selected as the secondary control dataset
SLS1212I JCL has been verified for the BACKUP utility
SLS1216I SLSCNTL2 was selected as the control dataset to output
SLS1215I SLSCNTL2 was successfully copied to SLSCOPY1
SLS1215I SLSCNTL was successfully copied to SLSCOPY2
SLS0191I Journal specified by SLSJRN01 DD statement successfully reset
SLS0191I Journal specified by SLSJRN02 DD statement successfully reset
SLS0191I Journal specified by SLSJRN03 DD statement successfully reset
SLS0191I Journal specified by SLSJRN04 DD statement successfully reset

SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility
TIME 08:58:23                             Backup Utility
                                     Block Processing Report
SLS1210I Processing has started for the DHB block
SLS1194I A DHB mismatch occurred in block 0000 at offset 0711
SLS1211I Processing complete for the DHB block

SLS1210I Processing has started for the DPV block
SLS1194I A DPV mismatch occurred in block 0001 at offset 02E8
SLS1211I Processing complete for the DPV block

SLS1210I Processing has started for the LCT block
SLS1211I Processing complete for the LCT block

SLS1210I Processing has started for the LCTA block
SLS1211I Processing complete for the LCTA block

SLS1210I Processing has started for the LCHA block
SLS1211I Processing complete for the LCHA block

SLS1210I Processing has started for the LATH block
SLS1194I A LATH mismatch occurred in block 0007 at offset 0040
SLS1194I A LATH mismatch occurred in block 0008 at offset 0FF3
SLS1211I Processing complete for the LATH block

SLS1210I Processing has started for the VSLB block
SLS1211I Processing complete for the VSLB block

SLS1210I Processing has started for the DITA block
SLS1211I Processing complete for the DITA block

SLS1210I Processing has started for the DITR block
SLS1194I A DITR mismatch occurred in block 0032 at offset 002C
SLS1211I Processing complete for the DITR block

SLS1210I Processing has started for the DVAR block
SLS1194I A DVAR mismatch occurred in block 00FB at offset 00E0
SLS1194I A DVAR mismatch occurred in block 0125 at offset 004C
SLS1194I A DVAR mismatch occurred in block 013E at offset 0042
SLS1211I Processing complete for the DVAR block

SLS1210I Processing has started for the VCAM block
SLS1194I A VCAM mismatch occurred in block 016B at offset 0027
SLS1194I A VCAM mismatch occurred in block 016D at offset 0027
SLS1194I A VCAM mismatch occurred in block 016E at offset 0029
SLS1211I Processing complete for the VCAM block
```

C46045

Figure 13. BACKup Utility Discrepancy Report

(1 of 2)

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0003
TIME hh:mm:ss                          Backup Utility                      DATE yyyy-mm-dd

                                       General Report

 SLS1211I Processing complete for the DDIR block

 SLS1210I Processing has started for the DALM block
 SLS1211I Processing complete for the DALM block

 SLS1210I Processing has started for the DPTR block
 SLS1211I Processing complete for the DPTR block

 SLS1210I Processing has started for the DRV block
 SLS1211I Processing complete for the DRV block

 SLS1210I Processing has started for the CAP block
 SLS1194I A CAP mismatch occurred in block 01B6 at offset 00E2
 SLS1211I Processing complete for the CAP block

 SLS1210I Processing has started for the LSM block
 SLS1194I A LSM mismatch occurred in block 01B7 at offset 002F
 SLS1211I Processing complete for the LSM block

 SLS1210I Processing has started for the DRV block
 SLS1211I Processing complete for the DRV block

 SLS1210I Processing has started for the DPTR block
 SLS1211I Processing complete for the DPTR block

 SLS1210I Processing has started for the ACS block
 SLS1211I Processing complete for the ACS block

 SLS1210I Processing has started for the GBL block
 SLS1211I Processing complete for the GBL block

 SLS1210I Processing has started for the FREE block
 SLS1211I Processing complete for the FREE block

 SLS0155I Condition code for utility function is 8
```

C46046

Figure 73. BACKup Utility Discrepancy Report (2 of 2)

How to Restart Backup

After executing the BACKup utility, if a system failure or any other circumstance occurs that causes a return code of eight (RC=8), the BACKup utility can be restarted as long as criteria described in “Parameters” on page 218 for OPTion(Restart) is true.

Related Utilities

The RESTore utility complements the BACKup utility. If a restore is required, it should be performed immediately after a CDS failure. Refer to “RESTore Utility” on page 285 for detailed information about the Restore utility.

Database Decompile (LIBGEN) Utility

The Database Decompile utility provides a way to generate LIBGEN macro statements from an existing library control data set.

Prerequisites

The utility runs under the control of the SLUADMIN program and does not require the HSC to be running.

Reasons for Running the Database Decompile Utility

The following are possible reasons for running the Database Decompile utility to restore the LIBGEN for a library:

- The LIBGEN for your library has been deleted, lost, or corrupted; you want to re-create the file to match your library configuration.
- The SET utility is used to change the library configuration stored in the CDS; consequently, the original LIBGEN no longer matches the CDS.

How the Database Decompile Utility Functions

The utility performs the following processing to create the LIBGEN from the existing control data set:

- opens the existing control data set and an output data set to hold the recreated LIBGEN data set
- reads the control data set into buffers and determines validity of the existing control data set
- locates host IDs generated for the library
- extracts values from the control data set corresponding with LIBGEN macro parameters and re-creates the output of each LIBGEN macro. The re-creation follows the same required order as in LIBGEN generation (see ‘‘LIBGEN Macros’’ in the *HSC Configuration Guide* for information about library generation). During the re-creation processing, various reads, calculations, and copies are performed.
- If errors are encountered, appropriate messages are displayed (see the *HSC Messages and Codes Manual* for explanations of error messages)
- Upon completion, the output LIBGEN deck is ready for configuration changes and reassembly for the SLICREAT program (see ‘‘Executing the SLICREAT Program’’ in the *HSC Configuration Guide* for information on data set initialization using the SLICREAT program).

Syntax

```
►►─LIBGEN──────────────────────────────────────────────────────────►◄
```

Utility Name

LIBGEN
specifies that database processing is to be performed and invokes the SLUDBMAP module. SLUDBMAP creates a complete HSC LIBGEN from an existing control data set.

Parameters

None.

JCL Requirements

The following definitions apply to the LIBGEN utility JCL:

SLSPRINT
output messages from the utility program.

SLSCNTL
the primary control data set. **This statement is required.**

Note: SLSCNTL should be the copy of the CDS currently selected as the primary CDS. Two ways to determine the identity of the primary CDS are:

- issue the Display CDS command, and look at PRIVOL
- run the BACKup OPTion(Analyze) utility and note the "*ddname* was selected as the control dataset to output'' line in the output report (ddname is the name of the current primary CDS).

SLSLIBGN
the output data set to accommodate the LIBGEN created by the utility. The data set has these characteristics: LRECL=80, fixed-blocked format (multiple of 80). The data set can be assigned to print or to output to a DASD. **This statement is required.** It may be assigned to DUMMY if only the SLSPRINT output is desired.

SLSIN
input to the utility in the form of control cards.

JCL Example

The following example shows JCL for creating a LIBGEN from the existing control data set.

JCL for Database Decompile

```
//JOB              job (account),programmer
//S1                 EXEC PGM=SLUADMIN
//SLSCNTL   DD DSN=control.dataset.name,DISP=SHR
//SLSLIBGN DD DSN=control.dataset.decompile,DISP=(NEW,CATLG,KEEP),
//            SPACE=(TRK,(1,1)),DCB=(RECFM=F,BLKSIZE=800),UNIT=SYSDA
//*
//SLSPRINT  DD SYSOUT=*
//SLSIN          DD *
  LIBGEN
/*
```

Output Description

Outputs resulting from the execution of the Database Decompile utility include:

- a valid LIBGEN file matching the existing control data set. The output file has the following characteristics:
  - All station and drive addresses are 4-character addresses.
  - In cases where multiple parameters point to the same label statement, the utility duplicates the statement with a unique label and points each parameter to a different, although identical statement.
  - Labels generated in the output LIBGEN are listed in Table 15.
  - If an EJect password exists, it is **NOT** displayed. Instead, the following line is displayed: EJCTPAS=????????
- messages associated with error conditions resulting from an unsuccessful execution of the utility.

Table 15. Label Descriptions for Devices in Output LIBGEN

Device	Label	Description
ACS	ACS*aa*	*aa* is the sequential hexadecimal ACSid value (0 through FF), beginning with zero.
LSM	LSM*aal*	*aa* is the ACSid, and *l* is the sequential hexadecimal LSMid value (0 through F), beginning with zero.
STATION	ST*aah*	*aa* is the ACSid, and *h* is the sequential hexadecimal host index value (0 through F), beginning with zero.
PANEL	P*aalpp*	*aa* is the ACSid, *l* is the LSMid, and *pp* is the sequential decimal panel number (0 through 10).

Table 15. Label Descriptions for Devices in Output LIBGEN

Device	Label	Description
DRIVE	D*aalpph*	*aa* is the ACSid, *l* is the LSMid, *pp* is the decimal panel number, and *h* is the hexadecimal host index value, beginning with zero.

Refer to Figure 15 on page 247 for an example of output from the utility.

```
                  J E S 2  J O B  L O G  --  S Y S T E M  M V S 3  --  N O D E   L S T C 3 M V S

10:21:02 JOB04009 ---- WEDNESDAY, 28 JAN 1998 ----
10.21.02 JOB04009 IRR010I USERID SPNR IS ASSIGNED TO THIS JOB.
10.21.02 JOB04009 ICH70001I SPNR LAST ACCESS AT 10:19:20 ON WEDNESDAY, JANUARY 28, 1998
10.21.02 JOB04009 $HASP373 SPNRDBMP STARTED - INIT SA - CLASS A - SYS MVS3
10.21.02 JOB04009 IEF403I SPNRDBMP - STARTED - TIME=10.21.02
10.21.06 JOB04009 -                       SYSTEM RELEASE: SP6.0.2 JBB6602
10.21.06 JOB04009 -                                         --TIMINGS(MINS.)--     ---PAGING COUNTS---
10.21.06 JOB04009 -JOBNAME  STEPNAME PROCSTEP    RC   XCP  CPU  SRB  CLOCK  SERV   PG  PAGE  SWAP  VIO  SWAPS
10.21.06 JOB04009 -SPNRDBMP DBMAP                00   209  .00  .00     .0  8483    1     0     0    0      0
10.21.06 JOB04009 IEF404I SPNRDBM - ENDED - TIME=10.21.06
10.21.06 JOB04009 -SPNRDBMP ENDED.  NAME-NANCY              TOTAL CPU TIME= .00 TOTAL ELAPSED TIME= .0
10.21.06 JOB04009 $HASP395 SPNRDBMP ENDED
------ JES2 JOB STATISTICS ------
- 28 JAN 1998 JOB EXECUTION DATE
-          26 CARDS READ
-         319 SYSOUT PRINT RECORDS
-           0 SYSOUT PUNCH RECORDS
-          23 SYSOUT SPOOL KBYTES
-        0.06 MINUTES EXECUTION TIME
        1 //SPNRDBMP  JOB 505141SPNR,NANCY,NOTIFY=SPNR,MSGCLASS=1,CLASS=A JOB04009
          //*
          //* *** RUN TEST SLUDBMAP
          //*
        2 //OUT OUTPUT DEFAULT=YES,CHARS=GT15,JESDS=ALL
          //*
        3 //DBMAP    EXEC PGM=SLUADMIN,TIME=(,10),PARM=MIXED
          //*
        4 //STEPLIB  DD DSN=SOS400.SPNR.LINKLIB,DISP=SHR
        5 //         DD DSN=SOS400.TEST.LINKLIB,DISP=SHR
          //*
        6 //SLSPRINT DD SYSOUT=*
          //*LSLIBGN DD SYSOUT=*
        7 //SLSLIBGN DD DSN=SPNR.LIB.ASM(LIBGNDC2),DISP=SHR
        8 //SYSMDUMP DD DSN=SPNR.DUMP02,DISP=SHR
          //*
        9 //SLSIN    DD *
ICH70001I SPNR     LAST ACCESS AT 10:19:20 ON WEDNESDAY, JANUARY 28, 1998
IEF236I ALLOC. FOR SPNRDBMP DBMAP
IGD103I SMS ALLOCATED TO DDNAME STEPLIB
IGD103I SMS ALLOCATED TO DDNAME
IEF237I JES2 ALLOCATED TO SLSPRINT
IEF237I 07FD ALLOCATED TO SLSLIBGN
IEF237I 07F2 ALLOCATED TO SYSMDUMP
IEF237I 07B4 ALLOCATED TO SLSCNTL
IEF237I JES2 ALLOCATED TO SLSIN
IEF142I SPNRDBMP DBMAP - STEP WAS EXECUTED - COND CODE 0000
IGD104I SOS400.SPNR.LINKLIB                        RETAINED, DDNAME=STEPLIB
IGD104I SOS400.TEST.LINKLIB                        RETAINED, DDNAME=
IEF285I SPNR.SPNRDBMP.JOB04009.D0000102.?            SYSOUT
IEF285I SPNR.LIB.ASM                                 KEPT
IEF285I VOL SER NOS= TSO008.
IEF285I SPNR.DUMP02                                  KEPT
IEF285I VOL SER NOS= TSO018.
IEF285I SPNR.DBASEPRM                                KEPT
IEF285I VOL SER NOS= TSO019.
IEF285I SPNR.SPNRDBMP.JOB04009.D0000101.?            SYSIN
*******************************************************************************
*                            DEVICE     DEVICE         EXCP                   *
*                DDNAME      CLASS      ADDRESS       COUNT                   *
*               --------     ------     -------      --------                 *
*               STEPLIB       DASD       07CD        00000000                 *
*               STEPLIB       DASD       07D1        00000106                 *
*               SLSPRINT      JES2                   00000000                 *
*               SLSLIBGN      DASD       07FD        00000007                 *
*               SYSMDUMP      DASD       07F2        00000000                 *
*               SLSCNTL       DASD       07B4        00000045                 *
*               SLSIN         JES2                   00000000                 *
*******************************************************************************
IEF373I STEP/DBMAP  /START 1998028.1021
IEF374I STEP/DBMAP  /STOP  1998028.1021 CPU 0MIN 00.27SEC SRB  0MIN 00.02SEC VIRT  192K SYS   280K EXT   56K SYS   10412K
IEF375I JOB/SPNRDBMP/START 1998028.1021
IEF376I JOB/SPNRDBMP/STOP  1998028.1021 CPU 0MIN 00.27SEC SRB  0MIN 00.02SEC
```

Figure 14. Database Decompile Utility Sample Output (1 of 5)

```
SLUADMIN (n.n.n)              StorageTek Automated Cartridge System Utility                PAGE 0002
TIME 10:21:04                         Reverse CDS to LIBGEN Utility                   DATE 1998-01-28

SLS1186I LIBGEN record - * LABELS WILL BE GENERATED IN THE OUTPUT LIBGEN AS FOLLOWS:
SLS1186I LIBGEN record - * ACS     - “ACSXX”   WHERE “XX” IS THE ACS NUMBER 00-FF
SLS1186I LIBGEN record - *                     STARTING WITH ZERO.
SLS1186I LIBGEN record - * LSM     - “LSMXXY”  WHERE “XX” IS THE ACS NUMBER OF THIS
SLS1186I LIBGEN record - *                     LSM AND “Y” IS THE HEX LSM NUMBER
SLS1186I LIBGEN record - *                     (0-F)IN THAT ACS, STARTING AT ZERO
SLS1186I LIBGEN record - *                     FOR EACH NEW ACS.
SLS1186I LIBGEN record - * STATION - “STXXH”   WHERE “XX” IS THE ACS NUMBER
SLS1186I LIBGEN record - *                     AND H IS THE HOST INDEX IN
SLS1186I LIBGEN record - *                     HEX (0-F).
SLS1186I LIBGEN record - * PANEL   - “PXXYPP”  WHERE “XX” IS THE ACS NUMBER IN HEX,
SLS1186I LIBGEN record - *                     Y IS THE LSM NUMBER IN HEX,
SLS1186I LIBGEN record - *                     AND PP IS THEDECIMAL PANEL
SLS1186I LIBGEN record - *                     NUMBER OF THE DRIVE PANEL.
SLS1186I LIBGEN record - * DRIVE   - “DXXYPPH” WHERE “XX” IS THE ACS NUMBER IN HEX,
SLS1186I LIBGEN record - *                     Y IS THE LSM NUMBER IN HEX, PP IS
SLS1186I LIBGEN record - *                     IS THE DRIVE PANEL NUMBER IN
SLS1186I LIBGEN record - *                     DECIMAL, AND H IS THE HOST INDEX
SLS1186I LIBGEN record - *                     IN HEX.
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - LIBGEN  SLIRCVRY TCHNIQE=STANDBY
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record -         SLILIBRY SMF=255,                                    X
SLS1186I LIBGEN record -               ACSLIST=ACSLIST,                               X
SLS1186I LIBGEN record -               EJCTPAS=????????,                              X
SLS1186I LIBGEN record -               HOSTID=(MVS1,MVS2,MVS5,MVS6,MVS7,              X
SLS1186I LIBGEN record -               MVS9,MVSC,MVSE,MVSF,MVSG,HST1,                 X
SLS1186I LIBGEN record -               HST2,HST3,MVSH,MVSI,MVS3),                     X
SLS1186I LIBGEN record -               NNLBDRV=(T3480,T3480,T3480,                    X
SLS1186I LIBGEN record -               T3480,T3480,T3480,T3480,T3480,                 X
SLS1186I LIBGEN record -               T3480,T3480,T3480,T3480,T3480,                 X
SLS1186I LIBGEN record -               T3480,T3480,T3480),                            X
SLS1186I LIBGEN record -               DELDISP=SCRTCH,                                X
SLS1186I LIBGEN record -               MAJNAME=STKHSCM,                               X
SLS1186I LIBGEN record -               CLNPRFX=CLN,                                   X
SLS1186I LIBGEN record -               COMPRFX=/,                                     X
SLS1186I LIBGEN record -               SCRLABL=SL
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - ACSLIST SLIALIST ACS00,ACS01
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - ACS00   SLIACS ACSDRV=(T2ACS0,T2ACS0,T2ACS0,                 X
SLS1186I LIBGEN record -               T2ACS0,T2ACS0,T2ACS0,T2ACS0,                   X
SLS1186I LIBGEN record -               T2ACS0,T2ACS0,T2ACS0,T2ACS0,                   X
SLS1186I LIBGEN record -               T2ACS0,T2ACS0,T2ACS0,T2ACS0,                   X
SLS1186I LIBGEN record -               T2ACS0),                                       X
SLS1186I LIBGEN record -               STATION=(ST000,ST001,ST002,                    X
SLS1186I LIBGEN record -               T003,ST004,ST005,ST006,ST007,                  X
SLS1186I LIBGEN record -               ST008,ST009,ST00A,ST00B,ST00C,                 X
SLS1186I LIBGEN record -               ST00D,ST00E,ST00F),                            X
SLS1186I LIBGEN record -               LSM=(LSM000,LSM001)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - ST000    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - ST001    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - ST002    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - ST003    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - ST004    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - ST005    SLISTATN ADDRESS=(00C8,00DD,00DE,00DC)
SLS1186I LIBGEN record - ST006    SLISTATN ADDRESS=(00C8,00DD,00DE,00DC)
SLS1186I LIBGEN record - ST007    SLISTATN ADDRESS=(00DD,00DE,00DC)
SLS1186I LIBGEN record - ST008    SLISTATN ADDRESS=(00DD,00DE,00DC)
SLS1186I LIBGEN record - ST009    SLISTATN ADDRESS=(00DD,00DE,00DC)
SLS1186I LIBGEN record - ST00A    SLISTATN ADDRESS=(00C8)
SLS1186I LIBGEN record - ST00B    SLISTATN ADDRESS=(00C8)
SLS1186I LIBGEN record - ST00C    SLISTATN ADDRESS=(00C8)
SLS1186I LIBGEN record - ST00D    SLISTATN ADDRESS=(00DD,00DE,00DC)
SLS1186I LIBGEN record - ST00E    SLISTATN ADDRESS=(00DD,00DE,00DC)
SLS1186I LIBGEN record - ST00F    SLISTATN ADDRESS=(00DD,00DE)
SLS1186I LIBGEN record - *
```

Figure 72. Database Decompile Utility Sample Output (2 of 5)

```
SLUADMIN (n.n.n)              StorageTek Automated Cartridge System Utility                PAGE 0003
TIME 10:21:04                         Reverse CDS to LIBGEN Utility                  DATE 1998-01-28

SLS1186I LIBGEN record - LSM000   SLILSM PASTHRU=((8,M)),                                  X
SLS1186I LIBGEN record - ADJACNT=(LSM001),
SLS1186I LIBGEN record - LSM000   SLILSM PASTHRU=((8,M)),                                  X
SLS1186I LIBGEN record -              ADJACNT=(LSM001),                                    X
SLS1186I LIBGEN record -              DRIVE=(10),                                          X
SLS1186I LIBGEN record -              DRVELST=(P00010),                                    X
SLS1186I LIBGEN record -              TYPE=4410,                                           X
SLS1186I LIBGEN record -              DOOR=STD
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - P00010   SLIDLIST HOSTDRV=(D000100,D000101,D000102,D000103,       X
SLS1186I LIBGEN record -              D000104,D000105,D000106,D000107,D000108,             X
SLS1186I LIBGEN record -              D000109,D00010A,D00010B,D00010C,D00010D,             X
SLS1186I LIBGEN record -              D00010E,D00010F)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - D000100  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000101  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000102  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000103  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000104  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000105  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000106  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000107  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000108  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D000109  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D00010A  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83
SLS1186I LIBGEN record - D00010B  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D00010C  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D00010D  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D00010E  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - D00010F  SLIDRIVS ADDRESS=(0A80,0A81,0A82,0A83)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - LSM001   SLILSM PASTHRU=((2,S)),                                  X
SLS1186I LIBGEN record -                ADJACNT=(LSM000),                                  X
SLS1186I LIBGEN record -                DRIVE=(10),                                        X
SLS1186I LIBGEN record -                DRVELST=(P00110),                                  X
SLS1186I LIBGEN record -                TYPE=4410,                                         X
SLS1186I LIBGEN record -                DOOR=ECAP
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - P00110   SLIDLIST HOSTDRV=(D001100,D001101,D001102,D00110         X
SLS1186I LIBGEN record -                D001104,D001105,D001106,D001107,D001108,           X
SLS1186I LIBGEN record -                D001109,D00110A,D00110B,D00110C,D00110D,           X
SLS1186I LIBGEN record -                D00110E,D00110F)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - D00110   SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001101  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001102  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001103  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001104  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001105  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001106  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001107  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001108  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D001109  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110A  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110B  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110C  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110D  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110E  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - D00110F  SLIDRIVS ADDRESS=(0A84,0A85,0A86,0A87)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - ACS01    SLIACS ACSDRV=(T2ACS1,T2ACS1,T2ACS1,T2ACS1,T2ACS1,       X
SLS1186I LIBGEN record -                T2ACS1,T2ACS1,T2ACS1,T2ACS1,T2ACS1,T2ACS1,         X
SLS1186I LIBGEN record -                T2ACS1,T2ACS1,T2ACS1,T2ACS1,T2ACS1),               X
SLS1186I LIBGEN record -                STATION=(ST010,ST011,ST012,ST013,ST014,ST015,      X
SLS1186I LIBGEN record -                ST016,ST017,ST018,ST019,ST01A,ST01B,ST01C,         X
SLS1186I LIBGEN record -                ST01D,ST01E,ST01F),                                X
SLS1186I LIBGEN record -                LSM=(LSM010,LSM011)
SLS1186I LIBGEN record - *
```

Figure 72. Database Decompile Utility Sample Output (3 of 5)

```
SLUADMIN (n.n.n)              StorageTek Automated Cartridge System Utility                PAGE 0004
TIME 10:21:04                         Reverse CDS to LIBGEN Utility                   DATE 1998-01-28

SLS1186I LIBGEN record - ST010    SLISTATN ADDRESS=(00D5)
SLS1186I LIBGEN record - ST011    SLISTATN ADDRESS=(00D5) ‘
SLS1186I LIBGEN record - ST012    SLISTATN ADDRESS=(00D5)
SLS1186I LIBGEN record - ST013    SLISTATN ADDRESS=(00D5)
SLS1186I LIBGEN record - ST014    SLISTATN ADDRESS=(00D5)
SLS1186I LIBGEN record - ST015    SLISTATN ADDRESS=(00C3,00D3,00D5,00D7)
SLS1186I LIBGEN record - ST016    SLISTATN ADDRESS=(00C3,00D3,00D5,00D7)
SLS1186I LIBGEN record - ST017    SLISTATN ADDRESS=(00D3)
SLS1186I LIBGEN record - ST018    SLISTATN ADDRESS=(00D3)
SLS1186I LIBGEN record - ST019    SLISTATN ADDRESS=(00D3)
SLS1186I LIBGEN record - ST01A    SLISTATN ADDRESS=(00C3)
SLS1186I LIBGEN record - ST01B    SLISTATN ADDRESS=(00C3)
SLS1186I LIBGEN record - ST01C    SLISTATN ADDRESS=(00C3)
SLS1186I LIBGEN record - ST01D    SLISTATN ADDRESS=(00D3)
SLS1186I LIBGEN record - ST01E    SLISTATN ADDRESS=(00D3)
SLS1186I LIBGEN record - ST01F    SLISTATN ADDRESS=(00D7)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - LSM010   SLILSM PASTHRU=((2,S)),                              X
SLS1186I LIBGEN record -                ADJACNT=(LSM011),                              X
SLS1186I LIBGEN record -                DRIVE=(1,3),                                   X
SLS1186I LIBGEN record -                DRVELST=(P01001,P01003),                       X
SLS1186I LIBGEN record -                TYPE=9360-100,                                 X
SLS1186I LIBGEN record -                DOOR=WC2
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - P01001   SLIDLIST HOSTDRV=(D010010,D010011,D010012,D010013,     X
SLS1186I LIBGEN record -                D010014,D010015,D010016,D010017,D010018,        X
SLS1186I LIBGEN record -                D010019,D01001A,D01001B,D01001C,D01001D,        X
SLS1186I LIBGEN record -                D01001E,D01001F)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - D010010  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010011  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010012  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010013  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010014  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010015  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010016  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010017  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010018  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D010019  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001A  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001B  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001C  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001D  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001E  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - D01001F  SLIDRIVS ADDRESS=(0A74,0A75,0A76,0A77)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - P01003   SLIDLIST HOSTDRV=(D010030,D010031,D010032,D010033,     X
SLS1186I LIBGEN record -                D010034,D010035,D010036,D010037,D010038,        X
SLS1186I LIBGEN record -                D010039,D01003A,D01003B,D01003C,D01003D,        X
SLS1186I LIBGEN record -                D01003E,D01003F)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - D010030  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010031  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010032  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010033  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010034  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010035  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010036  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010037  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010038  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D010039  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003A  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003B  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003C  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003D  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003E  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - D01003F  SLIDRIVS ADDRESS=(0A70,0A71,0A72,0A73)
SLS1186I LIBGEN record - *
```

Figure 72. Database Decompile Utility Sample Output (4 of 5)

```
SLUADMIN (n.n.n)              StorageTek Automated Cartridge System Utility                PAGE 0005
TIME 10:21:04                         Reverse CDS to LIBGEN Utility                  DATE 1998-01-28

SLS1186I LIBGEN record - LSM011   SLILSM PASTHRU=((0,M)),                                X
SLS1186I LIBGEN record -                ADJACNT=(LSM010),                                 X
SLS1186I LIBGEN record -                DRIVE=(1),                                        X
SLS1186I LIBGEN record -                DRVELST=(P01101),                                 X
SLS1186I LIBGEN record -                TYPE=9360-100,                                    X
SLS1186I LIBGEN record -                DOOR=WC2
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - P01101   SLIDLIST HOSTDRV=(D011010,D011011,D011012,D011013,    X
SLS1186I LIBGEN record -                D011014,D011015,D011016,D011017,D011018,          X
SLS1186I LIBGEN record -                D011019,D01101A,D01101B,D01101C,D01101D,          X
SLS1186I LIBGEN record -                D01101E,D01101F)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - D011010   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011011   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011012   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011013   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011014   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011015   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011016   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011017   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011018   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D011019   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101A   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101B   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101C   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101D   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101E   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - D01101F   SLIDRIVS ADDRESS=(0A78,0A79,0A7A,0A7B)
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record - *
SLS1186I LIBGEN record -           SLIENDGN ,
0SLS0155I Condition code for utility function is 0
```

Figure 72. Database Decompile Utility Sample Output (5 of 5)

Directory Rebuild Utility

The Directory Rebuild utility provides a means to rebuild the database directory for all defined CDS copies.

Prerequisites

The stand-alone Directory Rebuild utility:

- runs under the control of the SLUADMIN utilities program
- may be run while the CDS-related HSCs are STOPped
- must be run using all CDS copies as input.

Reasons for Running the Directory Rebuild Utility

The major purpose of the Directory Rebuild utility is to repair a corrupted CDS database directory when the HSC is not active. Normally, the HSC corrects errors automatically.

How the Directory Rebuild Utility Functions

The utility performs the following processing to rebuild the database directory:

- opens the control data sets specified by the SLSCNTL, SLSCNTL2, and SLSSTBY DD statements
- locates invalid pointers, directory entries, and recovery data
- rewrites corrected blocks to all CDS copies.

Syntax

```
►►─DIRBLD──────────────────────────────────────────────────────────►◄
```

Utility Name

DIRBLD
specifies that directory rebuild processing is to be performed and invokes the SLUDRDIR module.

Parameters

None.

JCL Requirements

The following definitions apply to the DIRBLD utility JCL:

SLSPRINT
output messages from the utility program.

SLSCNTL, SLSCNTL2, SLSSTBY
SLSCNTL is the primary CDS, SLSCNTL2 is the secondary CDS, and SLSSTBY is the standby CDS from which the directory is rebuilt. **This statement is required for each CDS that has been defined.**

SLSIN
input to the utility in the form of control cards.

JCL Example

The following example shows JCL for Directory Rebuild execution.

JCL for Directory Rebuild

```
//JOB               job (account),programmer
//S1                  EXEC PGM=SLUADMIN
//SLSCNTL    DD DSN=control.dataset.name,DISP=(OLD,KEEP)
//*
//SLSPRINT  DD SYSOUT=*
//SLSIN          DD *
  DIRBLD
/*
```

Output Description

Output resulting from the execution of the Directory Rebuild utility includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute DIRBLD processing
- an updated CDS with corrected pointer and directory information
- a condition code indicating successful or unsuccessful CDS update.

Eject Cartridge Utility

The EJECt Cartridge utility permits you to remove one or more cartridges from an ACS in a batch mode. For the automated ejection of cartridges, the EJECt Cartridge utility takes advantage of the Cartridge Access Port (CAP) in an LSM.

The control statement allows you to designate a single CAP, a specific CAP, or a list of specific CAPs. Specifying one or more CAPs limits cartridge ejection to those CAPs.

Ejections in a multiple ACS configuration may specify CAPs in each ACS if volumes reside in each ACS. If a CAP list is not provided, the utility selects the highest priority CAP available for each ACS (refer to the the ‘‘CAP Preference (CAPPref) Command and Control Statement’’ in the *HSC Operator’s Guide*).

You may elect to submit multiple EJECt Cartridge utility requests, each of which may specify a particular CAP. If you elect to specify a CAP in a multi-ACS configuration, then the list of volumes must reside within the CAP ACS.

Multiple CAPs within one ACS can be allocated to the EJECt utility. Specifying multiple CAPs in a single EJECt Cartridge utility typically improves performance by reducing pass-thrus.

If two CAPs are specified in the same LSM, cartridges in that LSM are ejected in sequential order. This is helpful for vaulting.

Syntax

```
►►─EJECt──┬─┬─ Eject Method 1 ─┬─┬──────────────────────────────────────►◄
          └─└─ Eject Method 2 ─┘ │ └──┬──────────────────────────────┬──┘
                                 │    │   ┌──────────────────────┐   │
                                 │    │   ┌─,──────────────────┐ │   │
                                 │    └─CAP(──┴─cap-list──────┴─)─┘   │
                                 │                                    │
  Eject Method 1:                │                                    │
                                 │                                    │
  ┌─,──────────────────┐         │                                    │
  ├─VOLser(──┴─vol-list──────┴─)─┘                                    │
                                 │                                    │
  Eject Method 2:                │                                    │
                                 │                                    │
  ├─SCRTCH──┬──────────────────────────────┬──┬──────────────────┬──►
            └─SUBpool(subpool-name)────────┘  └─VOLCNT(count)────┘
```

Syntax (continued)

Eject Method 2 (continued):

```
►──┬──────────────────────────────────────────────────────────────────────────────┬──┬──────────────────────────────────────────────────────────────────────────────┬──┤
   │                                                                              │  │                                                                              │
   └─MEDia(─┬─Standard─┬─)─┘                                                       │  └─RECtech(─┬─18track──────────┬─)─┘
            ├─CST──────┤                                                            │             ├─36Atrack────────┤
            ├─MEDIA1───┤                                                            │             ├─36Btrack────────┤
            ├─STD──────┤                                                            │             ├─36Ctrack────────┤
            ├─1────────┤                                                            │             ├─DD3─────────────┤
            ├─348Ø─────┤                                                            │             ├─STK1R───────────┤
            ├─ECART────┤                                                            │             ├─STK1R34─────────┤
            ├─E────────┤                                                            │             ├─STK1R35─────────┤
            ├─ECCST────┤                                                            │             ├─STK1RA───────────┤
            ├─ETAPE────┤                                                            │             ├─STK1RA34─────────┤
            ├─Long─────┤                                                            │             ├─STK1RA35─────────┤
            ├─MEDIA2───┤                                                            │             ├─STK1RB───────────┤
            ├─349ØE────┤                                                            │             ├─STK1RB34─────────┤
            ├─ZCART────┤                                                            │             ├─STK1RB35─────────┤
            ├─Z────────┤                                                            │             ├─STK2P────────────┤
            ├─DD3A─────┤                                                            │             ├─STK2P34──────────┤
            ├─DD3B─────┤                                                            │             ├─STK2P35──────────┤
            ├─DD3C─────┤                                                            │             ├─STK2PB───────────┤
            ├─STK1─────┤                                                            │             ├─STK2PB34─────────┤
            ├─STK1R────┤                                                            │             ├─STK2PB35─────────┤
            ├─R────────┤                                                            │
            ├─STK2─────┤                                                            │
            └─STK2P────┘                                                            │
```

Utility Name

EJECt
specifies that ejection processing is to be performed.

Parameters

VOLser
specifies that a VOLSER(s) is to be ejected.

(vol-list)
vol-list specifies the list of volumes to be ejected. A *vol-list* can be a single VOLSER, a range of VOLSERs or a list of VOLSERs and/or VOLSER ranges in any combination.

If a list is specified, the elements must be delimited by commas or blanks, and the entire list enclosed in parentheses. A range of VOLSERs consists of a starting VOLSER and an ending VOLSER separated by a dash.

SCRTCH
indicates that scratch volumes are to be ejected.

Note: If no CAPs are specified, only scratch tapes in ACS 00 are ejected.

SUBpool
optionally specifies the subpool from which scratch volumes are to be ejected. If MEDia or RECtech are specified, cartridges are ejected for that media type or recording technique within the same subpool.

(subpool-name)
subpool-name indicates the name for the subpool.

VOLCNT
optionally specifies that a designated number of scratch volumes are to be ejected.

(count)
count indicates the number of scratch volumes to be ejected.

MEDia
optionally, specifies that scratch cartridges of the desired media are to be ejected.

Note: If MEDia is not specified, the next scratch cartridge is selected without regard to media type if RECtech does not exist. If both MEDia and RECtech are supplied, they must be compatible.

Valid media types are:

Standard
indicates a standard length, 3480 cartridge. It can be used on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A — 10GB
- B — 25GB
- C — 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
optionally, specifies scratch cartridges of the desired recording technique are to be ejected. RECtech indicates the method used to record data tracks on the tape surface.

Note: If RECtech is not specified, the next scratch cartridge is selected depending on the media type (if supplied). If neither is supplied, the next scratch cartridge is selected without taking media type and recording technique into consideration. If both RECtech and MEDia are supplied, they must be compatible.

Valid recording techniques are:

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

CAP
specifies which Cartridge Access Port(s) is being used for the operation.

This utility ejects scratch volumes to the specified CAP(s) only. EJECt searches for scratch volumes only in the LSMs that contain the specified CAP(s).

Note: If a CAP has not been specified, EJECt determines the CAP to use based upon the CAPPref command setting (refer to ‘‘CAP Preference (CAPPref) Command and Control Statement’’ in the *HSC Operator’s Guide*).

If a CAP preference has not been specified, the HSC displays a message and waits until the user enters a CAPPref value. Pass-thrus can be made to CAPs specified by CAPPref.

(cap-list)
cap-list identifies the Cartridge Access Port(s). The cap-list requires explicitly specified CAPids separated by commas. A CAPid range is not allowed.

If more than one CAPid is specified, the elements must be separated by blanks or commas, and the entire list must be enclosed in parentheses. If no CAP is specified, one is chosen in each ACS. The format for cap-id is *AAL*:*CC* where *AA* is the ACS number, *L* is the LSM number, and *CC* is the CAP number.

Allowable values for CC are:

00
standard 21-cell CAP; or the right-hand 40-cell enhanced CAP; or the 20-cell WolfCreek CAP;or the 9740 fixed rack 14-cell or 10-cell removable magazine CAP.

01
left-hand 40-cell enhanced CAP or the 30-cell WolfCreek optional CAP

02
priority CAP (PCAP) for an enhanced CAP or WolfCreek CAP.

JCL Requirements

The following definitions apply to EJECt Cartridge utility JCL:

SLSPRINT
output messages from the utility program.

SLSIN
input to the utility in the form of control statements.

JCL Examples

The following example shows JCL for ejecting a single volume from the library.

JCL for Ejecting a Single Volume

```
//JOBEJCT        job (account),programmer
//S1                     EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT      DD SYSOUT=A
//SLSIN              DD *
  EJECT VOL(A1B1C1)
/*
/
```

The following example shows JCL for ejecting cartridges from the library with the CAPid specified. Nine cartridge volumes are specified for ejection at CAPid 012:01.

JCL to Eject Several Volumes (with a CAPid Specified)

```
//JOBEJCT        job (account),programmer
//S1                     EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT      DD SYSOUT=A
//SLSIN              DD *
  EJECT VOL(A1B1C1-A1B1C9) CAP(Ø12:Ø1)
/*
//
```

The following example shows JCL for ejecting one standard scratch cartridge.

JCL to Eject One STD Scratch Cartridge

```
//JOBEJCT       job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT     DD SYSOUT=A
//SLSIN             DD *
  EJECT SCRTCH MEDIA(STD)
/*
//
```

The following example shows JCL for ejecting five SD-3 (helical) scratch cartridges.

JCL to Eject Five SD-3 Scratch Cartridges

```
//JOBEJCT       job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT     DD SYSOUT=A
//SLSIN             DD *
  EJECT SCRTCH RECTECH(DD3) VOLCNT(5)
/*
//
```

Output Description

Output resulting from the execution of the EJECt Cartridge utility includes:

- a listing of input commands, with appropriate messages, when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute ejection processing
- a message indicating successful ejection processing (see Figure 15).

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                 DATE yyyy-mm-dd

 EJECT VOL(A1B1C1)                                  00130253
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                          Eject Cartridges Utility               DATE yyyy-mm-dd

SLS0174I Volume A1B1C1 successfully ejected from library.

SLS0155I Condition Code for Utility Function is 0.
```

C27483

Figure 15. EJECt Cartridge Utility Sample Output

Initialize Cartridge (INITIALIZE) Utility

The Initialize Cartridge utility permits you to batch enter cartridges into the library through the CAP and to write magnetic labels for those cartridges. This program reads the external Tri-Optic labels and records them in a data set defined through the CNTLDD parameter.

Note: CNTLDD is a control statement parameter that describes the DDname to be used for TMSTPNIT control statements.

The Initialize Cartridge utility does not initialize cartridges on its own; it invokes TMS, TLMS, or any other initialization utility, which performs the initialization. CNTLDD specifies, through the HSC to the TMS utility, the DD to be used for the input parameters the TMS utility requires.

When CAP processing completes, cartridges are placed in a home cell. Each new volume then is moved to the library transport defined by the SLSTAPE DD statement and the magnetic volume label is written. At the end of the labeling process, any of the following actions can occur:

- the volume(s) may be optionally ejected from the library
- the volume(s) may be optionally entered into the library control data set as a scratch volume
- the volume(s) may be entered as a non-scratch volume if the OPTion parameter is not specified
- the volumes that have a media mismatch are ejected.

This utility identifies the desired transport by one of the following:

- a specific unit address
- an esoteric limited to a single ACS and a single device type
- an esoteric limited to a single ACS and TAPEREQ statements, which restrict the transport to a specific device type.

  Note: TAPEREQ statements must match the unit esoteric specified for the cartridge initialization job being run. For example, if the esoteric designates helical cartridges, the TAPEREQ(s) must request helical media as well.

The HSC determines the recording technique and supported media from the selected drive. If the transport specified in the SLSTAPE DD statement does not match the media type of volumes entered into the CAP, the volumes are ejected and an error message is displayed.

Note: You must batch enter volumes through a manual mode CAP with a non-zero CAP preference.

By using TAPEREQ control statements, different cartridge initialization jobs can be defined to select different types of drives.

The following guidelines apply to running the Initialize Cartridge utility in a library with mixed device types:

- Do not mix recording techniques in a single job step. Run the utility to initialize cartridges in either 18-track, 36-track, helical, or 9840 recording format at one time. If 36-track recording format is desired, both standard and long media cartridges can be initialized in a single job.

  Note: A ZCART cartridge can be initialized only on a 9490EE transport, but a 9490EE transport can initialize a 36-track, ECART, or ZCART cartridge.

  If helical is requested, all helical types can be mixed.

- Specify the correct device for the volumes to be entered.

Interface with a Tape Management System

It is the responsibility of the installation to inform the tape management system (i.e., TMS, TLMS, or DFSMSrmm) of the volume's scratch status.

CAP Operating Instructions

Operating instructions for the CAP are provided in the *HSC Operator's Guide*.

Note: When there are no more cartridges to be entered, open the CAP once again to ensure that no cartridges are present in the CAP cells, and then close the CAP to complete processing.

How the Initialize Cartridge Utility Functions

Part of the labeling process involves an installation-specified program to perform the labeling. The program must conform to, or actually invoke, IEHINITT. The label program must issue SVC 39 which normally requires the operator to reply M to message IEC701D. The HSC causes the volume to be mounted and generates the reply to the IEC701D message. If the user-supplied label program requires a special DDname identity, then a DD statement containing that DDname should be specified with a reference to the required SLSTAPE DD statement via UNIT=AFF=SLSTAPE.

Note: The SLSTAPE DD statement defines the library transport where tape labeling is performed. In a multi-LSM environment, pass-thrus may be avoided by:

- supplying a specific address for the SLSTAPE device along with the CAP parameter (specifying the *cap-id* for the LSM where the SLSTAPE device is attached) on the control statement, or
- supplying the library esoteric on the SLSTAPE DD statement without a CAP parameter.

You must provide **all** necessary DD statements for the Initialize Cartridge utility and any program in its path (i.e., IEHINITT). You must also supply a prototype control statement, via the SLSINIT DD statement, in the format of card-images (a maximum of six) to initialize a single volume.

The control statement must contain a variable symbol indicator (a string of six asterisks) in place of the volume serial number. If the cartridges being entered have external labels with trailing blanks, it is suggested that the variable symbol indicators be the last characters on the prototype control statement to ensure the proper handling of other parameters present in this control statement. The utility substitutes the six characters from the external cartridge label for the asterisks and writes a control statement for each cartridge entered.

Note: The Initialize Cartridge utility may not run concurrently with an Audit utility within the same ACS. In addition, the Scratch Redistribution utility may not run concurrently, within the same ACS, when the Initialize Cartridge utility scratch option is specified. If either of these conditions are not followed, an HSC message is generated and the utility must be resubmitted.

Syntax

```
►►─INITialize──┬─────────────────────┬──────────────────────────────────►◄
               └┤ Optional Parameters ├┘

Optional Parameters:

├──┬──────────────┬──────────────────────────────────────────────────────►
   └─CAP(cap-id)──┘

►──┬──────────────────────────────────────────────────────────────────────►
   │                 ┌─IEHINITT──┐
   └──PROGram(───────┴─prog-name─┴──)─VERIFY(parameter-name)──────────────┘

►──┬──────────────────────────────────────────────────────────────────────┤
   │                 ┌─SYSIN─────┐                 ┌─EJEct───────┐)──┬──┘
   └──CNTLDD(────────┴─dd-name───┴──)──┘           └─OPTion(─────┴─SCRatch─┘
```

Utility Name

INITialize
specifies that cartridges are to be initialized.

Parameters

CAP
optionally specifies a particular CAP to be used for the operation.

If CAP is not specified, the utility chooses a CAP in the ACS implied by the device allocated to satisfy the SLSTAPE DD statement.

(cap-id)

cap-id identifies the CAP. The format for *cap-id* is *AAL*:*CC* where *AA* is the ACS number, *L* is the LSM number, and *CC* is the CAP number.

Allowable values for CC are:

00

standard 21-cell CAP; or the right-hand 40-cell enhanced CAP; or the 20-cell WolfCreek CAP; or the 9740 fixed rack 14-cell or 10-cell removable magazine CAP.

01

left-hand 40-cell enhanced CAP or the 30-cell WolfCreek optional CAP

02

priority CAP (PCAP) for an enhanced CAP or WolfCreek CAP.

PROGram

optionally specifies a program to be invoked to actually write the label (if not specified, IEHINITT is assumed).

(prog-name)

prog-name identifies the name of the program that is to perform the initialization.

(IEHINITT)

IEHINITT is the default value.

VERIFY

optionally specifies a parameter to be passed to the tape initialization program identified by the PROGram parameter. **VERIFY is valid only when the PROGram parameter specifies TMSTPNIT.**

(parameter-name)

parameter-name is the parameter passed to the TMSTPNIT program. For example, if the parameter entered is

```
VERIFY(ROBOT)
```

TMSTPNIT suppresses the TMS CAL0TN01 message for NL (nonlabeled) tapes. Refer to the appropriate CA-1 documentation for valid parameter values.

CNTLDD

optionally specifies the DD statement to which initialization control statements are written, and from which the label program reads its control statements.

Note: This is not your control data set.

(dd-name)

The name of the DD statement.

Note: The *dd-name* option may only be specified when using CA-1 (TMS) prior to version 5.1. The default value (SYSIN) MUST be used with CA-1 (TMS) version 5.1 or later.

(SYSIN)
SYSIN is the default value.

OPTion
specifies optional handling to be performed following the completion of label processing. If not specified, the default is retention of the new cartridges in the library with a non-scratch status.

(EJEct)
specifies that the labeled volumes are to be ejected from the library after the labeling process is complete.

(SCRatch)
specifies that the labeled volumes entering the library are to be added to the scratch list. If the volume is to be treated as scratch, the installation must inform the tape management system of the volume's scratch status.

JCL Requirements

The following definitions apply to the Initialize Cartridge utility JCL:

SLSPRINT
output messages from the utility.

SLSIN
input to the utility in the form of control statement card images.

SLSINIT
A substitution control card format for the invoked initialization program.

SLSTAPE
The library transport on which the cartridge is mounted for labeling. To prevent a nonlibrary transport from being allocated, specify the esoteric for library transports, a specific library transport address, or have HSC JES2 Allocation User Exit (SLSUX02, or SLSUX04 for JES3 users) installed.

CNTLDD or SYSIN
Contains volume serial labeling information and is passed as input to the initialization program (IEHINITT or the program specified by the PROG keyword parameter).

If CNTLDD is specified in the utility control statement, then the DDname identifies the data set containing the labeling information.

SYSPRINT
Output messages from IEHINITT.

JCL Examples

The following example shows JCL for cartridge initialization with a unit esoteric specified and no *cap-id* specified.

JCL for Initializing a Cartridge with Unit Esoteric and No CAPid

```
//JOBINCT        job (account),programmer
//S1                     EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT      DD SYSOUT=A
//SLSTAPE        DD UNIT=(LIB448Ø,,DEFER),DISP=NEW
//SYSPRINT      DD SYSOUT=A
//SLSINIT          DD *
SLSTAPE    INITT     OWNER='CUSTOMER',SER=******
//SLSIN               DD *
   INITIALIZE
/*
//SYSIN               DD DSN=&&TEMP,DISP=(,DELETE,DELETE),UNIT=SYSDA,
//                          SPACE=(TRK,1)
//
```

The following example shows JCL for cartridge initialization of a CA-1(TMS) cartridge that is in delete status in the TMC, with the unit, the cap-id parameter, the PROGram parameter, and the CNTLDD parameter all specified.

JCL for Initializing a Cartridge with CA-1 (TMS) 4.9/5.0

```
//JOBTINIT      job (account),programmer
//*
//TINIT              EXEC PGM=SLUADMIN,TIME=1440,PARM=MIXED
//LABELDD      DD UNIT=(580,1,DEFER),DISP=NEW
//*                                 TMSTPNIT INIT TAPE UNIT DD.
//*
//SLSTAPE       DD UNIT=AFF=LABELDD        INIT CARTRIDGES INIT TAPE
//*                                         UNIT DD
//SYSIN            DD UNIT=VIO,SPACE=(TRK,1)  IEHINITT CONTROL DATASET
//PRESYSIN     DD UNIT=VIO,SPACE=(TRK,1)  TMSTPNIT CONTROL DATASET
//TMC                DD DSN=XXXXX.TMC,DISP=SHR  TMS CATALOG
//TMSRPT        DD SYSOUT=*                TMSTPNIT REPORT OUTPUT
//SLSPRINT     DD SYSOUT=*                UTILITY MESSAGES
//SYSPRINT     DD UNIT=VIO,SPACE=(TRK,1)  IEHINITT MESSAGES
//SLSINIT        DD *                     PROTOTYPE CONTROL STATEMENT
INTAPE NUMBTAPE=1,SER=******
//*
//SLSIN            DD *                   INIT CART CONTROL STATEMENT
   INITIALIZE CAP(000:00) PROGRAM(TMSTPNIT) CNTLDD(PRESYSIN)
   OPTION(SCRATCH)
//*  WHEN USING THE TMS TAPE INITIALIZATION PROGRAM TMSTPNIT, YOU
  *  MUST SPECIFY THE ‘PROGRAM’ PARAMETER AND THE ‘CNTLDD’ PARAMETER
  *  ON THE INIT CARTRIDGES CONTROL STATEMENT.
/*
```

JCL for Initializing a Cartridge with CA-1 (TMS) 5.1/5.2

```
//JOBTINIT     job (account),programmer
//*
//TINIT             EXEC PGM=SLUADMIN,PARM=MIXED
//LABELDD    DD UNIT=(uuu,,DEFER),DISP=NEW TMSTPNIT TAPE UNIT DD
//SLSTAPE     DD UNIT=AFF=LABELDD           INIT CART TAPE UNIT DD
//SYSIN         DD UNIT=VIO,SPACE=(TRK,1)    TMSTPNIT CONTROL DATASET
//SLSPRINT   DD SYSOUT=*                   HSC UTILITY MESSAGES
//SYSPRINT   DD SYSOUT=*                   TMSUPNIT MESSAGES
//SLSINIT       DD *                      PROTOTYPE CONTROL STATEMENT
INTAPE NUMBTAPE=1,SER=******
//SLSIN           DD *
 INITIALIZE   PROGRAM(TMSTPNIT)
```

The following example shows JCL for cartridge initialization with the unit, the *cap-id* parameter, and the PROGram parameter (EDGINERS) specified.

JCL for Initializing a Cartridge with EDGINERS

```
//JOBTINIT    job (account),programmer
//*
//TINIT           EXEC PGM=SLUADMIN,TIME=1440,PARM=MIXED
//TAPE            DD UNIT=(580,1,DEFER),DISP=NEW
//*                                  EDGINERS INIT TAPE UNIT DD.
//*
//SLSTAPE    DD UNIT=AFF=TAPE           INIT CARTRIDGES INIT TAPE
//*                                        UNIT DD.
//SYSIN          DD UNIT=VIO,SPACE=(TRK,1)  EDGINERS CONTROL DATASET.
//SLSPRINT   DD SYSOUT=*                UTILITY MESSAGES.
//SYSPRINT   DD SYSOUT=*                EDGINERS MESSAGES.
//SLSINIT       DD *                      PROTOTYPE CONTROL STATEMENT.
INIT   LABEL(SL) VOL(******)
//*
//SLSIN           DD *                    INIT CARTRIDGES CONTROL
//*                                        STATEMENT.
* WHEN USING THE DFSMSrmm TAPE INITIALIZATION PROGRAM EDGINERS, YOU
* MUST SPECIFY THE ‘PROGRAM’ PARAMETER ON THE INIT CARTRIDGES
* CONTROL STATEMENT.
  INITIALIZE CAP(000) PROGRAM(EDGINERS) OPTION(SCRATCH)
/*
```

Output Description

Output resulting from the execution of the Initialize Cartridge utility includes:

- a listing of input commands with appropriate messages when syntax errors occur (see Figure 16 on page 256)
- console messages informing the console operator when the labeling of the new volume(s) is complete
- messages associated with error conditions resulting from an unsuccessful attempt to execute initialization processing or actions occurring during processing
- updated library control data set containing new volumes with the proper scratch disposition.
- labeled cartridges
- listing from the installation-specified initialization utility (see Figure 16 on page 256).

```
SYSTEM SUPPORT UTILITIES    IEHINITT                                                    PAGE 0001

SLSTAPE   INITT   SER=SQUARE,OWNER='CUSTOMER'                        00053024
VOL 1 QUARE
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                PAGE 0002
TIME hh:mm:ss                                Control Card Image Listing                     DATE yyyy-mm-dd
 INITIALIZE CAP(000:00)                                                  00100021
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                PAGE 0003
TIME hh:mm:ss                                Initialize Cartridges Utility                  DATE yyyy-mm-dd

SLS0211I Volume SQUARE successfully entered into library.

SLS0155I Condition Code for Utility Function is 0.
```

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Figure 16. INITialize Cartridge Utility Sample Output

Journal Offload Utility

The Journal Offload utility allows you to offload one or both of the journals on a given host without backing up the control data set. It is extremely important that you archive the offloaded journals, in the event that these journals are required for a restore operation.

The HSC can be operational while the Journal Offload utility is executing.

Syntax

```
►►─OFFLoad──────────────────────────────────────────────────────────►◄
```

Utility Name

OFFLoad
specifies that a journal offload is to be performed.

Parameters

None.

JCL Requirements

The following definitions apply to the Journal Offload utility program JCL:

SLSPRINT
the message output data set.

SLSCNTL
DD statement naming the primary library control data set.

SLSCNTL2
the secondary copy of the control data set.

SLSSTBY
the standby copy of the control data set.

SLSJRN01
the first of two journals on the given host.

SLSJRN02
the second of two journals on the given host. This statement is required only if both journals are to be offloaded. If specified, the SLSOFF02 statement is also required.

SLSOFF01
the created offload data set for the first journal (SLSJRN01).

SLSOFF02
the created offload data set for the second journal (SLSJRN02).

SLSIN
input to the utility in the form of control statement card images.

Note: The offloaded data sets created by SLSOFF01 and SLSOFF02 must be allocated on DASD. You can then copy the offloaded data sets to tape if you desire.

JCL Example

The following example shows JCL for the offload of both journals.

JCL for Offload of Journals

```
//JOBOFFL   job (account),programmer
//S2                 EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL   DD DSN=primary.dataset.name,DISP=SHR
//SLSCNTL2  DD DSN=secondary.dataset.name,DISP=SHR
//SLSSTBY    DD DSN=standby.dataset.name,DISP=SHR
//SLSOFFØ1  DD DSN=offload.file1,DISP=(NEW,CATLG),UNIT=unit-number
//SLSOFFØ2  DD DSN=offload.file2,DISP=(NEW,CATLG),UNIT=unit-number
//SLSJRNØ1  DD DSN=journal1.dataset.name,DISP=SHR
//SLSJRNØ2  DD DSN=journal2.dataset.name,DISP=SHR
//SLSPRINT  DD SYSOUT=*
//SLSIN          DD *
  OFFLOAD
/*
//
```

Output Description

Output resulting from the execution of the Journal Offload utility (see Figure 17 on page 259) includes:

- the journal(s) is copied to the offload data set(s)
- the journal(s) is reset
- messages associated with error conditions resulting from an unsuccessful attempt to execute the Journal Offload utility
- a condition code indicating successful or unsuccessful completion of the utility.

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                DATE yyyy-mm-dd

 OFFLOAD                                          00130000
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                        Journal Offload Utility                 DATE yyyy-mm-dd

SLS0282I Journal at DDname SLSJRN01 successfully offloaded to dataset defined by SLSOFF01 DD statement.

SLS0282I Journal at DDname SLSJRN02 successfully offloaded to dataset defined by SLSOFF02 DD statement.

SLS0191I Journal at DDname SLSJRN01 successfully reset.

SLS0191I Journal at DDname SLSJRN02 successfully reset.

SLS0155I Condition Code for Utility Function is 0.
```

C27481

Figure 17. Journal Offload Utility Sample Output

MERGEcds Utility

The MERGEcds utility integrates volume information from one CDS into another. Users can designate specific ACSids or LSMids to merge volume information from and to.

This utility supports the following activities:

- adding or changing a configuration to reflect new ACSs or LSMs

Notes:

1. StorageTek recommends that MERGEcds be used instead of the Reconfiguration utility. Support for RECONFIG will end in a future release.
2. If MERGEcds is used as a replacement for RECONFIG, the HSC should remain at the base service level until the merge is complete.

- consolidating multiple libraries and CDSs into one library and CDS. No audit is necessary.
- dividing one library and CDS into multiple libraries and CDSs. MERGEcds copies volume information from the old to the new CDS for each library.
- merging multiple ACSs into one ACS
- dividing one ACS into multiple ACSs
- modifying an ACSid and/or LSMid and copying the affected volume information from the old to the new CDS. This provides the ability to renumber ACSs and LSMs.

The ‘‘from’’ CDS is identified by DD statements in the utility JCL that designate the primary, secondary, or standby CDS. The utility uses the primary CDS for volume information, so if more than one of these DD statements is present, the HSC determines which CDS is the primary from the Database Heartbeat (DHB) record. The ‘‘from’’ CDS is not modified.

Note: Refer to “Renaming Control Data Sets” on page 61 for information about how to rename a CDS in the DHB.

The ‘‘to’’ CDS is accessed by an active HSC subsystem that executes on the same host as the SLUADMIN program that runs this utility. The ‘‘to’’ CDS can be either:

- an existing CDS containing volume information
- the output of a SLICREAT program, which initializes CDS configuration information but does not supply volume information. In this case, stop tape processing until the merge is complete.

If specific ACSids or LSMids have been named, the affected ACSs must remain disconnected from all hosts until the merge is complete.

How the MERGEcds Utility Functions

During a merge, volume information is copied from the “from’’ CDS to the “to’’ CDS. For each LSM included in the merge, volume information is copied for all panels as long as the panel type did not change.

Notes:

1. LSM types must be the same, or no volumes in those LSMs are merged. 4410 and 9310 LSMs are considered to be the same LSM type.
2. An example of a “changed’’ panel type is if a drive panel replaces a cell panel. In this case, volume information on that panel is not copied.

When panels are frozen by the SET FREEZE utility, the resulting panel status in the “to’’ CDS is determined by these conditions:

- If the panel types match on the “from’’ and “to’’ CDS, the panel is frozen only if the panel on the “from’’ CDS is frozen.
- If the panel types do not match on the “from’’ and “to’’ CDS, the panel is frozen only if the panel on the “to’’ CDS is frozen.

Note: In-transit volumes in *selected* status in the “from’’ CDS are copied to the “to’’ CDS but are changed to *unselected* status after the merge is completed.

To avoid losing in-transit information, the ‘‘from’’ CDS should not be in use by an active HSC subsystem. If active HSCs have been running using the ‘‘from’’ CDS, they should either be stopped normally (not cancelled) or recovered (see ‘‘RECOVER Host Command’’ in the *HSC Operator’s Guide*).

Errant volumes, along with all errant volume information, are copied to the ‘‘to’’ CDS.

Changing the HSC Library Configuration

The following procedure details the necessary steps to change your HSC configuration (add new ACSs or new LSMs, change LSM types, and so forth). **This procedure replaces the process described in** “Running a Successful Reconfiguration” on page 281.

1. Run the Database Decompile utility to create a new LIBGEN.

   Caution: Do not rely on old LIBGENs for accuracy. If you do not perform this step, modifications made to the CDS (e.g., changes entered from the SET utility) will not be added to the LIBGEN. Thus, you may encounter a mismatch between your CDS and LIBGEN.

2. Identify any proposed changes to the host system’s Configuration Plan.
3. Assemble a LIBGEN that contains the required macro changes.
4. Create the data set initialization JCL and execute SLICREAT to format the new control data set(s) (refer to Chapter 5, “Initializing the Control Data Sets’’ in the *HSC Configuration Guide*).

Note: SLICREAT must create **all** control data sets (primary, secondary, and standby) referenced by the HSC.

5. Update the CDSDEF PARMLIB statement to specify the new HSC data set to be created.
6. Initialize the HSC on a test system (or a production system that can be brought down to be used for a test).
7. Execute the SLUADMIN program and include the following control statement to verify that the merged configurations are compatible:

   ```
   MERGEcds ALL VALIDate
   ```

   Run the validation test using an active CDS as the ‘‘from’’ CDS, and ignore any in-transit or errant volume warning messages.
8. If additional libraries (i.e., CDSs and ACSs) will be merged in the future, you can also validate that the configurations are compatible at this time.
9. At a predetermined time, terminate the HSC on all hosts (suspending tape activity).
10. To retain the original CDS names, do the following:

- Back up the current active CDS.
- Restore the CDS to the same data set.
- Rename the CDS to reflect the desired name for your ‘‘from’’ CDS.
- Rename the output of your SLICREAT job to the original CDS names.

11. Start the HSC on the target host at the base level using the new CDS created by the SLICREAT program.

Note: Make sure tape activity is still suspended. Since the new CDS does not contain any volumes, all tape mounts during the merge are sent outside the library.

12. If some ACS(s) defined on the ‘‘to’’ CDS will not be used immediately, add to the HSC PARMLIB member the following command to suppress the ‘‘ACS is disconnected’’ message.

    ```
    OPTion DISCmsg SUppress ACS(aa)
    ```

    Refer to ‘‘OPTION Command and Control Statement’’ in the *HSC Operator’s Guide* for more information about this command.
13. Run SLUADMIN, specifying the following command:

    ```
    MERGE ALL
    ```

    Include the SLSFCNTL, SLSFCTL2, or SLSFSTBY DD statements, as appropriate, to indicate the ‘‘from’’ CDS.

Note: MERGEcds determines the primary CDS from these statements.

14. Back up the ‘‘to’’ CDS after the merge.

15. After the merge is complete, verify that the contents of the ACS(s) have been merged successfully into the new CDS. Check the output of the utility. Make hardware LMU microcode changes.
16. Restart tape processing on the host. The HSC does not need to be recycled.
17. Modify all LSMs online.
18. Start the HSC on the other hosts using the new CDS. Bring the HSC to the full service level.
19. Audit any panels that changed while reconfiguring the library.

    Caution: When an LSM panel is replaced, the contents of the original panel are not retained in the CDS. The entire new panel must be audited to update the CDS.

20. The reconfiguration sets all CAP preference values to MANUAL. If necessary, reassign CAP preference values.

Merging Additional Data Centers

Once the new CDS has been reconfigured, you are not required to recycle the HSC when you merge other data centers. The following procedure describes merging data centers into an active HSC.

1. Run a validation test on the host to be merged to using the CDS to be merged.

   ```
   SLSIN: MERGE VALIDate
   ```

   You must specify the ‘‘from’’ to ‘‘to’’ ACSs on the SLSMERGE DD statement. See “SLSMERGE DD Statement” on page 265 for information about its syntax.

   ```
   SLSMERGE: MERGE FACS(aa) TACS(aa)
   ```

   Run the validation test prior to the merge. If the ‘‘from’’ CDS is in use by active HSCs when the test is executing, ignore any in-transit or errant volume warning messages.

2. Review the output of the validation run and repeat the process until all errors are corrected.
3. Back up the CDS before running the merge.
4. Run the merge without the VALIDate parameter.

   ```
   SLSIN: MERGE
   SLSMERGE: MERGE FACS(aa) TACS(aa)
   ```

5. Back up the updated ‘‘to’’ CDS.
6. If additional ACSs are to be merged, repeat the previous steps.

Note: If LSMs in another data center are to be merged into an ACS, follow the same process used for ACSs. Specify the ‘‘from’’ and ‘‘to’’ LSM parameters, FLSM and TLSM, in the SLSMERGE DD statement.

a. Run the validation test.

```
SLSIN: MERGE VALIDate
SLSMERGE: MERGE FLSM(aal) TLSM(aal)
```

b. Verify the validation test.

c. Run the merge without the VALIDate parameter.

```
SLSIN: MERGE
SLSMERGE: MERGE FLSM(aal) TLSM(aal)
```

Since an LSM may be merged into a CDS where it becomes part of another ACS, it is likely that the LSM will be changed so that one or more of its panels becomes a pass-thru panel.

In this case, volumes stored on the affected panel(s) are not merged, and a warning message is issued indicating that the panel type does not match and that no volumes from the panel have been merged.

7. After completing any necessary hardware moves, connect the new ACS by entering:

```
Vary dev-id ONline
```

The HSC can now access the new ACS.

8. Stop suppression of the ‘‘ACS is disconnected’’ message by entering:

```
OPTion DISCmsg(SHow) ACS(acs-id)
```

9. Modify the new LSMs online.
10. Reset the CAPPREF parameter.
11. Remove the OPTion DISCmsg control statement from the HSC PARMLIB member.
12. If either of the following cases are reported

    - duplicate volumes from the merge
    - errant or in-transit volumes

    audit the target cell locations to eject these volumes.

Syntax

```
►►─MERGEcds──┬──────────┬──┬─────────┬──────────────────────────────►◄
             └─VALIDate─┘  └─ALL─────┘
```

Utility Name

MERGEcds
specifies that a CDS merge is to be performed.

Parameters

VALIDate
optionally, verifies that the configurations to be merged are compatible and reports duplicate, in-transit, and errant volumes. **The merge is not performed with this parameter.**

ALL
optionally, indicates that volume information associated with all ACSs and LSMs in the ‘‘from’’ CDS is to be merged into the corresponding ACSs and LSMs in the ‘‘to’’ CDS. The ACSids and LSMids must match.

If **ALL** is omitted, MERGEcds reads the parameters specified in the SLSMERGE DD statement.

Note: ALL and the SLSMERGE DD statement are mutually exclusive.

SLSMERGE DD Statement

This statement designates specific ACSs or LSMs to merge volume information from and to.

Notes:

1. If a “from’’ and “to’’ ACS is specified, all matching LSMs within the ACS are merged.
2. If a matching LSM contains panels types that do not match, no volumes in those panels are merged. 4410 and 9310 LSMs are considered to be matching LSMs.

   When LSM types in a merging ACS do not match, no volumes in those LSMs are merged.
3. The “to’’ ACS must not contain volumes in the “to’’ CDS unless the volumes reside in an LSM that is not included in the merge.
4. The “to’’ LSM must not contain volumes in the “to’’ CDS.
5. Duplicate volumes in LSMs are not merged.

6. The SLSMERGE DD statement and the MERGEcds **ALL** parameter cannot be entered in the same job step.

Multiple sets of parameters can be specified (with no limit) for a single MERGEcds run. ACS and LSM formats can be mixed, as long as the same ACS or LSM is not named more than once in a run.

The syntax for SLSMERGE is:

SLSMERGE Statement

```
►►─MERGE──┬─FACS(aa)──TACS(aa)──┬──────────────────────────────────►◄
          └─FLSM(aal)─TLSM(aal)─┘
```

where:

FACS
specifies the ‘‘from’’ ACS.

aa
specifies the hexadecimal ACSid value (00 through FF) to merge volume information from.

TACS
specifies the ‘‘to’’ ACS.

aa
specifies the ACSid to merge volume information to.

FLSM
specifies the ‘‘from’’ LSM.

aal
specifies the hexadecimal LSMid value. *aa* is the ACS value (00 through FF); l is the LSM value (0 through F).

TLSM
specifies the ‘‘to’’ LSM.

aal
specifies the LSMid to merge volume information to.

Note: The ‘‘from’’ and ‘‘to’’ LSM must be the same LSM type (4410 and 9310 are considered to be the same type).

JCL Requirements

The following definitions apply to the MERGEcds utility JCL:

SLSPRINT
output messages from the utility program.

SLSIN
input to the utility in the form of control cards.

SLSFCNTL, SLSFCTL2, SLSFSTBY
the ‘‘from’’ control data set. MERGEcds selects the primary CDS if more than one of these DD statements is provided.

SLSMERGE
the statement that contains specific ACSs and/or LSMs to be merged.

JCL Examples

The following example shows JCL for verifying volume information in all ACSs and LSMs.

JCL for Verifying All ACSs/LSMs

```
//JOBMERG   job (account),programmer
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSFCNTL  DD DSN=from.primary.control.dataset,DISP=SHR
//SLSFCTL2   DD DSN=from.secondary.control.dataset,DISP=SHR
//SLSFSTBY   DD DSN=from.standby.control.dataset.,DISP=SHR
//SLSIN           DD *
  MERGECDS VALIDATE ALL
/*
//
```

The next example merges volume information from an ACS and a LSM.

JCL for Merging ACS/LSM Volume Information

```
//JOBMERG   job (account),programmer
//S1                   EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSFCNTL   DD DSN=from.primary.control.dataset,DISP=SHR
//SLSFCTL2    DD DSN=from.secondary.control.dataset,DISP=SHR
//SLSFSTBY    DD DSN=from.standby.control.dataset.,DISP=SHR
//SLSIN            DD *
  MERGECDS
//SLSMERGE  DD *
  MERGE FACS(ØØ) TACS(Ø1)
  MERGE FLSM(ØØ) TLSM(Ø21)
/*
//
```

Output Description

Output resulting from the execution of the MERGEcds utility includes:

- a merged library control data set
- messages associated with error conditions resulting from an unsuccessful attempt to execute MERGEcds processing (with or without the VALIDate option)
- messages warning about each in-transit or errant volume affected by the merge, LSMid mismatches, LSM type and panel mismatches, and duplicate volumes in LSMs.

MOVe Utility

The MOVe utility permits you to request the HSC to move a single volume, a list of volumes, or a range of volumes to other locations within an ACS.

MOVe Considerations

You should be aware of the following considerations before attempting to use the MOVe utility:

- Movement of volumes to all LSMs is done on a first-come first-served basis. As volumes are moved, should an LSM become fully populated before the move request is satisfied for that LSM, the move request continues with the movement of volumes designated for the next LSM specified in the request. An LSM is fully populated when all available cells contain tape cartridges. This process continues until the entire move request is completed or all destination LSMs are full.
- Moves are performed one at a time so that other LSM work can be done.
- The target LSM for the move request must be specified. Optionally, the specific panel within the target LSM may also be specified. Cartridges may be moved from one panel to another panel within the same LSM, but cartridges may **not** be moved from one location to another on the **same** panel. Also, cartridges cannot be moved to frozen panels in an LSM which is the target of a move.

  The cartridges being moved may be specified in the following ways:

  - move a single cartridge or a group of cartridges (specified by a VOLSER, a list of VOLSERs, or a range of VOLSERs)
  - move the contents of a specified column, row, or entire panel (specified using the parameters FromLSM,Panel,Row,Column)
- An entire panel or panels can be emptied by specifying the **Panel** parameter without the **Row** or **Column** parameters. Any panels that are specified in the *panel-list* are excluded as destination panels if cartridges are being moved within the same LSM.

  Note: Other cartridge activity occurring in the LSM can result in cartridges being placed in cells in a panel that is being emptied by the MOVe utility.

  Refer to the appropriate ACS hardware document for information about LSM outer and inner wall panel layouts.

Syntax

```
►►─MOVe─┤ Parameters ├──────────────────────────────────────────►◄

 Parameters:

├──┬─Flsm(lsm-id)─Panel(panel-list)──┬──────────────────────────►
   │                                 └─Row(row-list)─┬──────────┬
   │                                                 └─Column(column-list)─┘
   │                                                 │          │
   └─Volume(vol-list)────────────────────────────────┘──────────┘

►─TLsm(lsm-list)─┬──────────────┬──────────────────────────────┤
                 └─TPanel(panel)─┘
```

Utility Name

MOVe
specifies a move request.

Parameters

Flsm
The ‘‘From’’ LSMid in the format ‘‘*aal*’’ that the cartridges are to be moved from. If you specify the **Flsm** parameter, you may not specify the Volume parameter.

(lsm-id)
LSM identifier name.

Panel
panel number to be moved from. This parameter has a corequisite of the **Flsm** parameter and is required.

An entire panel can be emptied if the **Row** and **Column** parameters are not specified.

(panel-list)
A one or two digit panel number. Ranges are not valid. This parameter cannot contain a list if a list is specified for the **Row** or **Column** parameter.

Panels specified by *panel-list* are excluded as destination panels if cartridges are being moved within the same LSM.

Row
list of rows to be moved from. This parameter has a corequisite of the **Panel** parameter.

(row-list)
A one or two digit row number or list of row numbers. The maximum list allowed is four rows. However, this parameter cannot contain a list if a list was specified for the **Column** parameter. Ranges are not valid.

Column
list of columns to be moved from. This parameter has a corequisite of the **Row** parameter and is optional. If this parameter is not specified, all columns will be moved for the rows specified.

(column-list)
A one or two digit column number or list of column numbers. This parameter cannot contain a list if a list was specified for the **Row** parameter. Ranges are not valid.

Note: Refer to the appropriate ACS hardware document for information about LSM panel, row, and column locations and layouts.

Volume
volumes to be moved.

(vol-list)
A list of volumes (a maximum of 100 can be specified) or a range of volumes. If you specify the **Volume** parameter, you may not specify the **Flsm** parameter.

TLsm
The target LSM(s). This is a required parameter. The LSMs are specified as ‘‘*aal*,’’ where ‘‘*aa*’’ is the ACSid and ‘‘*l*’’ is the LSMid. The ACSid

- must be identical to the Flsm parameter ‘‘aa’’ (ACSid), or
- must be the same ACS in which the volume resides if the **Volume** parameter is specified.

(lsm-list)
A list of LSMs (a maximum of 16 can be specified). Ranges are invalid.

TPanel
the panel in the **TLsm** to move the cartridge(s) to. This parameter is optional.

(panel)
The one or two digit panel number. This parameter cannot contain a list or range.

JCL Requirements

The following definitions apply to MOVe utility JCL:

SLSPRINT
output messages from the utility program.

SLSIN
input to the utility in the form of control cards.

JCL Examples

The following example shows JCL for moving a single volume from a panel to another panel within the same LSM.

The example JCL moves a volume from LSM 001, Panel 08, Row 05, Column 02 to the same LSM (001) to Panel 09.

JCL for Moving a Single Volume within the Same LSM

```
//JOBMOVE   job (account),programmer
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN           DD *
  MOVE FLSM(ØØ1) PANEL(Ø8) ROW(Ø5) COLUMN(Ø2) TLSM(ØØ1) TPANEL(Ø9)
/*
//
```

The example JCL moves volumes 000345, 000357, 000367, and 000360 to LSM 002, Panel 06.

Move Several Volumes From an LSM to Another LSM

```
//JOBMOVE    job (account),programmer
//S1                   EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT    DD SYSOUT=A
//SLSIN            DD *
  MOVE VOLUME(ØØØ345 ØØØ357 ØØØ367 ØØØ36Ø) TLSM(ØØ2) TPANEL(Ø6)
/*
//
```

Output Description

Typical outputs resulting from the execution of the MOVe utility include:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute unselect processing
- messages indicating actions occurring during processing (see Figure 18, Figure 19, and Figure 20).
- an updated control data set indicating the volume is moved
- a condition code indicating successful or unsuccessful volume movement (see Figure 18, Figure 19, and Figure 20).

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE nnnn
TIME hh:mm:ss                                          Move Utility                              DATE yyyy-mm-dd

SLS1925I Volume 000345 moved from 000:02:11:05 to 001:11:01:01
SLS1925I Volume 000346 moved from 000:02:11:06 to 001:11:01:02
SLS1155I  2 volumes moved to LSM 001
SLS0155I Condition Code for Utility Function is 0.
```

C29355

Figure 18. MOVe Utility Sample Output - Successful Completion

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE nnnn
TIME hh:mm:ss                                Move Utility                                DATE yyyy-mm-dd

SLS1950I Volume 000345 moved from 000:02:11:05 to 001:11:01:01

SLS1950I Volume 000346 moved from 000:02:11:06 to 001:11:01:02

SLS1959I Volume in cell location 000:02:11:07 does not physically match specified VOLSER 000347

SLS1955I   2 volumes moved to LSM 001

SLS1156I   2 volumes total moved

SLS1157I   2 volumes total not moved

SLS0155I Condition Code for Utility Fuction is 4
```

C29356

Figure 19. MOVe Utility Sample Output - Unsuccessful Volume Movement

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE nnnn
TIME hh:mm:ss                                Move Utility                                DATE yyyy-mm-dd

SLS1950I Volume 000345 moved from 000:02:11:05 to 001:11:01:01
SLS1950I Volume 000346 moved from 000:02:11:06 to 001:11:01:02
SLS1958I No more free cells available in specified LSM(s) to continue the MOVE function
SLS1155I   2 volumes moved to LSM 001
SLS1156I   2 volumes total moved
SLS0155I Condition Code for Utility Function is 4
```

C29357

Figure 20. MOVe Utility Sample Output - No Available Free Cells

Performance Log Reblocker

The Performance Log Reblocker utility is used by sites sharing an ACS between MVS and VM hosts. The utility is used to reformat the VM performance log data to a common format similar to that of the MVS/SMF data. This data is then used as input for the Activities Report utility. The Performance Log Reblocker utility is required to reconstruct the original-image SMF data; different versions are provided to execute in the CMS and MVS environments.

This utility prepares the generated performance log (SMF data) for use by the Activities Report utility.

SMF records passed to the SCP (see the glossary for a definition of SCP) are variable in length and can be up to 32K bytes long. The SCP breaks these records into sections that fit in a VM punch spool file, and passes reblocking information with each segment.

The MVS version takes SCP performance log output (with header/trailer data) and reblocks the physical records into the original length variable, blocked, spanned records that an MVS SMF function can handle.

For more information about the Performance Log Reblocker utility, refer to the *HSC System Programmer's Guide (VM Implementation)*. The PERFLOG trailer data optionally may be used to specify additional processing of the data after it is reblocked.

JCL Example

The following example shows JCL for Performance Log Reblocker formatter and merge tasks.

JCL for Performance Log Reblocker

```
//PERFLOG    JOB     (Accounting info),
//                   CLASS=x
//* - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - *
//* PERFLOG Formatter                                                      *
//* Takes PERFLOG records in 80 column card images and rebuilds them *
//* as SMF type records.                                                   *
//* - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - *
//STEP01         EXEC PGM=SLUPERF,REGION=512K
//STEPLIB      DD DSN=your.hsc.loadlib,DISP=SHR
//SYSPRINT   DD SYSOUT=*
//PRINTER     DD SYSOUT=*
//SLSSMF       DD DSN=PERFLOG.FORMATED,DISP=(NEW,CATLG,DELETE),
//           DCB=(BLKSIZE=3120,LRECL=16384,RECFM=VBS),
//           UNIT=SYSDA,SPACE=(CYL,(10,5))
//SYSIN           DD *
++++++++++++ PERFLOG DATA GOES HERE ++++++++++++
//* - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - *
//* PERFLOG Merge                                                          *
//* Takes the SMF type PERFLOG records and merges them with any other*
//* records desired.                                                       *
//* - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - *
//STEP02         EXEC PGM=merge,REGION=512K
//SYSPRINT   DD SYSOUT=*
//PRINTER     DD SYSOUT=*
//SYSUT1        DD DSN=PERFLOG.FORMATED,DISP=OLD
//SYSUT2        DD DSN=other.data,DISP=OLD
//SYSUT3        DD DSN=merged.data,DISP=(NEW,CATLG,DELETE),
//           UNIT=SYSDA,SPACE=(CYL,(10,5))
//
```

Output Description

Output resulting from the execution of the Performance Log Reblocker utility includes:

- a reblocked SMF data file
- a listing of record subtypes that have been reblocked.

A sample output listing of the Performance Log Reblocker utility follows.

```
SLUPERF: Begin Date= 1996155   Begin Time= 14:44:27   End Date= 1996155
         End Time= 14:45:42


 SMF Subtype: 001 LSM Offload Statistics 8

 SMF Subtype: 004 LMU Read Statistics 16
```

This example shows the number of records reblocked for a given SMF subtype. In this case, 8 subtype 001 records and 16 subtype 004 records have been reblocked.

POST VOLSER to Location Utility

The POST VOLSER to Location utility manually locates a volume containing system-critical data sets within a Library Storage Module (LSM). This utility is primarily for recovery purposes when MVS library host software is inoperative and the console operator must access a particular library volume.

How the POST VOLSER to Location Utility Operates

The utility program looks up the user specified volume serial number in the library control data set and converts its address to a readable LSMid and a panel/row/column location. The location of the requested volume is then displayed on the console and, optionally, on the hard copy listing file.

When to Use the POST VOLSER to Location Utility

The POST VOLSER To Location utility provides an interactive method to locate a selected volume within the library. The utility is useful in two situations:

- when MVS is inoperative, or
- when the HSC or SCP is inoperative.

Inoperative MVS

The POST VOLSER to Location utility provides a stand-alone mode of operation which interacts with a console, as a function of POST, to locate the selected volume within the library.

The POST Stand-alone Executive is IPLed, the address of the DASD which contains the library control data set is specified, the name of the control data set is provided, and the LOCATE control statement is entered to invoke the utility.

The utility verifies that the control data set is located on the specified DASD address. Then, the user is prompted for the volume serial number to be located.

Note: The Program for Online Subsystem Testing (POST) is a functional testing program for StorageTek devices. It is also used as a utility program for general applications and as a diagnostic tool for StorageTek Customer Services Engineers.

Refer to the *POST Reference Manual* for additional information.

Inoperative HSC

The POST VOLSER to Location utility provides a method to locate the selected volume within the library. Standard POST OS JCL is used for execution with the SYSUT1 DD specifying the library control data set. The LOCATE control statement is entered to invoke the utility.

Refer to the *POST Reference Manual* for additional information.

Reconfiguration Utility

The Reconfiguration utility is used as part of a four stage process to create a new copy of the control data set when library hardware configurations change, such as the addition of drives or LSMs, but when information regarding the location of cartridges in the library must be retained from the original control data set.

The four stages include:

- performing a LIBGEN to create the new hardware configuration
- executing the SLICREAT procedure to format the new CDS that will hold the information transferred from the old CDS during the execution of the Reconfiguration utility
- executing the Reconfiguration utility to transfer current cartridge information from the old CDS to the new CDS taking into account the hardware configuration changes made
- possibly executing a partial audit that may be necessary to make final corrections to the CDS contents for panels that may have changed as a result of hardware configurations, such as the addition of drive panels.

The Reconfiguration utility, called via an MVS START command parameter, runs as a special invocation of the HSC. The Reconfiguration utility uses as input the CDSDEF control statement (points to the old CDS) as its information source and the RECDEF control statement (points to the newly formatted CDS) as the target where the updated information is stored.

Note: StorageTek recommends that the MERGEcds utility be used instead of this utility. Support for Reconfiguration will end in a future release.

Reasons for Running the Reconfiguration Utility

The Reconfiguration utility minimizes the amount of time that the library is unavailable for your use due to library modifications. Some typical examples of library modifications are:

- an LSM panel is reconfigured (possibly by adding a drive panel to the LSM)
- an LSM is added to the existing configuration. Usually, this causes a change to the configuration of some of the existing LSMs since PTP panels replace panels that are currently full wall panels.
- an ACS is added to the library
- an LSM, or an entire ACS, is removed from the library.

Since the LIBGEN macros define the various physical aspects of a library, most changes or modifications affecting the physical configuration of the library require that corresponding LIBGEN macro(s) be updated. Any update to the LIBGEN (except changes made via the SET utility) requires that a new library control data set be created. To do this, run your LIBGEN through the SLICREAT program (refer to ‘‘Executing the SLICREAT Program’’ in the *HSC Configuration Guide*) and use that output file along with your old

CDS as input to the Reconfiguration utility (refer to “Reconfiguration CDS Definition (RECDEF) Control Statement” on page 100).

> **Note:** The SET utility allows many changes to be made without executing the Reconfiguration utility to accomplish a desired functional change. Refer to “SET Utility” on page 317 for a description of the SET utility.

How the Reconfiguration Utility Functions

During a reconfiguration, volume information is copied from the old CDS to the new CDS. If the same LSMid exists on both the old and new CDS, volume information is copied for all panels as long as the panel type did not change.

Notes:

1. LSM types must be the same, or no volumes in those LSMs are copied. 4410 and 9310 LSMs are considered to be the same LSM type.
2. An example of a ‘‘changed’’ panel type is if a drive panel replaces a cell panel. In this case, volume information on that panel is not copied.

When panels are frozen by the SET FREEZE utility, the resulting panel status in the new CDS is determined by these conditions:

- If the panel types match on the old and new CDS, the panel is frozen only if the panel on the old CDS is frozen.
- If the panel types **do not** match on the old and new CDS, the panel is frozen only if the panel on the new CDS is frozen.

The console operator can execute the Reconfiguration utility via a PROC (refer to “Reconfiguration PROC” on page 283) using the MVS START command to transfer data from the old control data sets to the new control data sets.

> **Note:** Reconfiguration executes under the Base service level only.

Before executing the Reconfiguration utility, it is highly recommended that you run the Volume Report utility, which specifies the ACS and/or ACS and LSM options.

The volume report detects any errant and/or selected volume plus cell-allocated, but empty, conditions. If any of these conditions exist, it is recommended that each condition be cleared before running the Reconfiguration utility. If not cleared, the condition is copied to the newly created control data set.

An exception exists for selected volumes that are copied and marked unselected in the new control data set. If duplicate VOLSERs exist, run the AUDIt utility before running the Reconfiguration utility.

The net result of executing the Reconfiguration utility (process) is the creation of new control data sets that must be used for HSC execution from this point.

Note: ALL new control data sets (primary, secondary, and standby) must conform to the library hardware.

Caution: Following a reconfiguration, all LSMs are in offline, manual mode and must be brought online. Commands that are dependent on the LSMs being online (including all commands used when automated mounts or dismounts are necessary) need to be issued after the LSMs are brought online.

I/O Considerations

The Reconfiguration utility supports creating data spaces to store CDS records subject to multiple I/O updates. Data space size is approximately 500K (.5M) for each LSM in the new configuration.

If the necessary data space cannot be acquired by the utility, CDS I/O will require significant additional time.

Note: Reconfiguration to real DASD with many scratch volumes has been known to take hours of wall clock time.

Running a Successful Reconfiguration

While the Reconfiguration utility is in process, the library is unavailable to the user. The steps necessary to achieve a successful reconfiguration are as follows:

1. Run the Database Decompile utility to create a new LIBGEN.

   Caution: Do not rely on old LIBGENs for accuracy. If you do not perform this step, modifications made to the CDS (e.g., changes entered from the SET utility) will not be added to the LIBGEN. Thus, you may encounter a mismatch between your CDS and LIBGEN.

2. Identify any proposed changes to the host system's Configuration Plan. Update your Hardware Configuration Definition (HCD) and LIBGEN to reflect these changes.

   If you want to insert new ACSs into the middle of an existing library, or LSMs into an existing ACS, use the MERGEcds utility instead of Reconfiguration.

   Caution:

   - **If new ACSs are inserted into the middle of an existing library, all volume information will be lost for ACSs after the inserted ACS(s). In this case, audits may need to be run on the affected ACSs.**

     When adding a new ACS(s), add it as the last ACS defined in LIBGEN; specifically, add it as the last assembler label specified on the SLIALIST macro and add all other affected macros. Refer to the ''SLIALIST Macro'' in the *HSC Configuration Guide* for a description of the macros.

   - **If new LSMs are inserted into the middle of an existing ACS LSM string, all volume information will be lost for LSMs after the inserted LSM(s). In this case, audits may need to be run on the affected LSMs.**

When adding a new LSM(s) to an ACS, add it as the last LSM(s) in that ACS; specifically, add it as the last SLILSM macro(s) specified in the LSM parameter of the SLIACS macro and add all other affected macros. Refer to the ‘‘SLIACS Macro’’ in the *HSC Configuration Guide* for a description of the macros.

3. Assemble a LIBGEN that contains the required macro changes.
4. Optionally, run the SLIVERFY program to verify the HCD and LIBGEN.
5. Create the data set initialization JCL and execute SLICREAT to format the new control data set(s) (refer to Chapter 5, “Initializing the Control Data Sets’’ in the *HSC Configuration Guide*).

Note: SLICREAT must create **all** control data sets (primary, secondary, and standby) referenced by the HSC.

6. Update the RECDEF PARMLIB statement to specify the new HSC data set to be created.
7. Ensure that the current primary CDS copy (as shown by the Display CDS command) is the primary copy of the old CDS input to RECONFIG.

   If the CDS copies need to be rotated into a different sequence, use the procedure described under “Reassigning Control Data Set Names in Database Heartbeat Record” on page 59.

8. Update the CDSDEF PARMLIB control statement to include **only** the primary CDS.

Warning: You must specify **only** the primary CDS copy that was last active. If you do not, unpredictable and undesirable operational results, including operating system hangs, can occur.

9. Stop execution of the HSC on all hosts.
10. Use the MVS START Command to invoke the Reconfiguration PROC. Refer to “Reconfiguration PROC” on page 283.
11. When the RECONFIG is complete, if necessary, make hardware/LMU microcode changes.
12. Back up the new control data set.

    a. Update the CDSDEF PARMLIB statement to specify the new HSC data set(s). Change the existing utility JCL to reflect the new CDS names.

    or

    b. Rename the CDSs. To see how to retain the CDS names, refer to “Renaming Control Data Sets” on page 61.

Note: The HSC startup after reconfiguration must point to the new primary, secondary, and standby CDS copies.

13. Remove the RECDEF PARMLIB statement.

14. Start the new production procedure (see “Renaming Control Data Sets” on page 61 for more information).
15. Modify all LSMs online.
16. The reconfiguration sets all CAP preference values to MANUAL. If necessary, reassign CAP preference values.
17. Audit any panels that changed while reconfiguring the library.

Caution: When an LSM panel is replaced, the contents of the original panel are not retained in the CDS. The entire new panel must be audited to update the CDS.

Reconfiguration PROC

Create a reconfiguration procedure that includes the new control data sets produced by the reconfiguration data set initialization JCL. This PROC may be identical to the startup PROC with the following modifications:

- Add RECONFIG to the PARM information passed from the EXEC statement.
- Enter the new control data set name specified in the RECDEF PARMLIB statement (refer to “Reconfiguration CDS Definition (RECDEF) Control Statement” on page 100) in your SLSSYS DD statement.

Refer to “JCL Example’’ for an example of a Reconfiguration PROC.

Syntax

```
►►──┬─START─┬──────reconfig-procname──────────────────────────────►◄
    └─S─────┘
```

Note: The Reconfiguration utility is invoked by using the MVS START command that includes the RECONFIG parameter in the PROC. This PROC executes program SLSBINIT.

MVS Command Name

START or S
initiates the MVS START command.

Parameters

reconfig-procname
is the name of the Reconfiguration PROC.

JCL Requirements

Refer to “Reconfiguration CDS Definition (RECDEF) Control Statement” on page 100 for information required for the Reconfiguration utility.

JCL Example

Sample Reconfiguration PROC

```
//newprocname   PROC
//IEFPROC         EXEC PGM=SLSBINIT,
//                           TIME=144Ø,
//                           REGION=2ØØØK,
//                           DPRTY=(7,5),
//                       PARM='E(EØ86) F(23) M(Ø2) SSYS(HSCØ) RECONFIG'
//*
//SLSSYSØ2        DD   DSN=your.parmlib.(member),DISP=SHR
//STEPLIB          DD   DSN=sys1.your.linklib,DISP=SHR
```

PARMLIB Example

The following JCL example represents the reconfiguration procedure using CDSDEF and RECDEF statements in the PARMLIB.

Refer to Chapter 3, “HSC Control Statements and HSC Start Procedure” on page 83 for more RECDEF PARMLIB examples.

PARMLIB Example of RECDEF Control Statement

```
/*                                                                  */
CDSDEF   DSN1=SLS.DBASEPRM
RECDEF   DSN1=SLS.NEW.DBASEPRM,+
                   DSN2=SLS.NEW.DBASESEC
```

Output Description

Output resulting from the execution of the Reconfiguration utility includes a message stating whether or not the utility ran successfully.

RESTore Utility

The RESTore utility provides a way to re-create the library control data set from a previous backup copy of the data set. You also have the option to apply all journals (maximum of 99 files per run) since the last backup, if journaling is enabled.

Caution: It is critical that you restore all data sets referenced by the HSC (primary, secondary, standby). Failing to restore all data sets can cause CDS mismatches. Refer to "Control Data Set Recovery" on page 57 **and** "Reassigning Control Data Set Names in Database Heartbeat Record" on page 59 **for additional information.**

Prerequisites

Warning: The host software must be **stopped** on all hosts when this utility is executed.

Reasons for Running the RESTore Utility

The RESTore utility performs the following tasks:

- re-creates the library control data set from a backup copy
- applies contents of any journals having activity since the backup. This process occurs only if you have designated that journals are enabled. See ''SLIRCVRY Macro'' in the *HSC Configuration Guide* for information about enabling journaling

Notes: The HSC BACKup and RESTore utilities can be used as part of a procedure to rename control data sets. Refer to "Renaming Control Data Sets" on page 61 for detailed information on renaming control data sets.

How the RESTore Utility Functions

The RESTore utility is executed in the following phases:

- A hardware reserve is issued against the control data set.
- The library control data set is restored from a previous backup copy.
- If journaling is enabled, the installation optionally can apply journals (up to 99 files per run) to the restored library control data set. It is the user's responsibility to include all journals and offload copies made since the last backup.
- The restored library control data set is duplicated in the secondary and standby control data sets if secondary and standby control data sets are being used. Refer to "Control Data Set Recovery" on page 57 for additional information about the control data set recovery scheme.

  Note: The restored data set is formatted as RECFM=F, BLKSIZE=4096. The logical record length may be LRECL=0. In this case, LRECL=0 indicates to default to the block size, so you should not construe this as a problem.

- If GENerate (YES, Only, or Short) is specified in the RESTore JCL, output of the discrepancies encountered is stored in the SLSAUDIT data set. For information on

resolving any discrepancies, see “How to Handle BACKup/RESTore Discrepancies” on page 292.

- The control data set is released, and the utility ends.

The RESTore utility does not reset the journals. It is recommended that a backup be performed following the completion of the restore to reset the journals and reflect the newly restored control data set.

Special Considerations for Control Data Sets Processing Independently

Special precautions should be taken for running BACKup and RESTore when local/remote-linked libraries run control data sets independent of each other. These precautions should be followed when the link connecting the local and remote libraries is disrupted. Refer to “When CDS Copies Are Split Among Hosts After an Error” on page 216 for more information.

Syntax

```
►►─RESTore──┬──────────────────────────┬──┬──────────────────────────────┬──►◄
            │              ┌─YES─┐     │  │                ┌─NO────┐     │
            └─APPly(───────┴─NO──┴─)───┘  └─GENerate(──┬───YES───┬──────)─┘
                                                       ├─Only────┤
                                                       └─Short───┘
```

Utility Name

RESTore
specifies that the restore operation is to be performed.

Parameters

APPly
optionally specifies whether or not the journals are to be applied to the restore operation.

(YES)
specifies that journals are to be applied. **YES is the default**.

(NO)
specifies that journals are not to be applied.

GENerate

optionally specifies what statements are output to the SLSAUDIT data set and whether or not control data sets are restored.

(NO)
specifies that NO statements are sent to the SLSAUDIT data set. The control data sets are also restored. **NO is the default.**

(YES)
specifies that statements are sent to the SLSAUDIT data set. The control data sets are also restored.

Note: If OPTion(Analyze) was specified for backup, this parameter should be specified for the restore.

(Only)
specifies that all statements are sent to the SLSAUDIT data set. The CDS and Journal DD statements need not be present. The control data sets are not restored.

(Short)
specifies that Audit statements only are sent to the SLSAUDIT data set. The control data sets are restored.

JCL Requirements

The following definitions apply to RESTore utility JCL:

SLSPRINT
output messages from the utility program.

SLSCNTL
the primary control data set.

SLSCNTL2
the secondary copy of the CDS (optional).

Notes:

1. If this is a new data set (e.g., DISP=(NEW,...)), DCB=(DSORG=PS) must be coded to insure that the data set organization of the control data set is defined correctly.
2. The logical record length of the restored data set may be LRECL=0. This is not an indication of a problem. In this case, the LRECL for the restored data set defaults to BLKSIZE=4096.

SLSBKUP
the backup data set.

SLSSTBY
a standby copy of the control data set having only the heartbeat block updated (optional).

SLSJRN*nn*
if journaling is enabled, statements that define all journals since the last backup. There are two journals per host and up to 16 hosts. The possibility exists that the journals could have been off-loaded since the last control data set backup. If so, all archived journals must also be specified here.

It is the user's responsibility to specify the archived journals, since there are no means of checking for missing archived journals. There is also no provision for specifying more than 99 journals. **Allowable values for *nn* are 01 to 99, but numbers cannot be skipped.**

SLSAUDIT
identifies where the UNSCratch, UNSElect, and AUDIt statements are to be placed. SLSAUDIT has a logical record length (LRECL) of 80 and a block size (BLKSIZE) of 80. These statements are in the optimal order and can be directly input to an execution of SLUADMIN. The data set name specified in SLSAUDIT can be used as SLSIN input to SLUADMIN.

SLSOUT
sort message output. Required if APPly(YES) is specified.

SLSIN
input to the utility in the form of control cards.

SLSDELTA
work data set created by the restore. The DD statement naming a temporary data set for the sorted deltas. The space allocation should be at least as large as the sum of all the SLSJRN*nn* data sets. This statement is only required when APPly(YES) is specified.

SORTWK*nn*
sort work data sets. Required if APPly(YES) is specified.

JCL Examples

Various examples showing JCL for running the RESTore utility are presented. Select the appropriate example matching the control data set conventions that you have used for specifying data sets.

The first example restores the control data sets using current data set conventions with the primary, secondary, and standby control data sets and journals applied.

JCL for RESTore (with Journals Applied)

```
//JOBRSTR      job (account),programmer,REGION=2Ø48K
//S1                    EXEC PGM=SLUADMIN,PARM=MIXED
//SLSBKUP      DD DSN=backup.set.name,DISP=(OLD)
//SLSCNTL      DD DSN=primary.set.name,DISP=(NEW,CATLG,DELETE),
//                        DCB=(DSORG=PS),UNIT=,SPACE=
//SLSCNTL2    DD DSN=secondary.set.name,DISP=SHR
//SLSSTBY       DD DSN=standby.set.name,DISP=SHR
//SLSJRNØ1      DD DSN=journal1.set.name,DISP=SHR
//SLSJRNØ2      DD DSN=journal2.set.name,DISP=SHR
//SORTWKØ1   DD UNIT=,SPACE=
//SLSDELTA    DD UNIT=,SPACE=
//SLSAUDIT     DD DSN=dataset.name,DISP=SHR
//SLSPRINT     DD SYSOUT=*
//SLSOUT         DD SYSOUT=*
//SLSIN             DD *
  RESTORE APPLY(YES)
/*
```

The second example shows JCL for the RESTore utility using the GENerate(Only) parameter.

JCL for RESTore (with GENerate Only)

```
//JOBRSTR    job (account),programmer,REGION=2Ø48K
//S1                  EXEC DD DSN=backup.set.name,DISP=OLD
//SLSAUDIT   DD DSN=dataset.name,DISP=SHR
//SLSPRINT   DD SYSOUT=*
//SLSIN           DD*
  RESTORE GENERATE(ONLY)
```

The third example shows JCL for restoring the library control data set without journals applied and without sending the output of the restore operation to the SLSAUDIT data set.

JCL for RESTore (without Journals or Output to SLSAUDIT)

```
//JOBRSTR      job (account),programmer,REGION=2Ø48K
//S1                     EXEC PGM=SLUADMIN,PARM=MIXED
//SLSBKUP       DD DSN=backup.set.name,DISP=(OLD)
//SLSCNTL       DD DSN=primary.set.name,DISP=(NEW,CATLG,DELETE),
//                        DCB=(DSORG=PS),UNIT=,SPACE=
//SLSCNTL2     DD DSN=secondary.set.name,DISP=SHR
//SLSSTBY        DD DSN=standby.set.name,DISP=SHR
//SORTWKØ1    DD DSN=temp.sort,DISP=(NEW,KEEP),UNIT=
//SLSDELTA    DD DSN=temp.delta,DISP=(NEW,KEEP),UNIT=
//SLSPRINT     DD SYSOUT=*
//SLSIN             DD *
  RESTORE APPLY(NO) GENERATE(NO)
/*
//
```

The fourth example shows JCL for restoring the library control data set with data set naming conventions. The example runs RESTore with journals applied (APPly(YES)) and a secondary CDS active.

JCL for RESTore (with Secondary [Shadow] and Journals)

```
//JOBRSTR     job (account),programmer,REGION=2Ø48K
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSBKUP     DD DSN=backup.set.name,DISP=(OLD)
//SLSCNTL     DD DSN=primary.set.name,DISP=(NEW,CATLG,DELETE),
//                       DCB=(DSORG=PS),UNIT=,SPACE=
//SLSDELTA  DD DSN=&&TEMP,DISP=(,DELETE,DELETE),UNIT=,SPACE=
//SLSJRNØ1    DD DSN=journal1.set.name,DISP=OLD
//SLSJRNØ2    DD DSN=journal2.set.name,DISP=OLD
//SLSPRINT   DD SYSOUT=A
//SLSCNTL2   DD DSN=secondary.set.name,DISP=(NEW,KEEP),UNIT=,SPACE=
//SORTWKØ1  DD DSN=&&TEMP,DISP=(,DELETE,DELETE),UNIT=,SPACE=
//SLSOUT       DD SYSOUT=A
//SLSIN           DD *
  RESTORE APPLY(YES)
/*
//
```

Note: The UNIT= and SPACE= parameters for SLSCNTL are completed with the same information defined for the Data Set Initialization JCL section in ‘‘Creating Data Set Initialization JCL’’ in the *HSC Configuration Guide*.

The fifth example shows JCL for restoring the library control data set with data set naming conventions. The example runs RESTore with journals applied (APPly(YES)) and the output of the restore operation placed in the SLSAUDIT data set (GENerate(YES)).

JCL for RESTore (Journals and Output to SLSAUDIT)

```
//JOBRSTR   job (account),programmer,REGION=2Ø48K
//S1                 EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL   DD DSN=primary.set.name,DISP=SHR
//SLSCNTL2  DD DSN=secondary.set.name,DISP=SHR
//SLSBKUP   DD DSN=backup.set.name,DISP=OLD
//SLSPRINT  DD SYSOUT=*
//SLSIN          DD *
RESTORE APPLY(YES) GENERATE(YES)
```

Output Description

Output resulting from the execution of the RESTore utility includes:

- a restored library control data set. A shadow or secondary data set is also output if specified in the JCL.
- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute RESTore processing
- a condition code indicating successful/unsuccessful restore processing (see Figure 21 on page 292)
- a control card output for CDS discrepancies.

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE 0001
TIME hh:mm:ss                              Control Card Image Listing                      DATE yyyy-mm-dd
 REST GEN(YES)

SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE 0002
TIME hh:mm:ss                                  Restore Utility                             DATE yyyy-mm-dd

SLS1212I JCL has been verified for the RESTORE utility.
SLS1199I The Backup being restored is from 06/22/91 at 14.08.04.
SLS0160I All 30 journals are successfully sorted.
SLS0161I Control database is successfully copied from the backup copy.
SLS0165I Control database is successfully restored by applying sorted journals
SLS0391I All host DHBEFLAGS reset in CDS.
SLS1219I SLSCNTL2 was successfully restored from SLSCNTL.

SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE 0003
TIME hh:mm:ss                                  Restore Utility                             DATE yyyy-mm-dd
                              Statement Generation Summary Report
            UNSCR VOL(EVT181-EVT182,EVT184-EVT187,EVT190-EVT191,EVT193-EVT194)
            UNSCR VOL(EVT286-EVT288,EVT386-EVT388,EVT480-EVT483,EVT485-EVT488)
            UNSEL VOL(*51233)
            UNSEL VOL(EVT180)
                    .
                    .
                    .
            UNSEL VOL(EVT488)

SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility                PAGE 0004
TIME hh:mm:ss                                  Restore Utility                             DATE yyyy-mm-dd
                              Statement Generation Summary Report
              AUDIT ACS(00) LSM(0) PAN(00) ROW(00) COL(00)
              AUDIT ACS(00) LSM(0) PAN(01) ROW(00) COL(03)
                                    .
                                    .
                                    .
              AUDIT ACS(01) LSM(0) PAN(19) ROW(03) COL(01)
SLS0155I Condition code for utility function is 0.
```

C27672

Figure 21. RESTore Utility Sample Output

How to Handle BACKup/RESTore Discrepancies

Under abnormal circumstances (CDS mismatch, link down, and so on), the backup operation must be performed periodically. During this operation, discrepancy blocks are generated within the SLSBKUP data set. Then, during the restore process, the discrepant records are formatted into control card statements and output to the SLSAUDIT data set.

After the HSC is reactivated, the statements defining discrepancies are input to SLUADMIN, and AUDIt, UNSCratch, and UNSElect are performed to resolve the discrepancies.

Scratch Conversion (SLUCONDB) Utility

The SLUCONDB program is provided to generate scratch transactions from CA-1, CA-DYNAM/TLMS, and DFSMSrmm tape management systems. It generates the scratch transactions in a format acceptable to the Scratch Update utility. In addition, the LIBONLY parameter can be coded on the EXEC JCL statement, which scratches the selected volume serial numbers in the HSC CDS using the HSC Programmatic Interface.

Warning: The Scratch Update utility should not be executed while the Scratch Conversion utility is running.

SLUCONDB

SLUCONDB processes the CA-1 Tape Management Catalog (TMC), CA-DYNAM/TLMS VMF, or DFSMSrmm and selects volume serial numbers for processing based on the date parameter(s) specified on the EXEC JCL statement.

Note: Volume serial numbers selected are those **not** already in scratch status in the CDS.

If a parameter is NOT specified on the EXEC JCL statement, defaults are assigned. These defaults are described in the Parameters section below.

SLUCONDB calls one of three routines to read either the CA-1 TMC, CA-DYNAM/TLMS VMF, or DFSMSrmm.

SLUDRCA1

SLUDRCA1 utilizes CA-1 macros to map the layout of the CA-1 TMC. The macro names which map the CA-1 TMC have changed from Release 4.9 to Release 5.0. Both macros are located at the end of this module with the CA-1 Release 4.9 macro as a comment. The version of SLUDRCA1 supplied in SAMPLIB utilizes CA-1 Release 5.0 macro and was assembled using this macro.

If you are using CA-1 Release 4.9 or earlier, you must comment out the Release 5.0 macro, remove the asterisk in column 1 of the Release 4.9 macro, and reassemble this module. Ensure the appropriate CA-1 macro library is used in the assemble SYSLIB concatenation.

If you are running CA-1 Release 5.0 without any local modifications, this module does not need to be reassembled and nothing further must be done to this module. If you have local modifications, you must reassemble this module.

SLUDRTLM

SLUDRTLM utilizes a CA-DYNAM/TLMS COPY member to map the layout of the VMF. This module must be re-assembled if you are running TLMS Release 5.4 or if you have local modifications. If you must re-assemble this module, ensure the appropriate CA-DYNAM/TLMS source library is used in the assemble SYSLIB concatenation.

SLUDRRMM

SLUDRRMM is called to read the DFSMSrmm report extract file if RMM is specified in the EXEC JCL statement. This program utilizes the DFSMSrmm EDGRVEXT macro to map the layout of the extract file. Fields read in the extract file include:

- RVTYPE (record type)
- RVVOLSER (volser number)
- RVLCDATE (last change date)
- RVNAME (unit type)
- RVSTATUS (volume status)
- RVEXPDT (volume expiration date)
- RVEXPDTO (volume original expiration date)
- RVLABEL (volume label type).

SLUDRRMM processes the extract and passes the volume record information to SLUCONDB, which builds scratch card images to be input to SLUADMIN. Volume scratch status (scratch/nonscratch) is then updated in the CDS for each volume record in the extract file.

Dates on the RMM report must be in Julian date format (EDGHSKP run with PARM ‘DATEFORM(J)’). Tapes listed on the RMM report without expiration dates will be skipped by SLUDRRMM.

Link Edit Parameters

The following is an example of the Link Edit control statements to be used for SLUCONDB if user modifications are required.

Link Edit Control Statements for SLUCONDB

```
//*
//S000001  EXEC PGM=IEWL,COND=(0,NE),
//  PARM=’SIZE=(400K,96K),LIST,XREF,NCAL’
//SYSPRINT  DD  SYSOUT=*
//ASLSLINK  DD  DISP=SHR,DSN=your.hsc.smp/e.loadlib
//USEROBJ   DD  DISP=SHR,DSN=your.user.objlib
//SYSLMOD   DD  DISP=SHR,DSN=your.user.loadlib
//SYSLIN    DD  *
  INCLUDE  ASLSLINK(SLSFLLVT)
  INCLUDE  ASLSLINK(SLSXCAL)
  INCLUDE  USEROBJ(SLUCONDB)
  ENTRY    SLUCONDB
  SETCODE  AC(1)
  NAME     SLUCONDB(R)
/*
```

The following is an example of the Link Edit control statements to be used for SLUDRCA1, SLUDRTLM, or SLUDRRMM.

Link Edit Statements SLUDRCA1/SLUDRTLM/SLUDRRMM

```
//*
//S000001 EXEC PGM=IEWL,COND=(0,NE),
//  PARM='SIZE=(400K,96K),LIST,XREF,NCAL'
//SYSPRINT DD  SYSOUT=*
//USEROBJ  DD  DISP=SHR,DSN=your.user.objlib
//SYSLMOD  DD  DISP=SHR,DSN=your.user.loadlib
//SYSLIN   DD  *
  INCLUDE USEROBJ(SLUDR___)
  ENTRY   SLUDR___
  SETCODE AC(1)
  NAME    SLUDR___(R)
/*
```

The following is an example of the assembly and link edit JCL required for SLUCONDB if user modifications are required.

Assembly and Link Edit JCL for SLUCONDB

```
//SLUCONAS JOB (acctg info),'SLUCONDB',...
//*
//ASM      EXEC PGM=IEV90,PARM='OBJECT,NODECK',REGION=1024K,
//SYSPRINT  DD  SYSOUT=*
//SYSLIB    DD  DISP=SHR,DSN=SYS1.MACLIB
//          DD  DISP=SHR,DSN=your.hsc.smp/e.maclib
//SYSUT1    DD  UNIT=VIO,SPACE=(CYL,(1,1))
//SYSLIN    DD  DISP=(,PASS),UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSIN     DD  DISP=SHR,DSN=slucondb.asm.dataset
//*
//LKED     EXEC PGM=IEWL,COND=(0,NE),REGION=1024K,
//  PARM='SIZE=(400K,96K),LIST,XREF,NCAL'
//SYSPRINT  DD  SYSOUT=*
//ASLSLINK  DD  DISP=SHR,DSN=your.hsc.smp/e.loadlib
//SYSLMOD   DD  DISP=SHR,DSN=your.user.loadlib
//SYSLIN    DD  DISP=(OLD,DELETE),DSN=*.ASM.SYSLIN
//          DD *
  INCLUDE  ASLSLINK(SLSFLLVT)
  INCLUDE  ASLSLINK(SLSXCAL)
  ENTRY    SLUCONDB
  SETCODE  AC(1)
  NAME     SLUCONDB(R)
/*
//
```

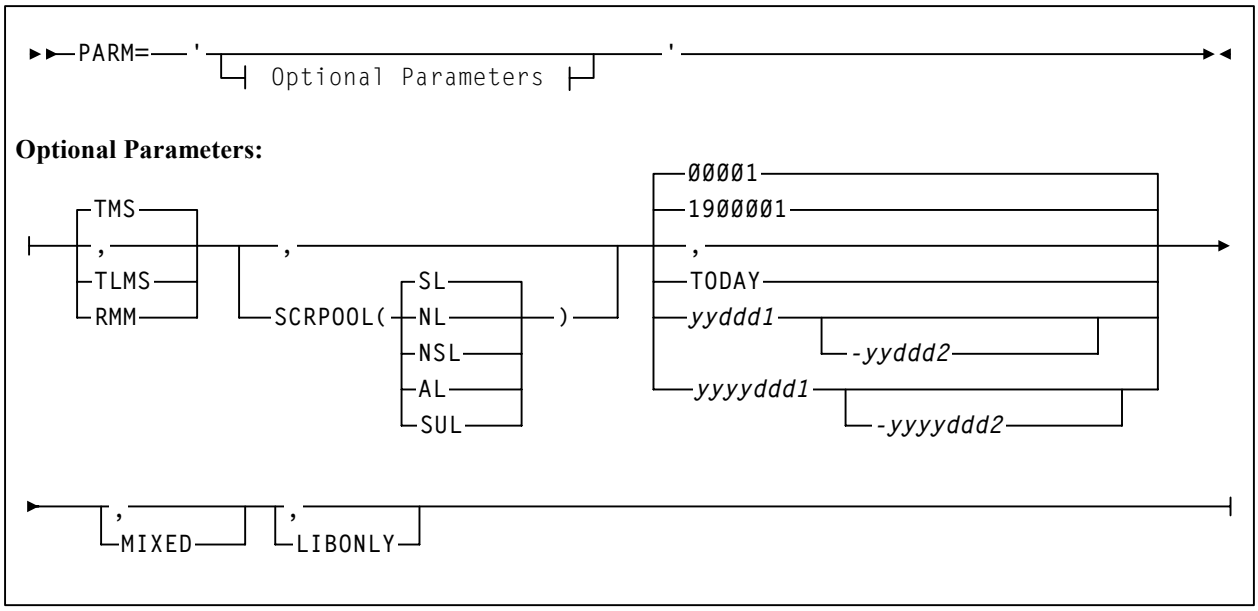
The following is an example of the assembly and link edit JCL required for SLUDRCA1, SLUDRTLM or SLUDRRMM if user modifications are required.

Assembly/Link-Edit JCL SLUDRCA1/SLUDRTLM/SLUDRRMM

```
//SLUDRASL JOB (acctg info),'SLUDR___',...
//*
//ASM      EXEC PGM=IEV90,PARM='OBJECT,NODECK',REGION=1024K,
//SYSPRINT  DD  SYSOUT=*
//SYSLIB    DD  DISP=SHR,DSN=SYS1.MACLIB
//          DD  DISP=SHR,DSN=your.hsc.smp/e.maclib
//          DD  DISP=SHR,DSN=your.tms.maclib
//SYSUT1    DD  UNIT=VIO,SPACE=(CYL,(1,1))
//SYSLIN    DD  DISP=(,PASS),UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSIN     DD  DISP=SHR,DSN=sludr___.asm.dataset
//*
//LKED     EXEC PGM=IEWL,COND=(0,NE),REGION=1024K,
//               PARM='SIZE=(400K,96K),LIST,XREF,NCAL'
//SYSPRINT  DD  SYSOUT=*
//SYSLMOD   DD  DISP=SHR,DSN=your.user.loadlib
//SYSLIN    DD  DISP=(OLD,DELETE),DSN=*.ASM.SYSLIN
//          DD  *
  ENTRY    SLUDR___
  SETCODE  AC(1)
  NAME     SLUDR___(R)
/*
//
```

Syntax

When running SLUCONDB (for processing the control database), optional PARM values on the EXEC statement in the JCL may be specified. The PARM values are positional. PARM option and values are:



Parameters

PARM=
specifies the parameters that follow can be accessed by the program indicated in the PGM parameter in the JCL.

The defaults for the PARM are:

- TMS
- SL
- all scratches from **January 1, 1900** to the current system date
- uppercase only for TMS-generated reports.

The keywords for the PARM are positional. There are several ways to invoke the defaults.

- If you accept the system defaults, do not specify the PARM. The system takes the defaults.
- Code the PARM as: PARM=’’ or PARM=’,,,,,’

TMS
specifies the CA-1 tape management system (TMS)

TLMS
specifies the TLMS: CA-DYNAM/TLMS tape management system

RMM
specifies the DFSMSrmm tape management system

SCRPOOL
is the scratch pool label type used by the library. This is required to ensure that the label type matches the label type specified for scratch tape label type specified during LIBGEN (SLILIBRY macro SCRLABL parameter).

The acceptable values for label type are as follows:

(SL)
the default, standard label

(NL)
nonlabeled

(NSL)
nonstandard label.

(AL)
ANSI label

(SUL)
standard user label

00001 or 1900001
This is the default for date. It means January 1, 1900.

TODAY
is the current system date. If TODAY is not specified, the only other acceptable date for the range is also the current system date. Therefore, TODAY is usually specified instead of a range.

yyddd1 **or** *yyyyddd1*
If a single date is specified, that date becomes the ‘‘from’’ date. The ‘‘to’’ date is the current system date (which is not specified). All specified dates are in Julian notation.

yyddd1-yyddd2 **or** *yyyyddd1-yyyyddd2*
specifies the date range in which the volumes became scratch. Neither of these dates can be greater than the current system date.

Note: If this keyword is not specified, the system defaults to **January 1, 1900 (00001)**.

MIXED
specifies to print all the headings and messages in mixed case characters (uppercase and lowercase characters).

Note: If a comma is specified, or if this keyword is not specified, the system defaults to **uppercase letters**.

LIBONLY
specifies that volumes are to be placed in scratch status through the HSC Programmatic Interface. If this parameter is specified, you can omit the SLUADMIN step that runs the Scratch Update utility from the invoking JCL (refer to “JCL Examples” on page 210). The HSC must be active.

Note: If this parameter is specified, the Scratch Conversion utility to be used must reside in an APF-authorized library.

JCL Requirements

The following definitions apply to Scratch Conversion utility JCL to process scratch report files.

SLSTMS
input to the utility in the form of either the CA-1 TMC, CA-DYNAM/TLMS Volume Master File (VMF), or DFSMSrmm report extract file. **This statement is required.**

SLSSOUT
output from the utility specifying the Scratch Update utility control statement. **This statement is required.**

If specifying a temporary or permanent data set for 'DSN=' in the JCL, be sure to include the appropriate DCB information (i.e., LRECL=72).

SLSIN
input to the utility in the form of scratch card images. **This statement is required.**

SLSPRINT
output messages from the utility program. **This statement is required.**

Note: The Scratch Conversion utility uses the Batch API to extract volume and VTV records from the CDS. The Batch API requires read access to the CDS, either from statements in the JCL or by getting the data set information from an active HSC. The SLSCNTL, SLSCNTL2, and SLSSTBY DD statements are optional if an active HSC is running on the same system. Refer to Appendix E, "Batch Application Program Interface (API)".

SLSCNTL
the primary control data set. **This statement is optional.**

SLSCNTL2
the secondary control data set. If a secondary CDS exists, it should be specified so that if a switch occurs and the secondary data set in now active, the CDSs can be reordered to maintain database integrity. **This statement is optional.**

SLSSTBY
the standby control data set. If a standby exists, it should be specified so that if a switch occurs and the standby data set is now active, the CDSs can be reordered to maintain database integrity. **This statement is optional.**

JCL Examples

In the following examples, specifying **LIBONLY** on the SLUCONDB EXEC statement causes SLUCONDB to directly update the CDS. In this case, you can omit the SLUADMIN job step that runs the Scratch Update utility.

Note: The UNIT, SPACE, and DCB parameter settings are determined by the user.

JCL to Process Tape Management Databases (Without CDS DDnames)

```
//JOBSCUP  JOB (account),programmer
//*
//STEP1    EXEC PGM=SLUCONDB,
//            PARM=('TLMS,SCRPOOL(NL),2002100,MIXED')
//STEPLIB  DD DISP=SHR,DSN=your.library.name
//         DD DISP=SHR,DSN=your.hsc.smp/e.loadlib
//SLSTMS   DD DSN=TMS.MASTER.FILE,DISP=OLD
//SLSSOUT  DD DSN=&&SCUPINPT,DISP=(NEW,PASS),UNIT=,SPACE=,DCB=
//SLSPRINT DD SYSOUT=A
//*
//STEP2    EXEC PGM=SLUADMIN,COND=(4,LT,STEP1),PARM=MIXED
//SLSIN    DD DSN=&&SCUPINPT,DISP=(OLD,DELETE)
//SLSPRINT DD SYSOUT=A
//
```

JCL to Process Tape Management Databases (With CDS DDnames)

```
//JOBSCUP  JOB (account),programmer
//*
//STEP1    EXEC PGM=SLUCONDB,
//            PARM=('TLMS,SCRPOOL(NL),2002100-2002110,MIXED')
//STEPLIB  DD DISP=SHR,DSN=your.library.name
//         DD DISP=SHR,DSN=your.hsc.smp/e.loadlib
//SLSTMS   DD DSN=TMS.MASTER.FILE,DISP=OLD
//SLSSOUT  DD DSN=&&SCUPINPT,DISP=(NEW,PASS),UNIT=,SPACE=,DCB=
//SLSPRINT DD SYSOUT=A
//SLSCNTL  DD DSN=primary.control.dataset,DISP=SHR
//SLSCNTL2 DD DSN=secondary.control.dataset,DISP=SHR
//SLSSTBY  DD DSN=standby.control.dataset,DISP=SHR
//*
//STEP2    EXEC PGM=SLUADMIN,COND=(4,LT,STEP1),PARM=MIXED
//SLSIN    DD DSN=&&SCUPINPT,DISP=(OLD,DELETE)
//SLSPRINT DD SYSOUT=A
//
```

JCL to Process DFSMSrmm Database

```
//JOBSCUP  JOB (account),programmer
//*
//STEP1    EXEC PGM=EDGHSKP,PARM='RPTEXT,DATEFORM(J)'
//MESSAGE  DD DSN=rmm.message.dataset,DISP=SHR
//REPTEXT  DD DSN=rmm.report.extract,DISP=SHR
//*
//STEP2    EXEC PGM=SLUCONDB,
//           PARM=('RMM,SCRPOOL(SL),2002100-2002110,MIXED')
//STEPLIB  DD DISP=SHR,DSN=your.library.name
//         DD DISP=SHR,DSN=your.hsc.smp/e.loadlib
//SLSTMS   DD DSN=rmm.report.extract,DISP=SHR
//SLSSOUT  DD DSN=&&SCUPINPT,DISP=(NEW,PASS),UNIT=,SPACE=,DCB=
//SLSPRINT DD SYSOUT=A
//*
//STEP3    EXEC PGM=SLUADMIN,COND=(4,LT,STEP2),PARM=MIXED
//SLSIN    DD DSN=&&SCUPINPT,DISP=(OLD,DELETE)
//SLSPRINT DD SYSOUT=A
//
```

Output Description

Output resulting from the execution of the Scratch Conversion utility includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute scratch conversion processing
- messages indicating errors and/or actions occurring during processing (see Figure 22 and Figure 23 on page 303).
- updated library control data set containing the new scratch lists.

```
            StorageTek Automated Library Conversion Utility    Page 001
Time hh:mm:ss                                            Date yyyy-mm-dd

 SLS0286I  000008 volumes have been selected
 SLS0155I  Condition code for utility function is 0
```

Figure 22. Scratch Conversion Output - Without LIBONLY Parameter

```
            StorageTek Automated Library Conversion Utility    Page 001
Time hh:mm:ss                                            Date yyyy-mm-dd

 SLS0167I  Volume 001284 successfully added to library as scratch
 SLS0167I  Volume 001294 successfully added to library as scratch
 SLS0167I  Volume 001495 successfully added to library as scratch
 SLS0167I  Volume 001652 successfully added to library as scratch
 SLS0167I  Volume 001673 successfully added to library as scratch
 SLS0167I  Volume 001677 successfully added to library as scratch
 SLS0167I  Volume 001679 successfully added to library as scratch
 SLS0167I  Volume 001680 successfully added to library as scratch
 SLS1312I  000008 volumes successfully scratched
 SLS0155I  Condition code for utility function is 0
```

Figure 23. Scratch Conversion Output - With LIBONLY Parameter

Scratch Redistribution Utility

The Scratch Redistribution utility provides you with a way to balance the number of scratch volumes across the ACS. It permits the redistribution of scratch volumes either:

- among LSMs implied by the specification of an ACS, or
- among the LSMs explicitly identified through an optional parameter.

This utility allows the user to select one media type and recording technique. If specified, scratch volume redistribution will be based on the MEDia and RECtech settings.

Note: If neither MEDia nor RECtech is specified, volumes are redistributed without regard to media type or recording technique.

How the Scratch Redistribution Utility Functions

When only the ACS parameter is specified, the redistribution method transfers cartridges from LSMs with a greater number of scratch volumes to LSMs with a lesser number of scratch volumes. The process is repeated until the number of scratch volumes in each LSM is within the defined scratch tolerance level.

Distribution in an ACS containing a mix of LSMs (4410s, 9310s, 9360s, 9740s) is performed based on a percentage of scratch cartridges in the ACS. That is, the utility causes each LSM to have the same percentage of scratch tapes within the ACS as the LSM has cells within the ACS. For example, in an ACS where a 9310 LSM contains 80 percent of the cells within the ACS, 80 percent of the scratch tapes will reside in the 9310.

After Scratch Redistribution is completed, only the specified LSMs contain scratch cartridges, if the LSM parameter was specified.

Concurrent redistributions among different ACSs are accomplished by multiple executions of this utility program.

Redistribution moves non-scratch cartridges to make space for scratch cartridges. The actual number of scratch cartridges moved may vary depending on the number of free cells and the number of scratch cartridges available.

Notes:

1. The Scratch Redistribution utility cannot be run concurrently with the Scratch Update utility, or when either the Audit or Initialize Cartridge (with the scratch option) utilities are being run in the same ACS as the Scratch Redistribution utility. An HSC message is generated, and the utility must be resubmitted.
2. Cartridges cannot be transferred to a frozen panel.

Syntax

```
►►─SCREdist──ACS(acs-id)──┬──────────────────────────────────────┬──┬──────────────────────────────────────►
                          │                ┌──,──────────┐       │  │                                      │
                          └──LSM(──────────┴──lsm-list────┴──)────┘  └──SUBpool(subpool-name)──────────────┘

►┬──────────────────────────┬──┬──────────────────────────────────────────────────────────────────────────►◄
 │                          │  │                                                                          │
 └──BALtol(tolerance-value)─┘  └──MEDia(──┬──LONGItud──────┬──)──┬──RECtech(──┬──LONGItud──────┬──)──┘
                                          ├──Standard──────┤     │            ├──18track──────┤
                                          ├──CST───────────┤     │            ├──36track──────┤
                                          ├──MEDIA1────────┤     │            ├──36Atrack─────┤
                                          ├──STD───────────┤     │            ├──36Btrack─────┤
                                          ├──1─────────────┤     │            ├──36Ctrack─────┤
                                          ├──348Ø──────────┤     │            ├──HELical──────┤
                                          ├──ECART─────────┤     │            ├──DD3──────────┤
                                          ├──E─────────────┤     │            ├──STK1R────────┤
                                          ├──ECCST─────────┤     │            ├──STK1R34──────┤
                                          ├──ETAPE─────────┤     │            ├──STK1R35──────┤
                                          ├──Long──────────┤     │            ├──STK1RA───────┤
                                          ├──MEDIA2────────┤     │            ├──STK1RA34─────┤
                                          ├──349ØE─────────┤     │            ├──STK1RA35─────┤
                                          ├──ZCART─────────┤     │            ├──STK1RB───────┤
                                          ├──Z─────────────┤     │            ├──STK1RB34─────┤
                                          ├──HELical───────┤     │            ├──STK1RB35─────┤
                                          ├──DD3───────────┤     │            ├──STK2P────────┤
                                          ├──DD3A──────────┤     │            ├──STK2P34──────┤
                                          ├──DD3B──────────┤     │            ├──STK2P35──────┤
                                          ├──DD3C──────────┤     │            ├──STK2PB───────┤
                                          ├──STK1──────────┤     │            ├──STK2PB34─────┤
                                          ├──STK1R─────────┤     │            └──STK2PB35─────┘
                                          ├──R─────────────┤     │
                                          ├──STK2──────────┤     │
                                          └──STK2P─────────┘     │
```

Utility Name

SCREdist
specifies that a scratch redistribution is to be performed.

Parameters

ACS
specifies one ACS in the library in which the scratch volumes are to be redistributed.

(acs-id)
identifies the ACS. The one or two digit hexadecimal ACS identifier.

LSM
optionally, specifies that only certain LSMs within an ACS are to contain scratch cartridges (if not specified, scratch volumes are redistributed across all LSMs in the ACS).

(lsm-list)
lsm-list can be a single LSM or a list of LSMids. An LSMid is a single hexadecimal digit. An LSM range is not allowed.

The element(s) contained in an *lsm-list* must be enclosed in parentheses; multiple elements must be separated by blanks or commas.

SUBpool
optionally, specifies the subpool name from which scratch volumes are to be redistributed.

(subpool-name)
subpool-name identifies the subpool.

BALtol
optionally, specifies a balance tolerance value. Scratch volumes are distributed based on this specified value.

(tolerance-value)
tolerance-value specifies a percent value that identifies when cartridge redistribution ends. Valid values are 1 through 999, where the values indicate a percentage from .1 to 99.9 (i.e., 1 signifies .1 percent; 999 equals 99.9 percent). **The initial value for the HSC is 1. If *tolerance-value* is not specified in this utility, HSC uses the initial value for scratch redistribution.**

The utility finishes redistributing scratch cartridges when the percentage of scratch tapes in all specified LSMs is within tolerance-value / 2 percentage points of each LSM's percentage of cells in the ACS.

For example, assume an ACS has one 4410 LSM with 5,000 cells, one 9360 (WolfCreek) LSM with 1,000 cells, and 600 total scratch tapes in the ACS.

Scratch Redistribution attempts to put 500 scratches in the 4410 and 100 scratches in the 9360.

Entering BALtol(100) specifies a setting of 10 percent, which means that the utility ends when all LSMs are within ±5 percent of the expected number of scratches for each LSM (500 for the 4410, 100 for the 9360).

The expected number can be determined as follows:

$$\text{expnumlsm} = \text{totscracs} * \frac{\text{totcellslsm}}{\text{totcellsacs}}$$

where:

expnumlsm
expected number of scratches for each LSM.

totscracs
total number of scratches in the ACS.

totcellslsm
total number of cells in the LSM.

totcellsacs
total number of cells in the ACS.

In the previous example, the 4410 should have a range 470-530 scratches and the 9360 a range of 70-130. To determine the BALtol range BALtol range

$$\text{BALtol range} = \text{expnumlsm} \pm \frac{\text{baltol} / 1000 * \text{totscracs}}{2}$$

where:

BALtol range
range of balance tolerance value.

expnumlsm
expected number of scratches for each LSM (see above).

baltol
user-supplied percent value (*tolerance-value*) that specifies when scratch cartridge redistribution ends.

totscracs
total number of scratches in the ACS.

MEDia

optionally, specifies the type of cartridge to redistribute across the ACS.

Valid media types are:

LONGItud

indicates any Standard, ECART, or ZCART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C cartridge.

HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A - 10GB
- B - 25GB

- C- 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1
indicates any T9840 cartridge.

STK1R
indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
optionally, specifies the method used to record data tracks on the tape surface.

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: If RECtech is not specified, the next scratch cartridge is selected depending on the MEDia type that has been specified.

JCL Requirements

The following definitions apply to Scratch Redistribution utility JCL:

SLSPRINT
output messages from the utility.

SLSIN
input to the utility in the form of control statement card images.

JCL Examples

The following example shows JCL for redistributing scratch volumes within all LSMs in an ACS.

JCL to Perform Scratch Redistribution

```
//JOBSCRD    job (account),programmer,TIME=1439
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN           DD *
  SCREDIST ACS(Ø1)
/*
//
```

The following example shows JCL for redistributing 36-track scratch volumes within all LSMs in ACS 00.

JCL to Perform Scratch Redistribution

```
//JOBSCRD    job (account),programmer,TIME=1439
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN           DD *
   SCREDIST ACS(ØØ) MEDIA(STD) RECTECH(36)
/*
//
```

The following example shows JCL for redistributing helical DD3A (10GB) scratch volumes within LSM 1 in ACS 01.

JCL to Perform Scratch Redistribution

```
//JOBSCRD    job (account),programmer,TIME=1439
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN           DD *
  SCREDIST ACS(Ø1) LSM(1) MEDIA(DD3A)
/*
//
```

Output Description

Output occurring from execution of the Scratch Redistribution utility includes:

- updated library control data set reflecting the redistribution of scratch volumes
- messages detailing actions or attempts to provide an even distribution of scratch volumes across LSMs in an ACS (see Figure 24 on page 312).

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                 DATE yyyy-mm-dd

 SCRED ACS(0),LSM(3)                                   00123088
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                          Scratch Redistribution                 DATE yyyy-mm-dd

SLS0244I Scratch Redistribution completed successfully for ACS.

SLS0155I Condition Code for Utility Function is 0.
```

C27485

Figure 24. Scratch Redistribution Utility Sample Output

Scratch Update Utilities

Scratch Update utilities provide three basic functions:

- SCRAtch utility — allows you to scratch a volume, a list of volumes, or a range of volumes
- UNSCratch utility — allows you to unscratch a volume, a list of volumes, or a range of volumes. The entire scratch list in the library control data set can be deleted by using the UNSCratch utility.
- REPLace utility — allows you to clear the entire scratch list and then add a volume, a list of volumes, or a range of volumes to the scratch list(s) in the library control data set. When using the Replace utility, additions to the scratch list(s) are made **after an initial clearing of the scratch list(s).**

Syntax

```
►►─SCRAtch──VOLser(─┬─vol-list─┬─)──────────────────────────────────────►◄
                    └──────────┘
                    ↓ ,
```

```
►►─UNSCratch──VOLser(─┬─vol-list─┬─)──────────────────────────────────────►◄
                      └──────────┘
                      ↓ ,
```

```
►►─REPLaceall──┬──────────────────────────────────────────────────────────►◄
               │                   ↓ ,
               └──VOLser(─┬─vol-list─┬─)──┘
                          └──────────┘
```

Utility Names

SCRAtch
specifies that scratch list additions are to be made in the library control data set.

UNSCratch
specifies that scratch list deletions are to be made in the library control data set.

REPLaceall
specifies that all scratch lists in the control data sets are to be cleared.

Parameters

VOLser
specifies the list of volume serial numbers to be added, deleted, or replaced in the scratch list(s).

(vol-list)
vol-list specifies the volume serial numbers; this can be a single volume, a list of volume serial numbers, ranges of volume serial numbers, or combinations of lists with ranges delimited by commas. The entire list must be enclosed in parentheses.

JCL Requirements

The following definitions apply to the Scratch Update utilities JCL:

SLSPRINT
output from the utility program.

SLSIN
input to the utility in the form of control cards.

JCL Example

The following example shows JCL for scratching cartridges and the alternatives of unscratching cartridges or clearing the scratch lists in the control data set.

Note: For REPLaceall, if the scratch pool size is large, specify TIME=1440 on the JOB-STEP statement. The time required to clear the entire scratch list may exceed the Job Wait Time (JWT in SMSPRM*xx* in SYS1.PARMLIB) specified for the system, which results in a system abend.

JCL to Scratch, Unscratch, and Replace

```
//JOBSCUP    job (account),programmer
//S1                  EXEC PGM=SLUADMIN,PARM=MIXED
//SLSPRINT   DD SYSOUT=A
//SLSIN           DD *
  SCRATCH VOLSER(102412,102414,VACANT)
  UNSCRATCH VOLSER(A1B1C1,A1B1C2,A1B1C3,A1B1C4)
  REPLACEALL VOLSER(A1B1C1-A1B1C4)
/*
//
```

Output Description

Output resulting from the execution of the Scratch Update utilities includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages indicating any errors encountered during execution of the utility (see Figure 25 on page 316)
- messages indicating successful scratching or unscratching of specific volumes
- an update to the library control data set reflecting volumes added to or deleted from the scratch lists, or that scratch lists have been cleared or replaced.

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0001
TIME hh:mm:ss                      Control Card Image Listing                 DATE yyyy-mm-dd

 SCRA VOL(102412, 102414)                          00120006
```

```
SLUADMIN (n.n.n)          StorageTek Automated Cartridge System Utility          PAGE 0002
TIME hh:mm:ss                            Scratch Update                       DATE yyyy-mm-dd

SLS0167I Volume 102412 successfully added to library as scratch.

SLS0164I Volume 102414 already defined in library as scratch.

SLS0155I Condition Code for Utility Function is 4.
```

C27486

Figure 25. Scratch Update Utilities Sample Output

SET Utility

The SET utility allows you to change certain library configuration information without performing reconfiguration on the library. The utility performs operations directly on the control data set, without requiring the HSC to be active.

In many cases, the SET function may run with an active HSC. In most such cases, **changes made are not effective until the HSC has been brought down and then reactivated.**

Exceptions include:

- SET CDSLVL CONVERT(210), where the converted CDS is immediately recognized by all active HSC 2.0.1 hosts
- SET FREEZE(ON|OFf), where frozen or unfrozen panels are recognized immediately by all active HSCs
- SET NEWHOST(*newhost*), where the new host will be ready to be brought online to the HSC.

In other cases, the SET function requires that the HSC on a specific system be shut down, or that all HSCs be shut down. This means that the heartbeat record indicates that the host is not active, which can be achieved via the MVS STOP (P) command. Table 16 shows whether affected HSCs and all other HSCs can be active for each SET option. Further information can be found in each individual option description.

Table 16. HSC State to Run SET Options

SET Option	Affected HSCs	All Other HSCs
ACSDRV	Down	Active
CDSLVL	Down	Active
CLNPRFX	Down	Down
COMPRFX	Active	Active
DELDISP	Active	Active
EJCTPAS	Active	Active
FREEZE	Active	Active
HOSTID	Down	Active
HSCLEVEL	Down	Active
MAJNAME	Down	Down
NEWHOST	Active	Active
NNLBDRV	Down	Active
SCRLABL	Active	Active
SLIDRIVS	Down*	Down *
SLISTATN	Active	Active
SMF	Active	Active
TCHNIQE	Down	Down

* In some cases, the SLIDRIVS parameter can be run effectively with the HSC active. Refer to "Running SET SLIDRIVS With the HSC Active" on page 332 for more details.

If a host has abended, the active flag is left on. If the host cannot be restarted and ended normally, use the SET HSCLEVEL utility to reset the active flag.

How the SET Utility Functions

One of the facilities provided by the SET utility is to change the RESERVE QNAME that was defined during LIBGEN and stored in the CDS. The RESERVE QNAME is used by the HSC and utilities running on each host to ensure that access to the CDS is serialized. The SET utility and HSC use an additional StorageTek-defined RESERVE QNAME to maintain serialization while the customer-defined RESERVE QNAME is being changed.

The SET utility issues two RESERVEs against the CDS prior to an update, consisting of:

- a RESERVE with the StorageTek-defined QNAME ''STKENQNM''

- a RESERVE using the existing customer-defined QNAME (or the default value of ‘‘STKALSQN’’).

When the HSC is started on any host, it initially serializes on the CDS using the StorageTek-defined QNAME. This prevents the HSC from being started while the customer-defined QNAME is potentially in the process of being changed. If this is successful (no SET utility in progress), the customer-defined QNAME is read from the CDS and is used for future serialization requests.

The SET utility does not perform changes that require the structure of the database to be changed. This includes changing the following:

- number of ACSs
- number of LSMs
- panel types.

Considerations Before Running the SET Utility

It is advisable to back up the CDS before running the utility. Note that this utility does not update the journals. After running the utility, a backup should be performed. Otherwise, a restore removes the changes made, and the SET utility must be rerun.

This utility does not in any way change the LIBGEN macros and does not update the journals. Either manually edit the LIBGEN macros to change them to match the SET changes or run the Database Decompile utility to create a new LIBGEN database (refer to “Database Decompile (LIBGEN) Utility” on page 227).

Access to the SET function can be restricted by password protecting the HSC CDSs, or by using RACF or functionally equivalent product to restrict access to the CDS.

Before running this utility, ensure that the SLUADMIN program resides in an APF-authorized library. The SET function can be invoked only when SLUADMIN is invoked APF authorized, key 0 through 7, or supervisor state. The load module invoked by SET is SLUSET. Restricting access to this module restricts access to the SET function.

Summary of SET Utility Options

Table 17 provides a summary of the options available for the SET utility.

Note: You can enter only one option in each SET statement. However, you can specify multiple SET statements within a single execution of the utility. Refer to “JCL Examples” on page 210 for an example showing multiple SET statements.

Table 17. SET Utility Options

SET Option	SET Utility Function and Location of Description
ACSDRV	“SET ACS Esoteric” on page 322
CDSLVL	“SET CDSLVL” on page 323
CLNPRFX	“SET Cleaning Prefix” on page 324
COMPRFX	“SET HSC Command Prefix” on page 324

Table 17. SET Utility Options

SET Option	SET Utility Function and Location of Description
DELDISP	“SET Delete Disposition” on page 326
EJCTPAS	“SET Eject Password” on page 326
HOSTID	“SET Host ID” on page 328
HSCLEVEL	“SET HSC Level” on page 328
MAJNAME	“SET ENQ/DEQ/RESERVE QNAME” on page 329
NEWHOST	“SET New Host” on page 329
NNLBDRV	“SET Nonlibrary Drive Esoteric” on page 330
SCRLABL	“SET Scratch Label Type” on page 330
SLIDRIVS	“SET Device Numbers for Drives” on page 330
SLISTATN	“SET LMU Station Address Numbers” on page 333
SMF	“SET SMF Record Type” on page 334
TCHNIQE	“SET Recovery Technique” on page 335

Syntax

```
►►─SET──┤ Options ├──────────────────────────────────────────►◄

Options:

├─ACSDRV(esoteric)─,FORACS(acs-id)──┬──────────────────────┬──┤
                                    └─,FORHOST(host-id)────┘

├─CDSLVL─┬─CONVERT(210)─┬──────────────────────────────────────┤
         └─REGRESS(200)─┘

├─CLNPRFX(prefix)──────────────────────────────────────────────┤

├─COMPRFX(cmdhex)──────────────────────────────────────────────┤

├─DELDISP(─┬─SCRTCH───┬─)──────────────────────────────────────┤
          └─NOSCRTCH─┘

├─EJCTPAS(──┬──────────┬─)──┬──────────────────────┬──────────┤
            └─newpswd──┘    └─,OLDPASS(oldpswd)────┘

├─FREEZE(─┬─ON──┬─),FORLSMID(lsm-id)·,FORPANEL(panel)──────────┤
          └─OFf─┘

├─HOSTID(newhost),FORHOST(oldhost)─────────────────────────────┤

├─HSCLEVEL(OFF),FORHOST(host-id)───────────────────────────────┤

├─MAJNAME(qname)───────────────────────────────────────────────┤

├─NEWHOST(newhost),LIKEHOST(model-host)────────────────────────┤

├─NNLBDRV(──┬──────────┬─)──┬──────────────────────┬──────────┤
            └─esoteric─┘    └─,FORHOST(host-id)────┘

├─SCRLABL(─┬─SL──┬─)──────────────────────────────────────────┤
          ├─AL──┤
          ├─NL──┤
          └─NSL─┘
```

Syntax (continued)

```
►►─SET──┤ Options ├──────────────────────────────────────────►◄

 Options:

├─SLIDRIVS(──┬──────────────────────────┬──),FORLSMID(lsm-id),FORPANEL(panel)──────►
             └─addr0──┬──────────────────┬─┘
                      └─,...addr19───────┘

►──┬──────────────────────────┬──────────────────────────────────────────────────┤
   └─,FORHOST(host-id)────────┘

├─SLISTATN(──┬──────────────────────┬──),FORACS(acs-id)──┬──────────────────────┬──┤
             └─stat1,...,stat16─────┘                    └─,FORHOST(host-id)────┘

├─SMF(libtype)──────────────────────────────────────────────────────────────────┤

├─TCHNIQE(──┬─NONE──────┬──)──────────────────────────────────────────────────┤
            ├─JOURNAL───┤
            ├─SHADOW────┤
            ├─BOTH──────┤
            ├─STANDBY───┤
            └─ALL───────┘
```

Utility Name

SET
specifies that the SET function is to be invoked.

Parameters

SET ACS Esoteric

ACSDRV
specifies that the esoteric for the specified ACS is to be changed. The change does not take effect until the relevant HSC(s) are recycled.

(esoteric)
specifies a 1- to 8-character esoteric that represents all of the drives in the specified ACS.

FORACS
specifies that the operation is being restricted to a specific ACS.

(acs-id)
specifies the ACSid whose esoteric is being changed.

FORHOST
specifies that the operation is being restricted to a specific host. Only the specified hosts' esoteric is set. If omitted, the esoterics for all hosts are changed.

(host-id)
specifies the 1- to 8-character host ID for the host to which the operation is restricted.

SET CDSLVL

CDSLVL
specifies that the release level of the CDS is to be changed.

CONVERT(210)
if converting from a release before HSC 2.1, specifies that the CDS level is to be changed to 2.1 **prior** to starting HSC 5.1 for the first time.

Note: Back up the existing CDS immediately before you execute this utility (you can do this by running SLUADMIN as a two-step job).

Converting the CDS changes it as follows:

- for some CDS information records:
  - adds new fields to unused portions of these records
  - reformats the drive ID field to allow more than four drives per panel.
- sets the CDS level indicator to 2.1.0.

Before executing SET CDSLVL CONVERT, the current CDS level must be 2.0.0, and HSCs on all active hosts must be at Release 2.0.1 with the coexistence PTFs applied.

REGRESS(200)
specifies that the CDS level is to be changed to 2.0. Prior to executing this utility, make sure to:

- recover any hosts marked active. On an active host, enter Display CDS to see if any hosts are mistakenly marked active.
- recover any errant volumes
- back up the current CDS.

Regressing the CDS changes it as follows:

- deletes drive records so that no more than four drives per panel are defined. 9840 and 9490EE transports must be varied offline to all hosts.
- resets the CDS level indicator to 2.0.0.

Before executing SET CDSLVL REGRESS, the current CDS level must be 2.1.0, all hosts must be inactive, and 9740 (TimberWolf) LSMs and 20-drive panels must be removed from the CDS. Refer to ‘‘Utility Usage Requirements’’ in Appendix D, ‘‘Migration and Coexistence Processes’’ of the *HSC Configuration Guide* for utility usage restrictions.

Do not run SET CDSLVL REGRESS unless you are planning to execute only HSC 2.0.1 or earlier releases.

SET Cleaning Prefix

CLNPRFX
specifies that the cleaning prefix is to be set. This parameter requires that the HSC on all systems be shut down before changing the cleaning prefix.

(prefix)
specifies a 3-character prefix for the cleaning cartridges. Valid characters are A-Z, 0-9, $, #, and @.

SET CLNPRFX Procedure

Follow this procedure to change a cleaning cartridge prefix:

1. Eject **all** cleaning cartridges from **all** ACSs. The HSC records information about cleaning cartridges in the CDS.
2. Terminate the HSC on all hosts.
3. Change the cleaning prefix using SET CLNPRFX.
4. Initialize the HSC on any desired hosts.
5. Enter new cleaning cartridges identified with the new prefix into all ACSs.

Note: It is preferable to enter new cleaning cartridges because a cartridge’s select count is set to zero when it is ejected and reentered. The select count tracks the number of times a cleaning cartridge has been used.

SET HSC Command Prefix

COMPRFX
specifies that the HSC command prefix is to be set. HSCs that were brought up before using this function still use the old command prefix. HSCs that are brought up after the function use the new command prefix.

(cmdhex)
specifies the 2-character hexadecimal code of the command prefix. Do not choose a value that conflicts with values assigned to other subsystems. The characters associated with each code are shown in Table 18 on page 325.

Notes:

1. Ensure that the prefix character used does not conflict with any of the following:
   - another subsystem's command prefix character (such as ''$'' for JES2, ''*'' for JES3, or '';'' the delimiter for TSO).
   - the command delimiter for MVS, specified as the value for the CMDDELIM keyword in SYS1.PARMLIB (CONSOL*xx*) and described in the *Installation and Tuning Guide for MVS*.
   - a JES line editing character as specified in the JES installation statements or default. For JES2 the initialization statement is CONDEF.
   - For JES3 the installation statement is CONSTD. Descriptions of these statements and default values can be found in the appropriate JES *Initialization and Tuning Guide*.
2. If you are running the HSC on a VM host that shares the CDS with an HSC running on MVS, make sure that your command prefix character does not conflict with any of the VM facilities, such as the CP line editing symbol.

Table 18. Mapping of Command Prefix Codes to Characters

Hex	Character	Description
40	null	blank
4A	¢	cent
4B	.	period
4C	<	less than
4D	(	left parenthesis
4E	+	plus
4F	|	vertical bar
50	&	ampersand
5A	!	exclamation point
5B	$	dollar sign
5C	*	asterisk
5D	)	right parenthesis
5E	;	semicolon
5F	¬	not symbol
60	-	minus
61	/	slash
6B	,	comma
6C	%	percent

Table 18. Mapping of Command Prefix Codes to Characters

Hex	Character	Description
6D	_	underscore
6E	>	greater than
6F	?	question mark
7A	:	colon
7B	#	crosshatch
7C	@	at sign
7E	=	equals sign
7F	“	double quote

Note: If you specify a null command prefix (hex 40), you must use the MVS MODIFY command to perform any HSC operator command.

Example: F SLS0 MOUNT EDU050,B30

where:

F an abbreviation for the MVS MODIFY command
SLS0 an HSC subsystem
MOUNT an HSC operator command
EDU050 a VOLSER ID
B30 a designated tape drive

SET Delete Disposition

DELDISP

specifies that the delete disposition parameter is to be set. The delete disposition parameter controls how the HSC interprets the delete disposition on a dismount message. HSCs that were brought up before using this function still use the old delete disposition. HSCs that are brought up after the function use the new disposition.

(SCRTCH)

specifies that the volume is to be placed in the scratch pool when the operating system indicates delete disposition.

(NOSCRTCH)

specifies that delete disposition is to be ignored. Because CA-1(TMS) and CA-DYNAM/TLMS provide a grace period, users of these products should specify NOSCRTCH.

SET Eject Password

EJCTPAS

specifies that the eject password is to be set. HSCs that were brought up before using this function still use the old password. HSCs that are brought up after the function use the new password.

(newpswd)

specifies a 1- to 8-character eject password. The new password must be alphanumeric: A-Z (capital letters only) and 0-9. If newpswd is omitted, eject password checking is disabled. Note that the newpswd will not be displayed on SLSPRINT.

OLDPASS

specifies that the old eject password is being specified. The old password must be specified to change or delete a password. To delete an old password, omit it from the syntax, i.e., OLDPASS(). If there is not currently an eject password, this parameter can be omitted.

(oldpswd)

specifies the 1-to 8-character old eject password. Note that oldpswd is not displayed on SLSPRINT.

SET Freeze Panel

FREEZE

specifies to disallow (freeze) or allow (unfreeze) additional cartridges to be stored on a panel.

Note: Frozen or unfrozen panels are recognized immediately by all active HSCs. It is not necessary to stop and reinitialize active HSCs to detect changes made by SET FREEZE.

ON

specifies to freeze a panel, which prevents additional cartridges from being moved to it. This restriction includes allocating new cartridge locations on a panel as a result of:

- a MOVe command, utility, or PGMI request
- cartridge entry into the ACS
- float, scratch dismount, or scratch redistribution processing.

If a cartridge on a frozen panel is selected (e.g., through a mount request), it may be returned to its home cell on the frozen panel after fulfilling the request. Cartridges already located on a frozen panel must be deliberately moved off using the MOVe command, utility, or PGMI request, or cartridges can be ejected by running the EJECt command or EJECt utility.

OFf

specifies to unfreeze a panel, which allows additional cartridges to be moved to it.

Note: On a frozen panel, if a panel type is changed by running the MERGEcds or Reconfiguration utility, the new panel is not frozen. If the panel type **did not** change, the panel remains frozen after a merge or reconfiguration.

SET Host ID

HOSTID
specifies that the old host ID is being changed to a new name.

(newhost)
specifies a 1- to 8-character host ID which also serves as the SMF system ID for JES2 or the main processor name for JES3. *newhost* cannot already be defined in the CDS.

FORHOST
specifies the old host ID.

(oldhost)
specifies a 1-to 8-character host ID. This host must not be marked active in the CDS. An HSC can be down but still marked active. SET HOSTID would fail to run. To be marked inactive, the HSC, in the host that is down, must be brought up and then shut down. Also, another host could perform cross-host recovery on the HSC that is down, but marked active. Either of these change the status in the CDS of the down HSC from active to inactive. See "SET HSC Level" for information about resetting operating flags.

Note: You must delimit the HOSTID (*newhost* or *oldhost*) with quotes when this ID is in lower case.

SET HSC Level

HSCLEVEL
specifies that the HSC active and release level indicators are to be cleared for the designated host.

Note: If used, HSCLEVEL should be performed **only when the host designated in** *host-id* **is inactive**.

These indicators remain set after an abrupt termination of the HSC has occurred (e.g., a cancellation of the HSC or a crash of the operating system).

(OFF)
specifies that the HSC active and HSC release level indicators for the designated host are to be cleared.

FORHOST
specifies that the active indicators are to be cleared for the designated host.

(host-id)
specifies the 1- to 8-character host ID of the host to which the operation is restricted.

Note: StorageTek recommends the following alternatives to executing SET HSCLEVEL because they reset the HSC indicators and recover resources owned by the failing host:

- Restart the HSC on the host.
- Enter the RECover *host-id* FORCE operator command.

SET ENQ/DEQ/RESERVE QNAME

MAJNAME

specifies that the ENQ/DEQ/RESERVE QNAME is to be set. This parameter requires that the HSC on all systems be shut down before changing the QNAME.

(qname)

specifies a 1- to 8-character QNAME. The QNAME is blank padded on the right. The name should conform to the requirements for a QNAME. If any hosts are MVS hosts, to prevent conflicts with the operating system, the QNAME should not start with ‘‘SYSA’’ through ‘‘SYSZ.’’ Since the HSC is authorized, the ‘‘SYSA’’ through ‘‘SYSZ’’ names would be allowed, but deadlock may result.

SET New Host

NEWHOST

specifies that a new host is to be added. The new host to be added cannot exceed the maximum limitation of 16 hosts.

(newhost)

specifies a 1- to 8-character host ID which also serves as the SMF system ID for JES2 or the main processor name for JES3. *newhost* cannot already be defined in the CDS.

Note: You must delimit the HOSTID with quotes when this ID is in lower case.

LIKEHOST

specifies that an existing configuration, as currently defined in the LIBGEN, is to be used for the new host. Settings used include:

- SLILIBRY NNLBDRV (nonlibrary drive esoteric)
- SLIACS ACSDRV (ACS drive esoteric)
- SLISTATN ADDRESS (ACS 3270 station addresses)
- SLIDRIVS ADDRESS (drive addresses).

(model-host)

specifies a 1- to 8-character host ID.

SET Nonlibrary Drive Esoteric

NNLBDRV
specifies that the nonlibrary drive esoteric is being set. The change does not take effect until the relevant HSC(s) is(are) recycled. A relevant HSC is one that resides in the host specified in FORHOST. If FORHOST is omitted, all HSCs are relevant because the operation is not restricted to a specific host.

(esoteric)
specifies a 1-to 8-character esoteric. If the value is omitted, this means that there are no nonlibrary drives installed.

FORHOST
specifies that the operation is being restricted to a specific host. Only the specified hosts' nonlibrary drive esoteric is to be set. If omitted, the nonlibrary esoterics for all hosts are to be changed.

(host-id)
specifies the 1- to 8-character host ID of the host to which the operation is restricted.

SET Scratch Label Type

SCRLABL
specifies the scratch label type is to be set. To add to the scratch pool, the REPLaceall function is run before the Scratch Update utility. Otherwise, the scratch update utility should be run to update the scratch pools after using this function.

(SL)
specifies that nonspecific requests for standard-labeled tapes are to be automated.

(AL)
specifies that nonspecific requests for ANSI-labeled tapes are to be automated.

(NL)
specifies that nonspecific requests for nonlabeled tapes are to be automated.

(NSL)
specifies that nonspecific requests for nonstandard labeled tapes are to be automated.

SET Device Numbers for Drives

SLIDRIVS
specifies that the device numbers for the drives in a particular panel are being changed or added. The change does not take effect until the affected HSC(s) is recycled. Refer to "Running SET SLIDRIVS With the HSC Active" on page 332 for more information.

(addr0,...addr19)

specifies the device numbers for the panel. The numbers are from the top of the panel down. If a device number is omitted, this means that the host cannot access a drive in that particular position in the panel, or the drive does not exist.

Notes:

1. Blanks as well as commas may be used to separate the drive specifications.
2. The total number of drives specified (including comma placeholders) must be 4, 10, or 20. You cannot specify 20-drive panels on 9740 (TimberWolf) LSMs.

   10-drive and 20-drive panels cannot be specified on 4410 LSMs.
3. Before this utility can be executed, all cells in the panel must be empty if the user is moving to or from a 20-drive panel configuration.
4. The user can change a drive panel between a 4- or 10-drive panel (normal) and a 20-drive panel (wide) without running a reconfiguration. Affected panels must be empty and no cells in the panels can be allocated to cartridges.

   To ensure that drive panels being changed from normal to wide configurations (or vice versa) remain empty, freeze them with the SET FREEZE utility. Then, move all cartridges to other panels or LSMs.

   If a panel type is changed by SET SLIDRIVS, the new panel will not be frozen. Frozen panels whose panel type did **not** change remain frozen after SET SLIDRIVS.
5. HSC does not allow duplicate addresses for drives.

   If it becomes necessary to exchange the drive addresses on one panel with the drive addresses on another panel, the addresses on one of the panels must first be changed to temporary addresses that are not currently defined. For example:

   ```
   LSM0, PANEL10, ADDRESSES-400,401,402,403
   LSM1, PANEL11, ADDRESSES-404,405,406,407
   ```

   If the 400-403 addresses are to be moved to LSM1 and 404-407 are to be moved to LSM0, the SET utility must first be run to change the LSM0 addresses (400-403) to 900-903 (or some other addresses that are not currently defined). The SET utility is then run to change the LSM1 addresses to 400-403. The utility is run a third time to change the temporary LSM0 addresses (900-903) to 404-407.
6. On all LSMs, drives are defined to the HSC from top to bottom, with *addr0* representing the topmost drive and *addrn* the bottommost drive.

However, on a 9740 10-drive panel LSM, the drives are populated and configured to the 9740 LSM from bottom to top. (9740 4-drive panels are configured to the 9740 LSM from top to bottom, as are all other LSM drive panels.)

An example showing how to define a 9740 10-drive panel containing five 9840 drives is:

```
SET SLIDRIVS(,,,,,BD4,BD3,BD2,BD1,BD0),FORLSMID(lsm-id),
              FORPANEL(panel)
```

FORLSMID
specifies that the operation is being restricted to a specific LSM.

(lsm-id)
specifies the 3-character LSMid (*aal*) containing the drive panel whose addresses are being changed.

FORPANEL
specifies that the operation is being restricted to a specific panel.

(panel)
specifies the 2-digit ID of the panel containing the drives whose addresses are being changed.

Note: The specified panel must be an existing drive panel in the LSM.

FORHOST
specifies that the operation is being restricted to a specific host. Only the specified hosts' drive device numbers are set. If omitted, the device numbers for all hosts are changed.

Note: The number of drive positions for a specific host must equal the number of drive positions defined globally (issuing SET SLIDRIVS without the FORHOST parameter).

(host-id)
specifies the 1- to 8-character host ID of the host, to which the operation is restricted.

Running SET SLIDRIVS With the HSC Active

Ideally, the HSC should be shut down on all hosts when you specify this parameter. In some cases, however, the HSC can be left active without causing adverse results. Table 19 defines options for running SET SLIDRIVS.

Table 19. HSC State/SET SLIDRIVS Operation

HSC State	Effect on SET SLIDRIVS
Down	If the HSC is down on all hosts, the HSC recognizes all new drive locations when it is initialized.

Table 19. HSC State/SET SLIDRIVS Operation

HSC State	Effect on SET SLIDRIVS
Active	The HSC can be up on all hosts only if *new drives are being added at new drive locations*. The HSC recognizes the new drive locations when it is recycled on a host.
Active	If unit addresses are changed or deleted for an *existing drive location*, either • the affected LSM must be offline until the HSC has been recycled on all hosts, or • the affected ACS must be offline to all affected hosts that access an HSC that has not been recycled.

SET SLIDRIVS Procedure

The following procedure shows one method for changing unit addresses with the HSC active.

- For one host:
  1. Modify the affected LSM offline (MODify *lsm-id* OFFline). The LSM will be offline to all hosts.
  2. Use SET SLIDRIVS to update the CDS drive records while the StorageTek CSE(s) is making the hardware changes.
  3. Recycle the HSC on one host.
  4. Vary the affected ACS offline (Vary ACS(*acs-id*) OFFline) on all hosts running an HSC that has not been recycled.
  5. Modify the affected LSM online (MODify *lsm-id* ONline). The LSM will be online to all hosts where the ACS is online.

  Note: Only hosts that are online to the ACS and running a recycled HSC will mount to drives connected to this LSM.

- For the remaining hosts, recycle the HSC, and the affected ACS will come up.

SET LMU Station Address Numbers

SLISTATN

specifies that the LMU station addresses are to be set. The change does not take effect until the affected HSC(s) is recycled. An affected HSC is one that resides in the host specified in FORHOST. If FORHOST is omitted, all HSCs are relevant because the operation is not restricted to a specific host.

(stat1,...,stat16)
specifies the LMU station addresses associated with a particular ACS. No station addresses are required. Up to 16 can be specified, separated by commas.

Notes:

1. When adding one or more station addresses to an existing list of stations, you must specify all old stations as well as new ones. Any stations (for this ACS and Host ID) not specified here will be deleted and no longer available for use.
2. To remove station addresses for an ACS or host, do not specify station addresses following the SLISTATN parameter. For example,

```
SET SLISTATN(),FORACS(Ø1),FORHOST(HSCA)
```

FORACS
specifies the ACS for which station addresses are being changed.

(acs-id)
specifies the ACSid whose stations are being changed (00 - FF).

FORHOST
specifies that the operation is being restricted to a specific host. Only the specified hosts' stations are set. If omitted, the stations for all hosts are changed.

(host-id)
specifies the 1- to 8-character host ID for the host to which the operation is restricted.

SET SMF Record Type

SMF
specifies that the SMF record type used by the HSC is to be set. Until the HSC is brought down and back up on all CPUs, the Activities Report utility produces incorrect results. This is because some HSCs are writing records with the old SMF record type, and some with the new record type.

(libtype)
specifies the SMF record type. The range is from 0 to 255, inclusive. Since 128 through 255 are for user-defined records, it is recommended that a number from 128 through 255 be chosen, and that the number does not conflict with other user-defined record types.

SET Recovery Technique

TCHNIQE

specifies that the control data set recovery technique is to be set. This SET utility replaces the recovery technique that is currently defined in the CDS. Refer to ‘‘SLIRCVRY Macro’’ in the *HSC Configuration Guide* for a complete description of the LIBGEN SLIRCVRY macro. A recovery technique value must be specified; there is no default value.

NONE

specifies no form of recovery is used for the control data set. Thus, the primary control data set must be rebuilt, if inaccessible.

JOURNAL

specifies that there is to be only one primary control data set and that journals are kept. These data sets are to be used for recovery purposes.

The journals contain a record of all transactions that update the control data set. There are two journals per host. It is recommended that they are placed on separate HDAs from the primary control data set DASD volume.

SHADOW

specifies that there is to be two distinct copies of the control data set (primary and secondary) for recovery purposes. It is recommended that these data sets reside on separate HDAs and separate strings. A journal is not recorded.

BOTH

specifies that two distinct copies of the control data set (primary and secondary) and journals are specified for recovery purposes. **The default is BOTH.**

STANDBY

specifies that primary, secondary, and standby control data sets are to be recorded for recovery purposes. No journals are recorded during HSC operation.

ALL

specifies that all control data sets (primary, secondary, and standby) and journals are to be kept and available for recovery purposes.

SET TCHNIQE Procedure

Use the following procedure to invoke the TCHNIQE utility and to set the appropriate recovery technique value:

1. ALLOCATE, based on existing CDS definitions, any new CDS copies that will be needed for the subsequent SET recovery technique.
2. Stop the HSCs on all hosts configured to use the CDS you are intending to update with SET recovery technique.
3. Run the BACKup utility.

4. Run the RESTore utility to restore all CDS copies required to support the current recovery technique. If the recovery technique update in the following step requires new CDS copies, then include them in this restore.
5. Run the SET utility with the appropriate recovery technique value. It is important to note that the SET utility for this recovery technique update must include DD statements for all CDS copies defined in either the old or the new recovery technique.
6. Run the BACKup utility again. This backup provides you with the ability to restore the updated CDS.

JCL Requirements

The following definitions apply to the JCL for SET utilities:

SLSPRINT
output messages from the utility program.

SLSCNTL
the primary control data set. A primary control data set is required.

SLSCNTL2
the secondary control data set. This statement is used only if you have configured and initiated a secondary control data set for your installation. A secondary control data set is optional, but highly recommended.

SLSSTBY
the standby control data set. This statement is used only if you have configured and initiated a standby control data set for your installation.

SLSIN
input to the utility in the form of control cards.

JCL Examples

The following example shows basic JCL that is required for executing the SET utility. Statements that represent individual utility functions are included in the JCL, as you deem necessary, to comprise the HSC configuration that you want to invoke.

JCL for Set Utility

```
//JOBSET      job (account),programmer
//S1                 EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL   DD DISP=SHR,DSN=control.set.name
//SLSCNTL2 DD DISP=SHR,DSN=secondary.set.name
//SLSSTBY    DD DISP=SHR,DSN=standby.set.name
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
//*  List individual utility statements following this comment
                      .
                      .
             (utility statements)
                      .
/*
//
```

Note: JCL statements for SLSCNTL2 and SLSSTBY are optional. However, if you have configured your library to have a secondary and standby control data set, you **must** include statements for these control data sets. It is highly recommended that you operate your library with a secondary and standby control data set.

The following example shows JCL that makes these modifications:

- changes the host ID from HSCB to HSC2
- sets the library station device numbers to 0CD and 0DD for ACS 00 on host HSC2
- changes the nonlibrary drive esoteric to ‘‘CTAPE’’ for hosts CPUA and CPUB
- changes the device numbers for ACS 00 LSM 0 panel 10 on all hosts.

Notes:

1. Only one option can be specified per SET statement. This example demonstrates that multiple SET statements can be entered for each execution of the utility.
2. In the SET SLIDRIVS statement below, note that a continuation character (+) has been added to allow 10-drive panels to be specified on one statement.

JCL for Multiple SET Statements

```
//JOBSET      job (account),programmer
//S1                 EXEC PGM=SLUADMIN,PARM=MIXED
//SLSCNTL   DD DISP=SHR,DSN=control.set.name
//SLSCNTL2 DD DISP=SHR,DSN=secondary.set.name
//SLSPRINT  DD SYSOUT=A
//SLSIN          DD *
  SET HOSTID(HSC2) FORHOST(HSCB)
  SET SLISTATN(ØCD,ØDD) FORACS(ØØ) FORHOST(HSC2)
  SET NNLBDRV(CTAPE) FORHOST(CPUA)
  SET NNLBDRV(CTAPE) FORHOST(CPUB)
  SET SLIDRIVS(16ØB,16ØC,16ØD,16ØE,16ØF,23ØB,23ØC,23ØD,23ØE,23ØF), +
             FORLSMID(ØØØ) FORPANEL(Ø1)
/*
//
```

Output Description

Output resulting from the execution of the SET command includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute SET processing
- an updated CDS with the changed parameters
- a condition code indicating successful or unsuccessful CDS update.

UNSElect Utility

The UNSElect utility allows you to ‘‘unselect’’ a volume that the HSC leaves in a selected state. Usually, this is an error. The ‘‘unselect’’ operation is performed without cycling the HSC.

Note: Use this utility only if you are certain that the HSC has incorrectly left the volume selected. Incorrect use of this utility can result in HSC abends and errant volumes.

Issue a Display Volume DEtail command to determine which host has the volume in question. Then, issue Display DRives and Display Requests commands on the host that has the volume in question to see if that volume is being used.

If the selected volume is mounted on a transport, issue a DISMount command for the transport. If there is a request active to the LMU for the volume, wait for the request to complete. If the overdue response handler indicates the request has timed out, you may want to abort the request.

Note: For detailed information about the Display and DISMount commands, refer to ‘‘DISPLAY Command’’ and ‘‘DISMOUNT Command’’ in the *HSC Operator’s Guide.*

The HSC must be running on the same host that is running the UNSElect utility. If the selected volume is selected by another active (not marked inactive in the CDS) host, the HSC on that host must be running. Both hosts must be connected to the same LMU. In an environment with multiple ACSs, this can be any LMU, as long as it is the same LMU.

If the **FORCE** option is specified, the volume is ‘‘unselected’’ regardless of the other host being active. Using this option can result in a greater likelihood of abends if the host is running.

If the host running UNSElect cannot communicate because both hosts are not connected to the same LMU, rerun UNSElect on the host with the volume selected. Do not use the FORCE parameter in this case.

The UNSElect function can only be invoked when SLUADMIN is invoked APF authorized, key 0 through 7, or supervisor state. The load module invoked by UNSElect is SLUNSEL. Restricting access to this module restricts access to this utility function.

Syntax

```
►►─UNSElect──VOLser(volser)──┬──────────┬──────────────────────────────►◄
                             └─,FORCE───┘
```

Utility Name

UNSElect
specifies that the UNSElect function is to be performed.

Parameters

VOLser
indicates that a VOLSER is being specified for unselection.

(volser)
volser specifies the VOLSER to be unselected.

FORCE
optionally indicates that the volume is to be unselected even if communication with the host that has the volume selected is not possible.

JCL Requirements

The following definitions apply to UNSElect utility JCL:

SLSPRINT
output messages from the utility program.

SLSIN
input to the utility in the form of control cards.

JCL Example

The following example shows JCL for unselecting volume BWX119.

JCL to Unselect a Volume

```
//JOBUNSEL   job (account),programmer
//S1                  EXEC PGM=SLUADMIN{,PARM=MIXED}
//SLSPRINT    DD SYSOUT=A
//SLSIN            DD *
  UNSELECT VOLSER(BWX119)
/*
//
```

Output Description

Output occurring from execution of the UNSElect utility includes:

- a listing of input commands with appropriate messages when syntax errors occur
- messages associated with error conditions resulting from an unsuccessful attempt to execute UNSElect processing
- messages indicating actions occurring during processing (see Figure 26 on page 341)
- an updated control data set indicating the volume is unselected
- a condition code indicating successful or unsuccessful unselection (see Figure 26 on page 341).

```
SLUADMIN (n.n.n)                StorageTek Automated Cartridge System Utility
TIME hh:mm:ss                             Control Card Image Listing                UNSELECT VOL(BWX119)

SLS0376I Volume BWX119 is now unselected.  Owning host was HSC1.
SLS0155I Condition Code for Utility Function is 0.
```

C28800

Figure 26. UNSElect Utility Sample Output

Volume Report Utility

The function of the Volume Report utility is to produce a listing of the physical location for volumes residing in an LSM. This utility is used primarily for informational purposes and provides history and usage statistics on specific library volumes.

The Volume Report utility program functions as a stand-alone process in batch mode and does not require that the HSC be operational in order to execute. If the HSC is operational, Volume Report can extract CDS and VOLATTR information from the active HSC.

In addition to the reporting capability, the utility can produce a ‘‘flat file’’ which may be used as a data source for manipulating the data for user-defined reports with other software products.

Note: It is recommended that a 2 megabyte region size be used when running the Volume Report utility.

A report may be sorted or unsorted. When the SORT option is specified, volume data can be sorted by:

- volume serial numbers
- location of volumes
- select count (usage) of volumes
- date volumes were inserted into the library control data set
- last date volumes were selected.

Sorting may be done in ascending or descending order.

- The report sorted by volume serial number is useful when a listing of library information is needed in ascending VOLSER sequence.
- The report sorted by location can be utilized for either the mass transfer of volumes or assessing the potential impact of a component failure. With this information, the installation can avoid jobs which access volumes within failed components.
- The report sorted by usage lists volumes by selection count. This report is useful for either ejecting low use volumes or replicating information on high use volumes.

The utility output may include a variety of information, depending upon the user-specified parameters. For example, volume information can be specifically included or excluded from a report based on:

- scratch status
- errant status
- external label status
- selected status.

Specifying of report parameters can range from the ACS or LSM level to as specific as a single volume serial number or list of volume serial numbers. Whenever a report is generated using library element parameters (i.e., LSM and/or ACS), the Volume Report utility may also output messages identifying empty but allocated cells.

The volume location information in this report is accurate only up to the time that the volume information is read from the database. For recovery purposes, a listing from a Volume Report run, while the HSC is down on all hosts, must be used to assist locating the required volumes.

Note: Volume movement occurs as a result of:

- mount activity, dismount activity, enter activity, or eject activity
- invoking the Scratch Redistribution utility
- invoking the MOVe command or utility.

Media Type and Recording Technique Considerations

Volume reports can display media type (MEDia) and recording technique (RECtech).

MEDia data is extracted from either the CDS volume attribute record (VAR) or the VOLATTR statements. The VAR media information is updated when the volume external media label is read by the robotic vision system and is transmitted back to the HSC through the LMU. This can occur as a result of mounts, CAP enters, or audits.

RECtech is extracted from the VOLATTR statement. If the VOLATTR statement does not contain the recording technique for the volume, or if the VOLATTR media value conflicts with the media value that is present in the VAR, the RECtech value is determined from the MEDia value that is being reported. This RECtech value will include all recording techniques that the reported MEDia value allows (e.g., if the media value is Standard and the recording technique value defaults to LONGItud, then 18track, 36track, 36Atrack, 36Btrack, and 36Ctrack recording techniques also are included).

The report indicates if the VAR media type has been verified by the LMU. If the LMU verified the media type, the VAR media value is reported. If the media type has not been verified by the LMU, the VOLATTR MEDia value is used if it exists. If both VOLATTR and VAR media type information do not exist, the volume is considered to be Standard. At a minimum, a VOLATTR statement must be present for all volumes that are not Standard cartridges. This is because:

- the vision system cannot recognize two-tone (ECART) cartridges without an external media label

  Note: It is recommended that users provide an external media label for all ECARTs. ZCART, DD3, and STK1 media **must** have external labels.

- for scratch purposes, volume categorization occurs based on the media type. Therefore, it is extremely important that accurate VOLATTRs be defined to maintain accurate scratch counts.

Run the Volume Report utility to verify that your VOLATTR statements and the VARs are in agreement.

To determine which volumes are mismatched between the VAR and the VOLATTR statements, specify either INCLUDE(NONMEDEQ) or EXCLUDE(MEDEQUAL) in the Volume Report syntax. Refer to the syntax and parameter descriptions sections of this utility for more information.

If the VAR is not synchronized with the VOLATTR statements, take one of the following actions to resolve the mismatch.

- change the VOLATTR statement(s)
- add an external media label to cartridges that are not Standard
- mount the cartridges
- enter the cartridges through the CAP
- run an audit.

Note: Be aware that if you choose to run an audit to update the VAR, audits can be very time-consuming and can slow HSC processing.

Syntax

```
►►─VOLRpt──┬──────────────────────────────────────────────────────────────────────────────────►
           │──ACS(acs-id)──┬──────────────────────────────────────────────────────────────┐
           │               └──LSM(──┬──lsm-list──┬──)──┘                                    │
           │                        ↓ ,          │                                          │
           │──VOLser─(──┬──volser──────────┬──)──────────────────────────────────────────┤
           │            │──vol-range───────┤                                              │
           │            │──,──────────────┬┘                                              │
           │            ↓ vol-list        │                                               │
           │──VOLume─(──┬──volser──────────┬──)──────────────────────────────────────────┤
           │            │──vol-range───────┤                                              │
           │            │──,──────────────┬┘                                              │
           │            ↓ vol-list        │                                               │
           │──SORT(──┬──VOL──┬──)──┬──ASCend──┬──┐
           │         │──INS──┤     │          │  │
           │         │──LOC──┤     └──DESCend─┘  │
           │         │──SEL──┤                   │
           │         └──USE──┘                   │
           └──NOSORT──────────────────────────────┘

►──┬──────────────────────────────────────────────────────────────────────────────────────►
   │──INCLude(──┬──,──────────────────────────────────────────┬──)──┬──────────────────────┐
   │            ↓ *──┬──SCR──────────┬──┬──────────────────────┤     │                      │
   │                 │──NONSCR───────┘  │                      │     │                      │
   │                 │──ERR──────────┬──┤                      │     │                      │
   │                 │──NONERR───────┘  │                      │     │                      │
   │                 │──SEL──────────┬──┤                      │     │                      │
   │                 │──NONSEL───────┘  │                      │     │                      │
   │                 │──READable─────┬──┤                      │     │                      │
   │                 │──UNREADable───┘  │                      │     │                      │
   │                 │──MEDEQUAL─────┬──┤                      │     │                      │
   │                 │──NONMEDEQ─────┘  │                      │     │                      │
   │                 └──NOEXTernal──────┘                      │     │                      │
   │──EXCLude(──┬──,──────────────────────────────────────────┬──)──┬──────────────────────┤
   │            ↓ SCR──────────┬──┬──────────────────────────┤     │                      │
   │              NONSCR───────┘  │                          │     │                      │
   │              ERR──────────┬──┤                          │     │                      │
   │              NONERR───────┘  │                          │     │                      │
   │              SEL──────────┬──┤                          │     │                      │
   │              NONSEL───────┘  │                          │     │                      │
   │              READable─────┬──┤                          │     │                      │
   │              UNREADable───┘  │                          │     │                      │
   │              MEDEQUAL─────┬──┤                          │     │                      │
   │              NONMEDEQ─────┘  │                          │     │                      │
   │              NOEXTernal──────┘                          │     │                      │
   │                                                         │     │                      │
   │──┬──VOLIST──┬──┬──────────────────────────────────────────────────────────────────────►◄
   │  │          │  │
   │  └──VOLDATA─┘  │
   │                │
   │                └──CDSDATA──┬──┬──────────────────────────────────────────────────────┤
   │                            │  │                                                      │
   │                            │  └──SUMMary(──┬──TOTal──────────────┬──)──┬──────────────┤
   │                            │               │──SUBpool────────────┤     │              │
   │                            │               └──TOTal,SUBpool──────┘     │              │
   │                            │                                           │              │
   │                            └──────────────────────────────────────────┘              │
   └─────────────────────────────────────────────────────────────────────────────────────┘
```

Utility Name

VOLRpt
specifies that a volume report is to be produced.

Parameters

ACS
optionally specifies that a report is to be produced for only a particular ACS.

(acs-id)
The one or two digit hexadecimal ACS identifier.

LSM
optionally specifies that a report is to be produced for only certain LSMs within an ACS.

(lsm-list)
lsm-list indicates the LSMs. An lsm-list can be a single LSMid or a list of LSMids. An LSMid is a single hexadecimal digit. An LSM range is not allowed. If a list is specified, the elements must be separated by blanks or commas, and the entire list enclosed in parentheses.

VOLser *or* **VOLume**
optionally specifies that the report only contain information on certain VOLSERs.

(volser* or *vol-range* or *vol-list)
volser, *vol-range*, and *vol-list* indicate the volume serial numbers requested. Any subranges of volumes specified in the *vol-list* that are not in the control data set are listed in the Control Card Image Listing portion of the report using one line per subrange.

A percent sign (‘‘%’’) may be used as a ‘‘wildcard’’ character in the VOLSER to specify pattern matching. The percent sign designates that any single character can match the corresponding position in the VOLSER.

For example, A9%%%% specifies that all of the six-character volume serial numbers that begin with the characters ‘‘A9’’ are selected for the report.

Q%12% specifies that all five-character VOLSERs that begin with ‘‘Q’’ and have a ‘‘12’’ in the third and fourth positions of the VOLSER are selected for the report. The percent sign cannot be specified in a range specification. Therefore, ‘‘A%0000-A%9999’’ is invalid.

In the Volume Report Listing of the utility, the volumes requested which are not in the control data set are not listed.

SORT
optionally specifies a specified sort sequence. The following options are available:

VOL
indicates that the report is to be sorted by volume serial number (VOL is the default).

LOC
indicates that the report is to be sorted by location.

USE
indicates that the report is to be sorted by selection count.

INS
indicates that the report is to be sorted by date and time the volume was inserted into the control data set.

SEL
indicates that the report is to be sorted by date and time the volume was last selected.

Multiple sort criteria may be specified. The order, from left to right, specifies the order in which the report is to be sorted.

For example, **SORT(INS,USE)** produces a report sorted by date inserted in the control data set, and then for each date, sorted by select count. **SORT is mutually exclusive with NOSORT.**

NOSORT
specifies that an unsorted report is to be produced. **NOSORT is mutually exclusive with SORT, ASCend, and DEScend.**

ASCend
optionally specifies that the report is to be sorted in ascending order. **ASCend is the default.** This parameter is ignored if NOSORT is specified. **ASCend is mutually exclusive with NOSORT and DEScend.**

DEScend
optionally specifies that the report is to be sorted in descending order. This parameter is ignored if NOSORT is specified. **DEScend is mutually exclusive with NOSORT and ASCend.**

INCLude
optionally specifies the criteria for including volume information in the report. If this keyword is specified, all volumes that match at least one of the specified criteria are tentatively selected for the report. Information about volumes may be removed from the list of volumes selected for the report if other options, such as **EXCLUDE**, **VOL**, **ACS**, or **LSM** are specified.

Notes:

1. INCLude parameters are applied before EXCLude parameters in volume selection.
2. Parameter values are not checked for the existence of their opposite values (for example, ‘‘SEL’’ is still flagged even if ‘‘NONSEL’’ is specified, and vice versa).
3. Positive attributes are applied before negative attributes (for example, SCR is applied before NONSCR).

*****
indicates that all volumes in the library are considered for being included in the report. **The default is *.** If more than one of the following parameters is specified, the parameters must be separated by commas.

SCR
specifies that scratch volumes match the specified criteria.

NONSCR
specifies that nonscratch volumes match the specified criteria.

ERR
specifies that errant volumes match the criteria.

NONERR
specifies that non-errant volumes match the criteria.

SEL
specifies that selected volumes match the criteria.

NONSEL
specifies that nonselected volumes match the criteria.

READable
specifies that volumes with a readable external label match the criteria.

UNREADable
specifies that volumes with an unreadable external label match the criteria.

MEDEQUAL
specifies that volumes for which the media types of the VOLATTR and the VAR are equal match the criteria.

NONMEDEQ
specifies that volumes for which the media types of the VOLATTR and the VAR are not equal match the criteria.

NOEXTernal
NOEXTernal specifies that volumes without an external label match the criteria.

For example, **INCLUDE(SEL,ERR)** tentatively chooses only selected and errant volumes for the report. INCLude parameters are applied before EXCLude parameters in volume selection.

EXCLude

optionally specifies the criteria for excluding volume information from the report. Any volumes that match one or more of the exclusion criteria are excluded from the report.

EXCLude parameter values are the same as INCLude values, except for the ‘‘*’’ parameter (see the INCLude options list above).

As an example, **EXCL(NONSEL)** excludes nonselected volumes from the report.

Notes:

1. INCLude parameters are applied before EXCLude parameters in volume selection.
2. Parameter values are not checked for the existence of their opposite values (for example, ‘‘SEL’’ is still flagged even if ‘‘NONSEL’’ is specified, and vice versa).
3. Positive attributes are applied before negative attributes (for example, SCR is applied before NONSCR).

VOLDATA

optionally specifies that a flat file, not a volume report, is to be produced.

When this keyword is specified, the utility attempts to write the volume data to a data set defined by the SLSCDATA DD statement (refer to the SLSCDATA description “JCL/Parameter File Requirements” on page 351).

If both VOLDATA and CDSDATA (see below) are specified, a single flat file is produced that contains volume and non-volume information.

VOLIST

optionally specifies that the utility produce a volume report. This parameter is used in combination with VOLDATA so that both a flat file and a volume report can be created. Normally, you would not specify VOLIST without also designating **VOLDATA**.

If **VOLIST**, **VOLDATA**, and **CDSDATA** (see below) are specified, a volume report is created and a single flat file is produced that contains volume and non-volume information.

CDSDATA

optionally specifies that the Volume Report utility is to produce non-volume CDS data for the data set defined by the SLSCDATA DD statement (refer to SLSCDATA “JCL/Parameter File Requirements” on page 351). CDSDATA is independent of VOLDATA and does not keep a volume report from being produced.

SUMMary

optionally specifies that the utility provide totals of volume attributes on an LSM and ACS basis, and/or subpool data on an ACS or LSM basis. Totals are affected by the

use of limiting parameters such as ACS (and possibly LSM), VOLser/VOLume, and INCLude and/or EXCLude.

If both **TOTal** and **SUBpool** are specified, both reports are provided. The time and date displayed in the header for the Summary Report(s) are the same as the Volume Report Listing header.

TOTal

specifies that totals of scratch, selected, errant, available cells, and external label status types be provided on an LSM, ACS, and library basis in the report.

The totals are listed on a separate listing, on a new page from the Volume Report Listing and the Control Card Listing. An example depicting the totals is in Figure 27 on page 358.

SUBpool

specifies that subpool totals be provided on an LSM, ACS, and library basis in the report.

Subpool information must be provided in one of the following ways:

- through PARMLIB SCRPOol control statements (refer to “Scratch Subpool Control Statement” on page 102). These statements are contained in an HSC PARMLIB data set pointed to by the SLSSCRPL DD statement (refer to “JCL/Parameter File Requirements” on page 351) or used by the active HSC on this host.
- through an accessible SLSUX03 user exit (refer to Chapter 9, “User Exits”). This exit must be in a library included somewhere in the MVS load library search order.

SCRPOol control statements are the preferred method of subpool definition. If the HSC PARMLIB data set pointed to by the SLSSCRPL DD statement or used by the active HSC on this host is missing or invalid, a search for a valid SLSUX03 is made. If the exit cannot be found or if a code of 64 is returned on its initial call, a message is issued and a utility return code 4 is set.

The totals are listed on a separate listing, on a new page from the Volume Report Listing, the Control Card Listing, and the Volume Report Totals Listing. An example displaying subpool information is shown in Figure 28 on page 359.

If subpools overlap (i.e., a volume belongs to more than one subpool) then the sum of the subpool totals may be greater than the total number of scratch volumes or the number of volumes in the library.

JCL/Parameter File Requirements

The following definitions apply to Volume Report utility JCL:

SORTWK*nn*
sort work files to optimize the sorting of volume records into the requested order. SORTWK statements are optional. Up to 99 SORTWK statements are allowed.

SLSCNTL, SLSCNTL2, SLSSTBY
HSC control data set to be processed.

If these statements are omitted, the data sets used by the active HSC on the host are accessed. If the HSC on the host is inactive, one or more of these DD statements are required.

The utility attempts to select the primary CDS from the data sets specified.

SLSPRINT
output messages and report from the utility. A message is displayed detailing the data set names being used to produce the report.

SYSOUT
sort message output.

SLSIN
input to the utility in the form of control statement card images.

SLSCDATA
statement required if VOLDATA and/or CDSDATA parameters are specified to request CDS data.

The data set defined by SLSCDATA must be sequential and have a variable record format. Optionally, DCB parameters LRECL and BLKSIZE may be specified by the user.

The minimum LRECL should be 2376 if CDSDATA is specified or 136 if VOLDATA is specified.

It is recommended that the LRECL be set larger than the minimum LRECL to accommodate any future changes.

BLKSIZE can be any valid block size and must be at least LRECL + 4.

If individual DCB parameters are not specified at execution time, the following defaults are provided:

- RECFM=VB
- LRECL=2376 or 136
- BLKSIZE=LRECL + 4

If any DCB parameters are specified which conflict with any of the requirements described above, the defaults are used.

SLSSCRPL

points to a data set containing HSC PARMLIB statements. The SCRPOol scratch subpools and MNTD MAXclean values are defined in these control statements.

If this statement is omitted, the data set used by the active HSC on the host is accessed. If the HSC on the host is inactive, SLSSCRPL is required to produce a SUMMary(SUBpool) report.

SLSVA

statement that points to the data set containing the VOLATTR statements for the CDS being reported on.

If SLSVA or VOLATTRs are omitted, several different scenarios can occur depending on the HSC state. Table 20 describes these situations.

Table 20. SLSVA Effect on Volume Report

HSC State:	SLSVA Specified:	SLSVA Not Specified:
Active	Use VOLATTRs pointed to by SLSVA. *	Use VOLATTRs used by the HSC. *
Inactive	Use VOLATTRs pointed to by SLSVA.*	The HSC generates an error message saying that SLSVA is missing and incorrect data may be reported. In addition, no prefix characters appear before the ‘‘Media’’ field on the report to identify media type discrepancies.

* If VOLATTRs have been defined, media prefix characters are displayed before the ‘‘Media’’ field if the media types reported by the LMU and the VOLATTR statements do not agree. If VOLATTRs are not present, media prefix characters are not displayed.

JCL Examples

The following example shows JCL to produce a Volume Report for several LSMs sorted by selection count.

JCL to produce a Volume Report (LSMs Sorted by Selection Count)

```
//JOBVOLR     job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM=‘NOHDR,MIXED’
//STEPLIB       DD DSN=sys.your.linklib,DISP=SHR
//SLSCNTL      DD DSN=control.dataset.name,DISP=SHR
//SORTWKØ1  DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SORTWKØ2  DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SLSPRINT    DD SYSOUT=A
//SYSOUT        DD SYSOUT=A
//SLSIN            DD *
  VOLRPT ACS(Ø1) LSM(Ø,1,5) SORT(USE)
/*
//
```

The following example shows JCL to produce a Volume Report using work files.

JCL to produce a Volume Report (Using Work Files)

```
//JOBVOLR     job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM=‘NOHDR,MIXED’
//STEPLIB        DD DSN=sys.your.linklib,DISP=SHR
//SLSCNTL      DD DSN=control.dataset.name,DISP=SHR
//SLSPRINT     DD SYSOUT=A
//SYSOUT         DD SYSOUT=A
//SORTWKØ1   DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SORTWKØ2   DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SORTWKØ3   DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SORTWKØ4   DD UNIT=SYSDA,SPACE=(TRK,(space),,CONTIG)
//SLSIN             DD *
  VOLRPT VOLSER(ABCDØ1-ABCD99)
/*
//
```

The optional parameter ‘‘NOHDR’’ suppresses page headings on the volume report.

The following example shows JCL to produce a Volume Report using work files and scratch subpool PARMLIB definitions.

SORTWK*nn* DD statements are optional and should be included if sorting is to be done. Up to 99 SORTWK DD statements are allowed. The SLSSCRPL DD statement is necessary if subpool information is to be obtained from SCRPOol PARMLIB statements.

This example sorts volumes by date last selected; calls for subpool totals by LSM, ACS, and library; and sends non-volume CDS data to the data set specified in SLSCDATA.

JCL to produce a Volume Report (Using Scratch Subpool Definitions)

```
//JOBVOLR     job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM='NOHDR,MIXED'
//STEPLIB       DD DSN=sys.your.linklib,DISP=SHR
//SLSPRINT     DD SYSOUT=A
//SYSOUT         DD SYSOUT=A
//SORTWK01   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SORTWK02   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SORTWK03   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SLSCNTL      DD DSN=control.dataset.name,DISP=SHR
//SLSSCRPL    DD DSN=your.hsc.parmlib.name(SLSSYSnn),DISP=SHR
//SLSCDATA   DD DSN=your.cdsdata.name,
//                        DISP=(,CATLG,DELETE),
//                        UNIT=SYSDA,
//                        SPACE=(TRK,(prim,sec),RLSE)
//SYSIN            DD *
  VOLRPT SORT(SEL) SUMMARY(SUBPOOL) CDSDATA
/*
//
```

This example shows JCL to produce a Volume Report listing media types that are mismatched between the CDS VAR and VOLATTR control statements. The SLSVA DD statement must be present to identify the VOLDEF data set containing the VOLATTR statements.

JCL to produce a Volume Report (Comparing VAR/VOLATTR)

```
//JOBVOLR      job (account),programmer
//S1                    EXEC PGM=SLUADMIN,PARM='NOHDR,MIXED'
//STEPLIB        DD DSN=sys.your.linklib,DISP=SHR
//SLSPRINT     DD SYSOUT=A
//SYSOUT         DD SYSOUT=A
//SORTWK01   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SORTWK02   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SORTWK03   DD UNIT=SYSDA,SPACE=(TRK,(prim),,CONTIG)
//SLSCNTL       DD DSN=control.dataset.name,DISP=SHR
//SLSVA            DD DSN=voldef.dataset.name,DISP=SHR
//SYSIN             DD *
  VOLRPT SORT(VOL) SUMMARY(TOTAL) EXCLUDE(MEDEQUAL)
/*
//
```

Output Description

A report in the specified sort order provides details about the library volumes in the ACSs/LSMs for which the report is produced. Other outputs may include error messages to the listing.

Report Detail Lines

The following sections describe the detailed volume information reported for each volume.

Media and Recording Technique Origin

The media and recording technique are derived from the media type reported by the LMU (recorded in the VAR) and the applicable VOLATTR statement, if one exists. If the media type from the LMU is compatible with the VOLATTR statement, the VOLATTR's media type and recording technique is reported. If the LMU and VOLATTR data and VOLATTR data is incompatible, or the VOLATTR is not provided, the LMU media type is used.

Media Type Prefix Characters

If discrepancies exist between the media type reported by the LMU (in the VAR) and the VOLATTR information, the media type is prefixed by one of the following characters:

* displayed if the VAR media type and VOLATTR information do not match. In this case, the user should correct the erroneous VOLATTRs.

– displayed if **both** of these conditions are true:
  - a VOLATTR cannot be found for an ECART, ZCART, helical, or STK1 cartridge (anything other than a Standard cartridge), and
  - the cartridge external media label has been verified by the LMU.

@ displayed if **both** of these conditions are true:
  - a VOLATTR exists for an ECART, ZCART, helical, or STK1 cartridge (anything other than a Standard cartridge), and
  - the cartridge external media label has not been verified by the LMU.

Errant, Scratch, Selected Fields

A flag of ''Y'' (yes) under the Errant (Err), Scratch (Scr), or Selected (Sel) headings indicates that the volume is currently in that status.

A volume in Errant (Err) status shows the volume's home cell in the Cell Loc column.

External Label Field

Under the heading External Label (Ext Lbl), ''R'' indicates that the volume has a readable external label. A flag of ''U'' (unreadable) means that the cartridge has an external label which the camera system is unable to read. ''N'' indicates that the cartridge has no external label.

Cartridge Usability (CLN USE) Field

An ''N'' indicates a cartridge which is not usable, for example, a spent cleaning cartridge that is not usable because it has exhausted its cleaning surface. An ''M'' means that a

cleaning cartridge has exceeded its maximum usage set by the VOLATTR MAXclean or MNTD MAXclean value.

Subpool ID Field

Scratch subpools for volumes are listed if:

- SUMMary(SUBpool) is specified and
- scratch subpool definitions have been provided either by SCRPOol control statements or User Exit 03.

If the VOLSER is not within any scratch subpool range,

```
** DEFAULT **
```

appears in this field.

Times Selected Field

The Times Selected count is the number of times the volume has been selected for use by a host. A single selection may represent a mount/dismount pair, the volume's initial entry, participation in scratch redistribution, or any update to its scratch status.

Note: The count is valid only for the time that the volume exists in a CDS.

Totals Reports

Two totals reports can be produced:

- volume report totals
- subpool totals.

Volume Report Totals

Total of cartridges with various characteristics are displayed for LSMs, ACSs, and the entire library.

Note: The free storage cells reported do not include free cells on frozen panels. An LSM with at least one frozen panel is indicated by an asterisk after the free cell count.

Subpool Totals

Totals of cartridges by subpool are produced for LSMs, ACSs, and the entire library.

Volume Report Flat Files

Specifying the VOLDATA parameter produces a volume flat file. The layout of the volume records is defined by the SMP/E-distributed SLUVVDAT macro. Refer to "SLUVVDAT" on page 646 in Appendix B, "Record Formats" to see the SLUVVDAT record format.

When **VOLDATA** is specified under CMS, only the volume information that passed all of the selection criteria is written to the specified output data set, one volume per record.

The **CDSDATA** parameter creates a non-volume CDS flat file. The following SMP/E-distributed macros define the non-volume information:

- SLUVADAT (flat file ACS/LSM information DSECT)
- SLUVCDAT (flat file static configuration data DSECT)
- SLUVHDAT (flat file host information DSECT)
- SLUVIDAT (flat file CDS information DSECT).

Refer to “Volume Report and Batch API Records” on page 626 in Appendix B, “Record Formats” for the layouts of these records.

An optional parameter, ‘‘NOHDR,’’ may be specified in the JCL to eliminate printing page headings. This option enables the user to customize the output data to produce reports in various formats.

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0001
TIME hh:mm:ss                                Control Card Image Listing                          DATE yyyy-mm-dd

 VOLRPT SUMM(TOT) VOLUME(CLN400-CLN418)
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0002
TIME hh:mm:ss                                Volume Report Utility                               DATE yyyy-mm-dd

Volume                          Cell Loc                Ext Cln                |--- Inserted --|  |-- Last Used --|    Times
Serial  Media     Rectech  LSM:Pa:Ro:Co Err Scr Sel Lbl Use   Subpool ID    Date     Time     Date     Time     Selected
CLN400  STK1U     STK1R    011:14:00:17               R   N  ** DEFAULT ** 19980716 12:56:56 19980716 13:11:10        23
CLN401  STANDARD  18TRACK  011:18:00:19               R      ** DEFAULT ** 19980716 12:56:57 19980716 13:11:17        98
CLN402  STANDARD  18TRACK  011:01:00:23               R   M  ** DEFAULT ** 19980716 12:56:59 19980716 13:11:20       101
CLN403  STANDARD  18TRACK  011:04:00:23               R      ** DEFAULT ** 19980716 12:57:00 19980716 13:11:25        96
CLN404  STK1U     STK1R    011:06:00:20               R   NM ** DEFAULT ** 19980716 12:57:01 19980716 13:11:27       105
CLN405  STK1U     STK1R    011:07:01:10               R   N  ** DEFAULT ** 19980716 12:57:03 19980716 13:11:30        26
CLN406 *STANDARD  18TRACK  010:03:30:01               R      ** DEFAULT ** 19980716 12:57:04 19980716 13:05:51         3
CLN407 *STANDARD  18TRACK  010:00:15:02               R      ** DEFAULT ** 19980716 12:57:05 19980716 13:05:53         3
CLN408  STANDARD  18TRACK  010:02:15:05               R      ** DEFAULT ** 19980716 12:57:06 19980716 13:05:54         3
CLN409  STANDARD  18TRACK  010:03:30:02               R      ** DEFAULT ** 19980716 12:57:06 19980716 13:05:56         3
CLN410 @DD3D      DD3      010:00:15:03               R   M  ** DEFAULT ** 19980716 12:57:08 19980716 13:05:58         3
CLN411 @DD3D      DD3      010:02:16:00               R   M  ** DEFAULT ** 19980716 12:57:08 19980716 13:06:00         3
CLN412  DD3D      DD3      010:03:31:00               R   M  ** DEFAULT ** 19980716 12:57:11 19980716 13:06:02         3
CLN413 -DD3D      DD3      010:00:15:04               R   M  ** DEFAULT ** 19980716 12:57:12 19980716 13:06:04         3
CLN414  DD3D      DD3      010:02:16:01               R   M  ** DEFAULT ** 19980716 12:57:13 19980716 13:06:05         3
CLN415  DD3D      DD3      010:03:31:01               R   M  ** DEFAULT ** 19980716 12:57:14 19980716 13:06:07         3
CLN416  DD3D      DD3      010:00:15:05               R   M  ** DEFAULT ** 19980716 12:57:17 19980716 13:06:11         3
CLN417  DD3D      DD3      010:02:16:02               R   M  ** DEFAULT ** 19980716 12:57:18 19980716 13:06:14         3
CLN418  DD3D      DD3      010:03:31:02               R   M  ** DEFAULT ** 19980716 12:57:20 19980716 13:06:16         3
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0003
TIME hh:mm:ss                                Volume Report Totals                                DATE yyyy-mm-dd

                                    No      Un      External                Non     Not     Over                    Free
Type  Loc   Errant  Selected  External  Readable  Readable  Scratch  Scratch  Usable  MAXclean   All     Cells
 LSM  000       0         0         0         0         0        0        0       0         0     0      4069
 ACS  00        0         0         0         0         0        0        0       0         0     0      4069

 LSM  010       0         0         0         0        13        0       13       0         9    13       346
 LSM  011       0         0         0         0         6        0        6       3         2     6      4660
 ACS  01        0         0         0         0        19        0       19       3        11    19      5006

 ALL            0         0         0         0        19        0       19       3        11    19      9075
```

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Figure 27. Volume Report SUMMary(TOTal) Sample Output

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0001
TIME hh:mm:ss                                Control Card Image Listing                          DATE yyyy-mm-dd

  VOLRPT SUMM(SUB) VOLUME(EE0000-EE9999)
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0002
TIME hh:mm:ss                                Volume Report Utility                               DATE yyyy-mm-dd

Volume                          Cell Loc                Ext Cln                |--- Inserted --|  |-- Last Used --|    Times
Serial  Media     Rectech  LSM:Pa:Ro:Co Err Scr Sel Lbl Use   Subpool ID    Date     Time     Date     Time     Selected
EE0000  ZCART     36CTRACK 010:02:00:01              R      SUB1          19980914 15:14:39 19980921 10:16:59      5453
EE0001  ZCART     36CTRACK 010:03:01:00      Y       R      SUB1          19980910 11:30:51 19980921 16:23:56        28
EE0002  ZCART     36CTRACK 010:00:00:00      Y       R      SUB1          19980910 11:30:55 19980921 16:23:56        29
EE0003  ZCART     36CTRACK 010:01:36:01  Y   Y   Y   R      SUB1          19980910 11:31:01 19980921 16:23:57        25
EE0004  ZCART     36CTRACK 010:02:01:02      Y       R      SUB1          19980910 11:31:07 19980921 16:23:57        27
EE0005  ZCART     36CTRACK 010:03:01:01      Y       R      SUB1          19980910 11:31:12 19980921 16:23:57        23
EE0006  ZCART     36CTRACK 020:00:00:00      Y       R      SUB1          19980914 14:48:10 19980918 10:33:07         6
EE0007  ZCART     36CTRACK 021:00:04:03      Y       R      SUB1          19980714 09:39:53 19980918 10:33:08       100
EE0008  ZCART     36CTRACK 020:01:39:01      Y       R      SUB1          19980714 09:40:07 19980918 10:33:08        45
EE0009  ZCART     36CTRACK 020:00:02:00          Y   R      SUB1          19980714 09:40:19 19980921 16:34:17       676
EE0010  ZCART     36CTRACK 021:01:39:02      Y       R      SUB1          19980714 09:40:33 19980921 16:23:58        82
EE0011  ZCART     36CTRACK 021:00:08:01      Y       R      SUB1          19980914 14:24:46 19980921 16:24:00        15
EE0012  ZCART     36CTRACK 020:01:36:01      Y       R      SUB1          19980814 08:33:30 19980918 10:33:08        19
EE0800  ZCART     36CTRACK 011:01:00:04              R      SUB2          19980910 10:58:04 19980921 16:26:39        64
EE0801  ZCART     36CTRACK 011:14:00:04      Y       R      SUB2          19980910 10:57:13 19980918 12:44:54        34
EE0802  ZCART     36CTRACK 011:15:00:08      Y       R      SUB2          19980910 10:57:20 19980918 10:33:09        30
EE0803  ZCART     36CTRACK 011:16:00:06      Y       R      SUB2          19980910 10:57:27 19980918 13:12:31        34
EE0804  ZCART     36CTRACK 011:17:00:10      Y       R      SUB2          19980910 10:57:35 19980918 10:33:09        30
EE0805  ZCART     36CTRACK 011:18:00:06      Y       R      SUB2          19980910 10:57:43 19980918 10:33:09         7
EE0806  ZCART     36CTRACK 011:19:00:05      Y       R      SUB2          19980910 10:57:49 19980918 12:54:17        34
EE0807  ZCART     36CTRACK 011:00:00:01      Y       R      SUB2          19980910 10:57:58 19980918 13:08:24        34
EE0808  ZCART     36CTRACK 011:13:00:02      Y       R      SUB2          19980910 10:53:06 19980918 13:04:13        34
EE0809  ZCART     36CTRACK 021:01:36:00      Y       R      SUB2          19980820 10:33:34 19980918 10:33:10        50
```

```
SLUADMIN (n.n.n)                    StorageTek Automated Cartridge System Utility                    PAGE 0003
TIME hh:mm:ss                                Subpool Totals, all Ranges                          DATE yyyy-mm-dd

                                  Subpool ID     Label Type     Range Limits
                                   SUB1              SL          N/A -  N/A

                                                     Non
                                  ACS   LSM   SCRATCH   SCRATCH   Media      Rectech
                                   00   000         0         0
                                                 _______   _______
                                  ACS total        0         0
                                   01   010         5         1   ZCART      36CTRACK
                                        011         0         0
                                                 _______   _______
                                  ACS total        5         1
                                   02   020         3         1   ZCART      36CTRACK
                                        021         3         0   ZCART      36CTRACK
                                                 _______   _______
                                  ACS total        6         1
                                Library total     11         2
```

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Figure 28. Volume Report SUMMary(SUBpool) Sample Output

Chapter 6. Software Diagnostics and Recovery

Overview

This chapter describes the overall diagnostic capabilities supported by all components of the HSC. Diagnostic capabilities include:

- **Generalized Trace Facility (GTF) Tracing (GTRACE)** — This facility provides a history of the processing before a failure.
- **Supervisor Call (SVC), Dump (SDUMP)**, and **Abnormal End (ABEND) Dumps** — Record information on dumps is made available at the time of failure by using these dumps.
- **Error Recording Data Sets (ERDS)** — Software failures are logged into these error recording data sets.

These diagnostic tools can be helpful to you in diagnosing software problems and useful when discussing any problems with StorageTek Support Services.

Generalized Trace Facility

The Generalized Trace Facility (GTF) provides a low level history of the recent past. The HSC issues GTRACE requests for significant events during operation. Format ID and Event ID (FID and EID) are specified as parameters on the EXEC statement (PARM=) of the HSC JCL procedure (refer to “Creating an HSC START Procedure” in the *HSC Configuration Guide* for an example procedure).

Supervisor Call and Abnormal End Dumps (ABEND)

SVC and ABEND dumps are taken where appropriate to diagnose software failures. Do not use SYSUDUMP, SYSMDUMP or SYSABEND DD statements in HSC JCL. These ABEND types do not provide enough information on the HSC address space.

Error Recording Data Set Records

4480 Cartridge Subsystem and 3278 Terminal Subsystem Error Recording Data Set (ERDS) records are written by MVS routines. The HSC writes software records to the ERDS to record:

- software failures for task/service request block (SRB) end
- LSM access door opening events
- LSM and LMU status responses
- LMU error responses
- control data set inaccessible
- control data set copy inaccessible
- both journals filled
- current journal inaccessible
- a switch to the copy of the control data set
- dual LMU status change in a dual LMU environment
- a switch of the host-to-host communication method level.

Library software uses normal ESTAE and FRR capabilities to log task/SRB termination records to the ERDS. Information in the variable recording area of the software record is used to record data pertinent to each subtype of HSC software ERDS records.

HSC Diagnostic Commands

The following HSC diagnostic commands are provided:

- LIst
- Display.

LIst Command

The LIst command is used to display an HSC data structure and to provide for diagnostic support for the HSC. **Use this command under the direction of StorageTek support personnel.**

Syntax

```
►►─LIst──┬─data-structure──┬──────────────────────────────────────►◄
         │                 │
         │          ┌─16───┐
         └─address──┼──────┼──┘
                    └─size─┘
```

Command Name

LIst
initiates the LIst command.

Parameters

data-structure
specifies the name of a single HSC data structure. It may be any one of the following:

LVT
Library Vector Table (large output produced)

BCVT
Initialization/Termination Communication Vector Table

CCV
CAP Communication Vector Table

DCV
Database Server Communications Vector Table

FCVT
Configuration Control Communication Vector Table

HCVT
Host Communication Vector Table

LCVT
LMU Communication Vector Table

MCVT
Mount/Dismount Vector Table

OCVT
Operator Command Vector Table

QVT
Ascomm Vector Table

RCVT
Recovery Communication Vector Table

UCT
Utilities Communication Vector Table

VCT
Volume Cell Communication Table

address
specifies a hexadecimal address of memory.

size
specifies the amount of memory (in decimal) to display. The default size is 16.

Display Command

The Display command offers several options that are useful for diagnostic purposes. For more information on the Display command and its uses for diagnostics, refer to "DISPLAY Command" in the *HSC Operator's Guide*.

CDS Recovery Capabilities

Capabilities to recover the CDS from certain hardware and software failures are inherent in the HSC. CDS recovery capabilities include:

- dynamic recovery of the control data set
- control data set error diagnostics
- initializing/running on one copy of the control data set
- switching to another copy of the control data set
- control data set integrity during BACKup and RESTore
- detecting mismatch of control data sets

Additional recovery information is available in the *HSC Operator's Guide* pertaining to the following topics:

- cartridge recovery
- errant cartridge recovery
- switch to standby LMU
- automatic downward switch of the host-to-host communication method level
- starting the HSC at the base service level.

Control Data Set Recovery

Dynamic Recovery of the Control Data Set

At HSC installation, specifying additional control data sets, secondary and standby, in the LIBGEN SLIRCVRY macro indicates that these additional copies of the control data set are maintained by the HSC during library operation and kept on DASD. In addition, a CDs operator command provides you with the capability to enable or disable any of the various control data sets. An auto-enable function of the command sets the automatic switch capability of the HSC to automatically switch operation to another control data set.

If a failure occurs accessing the primary control data set, the HSC automatically switches operation to the secondary control data set. At the time that the switch to the secondary control data set occurs, the standby control data set becomes valid. After library operation continues with the secondary control data set, should the secondary control data set become inaccessible, the standby control data set is accessed and used by the HSC to keep the library operating.

Note: If the primary and secondary control data sets fail simultaneously, without sufficient time for the HSC to make the standby data set valid and accessible, HSC operation is impaired.

These backup data sets replace a failing control data set; however, they retain their original data set name.

Figure 29 on page 366 illustrates the built-in recovery scheme for the control data sets.

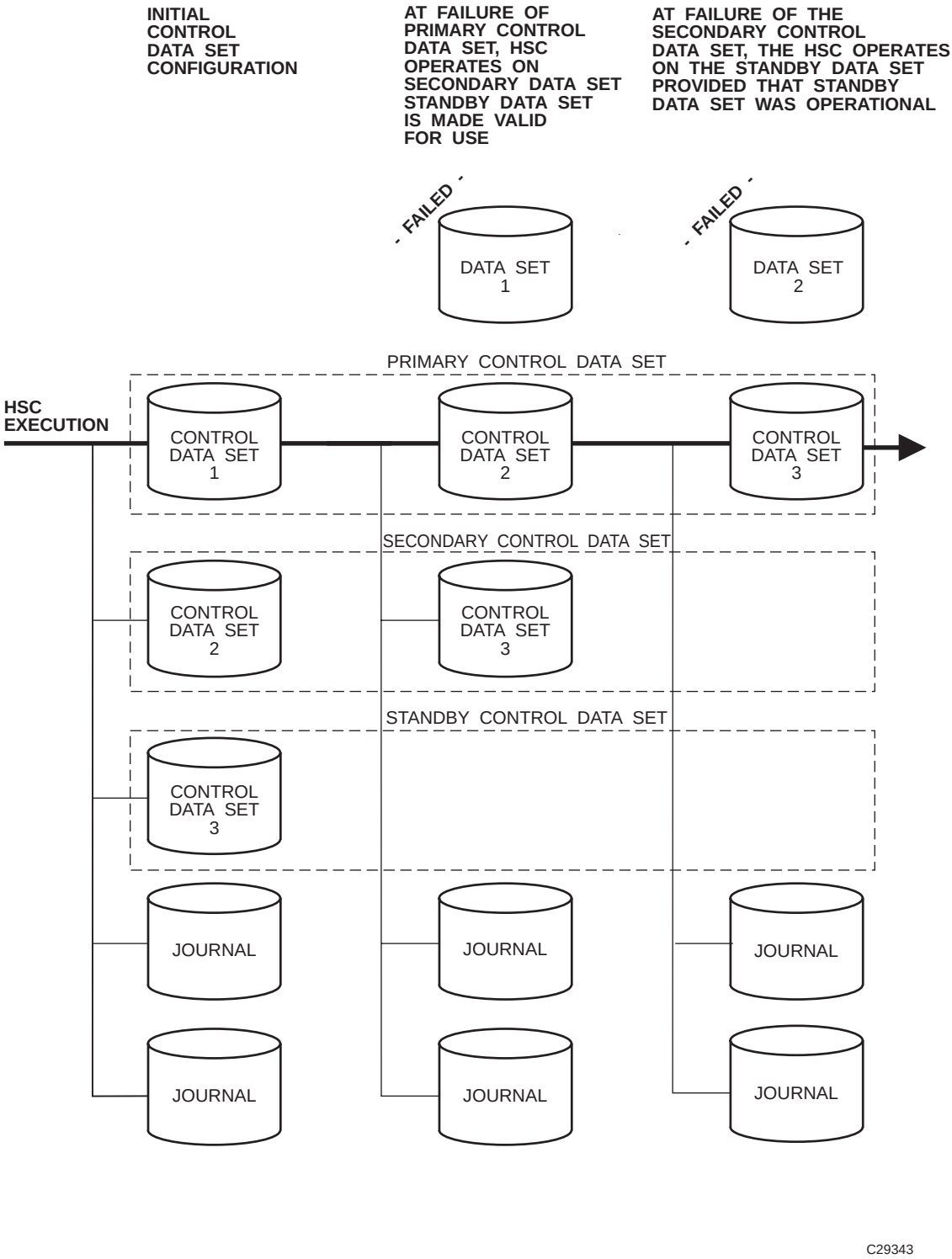

Figure 29. Control Data Set Recovery Scheme

All HSCs in operation must be stopped to perform the restore operation.

If the three control data sets fail, the journal(s) can be used to restore a valid control data set. Refer to “BACKup Utility” on page 214 for detailed information about running the BACKup utility. Refer to “RESTore Utility” on page 285 for detailed information about running the RESTore utility.

Control Data Set Error Diagnostics

Numerous messages are provided to permit you to diagnose problems pertaining to the control data sets. The messages describe error circumstances including:

- block mismatches between copies of the control data sets
- missing DD statements required for control data set initialization
- various backup and restore actions
- discrepancy block information, and other pertinent diagnostic information.

Refer to HSC Messages and Codes Manual for more information about messages encountered that pertain to the control data sets and the BACKup and RESTore utilities.

Control Data Set Processes

Several important processes are available to you for recovery purposes. These are designed to permit you to keep your library running when there are apparent problems with the primary control data set. Processes include how to:

- initialize and run the HSC on one copy of the control data set
- switch to any backup copy of the control data set
- switch the control data set in a multiple-host environment.

Initializing/Running the HSC on One Copy of the Control Data Set

You have the option of initializing and running the HSC on only one copy of the control data set. With the available PARMLIB control statements, you can specify backup control data sets (secondary and standby control data sets); however, if for any reason, the HSC can run on only one of the control data sets, the HSC continues to run normally.

The HSC has the capability of determining which of any number of control data sets are valid and consequently chooses a valid data set with which to continue operation.

It is highly recommended that you initialize, in addition to the primary control data set, a secondary and a standby control data set. With these data sets, you can recover from problems with the primary control data set.

Switching to a Backup Copy of the Control Data Set

If you have initialized your HSC subsystem with the additional backup copies of the control data set, you can dynamically switch operation to any one of the copies without affecting the HSC and library operation.

With an operator command, you can enable or disable specific copies of the control data set. When a copy of the CDS is disabled, the specified control data set is taken offline while the current standby control data set (if present) is brought online; HSC does not terminate during the switch.

When a new control data set is brought online, all work within a library complex requiring CDS access halts until the switch function completes. Depending on the size of the complex, this switching time can take a few minutes. However, this is a better alternative than an HSC shutdown and subsequent restore of data sets, especially in a multiple-host environment.

Operator commands are available to display the status of current control data sets or to enable, disable, or auto-enable any copy of the control data set. Refer to the *HSC Operator's Guide* for detailed information about the commands.

Switching the Control Data Set in a Multiple-host Environment

In a multiple-host environment, the HSC automatically provides communications to all hosts when a control data set switch has occurred. Communications is based on settings from the COMMPath command and control statement (refer to the "Communications Path (COMMPath) Command and Control Statement" in the *HSC Operator's Guide*).

Recommended Recovery Actions

Once you are aware that a switch of the control data set has occurred, it is recommended that the following actions be taken:

1. Run the BACKup utility.
2. Retain a backup copy of each control data set for diagnostic purposes.
3. Run the RESTore utility.
4. If DASD hardware errors are found, reallocate valid control data sets to a good storage device.

If you are unsuccessful in recovering from mismatch errors, contact StorageTek Software Support (refer to the guide *Requesting Help from Software Support)*.

Control Data Set Integrity During RESTore

Refer to "RESTore Utility" on page 285 for more information about running the Restore utility.

Detecting Mismatch of Control Data Sets

Control data set mismatch occurs when the HSC has determined that the primary and secondary (or shadow) control data sets are not synchronized. Normally, the HSC automatically determines which copy of the control data set is valid and switches operation to that data set.

The recovery performed by the HSC is transparent to you, except for the issuance of appropriate messages to the operator. Through the messages, the operator is made aware of the switching that has occurred.

In cases where the HSC cannot determine which control data set is valid, you must run the BACKup and RESTore utilities to recover the data sets. Refer to "When CDS Copies Are

Split Among Hosts After an Error” on page 216 for some special considerations concerning control data sets.

Using a Periodic Backup When Journaling is Not Present

Periodic backups retain information current up to the time they are taken. If the backup copies at restored at some later time, a full audit may be required. However, backups do provide the majority of the inventory information necessary to keep your shop running.

If a corrupted CDS exists, one method of recovery is to run BACKup OPTion(Analyze) specifying the old periodic backup copy and the current corrupted CDS. The CDS parameter should specify the old backup.

If the analyze process is successful or indicates that the corrupted CDS returned an I/O error after the DVAR blocks were processed, the discrepancy list should be correct or close to correct.

An audit run as a background task is still a good idea after the restore, subsequent to bringing up the HSC and running SLSAUDIT, AUDIT, UNSCRATCH, and UNSELECT statements. Recovery time for mission-critical cartridges is less if this is done.

Information Required for StorageTek Diagnosis

To aid diagnosis, collect the following information:

- backup copies of the primary, secondary, and standby control data sets at the time of the error
- console logs for a period of one hour before the mismatch condition was detected.

Gather Diagnostic Materials

During problem resolution, Software Support may request that you provide them with specific diagnostic material. While printed format may be accepted, it is most desirable that you provide machine readable data (on magnetic tape). For small amounts of data, Software Support may request that you FAX the data, instead of mailing it. Sending small amounts of data by FAX may significantly reduce the time taken to resolve problems.

Diagnostic Materials

HSC diagnostic material may be requested by Software Support and, as appropriate to the problem, may include one or more of:

- MVS SYSLOG
- JESMSG data set
- SYSMSG data set
- SYSPRINT data set
- SLSPRINT data set
- system dump data sets
- database DUMPS/DEBUG if master
- EREP - Type ’S; from LOGREC
- details of circumstances

- ISPF/PDF PANEL IMAGES/SPFLOG
- external TRACE for HSC via GTF
- CCW traces
- copy of database files
- INISH deck
- IOCDS
- SAE dumps
- JCL/JOBLOGS.

Tape Format

If Software Support requests a tape of your SYSMDUMP or SYS1.DUMP, follow the format requirement listed below for your operating system type. Failure to follow this requirement may result in a delayed resolution to the problem you are reporting.

Dump using IEBGENER or IPCS

```
DCB=(RECFM=FB,LRECL=4160,BLKSIZE=4160)
```

Tape Return

When requested, Software Support will return any tapes which the sending party has labeled with a return address. Refer to the guide *Requesting Help from Software Support* for more information.

Chapter 7. Performance Considerations

Overview

After installing your Automated Cartridge System you will notice an improvement in your site system performance, especially for jobs and programs where tape cartridge handling is involved. Without any tuning, the ACS should significantly decrease mount/dismount times, shorten batch elapse times, open production windows, and reduce operator intervention. By making minor performance adjustments, you may achieve even more efficiency from your library.

The performance of a library is related to the following:

- overall library activity
- actions performed by systems programmers, at installation or during library operation
- daily operations controlled by an operator.

This chapter contains recommendations and highlights performance techniques that can be helpful to you in making your library operate more efficiently.

How Library Activity Affects Library Performance

Overall library activity and the type of activities involved are great influences on the performance of the library. In a large data center, the vast volume of jobs running that require entering and ejecting of cartridges, mounting, swapping, dismounting, tape drive cleaning, and pass-thrus determine the performance of the library.

Without proper planning and implementation of techniques to control how all of these activities affect performance, a library may not operate as intended or preferred. Therefore, it is important that you customize techniques and employ standard methods developed especially for your data center to optimize the overall performance of your library.

How System Programmers Control Library Performance

Systems programmers command extensive control of overall library performance. This control of performance is inherent with how a systems programmer:

- initially configures the library (during the LIBGEN process)
- uses available utilities and commands
- monitors and analyzes performance
- participates in the development of standard methods and procedures for the data center.

How Operators Control Library Performance

An operator may participate in the initial configuration of a library; however, an operator usually does not have control to change the majority of the static parameters set for library operation at installation time. There are exceptions. Some commands relate to the same functions initially set by PARMLIB control statements. These commands are available for use by an operator for resetting some library parameters initially set at HSC installation and initialization.

An operator impacts library performance primarily during daily operations with the use of operator commands. These commands may be used when operator intervention is required or when it is necessary to reset some static library parameter to improve performance.

Monitoring Library Activity and Performance

There are several methods to monitor library activity and performance:

- running the Activities Report utility to produce a detailed report identifying performance values for various library activities.

  The data in the report can be easily analyzed to produce performance criteria for your installation.

- using the StorageTek Performance Measurement and Predictive Maintenance System (PM2) to collect performance information
- using Expert Library Manager (ExLM) to monitor performance and to balance workload. For more information on ExLM, refer to the *Expert Library Manager User Guide and Reference*.

Using the Activities Report Utility

The Activities Report utility can be used to effectively record, monitor, and analyze library performance. Running the utility on a regular basis in addition to comprehensive analyses can provide you with information disclosing total performance characteristics for your library.

The Activities Report utility generates a report listing relative activity by volume groups. Information reflected on this report can be used to redistribute resources and, if necessary, to balance the cartridge activity load in a library.

This utility provides the library administrator with the information necessary to balance mount/dismount activity across ACSs and LSMs within a library. The information is based on statistics contained in SMF records that are tallied for each cartridge movement. Total Mount and Dismount activity is categorized to show a percentage for:

- scratch mount/total mounts and average time per mount
- nonscratch mounts/total mounts, and average time per mount
- scratch mounts in a different LSM/total mounts, average time per mount, and average number of pass-thrus
- nonscratch mounts in a different LSM/total mounts, average time per mount, and average number of pass-thrus.

Refer to “Activities Report Utility” on page 192 for detailed information on the Activities Report utility.

Using the Performance Measurement and Predictive Maintenance System (PM2)

The Performance Measurement and Predictive Maintenance System generates performance and error reports on various StorageTek equipment, including the library.

There are two categories of reports that provide information about library operation:

- ACS Daily Report
- Tape Volume Report.

ACS Daily Report

The ACS Daily Report contains the following information:

- Library Subsystem Error Report
- LMU Response Summary
- Problem Volume Serial List
- ACS Deblocking Error Report
- ACS Door Open Summary
- ACS LMU Degraded Summary
- ACS Database Journaling Entry
- ACS Primary/Shadow Switch Record
- ACS Audit Required Summary
- ACS Host Recovery Summary.

Tape Volume Report

The Tape Volume Report contains the following information:

- Tape Volume Select
- Tape Volume Analysis.

Refer to *PM2 Report Description & Analysis Manual - Install User's Manual* for detailed information about PM2 and the reports that can be helpful to you in monitoring library performance.

Redistribute Scratch Volumes in the Library

The Scratch Redistribution utility allows you to redistribute scratch volumes across the LSMs within a particular ACS. You can choose to have the scratch volumes go to only specified LSMs or all LSMs within an ACS.

Redistribution is performed to an evenness defined by the balance tolerance level which is specified via the Scratch Redistribution utility. If necessary, the Scratch Redistribution utility swaps scratch volumes with nonscratch volumes to equalize the count of scratch cartridges in an ACS.

Refer to "Scratch Redistribution Utility" on page 304 for detailed information on the Scratch Redistribution utility, syntax, and parameters.

Maintain Quantities of Scratch Cartridges

Typically, in a high-activity environment, if there are insufficient quantities of scratch volumes available within a library, production time can be lost. Scratch volumes are maintained in scratch pools that are defined across the library LSMs. It is important that the number of cartridges maintained in the scratch pools are sufficient enough for normal library operation at your data center. The operator or the systems programmer can control when the HSC warns of low quantities of scratch cartridges.

The Warn command establishes thresholds which control when the HSC notifies the operator of an insufficient quantity of scratch cartridges in an ACS. The scratch pool depletion warning notifies the operator when the number of scratch volumes in an ACS falls below a specified minimum value.

By specifying warning thresholds, you can know when the number of scratch cartridges is too low for normal library operation.

Refer to Chapter 2, "Commands, Control Statements, and Utilities" in the *HSC Operator's Guide* for more information about the command, syntax, and parameters.

Define CAP Preferences

The physical configuration of your library, especially the location of CAPs, can affect both library performance and operator performance. For a more efficient operation, ideally the operator should be located close to the CAPs being used the most. You can control which CAPs are most used.

The CAP preference (CAPPref) command enables you to specify preference values for CAPs. If CAP preferences are not specified, the CAP preference value is set to zero. A CAP with a preference value of zero is never selected (defaulted to) by the HSC unless specifically requested. The CAP preference list specified in the command establishes an ordered list of CAPs for use during cartridge entry and ejection. The HSC chooses an available CAP from this list by starting at the highest priority and moving down the list until a nonbusy, nonzero-priority CAP is identified.

If ejects and/or enters of large numbers of cartridges are frequent, you may want to set higher CAP preferences for enhanced CAPs.

Refer to the “CAP Preference (CAPPref) Command and Control Statement” in the *HSC Operator’s Guide* for information.

Use SMF Records to Collect Performance Data

Library performance data can be accumulated from SMF records. The SMF operand of the SLILIBRY macro for LIBGEN or the SMF parameter of the HSC SET utility determines the SMF record type written by the HSC. The MVS SET SMF command is used to enable recording of SMF data for specific SMF record subtypes to be collected. With SMF recording enabled, a record of various library activities is made for the specified record subtypes. Each library activity, such as each time the VIew command (optional subtype(8)) is used, each time a cartridge is entered or ejected, etc., is recorded as an SMF subtype record.

The SMF database that is created can be used to analyze library performance. Software analytical tools can be used to manipulate the data and create various performance statistics.

The HSC SAMPLIB contains SAS layout statements that can be used to convert SMF data to SAS formatted data. Various SAS reports and graphs can be produced from the formatted data.

Refer to Appendix C, “Record Formats” for information about SMF record subtypes. Refer to “SET Utility” on page 317 for information about the SET utility, syntax, and parameters.

Use PARMLIB to Define Static Parameters

Control statements can be entered into a user-defined PARMLIB data set at HSC installation to statically set various performance criteria. The systems programmer may specify these control statements to be executed when the HSC software is initialized. Most of the statically set parameters can be changed at any time after initialization by issuing an appropriate operator command.

Table 21 on page 378 summarizes the PARMLIB control statements with corresponding operator commands. Any of the PARMLIB control statements can be used to improve various performance aspects of library operation.

Refer to "PARMLIB Control Statements" on page 83 for detailed information about using PARMLIB control statements.

Table 21. Performance Parameters Controlled by PARMLIB Control Statements

Statements Performance Parameter	Control Statement	Operator Command
Device Allocation	ALLOC	ALLOC
CAP Preference	CAPPref	CAPPref
Control Data Set Definition	CDSDEF	
Host-to-Host Communications Path	COMMPath	COMMPath
Control Message Prefix,Eid,Fid,and Hostid	EXECPARM	
Journal Definition	JRNDEF	Journal (specify FULL=Abend or FULL=Continue
Journals	JRNDEF	Journal (specify FULL=Abend or FULL=Continue)
Mount Processing	MNTD	MNTD
General Purpose Options	OPTion	OPTion
Scratch Subpool	SCRPool	Warn (specify SUBpool option)
User Exit	UEXIT	UEXIT

Define High Dispatching Priority for the HSC

The HSC should be defined in a performance group below JES, but above that established for VTAM. You can modify SYS1.PARMLIB members IEAICS00 and IEAIPS00 to assign the HSC to a performance group that has a dispatching priority in the range of JES and VTAM. Since the HSC uses very little CPU time, its high dispatching priority will not affect other system tasks.

During initialization, the HSC uses SYSEVENT TRANSWAP to make its address space non-swappable. The HSC address space cannot be swapped out once this has been accomplished.

Set High-performance Host-to-Host Communications

In a multi-host ACS configuration, host-to-host communications allows hosts to notify each other of a CDS switch. Host-to-host communications can be accommodated through three performance levels of communications, ranked as follows:

- ACF/VTAM
- LMU(s)
- CDS.

The high-performance telecommunications method is through VTAM. This method is recommended by StorageTek. Host-to-host communications through the control data set should be used only as a backup facility. You should implement the highest level of host-to-host communications available.

“Communication Functions” and “Communications Path (COMMPath) Command and Control Statement” in the *HSC Operator’s Guide* describe how multiple hosts are connected by any of the three possible communication methods. You have the capability to set or dynamically switch the host-to-host communication method between each pair of hosts. You can monitor the level of communication using the Display COMMPath command. If a level of communications fails, it automatically drops to the next lower level, allowing the HSC to continue without interruption.

The communications parameters can be modified dynamically, using the COMMPath command, without halting HSC execution.

Detailed Information about Host-to-Host Communications

Refer to "Communication Functions" and “Communications Path (COMMPath) Command and Control Statement" in the *HSC Operator’s Guide* for a general description of communication functions.

Refer to “PARMLIB Control Statements” on page 83 for how to define communication functions in a PARMLIB control statement.

The “Communications Path (COMMPath) Command and Control Statement” in the *HSC Operator’s Guide* contains information about the operator commands for controlling the host-to-host communication path.

Functioning of Host-to-Host Communications

The method hierarchy that is established is, from highest to lowest, VTAM, LMU, CDS. Initially, all methods are set to CDS. Appropriate entries can be placed in the PARMLIB statement to set the communications method at HSC initialization. If an error in communications occurs during communications with the current communication method, a method switch is performed.

The system may switch from a method of VTAM to LMU, selecting the first LMU available from a list of defined LMUs. If the current method is LMU, the system attempts to find the next LMU available from the list, or switches from LMU to CDS. If a list of

LMUs has not been defined by the PARMLIB statement, or if no LMUs are available, the system switches directly from VTAM to CDS.

Note: After a downward switch has occurred, you **must** issue an operator command to perform an upward switch (for example, from CDS to LMU, CDS to VTAM, or LMU to VTAM).

Figure 8 on page 80 illustrates how various combinations of communication methods can exist at the same time between multiple hosts.

Designation of Communication parameters

When specifying communication parameters in the operator command, the parameters can designate different actions depending upon whether or not the host specified in the command is the host that is executing the command.

When the command is defining parameters for the host executing the command, the method parameter defines the highest method in the hierarchy allowed to be defined on that host.

If a command defining parameters for another host specifies a higher method, the current method for this other host is set to the executing host's limit, if possible. To change a host's method hierarchy limit, the command must be issued on that host, except during HSC initialization when the method is set from a PARMLIB control statement.

When the command is defining parameters for the host executing the command, the LMUpath parameter defines those LMUs this host is allowed to use for sending messages. For two hosts to communicate via an LMU, there must be matching entries in their respective LMUpath lists.

Careful analysis should be performed when defining the communication method in the PARMLIB control statement because of how the system handles the switching.

Define Secondary and Standby Control Data Sets

Various controls and services are in place in the HSC subsystem to ensure that the primary control data set maintains its integrity. Included among the controls are the capability to:

- designate secondary and standby control data sets as backup
- run BACKup and RESTore utilities
- designate journal data sets for use in recovery of control data set errors.

However, though all of these means are available, you must configure your installation to take advantage of the capabilities. At installation, when defining the library configuration, it is important that you initialize the additional control data sets.

It is highly recommended that secondary and standby data sets be used to ensure the performance and reliability of your library.

Refer to Chapter 5, "Initializing the Control Data Sets" in the *HSC Configuration Guide* for information about defining control data set requirements at HSC installation.

See ‘‘SWITCH Command’’ in the *HSC Operator’s Guide* for information about the operator commands to control switching of control data sets.

Limit View Time to Maintain High Performance

Certain conditions within a library can significantly affect performance. These conditions may occur because of software issues or simply because of daily procedures used within a data center. The VIew command is invoked to improve performance because it can be used to quickly resolve problems. It can often eliminate the need for an operator to open an LSM door and enter the LSM to resolve a problem. Excessive use of the VIew command is a typical example of how library performance can be drastically affected unless you plan and consider how it can impact the performance of your library.

Though the VIew command is primarily used by operators, it is important for systems programmers to know that excessive use of the VIew command for extended periods of time can impact the performance of an LSM and your library. However, you should use the VIew command to inspect the interior of an LSM rather than place the LSM in manual mode and physically enter the LSM. If it is necessary to inspect the robot, its hands, and/or cameras, you must modify the LSM offline and enter through the access door.

Default view time can be controlled with the OPTion Viewtime command. The system default for view time is 10 seconds. However, you can change this default value to fit your needs.

Refer to Appendix A, “Macros, Control Statements, Utilities, and Commands Syntax Reference” for the OPTion Viewtime command syntax or to Chapter 2, “Commands, Control Statements, and Utilities” in the *HSC Operator’s Guide* for information about the command, syntax, and parameters.

Excessive Use of VIew Command Affects Performance

Each time the VIew command is invoked, the automatic functioning occurring within an LSM is interrupted. During the interruption, the robot hands and associated cameras are stopped from performing HSC directed library functions to focus on some specified area within the LSM for some specified time interval. Any manual intervention with library functioning can have a negative effect on the throughput of an LSM and consequently affect overall library performance.

How to Monitor Usage of the VIew Command

There are two facilities available for monitoring use of the VIew command:

- enabling SMF logging
- running and analyzing the Activities Report.

It is highly recommended that you enable recording of the subtype 8 SMF record. After each successful use of the VIew command, a subtype 8 SMF record is written. The record documents the component that was viewed, the view time requested, and the actual view time used. Be aware that the time actually used can be shorter than time requested at the invocation of the command, if the operator responds to the outstanding WTOR before the expiration of the requested time interval. Refer to the post-installation tasks information in the *NCS Installation Guide* for details on how to specify the SMF parameters.

Note: Subtype 8 SMF record logging is not a default and must be specified in accordance with the instructions contained in the referenced paragraph.

Another useful technique to monitor the use of the VIew command is to run the Activities Report utility and to thoroughly analyze the resulting report. Heavy use of the VIew command results in low levels for performance criteria delineated in an Activity Report. Depending upon system load for the specified time reported in an Activity Report, most performance parameters are adversely affected by excessive use of the command. For example, LSM ARM USE percentages reflected in an Activities Report are most likely to be low during heavy use of the command.

Each successful use of the VIew command is counted as one robotic motion for reliability measuring (R+) purposes. Refer to Appendix C, “Logging ACS Robotics Motion” on page 667 for more information.

Advantages of Using the VIew Command

There are definite advantages for using the VIew command in place of other alternatives. Obvious benefits for using the command include:

- The VIew command easily permits monitoring of tape drives and other LSM components with the execution of a single command entered at the system console.
- The LSM does not need to be modified offline to execute the command.
- The operator does not enter the LSM.
- The camera can be focused on a specific component that is considered as suspect; thus, time is saved by avoiding the lengthy process of physically entering the LSM.
- With the use of SMF logging, accurate records can be accumulated for system analysis or to monitor system status.

Loading Cartridges into the Library

There are different methods that can be used to load an LSM with cartridges at installation time. There are advantages and disadvantages involved for each method. The following brief discussions may help you determine which loading method is best for your installation.

Loading Cartridges for Immediate Use in a Newly Installed LSM

If you are loading cartridges into an LSM that must be placed into production, it may be advantageous to begin entering volumes a few at a time through the CAP.

Tape cartridges can be entered into an LSM by several methods:

- using the ENter command to enter cartridges through the CAP
- setting a CAP to automatic mode and opening and filling the CAP repeatedly
- loading the CAP and running the Cartridge Initialization utility to load the cartridges into the LSM and to write the magnetic label on the cartridges (provided that they are in scratch status in the tape management system).

Refer to "Initialize Cartridge (INITIALIZE) Utility" on page 248 for information about the Initialization utility, the syntax, and parameters. Refer to the "CAP Preference (CAPPref) Command and Control Statement" in the *HSC Operator's Guide* for information about how to set the CAP in automatic mode. Refer to "ENTER Command" in the *HSC Operator's Guide* for information about the ENter command.

Note: The control data set is updated with each load of cartridges entered through the CAP.

If you begin entering cartridges containing data sets known to be required by regularly scheduled jobs, these volumes are immediately available for use. The obvious advantage of using this method is that the LSM and any cartridges entered are immediately available for use.

Loading Cartridges for Later Use in a Newly Installed LSM

If you are loading cartridges into an LSM that is not scheduled for production immediately, it may be to your advantage to manually load the entire LSM. The cartridges must be previously initialized to use this method.

After all cartridges are loaded into cells, run the AUDIt utility for the LSM to update the control data set.

This method of loading cartridges into an LSM is faster for physically moving the cartridges and takes less operator time. However, running the AUDIt utility for an entire LSM can take a significant amount of time.

Reduce Pass-Thrus

The number of pass-thrus required to mount, dismount, and replace cartridges in LSMs can impact library performance. In a large or busy ACS, this impact may be significant especially during periods of heavy mount activity. There are three categories of pass-thrus:

- unavoidable
- unnecessary
- scheduled.

Unavoidable Pass-Thrus

The HSC attempts to minimize the number of pass-thrus required; however, depending upon available tape transports and locations of cartridges, pass-thrus often cannot be avoided. By running Activities Reports on a regular basis and examining the results, you can see that mounts for different LSMs take longer than mounts for the same LSM.

Unnecessary Pass-Thrus

Scratch mounts, dismounts, enters, and ejects that require pass-thrus are unnecessary and should be avoided. These types of activities divert the robot from productive work especially during periods of peak activity.

If scratch subpools are properly defined and managed, scratch cartridges normally are not involved in pass-thrus. Scratch mounts are the same as specific mounts as far as pass-thrus that cannot be avoided. In general, you should never see a scratch pass-thru. But, if you do see a scratch pass-thru, it was unavoidable.

The effect of unnecessary pass-thrus is not obvious in the Activities Report. You must compare their number with average mount times to see the effect on performance.

Scheduled Pass-Thrus

Using the Scratch Redistribution utility to balance scratch cartridges involves moving cartridges to various LSMs to achieve scratch balancing. This type of activity involves heavy pass-thru usage. If you must balance scratch volumes across your library, schedule such activity during off peak hours. This approach will ensure that the pass-thru activity involved does not directly interfere with mounts and dismounts for high-priority production.

You can use Expert Library Manager (ExLM) to schedule pass-thrus. Refer to the *Expert Library Manager User and Reference Guide* for more information.

Ways to Reduce Pass-Thru Activity

There are various ways to reduce pass-thru activity. Each of these ways is briefly discussed in the following paragraphs.

Set MNTD Float to ON

The Float option of the MNTD command specifies whether the HSC is to select a new home cell location when it dismounts a volume that requires a pass-thru when it is dismounted.

When MNTD Float is set to ON, cartridges are not passed back to their original LSM. The cartridges are assigned new cells in the LSM where they are dismounted. This action eliminates most unnecessary pass-thrus.

Set MNTD SCRDISM to CURRENT

When MNTD SCRDISM is set to CURRENT, scratch cartridges mounted in a 9360 (WolfCreek) LSM are dismounted in the same device rather than being archived in the next largest storage device.

Ensure adequate free cells

Setting MNTD Float to ON can be defeated if there are no free cells in the dismounting LSM. Dismounted cartridges are passed to other LSMs to find a new home cell.

Use the Display Lsm command to determine the number of free cells in each LSM. Use MOVe or EJect to create free cells if they are needed.

Eject through the CAP closest to the cartridge

If you eject a cartridge through the CAP of the LSM where it resides, no pass-thrus are required.

If you eject a cartridge without specifying a CAPid, the cartridge is ejected through the highest priority CAP that is not busy. This type of activity may cause one or more unnecessary, nonproductive pass-thrus.

The recommended way to accomplish ejects without affecting performance with pass-thrus, is to use multiple CAP option on the EJECt utility. By specifying multiple CAPs (i.e., CAP(000,001,002)), the desired effect (i.e., no pass-thrus) is achieved.

Redistribute cartridges during off-peak times

You can use the MOVe command and utility to move cartridges within an LSM or between LSMs. The Scratch Redistribution utility can be used to move scratch cartridges between LSMs until an equilibrium is reached. Each inter-LSM movement of cartridges causes pass-thrus which delay robot movement in mounting a cartridge.

Depending on the number of cartridges to be redistributed, you may prefer to schedule moves and scratch redistribution during periods of low data center activity. The redistribution runs faster and performance is not affected during off peak times.

Reduce Operator Intervention

Although the ACS runs mostly unattended, situations occur where operator intervention is required. Excessive and unnecessary operator intervention impacts library performance. There are specific ways in which operator intervention can be reduced. These include:

Set ALLOC Defer to ON

If a keep is issued for a cartridge while it is being mounted, the HSC issues a message indicating that the robot cannot dismount the volume. An operator must unload the tape transport and then reply ‘‘R’’ to the message.

This situation is caused by programs allocating cartridges through JCL, not opening the data set on the cartridge, and terminating before the mount completes. It causes unnecessary mounts, extends dismount time, and delays the availability of cartridges and transports.

If a message requiring operator intervention occurs frequently, you may want to set ALLOC Defer to ON so ACS mounts are deferred until the data set is opened. Alternatively, you can code User Exit 09 for JES2 or User Exit 11 for JES3 with SETUP processing to selectively defer a subset of ACS mounts.

Set CAP Preference

In a multiple-LSM ACS, the CAPPref command establishes an ordered list of CAPs to use should the operator or HSC start an activity that requires a CAP without specifying a CAPid.

To enter or eject cartridges faster, set CAPPref such that the CAP closest to the cartridge racks is preferred. This minimizes operator travel distance.

In large ACS configurations, of five or more LSMs, consider setting CAPPref such that a CAP in the middle of the ACS has the highest priority. This may make the operators walk further, but it reduces the number of pass-thrus should the default (highest priority) CAPid be used for ejecting cartridges.

Prefetch Enters

Nonlibrary cartridges that are mounted on library transports are delayed while the operator fetches and enters them. This is a common occurrence for HSC sites with all transports attached to the library.

If you or your scheduling system can predict which nonlibrary cartridges will be mounted in the library before a mount message appears, your operator can improve performance by entering those cartridges in advance.

Avoid Crashing Test Systems

Library attached hosts own library resources, including CAPs, tape drives, and cartridges. If a host fails, another host must clean up the resources held by the failing host. This delays mounts and dismounts on the recovering host while recovery takes place.

You should attempt to shut down the HSC properly before IPLing a system. This is especially important for test systems that may be restarted several times a day.

Use Unit Affinity Separation

Unit affinity separation can improve library performance by eliminating the need for operators to enter or eject tape cartridges when volumes are requested with unit affinity. Without unit affinity separation, a tape transport is selected based on the location of the first volume.

Refer to the *SMC Configuration and Administration Guide* for information about the ALLOCDef command SEPLvl parameter, which specifies the exclusion level at which affinity chains are separated.

Reduce Tape Transport Contention

Balanced use of library tape transports results in better robotic and system performance. In a multiple LSM library, you want the workload to be spread evenly among the robots rather than having one robot overloaded while the others are idle. Within each LSM, you want mounts to be evenly distributed among transports rather than having the robot wait for a cartridge to be rewound so it can mount the next cartridge on the same tape transport.

Tape transport contention can be reduced by:

- ensuring scratch cartridge balance
- managing multi-host tape transports
- avoiding dedicating tape transports
- using two tape transports for multi-volume files.

Reduce Scheduling Contention

Effective scheduling can increase library performance. Controlling the following scheduling related areas can help significantly in further increasing library performance:

- strive for a balanced workload
- schedule nonproductive library activities during low-demand times.

Balancing the Workload

If you experience higher than expected average mount times, but at the same time experience an improvement in production throughput, it could be an indication that your system is periodically flooded with work rather than having a balanced workload.

For example, all of your production jobs may be getting submitted at the beginning of a shift so that the library robots are overworked for the first few hours of the shift. Then, the robots may remain idle for the remainder of the shift. If you are using a scheduling software package and it releases jobs every hour on the hour, there may be tremendous tape transport contention for the first few minutes of each hour while the transports are unused for the remainder of each hour.

These situations tend to elevate average mount times; however, as long as the work is performed on time, there is probably no need to change conditions. However, if the work is not getting performed on schedule, you can improve performance by balancing your production workload.

Scheduling Nonproductive Activities During Low-Demand Times

There are several library utilities, which, though very essential, severely impact the library's ability to mount and dismount cartridges. The following utilities should not be run when high-priority production jobs are pending:

- AUDIt
- EJECt
- Initialize Cartridge
- MOVe
- Scratch Redistribution
- Scratch Update.

These utilities should be scheduled during quiet periods so they do not contend with mounts and dismounts. Running these activities during quiet periods also ensures that the tasks complete faster. In the case of mass enters or ejects, operator's time can also be optimized.

Use Deferred Mounting in a Manual Mode LSM

Using the ALLOC command with the Defer parameter set to ON in a manual mode LSM can improve performance. Under the conditions set to defer mounting of cartridges, a cartridge is not mounted at step allocation time, but is only mounted if a data set on the volume is required to be opened by a calling program. Thus, unnecessary mounts and dismounts by the operator can be avoided.

Use Performance Log Reblocker to Format Data

The performance log reblocker (SLUPERF) prepares the performance log file produced by the SCP for use by the library Activities Report utility. The utility executes in both MVS and VM environments, for which different versions of the utility are produced.

Use the AUDIt Utility Effectively

The AUDIt utility causes the robot to read cartridge labels. Tape cartridge information is uploaded to the CDS. In a quiesced LSM, performing an audit on a full panel can take up to 15 minutes, depending upon the LSM type, size, and configuration.

You should keep in mind that empty cells slow down an audit. If the robot cannot read a cartridge label, it must reach out to determine if the cell is empty. Each empty cell takes approximately three times longer to audit than a cell containing a cartridge.

If you are partially filling an LSM before running an audit, you should fill as many complete panels as possible and then audit only those filled panels. Avoid auditing empty cells.

Use LSMs as Scratch Loaders in a Mixed ACS

In an environment where massive cartridge input is required or a lot of cartridge movement occurs, 9360 (WolfCreek) or 9310 (PowderHorn) LSMs can be used to simulate scratch loaders intermixed with 4410 LSMs to improve library performance.

1. Specify the following operator commands:
   - MNTD SCRDISM(ARCHIVE)
   - ALLOC SCRtech(ROTATE)
2. Run scratch redistribution frequently or enter scratches into devices previously selected by the ALLOC LSMpref command.
3. Eject cartridges when necessary from the archive device (4410 or 9310).

Figure 30 on page 392 shows a 9360 used as a scratch loader.

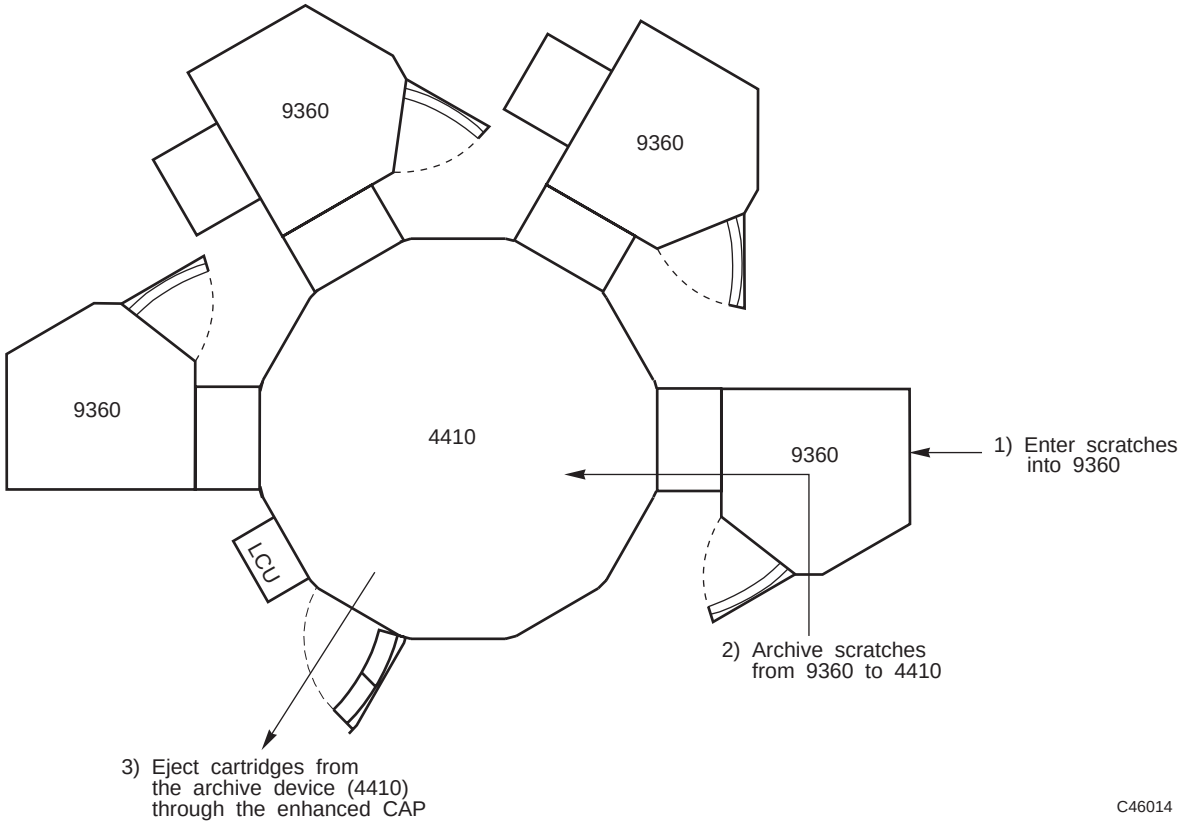

Figure 30. Using LSMs as Scratch Loaders

Chapter 8. Software Interaction

Overview

The HSC subsystem operates in conjunction with various other third-party software. However, StorageTek can only recommend some techniques to ensure complete compatibility of the HSC with these third-party packages.

There are distinct areas of software interaction possible:

- operating system software interaction
- third-party software interaction
- customized programmatic interfaces.

Operating System Software Interaction

DFSMSrmm

DFSMSrmm Scratch Subpools

DFSMSrmm defines a scratch pool consisting of a single range of volumes (in powers of 10). Scratch pools are based on the host system that is using the volumes. There is no mechanism for associating a scratch tape request with a specific pool. Any volume from a pool that allows use on the system making the request can be used to satisfy the scratch request.

IBM recommends one scratch pool per host system. You can create and manage subpools of library controlled scratch volumes using the SCRPOol PARMLIB control statement and HSC user exits 01, 02, 03, and 04. Refer to “Scratch Subpool Control Statement” on page 102 syntax and parameter descriptions, and to Chapter 9, “User Exits” on page 397 for information about HSC user exits.

Data Facility Hierarchical Storage Manager (DFHSM)

If you plan to use DFHSM for library transports, you must code the SETSYS command to define the tape environment. You must also specify the esoteric name that represents the library transports used for DFHSM functions on the USERUNITTABLE parameter. See the appropriate IBM publication for more information on DFHSM.

Third-Party Software Interaction

Note: Exercise caution if you use any third-party software that modifies the Eligible Device List (EDL) and therefore the MVS Device Allocation process. These products may compromise the functionality of the HSC and lead to unpredictable results.

Multi-Image Manager

Multi-Image Manager (MIM) is a third-party software product produced by Computer Associates International, Inc. MIM is used in a multi-CPU environment to control the allocation of transports to a particular host.

Devices within the library should **not** be used for MIM device preferencing or job reserve. If library devices are used for these MIM functions, the HSC only allows MIM device preferencing or job reserve to modify device selection if the target VOLSER resides in the same LSM as the devices that are requested to be preferred or reserved. The primary goal of HSC is to eliminate pass-thru events.

Warning: To prevent response or lockout problems, it is strongly recommended that MIM data sets do not reside on the same volume with the HSC's CDS or journal files.

CA-ASM2

Automatic Reload uses Open Type J for auto data set reload. The user explicitly specifies the appropriate transport pool (ACS or manual) for auto data set reload.

- If it is desired to have all reloads done for the library, specify the esoteric associated with ACS transports.
- If it is **not** desired to have all reloads done for the library, specify the manual transport esoteric.

Global Resource Sharing (GRS) and Multi-Image Integrity Manager (MII)

For performance reasons, it is required that the DEQ/RESERVE QNAME (defined in the LIBGEN SLILIBRY macro MAJNAME parameter) and DEQ/RESERVE QNAME "STKENQNM" (used at HSC startup time and for HSC utilities) be added to the GRS Systems Exclusion List or the MII exclusion list so the HSC device reserves and releases take effect on the DASD rather than being handled by GRS or MII.

In addition, the HSC should be started after MII.

Note: If you have installed StorageTek's LibraryStation product, you must add to the QNAME being excluded an RNAME for each HSC CDS data set.

CONTROL-M/TAPE Tape Management System

HSC provides limited support for the CONTROL-M/TAPE tape management system. Refer to the BMC publication *CONTROL-M/TAPE Implementation Guide* for more information.

Customized Programmatic Interfaces

The HSC can interface with custom programs provided that the specifications described in Appendix D, “Programmatic Interface (PGMI)” on page 685 are followed.

The HSC is capable of providing various services and information to custom programs with which it interfaces. The appendix provides the following:

- descriptions of the services and information that the HSC can provide
- how to use the interface
- macros, including usage considerations, syntax, parameter descriptions, and return codes.

Chapter 9. User Exits

Overview

The HSC has a facility to define and invoke user exits at particular points during its processing. For every defined exit, StorageTek distributes a dummy exit routine in both source and object form. The dummy version causes the HSC to effectively turn off the use of that particular user exit. Customers can replace the dummy exit routine by coding their own routine and replacing that module in the HSC program library, or the library specified by the SLSUEXIT DD statement in the HSC startup proc.

Note: When migrating to a new release of the HSC, you are not required to reassemble your user exits. However, if you choose to do so, StorageTek suggests that user modifications to user exits and other StorageTek-supplied programs be based on the source code shipped in the current release.

Sample source code for several user exits and programs SLUCONDB, SLUDRCA1, SLUDRTLM, and SLUDRRMM shipped with HSC 2.0.1 and earlier releases contained references to the SLSSAPAR macro. This macro has been removed from the product, and references to it will cause an assembly error.

Source for the dummy exit routines (SLSUX*nn*) and other sample user exits (UX*nn*SAM*n*) is distributed via SMP/E in SAMPLIB. User exits for JES2 and the base HSC are distributed in the HSC JES2 SAMPLIBs. HSC JES3 user exits are distributed on the HSC JES3 SAMPLIBs.

Notes:

1. In this chapter, the term JES2 includes JES3 without SETUP processing; the term JES3 refers to JES3 with SETUP processing.
2. The HSC allows ESOTeric and SUBPool parameters to be specified in the TAPEREQ control statement as well as user exits. Customers should examine their user exits to determine whether they could be replaced with TAPEREQ parameters. Control statements can also be used to control affinity separation policy and defer policy.

   Refer to the *Storage Management Component (SMC) Configuration and Administration Guide* for information on TAPEREQ and user exit interaction.

Overview of User Exits

Table 22 lists the user exits provided with the HSC software and describes the primary function of each exit.

Table 22. Summary of HSC User Exits and Functions

User Exit Name	Exit Number	Description
Job Processing User Exit	SLSUX01	Facilitates interface of the HSC to tape management systems. It is also used to implement scratch subpooling.
JES2 Scratch Allocation User Exit	SLSUX02	Used to influence allocation and selection of tape transports to satisfy a nonspecific volume request under JES2.
Scratch Subpool User Exit	SLSUX03	Used to define multiple scratch subpools or scratch subpools of different volume label types.
JES3 Scratch Allocation User Exit	SLSUX04	Used to influence allocation and selection of tape transports to satisfy a nonspecific volume request under JES3.
Programmatic Interface Authorization User Exit	SLSUX05	Implements the performance of authorization checking.
Insert/Delete User Exit	SLSUX06	Implements reporting to provide information about volumes added or deleted from the library control data set.
User Exit Maintenance User Exit	SLSUX07	Allows you to maintain user exit words passed to each defined user exit.
JES2 Specific Volume Allocation User Exit	SLSUX08	Used to influence allocation and selection of tape transports to satisfy a specific volume request under JES2.
Deferred Mount User Exit	SLSUX09	Allows you to override the default setting and MVS defer the mount of a cartridge on a library transport.
JES2 Unit Affinity Separation User Exit	SLSUX10	Allows you to override the default setting, and control GDG or unit affinity separation for a specific GDG ALL or unit affinity chain.
JES3 Deferred Mount User Exit	SLSUX11	Allows you to override the default setting and JES3 defer the mount of a cartridge on a library transport.
JES3 Unit Affinity Separation User Exit	SLSUX12	Allows you to override the default setting, and control GDG or unit affinity separation for a specific GDG ALL or unit affinity chain.
JES3 Specific Volume Allocation User Exit	SLSUX13	Used to influence allocation and selection of tape transports to satisfy a specific volume request under JES3.
Volume Access User Exit	SLSUX14	Allows you to invoke security checking for volume access at mount and eject time.
Command Authorization User Exit	SLSUX15	Used to ensure command security.

Each user exit routine must conform to processing requirements and specifications for that particular user exit. Requirements for each user exit are specified in detail in each user exit topic that follows.

Application of User Exits in JES Environments

Table 23 provides a reference for determining the applicability of any user exit function within the JES environments.

Note: All of these user exits are managed by the HSC but invoked by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

Table 23. Application of User Exits in JES Environments

User Exit Function	JES2	JES3
Deferred Mount	SLSUX09	SLSUX09, SLSUX11
Influence Device Allocation for Scratch Volume Requests	SLSUX02	SLSUX04
Influence Device Allocation for Specific Volume Requests	SLSUX08	SLSUX13
Esoteric Substitution or Unit Affinity Separation for Affinity Chains	SLSUX10	SLSUX12

Note: All other user exits are applicable regardless of the JES running.

User Exit Attributes and Execution Environment

Unless otherwise noted in the description of an individual exit, the following sections apply to all HSC user exits.

Entry Specifications

The entry point for all exits is at offset zero. The register contents upon entry to user exit routines are as listed in Table 24.

Table 24. User Exit Entry Specifications

Register	Contents
0	Undefined.
1	Address of parameter list.
2 - 12	Undefined.
13	Address of 18 word register save area.
14	Return address.
15	Address of user exit entry point.

Program Attributes

Write user exits with the following program attributes in mind:

- A user exit is entered via SYNCH (SVC 12) and its own PRB is created for it. Follow standard OS save area chaining and linkage conventions.
- If the exit uses authorized services it must be link-edited with the authorized attribute 'AC=1'.
- The exit must reside in a library defined in the IEAAPF*xx* member of the SYS1.PARMLIB.
- The exit is given control with Storage Key 0 and in Supervisor State.
- The exit must be reentrant and refreshable.
- The exit is loaded in pageable CSA.
- The exit is executed in TCB mode, no locks held.
- Because of their privileged status, have user exits to the HSC reviewed by system auditors conducting any system integrity or security audit.
- In general, user exits are given control with AMODE set to 31. Exceptions to this rule are noted in the detailed descriptions of individual exits.
- In general, user exits are regarded as having RMODE ANY. Exceptions to this rule are noted in the detailed descriptions of individual exits.

  If it is necessary to force an RMODE of 24, you must give the exit's load module the RMODE 24 attribute through either the assembler RMODE statement or the link-edit process. The HSC honors the RMODE attribute it finds for the exit's load module. If you do not specify the RMODE attribute during either assembly or link-edit, the default RMODE will be 24. This is normally not a problem, but your exit may contain some special logic that is sensitive to RMODE.

Return Specifications

Registers on return to HSC from user exits are listed in Table 25.

Table 25. User Exit Return Specifications

Register	Contents
0-14	Values at entry to exit.
15	Return code (in hexadecimal).

How to Enable/Disable/Reload User Exits

User exits are loaded at HSC subsystem initialization from the load library identified by ddname SLSUEXIT, or from the HSC load library with the default names.

- Each user exit can be defined to the HSC with the UEXIT PARMLIB control statement. Issue a separate control statement for each user exit you want to invoke by substituting the exit number in the SLSUX*nn* parameter, or by specifying the entry point name used to link-edit the load module. The UEXIT statement allows you to load the exit in either an enabled or disabled state.
- If no UEXIT statement for a particular user exit is found in the HSC PARMLIB data set, the HSC loads that user exit's default stub from one of two sources:
  - the SLSUEXIT DD statement, if it is present in the HSC START procedure, or
  - the HSC load library, if SLSUEXIT does not exist.

  Unless replaced by the customer, the HSC load library contains the StorageTek default stubs of each user exit and sets a return code of 64, indicating the user exit is inactive. When the HSC receives a return code of 64 from an initial call to the user exit, it does not call the exit again during that HSC session unless the exit is explicitly reloaded or activated using the UEXIT operator command.

The HSC UEXIT command can be used to dynamically enable, disable, reload, or query the status of user exits. Refer to ''User Exit (UEXIT) Command and Control Statement'' in the *HSC Operator's Guide* for details.

User Exits and Scratch Subpooling

Tape management systems, such as CA-1 (TMS) and CA-DYNAM/TLMS, permit definition of relationships between job names or data set names and tape or cartridge volume serial numbers. This concept is sometimes referred to as scratch subpooling. When it is employed, the tape management system only permits certain nonspecific (scratch) mounts to be satisfied by volumes in qualified scratch subpools.

Scratch subpooling is supported in the HSC through user exits.

- User Exits SLSUX01, SLSUX02, SLSUX03, and SLSUX04 are used to implement scratch subpooling.
- SLSUX01 is called at volume mount time to select a scratch volume. The subpool information provided by SLSUX01 allows the selection of a tape volume from the correct subpool.

  Note: You must code either the TAPEREQ SUBPool parameter or the SLSUX01 user exit regardless of whether you are using a tape management system or one of the HSC methods for scratch subpooling.

- SLSUX02 is called at device allocation time to select a device in the LSM containing the most scratch volumes of the correct subpool type. The subpool information provided by SLSUX02 allows the selection of a tape transport in the LSM with the most scratch volumes of the correct subpool type. SLSUX02 is used in a JES2 or JES3 (without device setup) environment.

- SLSUX03 is called at HSC initialization time to define the scratch subpools. Scratch subpools may be defined to the HSC using the SCRPOol control statement in the PARMLIB data set. Using this method is preferable to specifying scratch subpool names through SLSUX03.

  For more information on using the SCRPOol control statement, refer to "Scratch Subpool Control Statement" on page 102.

- SLSUX04 performs the same function as SLSUX02 for a JES3 environment with SETUP.

"Scratch Subpool Management" on page 43 provides additional information about user exits, the SCRPOol control statement, and operator commands used to work with scratch subpools.

Note: The HSC supports subpool specification by name using the SUBPool parameter on the TAPEREQ control statement. Refer to "Tape Request (TAPEREQ) Control Statement" on page 120 for more information.

Virtual Storage Manager (VSM) Support

VSM support has been added for certain HSC user exits. See the VTCS documentation for more information.

Job Processing User Exit (SLSUX01)

Functional Description

The SMC requests HSC library actions by receiving and analyzing system console messages. If the message is of use to the SMC, for example, an MVS mount message, the SMC extracts the necessary information from the message, such as the VOLSER and drive address, and sends this information to the HSC to direct the library hardware to perform the requested action.

User Exit 01 provides the facility the customer can use to change or enhance actions taken on intercepted messages or can direct the SMC to perform actions on messages that are not in the intercepted messages list. The user exit requests a specific SMC action by returning appropriate values to the SMC in the form of a parameter list.

There are two principal applications for User Exit 01:

- Request the SMC to take action for messages other than those automatically intercepted by the SMC. You may have a tape management system that issues special messages requiring the SMC to take a certain action. User Exit 01 intercepts console messages requiring action, and uses the User Exit 01 parameter list to instruct the SMC to perform the required action.

  Note: There are several CA-1 messages that are automatically intercepted. Refer to the *SMC Configuration and Administration Guide* for information about the JMSGdef command, which adds messages to the list sent to SLSUX01.

- Enhance the SMC to support scratch subpooling in response to a Mount message requesting a scratch tape.

  The default SMC action for a Mount message requesting a scratch tape is to request that the HSC select the appropriate scratch volume contained in the library and mount it on the drive address requested in the Mount message.

  Using User Exit 01, you can examine the Mount message and according to the exit code defined criteria (jobname, etc.), specify through the User Exit 01 parameter list that the scratch tape selected to satisfy the request must be chosen from a specified subpool of available scratch tapes. The VOLSERs contained in a particular scratch pool are defined using User Exit 03 or the HSC PARMLIB SCRPOol control statement.

Environment

SLSUX01 is applicable for both JES2 and JES3 environments. It executes in the job's address space.

Note: Users in a JES3 environment should take note that the parameter list has been changed from that used by HSC releases prior to 1.2 (see "Special Considerations" on page 407).

This exit is invoked for every WTO or WTOR intercepted by the SMC (refer to the *SMC Configuration and Administration Guide* for a list of intercepted messages). The exit

should evaluate the message and, if owned by the exit, fill in the appropriate fields in the parameter list.

Your systems programming staff may replace the default user exit with one designed to implement your system's specific needs.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX01P.

Entry Specifications

Upon entry to SLSUX01, the register contents are as listed in Table 24 on page 399.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX01 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX01 are listed in Table 26.

Table 26. SLSUX01 Return Codes in Register 15

Return Code	Name	Description
0	UX01HSC	SMC to interpret message.
4	UX01ACTN	Message interpreted by user exit. SMC acts per user exit direction.
64	UX01NOPR	User exit not operational. SMC to interpret messages.

Table 27. SLSUX01 Return Data in Parameter List

Name	Description
UX01FUNC	Function code if return code UX01ACTN is issued.
UX01FUNT	Mount/dismount/swap FROM unit address if return code UX01ACTN is issued.
UX01LABT	Label type if return code UX01ACTN is issued.
UX01OPIN	Operator intervention flag if return code UX01ACTN is issued.
UX01SNAM	Scratch subpool name if return code UX01ACTN is issued.
UX01SSUB	Scratch subpool index if return code UX01ACTN is issued.
UX01TUNT	TO unit address if return code UX01ACTN is issued.

Table 27. SLSUX01 Return Data in Parameter List (Continued)

Name	Description
UX01VOLS	Volume serial number of cartridge if return code UX01ACTN is issued.
Note: If you define scratch subpools by using SCRPOOL statements in SLSSYS*xx* PARMLIB member (the preferred method), specify UX01SNAM. If you define scratch subpools by using SLSUX03, specify UX01SSUB.	

Programming Considerations

This exit is invoked in both JES2 and JES3 environments. In these environments, field UX01WQE in the parameter list mapped by SLSUX01P contains the pointer to the MVS WQE.

The exit routine should examine each message and set the operation to be performed in UX01FUNC, and then fill in the appropriate fields which apply to the function.

StorageTek samples include SLSUX01 and UX01SAM0.

Examples

In the following example, the user exit is set to mount a nonspecific volume of the library label type.

Mount Nonspecific Volume

```
set UXØ1FUNC to C'1'.
set UXØ1VOLS to 'SCRTCH' or 'PRIVAT'.
set UXØ1FUNT to drive address.
set UXØ1SSUB to zero.
set UXØ1LABT to UXØ1DFLT.
```

In the following example, the user exit is set to mount a nonspecific volume from a scratch subpool of the library label type.

Mount Nonspecific Volume from Scratch Subpool

```
set UXØ1FUNC to C'1'.
set UXØ1VOLS to 'SCRTCH' or 'PRIVAT'.
set UXØ1FUNT to drive address.
set UXØ1SSUB to subpool index.
set UXØ1LABT to UXØ1DFLT.
```

In the following examples, the user exit is set to mount a nonspecific volume from a scratch subpool with a label type different than the library label type.

Mount Nonspecific Volume from Scratch Subpool

```
set UXØ1FUNC to C'1'.
set UXØ1VOLS to 'SCRTCH' or 'PRIVAT'.
set UXØ1FUNT to drive address.
set UXØ1SNAM to subpool name.
```

Mount Nonspecific Volume from Scratch Subpool

```
set UXØ1FUNC to C'1'.
set UXØ1VOLS to 'SCRTCH' or 'PRIVAT'.
set UXØ1FUNT to drive address.
set UXØ1SSUB to subpool index.
set UXØ1LABT to label type.
```

In the following example, the user exit is set to mount a specific volume.

Mount Specific Volume

```
set UXØ1FUNC to C'1'.
set UXØ1VOLS to appropriate VOLSER for specific request.
set UXØ1FUNT to drive address.
set UXØ1LABT to label type.
```

In the following example, the user exit is set to dismount a volume.

Dismount Volume

```
set UXØ1FUNC to C'2'.
set UXØ1FUNT to drive address.
set UXØ1DISP to disposition.
```

In the following example, the user exit is set to swap a volume.

Swap Volume

```
set UXØ1FUNC to C'3'.
set UXØ1FUNT to FROM drive address.
set UXØ1TUNT to TO drive address.
```

Operator Intervention on a mount

```
set UXØ1FUNC to C'1'.
set UXØ1OPIN to UXØ1ON.
set UXØ1VOLS to volume serial number.
set UXØ1FUNT to FROM drive address.
set UXØ1TUNT to TO drive address.
set UXØ1LABT to label type.
```

In the following example, the user exit is set to bypass all HSC processing of and for this message.

No Operation

```
set UXØ1FUNC to C'5'.
```

Special Considerations

Operator intervention is only supported on mount requests. It is not supported for dismount requests or for subsequent messages.

Setting the function code (UX01FUNC) to NOP (no operation) results in all SMC processing of the message being bypassed.

The user exit parameter list SLSUX01P and the MVS WQE, which are pointed to by UX01WQE, reside above the 16M line. The storage is not accessible to programs that are running with AMODE=24.

Restrictions and Limitations

The exit should not invoke any MVS services that could cause a console message to be issued. Otherwise, a loop in message processing could occur. Examples of services that should be avoided are:

- I/O services including: OPEN, CLOSE, READ, WRITE, etc.
- Message services including: WTO, WTOR, etc.

Note: MVS/ESA 5.2 and above requires 4-digit UCBs. If your version of SLSUX01 contains 3-digit UCBs, you must recode this exit using 4-digit UCBs.

Parameter List

Description

The parameter list is built by the SMC message intercept program prior to invoking the user exit and contains the address of the WQE (the MVS write queue element containing this message). If after inspection of the message the user exit must request specific SMC action, the parameter list is filled in accordingly and control is returned to the SMC with a return code of 4 (UX01ACTN). If no user exit action is required, the parameter list remains unchanged and control is returned to the SMC with a return code of 0 (UX01HSC).

Record Layout

The record layout for SLSUX01 parameter list is presented in Table 28.

Table 28. SLSUX01P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX01P USER EXIT 01 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT BY MESSAGE INTERCEPT PROGRAM CONTAINING THE ADDRESS OF THE WQE. THE EXIT ROUTINE SHOULD EXAMINE THE MESSAGE IN THE WQE. IF THE MESSAGE IS OWNED BY THE TAPE MANAGEMENT SYSTEM FOR WHICH THE EXIT REPRESENTS, THE VOLSER OF THE CARTRIDGE, THE DEVICE ADDRESS(S), THE DISPOSITION OF THE VOLUME (IF APPROPRIATE), THE LABEL TYPE, AND THE FUNCTION MUST BE FILLED IN. IF THE MESSAGE IS NOT OWNED BY THE EXIT, CONTROL SHOULD BE RETURNED WITHOUT MODIFYING THE PARAMETER LIST AND SET REGISTER 15 TO UX01HSC. WHEN CONTROL IS RETURNED TO THE MESSAGE INTERCEPT ROUTINE, ACTION WILL BE TAKEN BASED ON THE INFORMA UX01ACTN SET IN REGISTER 15. SPECIAL CONSIDERATIONS: THIS PARAMETER LIST MAP WORKS FOR THE USER EXIT 1 (JOB PROCESSING USER EXIT) IN EITHER THE HSC OR MVS/CSC. FOR LOCAL ASSEMBLIES, THE USER SHOULD SET THE &SLSHVSC GBLC TO EITHER ‘HSC’ OR ‘CSC’ TO GENERATE THE CORRECT MAPPING FOR THE APPROPRIATE SUBSYSTEM.					
0	(0)	STRUCTURE		SLSUX01P	USER PARAMETER LIST.
0	00)	OFFSET		SCSUX01P	
* HERE IS WHERE TO SET THE &SLSHVSC GBLC. THE USER SHOULD SUPPLY ONE OF THE FOLLOWING TO PROVIDE THE CORRECT MAPPING FOR THE PARAMETER LIST: &SLSHVSC SETC ‘HSC’ MAP PARM LIST FOR HSC. - OR - &SLSHVSC SETC ‘CSC’ MAP PARM LIST FOR MVS/CSC. (NOTE: IF THE &SLSHVSC GBLC IS NOT SET, THE DEFAULT HANDLING IS THE SAME AS IF IT WERE SET TO ‘HSC’.)					
0	(0)	SIGNED-FWORD	4	UX01WQE	ADDRESS OF MVS WQE OR ADDRESS
4	(4)	CHARACTER	1	UX01FUNC	FUNCTION CODE.

Table 28. SLSUX01P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
‘1’	(F1)	CHAR CONST		UX01MNT	MOUNT A CARTRIDGE.
‘2’	(F2)	CHAR CONST		UX01DMNT	DISMOUNT A CARTRIDGE.
‘3’	(F3)	CHAR CONST		UX01SWAP	SWAP CARTRIDGE FROM XXX TO YYY.
‘4’	(F4)	CHAR CONST		UX01RPLY	REPLY TO A MESSAGE.
‘5’	(F5)	CHAR CONST		UX01NOP	NO OPERATION TO BE PERFORMED.
5	(5)	BITSTRING	1	UX01OPIN	OPERATOR INTERVENTION FLAG.
		...1 .... X’10’		UX01ON	OPERATOR INTERVENTION REQUESTED.
6	(6)	CHARACTER	6	UX01VOLS	VOLUME SERIAL NUMBER OF CARTRIDGE.
12	(C)	CHARACTER	1	UX01RPTX	REPLY TEXT AREA.
13	(D)	CHARACTER	7	-RESERVED-	RESERVED.
20	(14)	HEXSTRING	2	UX01REID	MESSAGE REPLY ID.
22	(16)	CHARACTER	1	UX01DISP	DISPOSITION OF VOLUME.
‘K’	(D2)	CHAR CONST		UX01KEEP	KEEP VOLUME.
‘D’	(C4)	CHAR CONST		UX01DELT	DELETE VOLUME.
23	(17)	BITSTRING	1	UX01LABT	LABEL TYPE.
		.... X’00’		UX01DFLT	LIBRARY DEFAULT LABEL TYPE.
		....1 X’01’		UX01SL	STANDARD LABEL.
		.... ..1. X’02’		UX01AL	ANSI LABEL.
		.... ..11 X’03’		UX01NL	NO LABEL.
		.... .1.. X’04’		UX01NSL	NON STANDARD LABEL.
24	(18)	CHARACTER	4	UX01FUNT	MOUNT/DISMOUNT/SWAP FROM UNIT ADDR.
28	(1C)	CHARACTER	4	UX01TUNT	TO UNIT ADDRESS.
32	(20)	HEXSTRING	1	UX01SSUB	SCRATCH SUBPOOL NUMBER.
33	(21)	HEXSTRING	3	-RESERVED-	RESERVED.
0	(00)	CONST		UX01HSC	HSC TO INTERPRET MESSAGE.
0	(00)	CONST		UX01CSC	CSC TO INTERPRET MESSAGE.
4	(04)	CONST		UX01ACTN	MESSAGE INTERPRETED BY USER EXIT. HSC (OR CSC) ACTS PER USER EXIT.

Table 28. SLSUX01P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
64	(40)	CONST		UX01NOPR	USER EXIT NOT OPERATIONAL. HSC (OR CSC) ALWAYS INTERPRETS MSGS.
36	(24)	HEXSTRING	4	UX01RID2	REPLY ID FOR 4-BYTE
40	(28)	CHARACTER	13	UX01SNAM	SCRATCH SUBPOOL NAME.
56	(38)	AREA	4	-RESERVED-	(PADDING TO FULL WORD BOUNDARY)
56	(38)	SIGNED-FWORD	4	UX01WORD	USER EXIT WORD
60	(3C)	LENGTH		UX01L	LENGTH OF PARAMETER LIST. SLSUX01X DELETED. NO LONGER REQUIRED FOR JES3 PROCESSING OF MESSAGES.

Cross Reference

Name	Len	Offset Value
SCSUX01P	-	00
UX01ACTN	-	04
UX01AL	-	02
UX01CSC	-	00
UX01DELT	-	‘CVAL’
UX01DFLT	-	00
UX01DISP	000001	16
UX01DMNT	-	‘CVAL’
UX01FUNC	000001	04
UX01FUNT	000004	18
UX01HSC	-	00
UX01KEEP	-	‘CVAL’
UX01L	-	3C
UX01LABT	000001	17
UX01MNT	-	‘CVAL’
UX01NL	-	03
UX01NOP	-	‘CVAL’
UX01NOPR	-	40
UX01NSL	-	04
UX01ON	-	10
UX01OPIN	000001	05
UX01REID	000002	14
UX01RID2	000004	24
UX01RPLY	-	‘CVAL’
UX01RPTX	000001	0C
UX01SL	-	01
UX01SNAM	000013	28
UX01SSUB	000001	20
UX01SWAP	-	‘CVAL’
UX01TUNT	000004	1C
UX01VOLS	000006	06

Name	Len	Offset Value
UX01WORD	000004	38
UX01WQE	000004	00

JES2 Scratch Allocation User Exit (SLSUX02)

Functional Description

The JES2 Scratch Allocation User Exit enables you to request the modification of actions taken by the SMC during allocation of a nonspecific (scratch) volume DD statement which references cartridge tape devices on a JES2 system. This exit can be used to:

- request allocation of library drives
- request allocation of nonlibrary drives
- request allocation to prefer library drives over nonlibrary drives, but not exclude nonlibrary drives
- change esoteric (unit name) used for device allocation
- request allocation of a particular ACS
- request allocation to preference LSMs based on LSM type (LSMPREF)
- request allocation to use LSM preferencing when scratch volumes available reach a defined level (LOWSCR)
- supply scratch subpool information for allocation.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX02 is applicable in JES2 during device allocation. This exit is called for every allocation request for a nonspecific volume on a cartridge tape device. It executes in the job's address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX02P.

Execution Attributes

Shared enqueues are held on major name SYSIEFSD and minor names Q4, CHNGDEVS, DDRTPUR, and DDRDA.

Entry Specifications

Upon entry to SLSUX02, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX02 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX02 are listed in Table 29.

Table 29. SLSUX02 Return Codes in Register 15

Return Code	Name	Description
0	UX02HSC	Take default HSC allocation action.
4	UX02LIB	Use library drives.
8	UX02NLIB	Use nonlibrary drives.
12	UX02LIBP	Prefer library drives.
16	UX02ESUB	Change the esoteric (unit name) to be used for the allocation.
20	UX02ASUB	Request the allocation to the specified ACS.
24	UX02LS	Change the LSMPREF parameter value
28	UX02LO	Change the LOWSCR parameter value
32	UX02VIRT	Select a virtual drive.
64	UX02IACT	User exit is not operational.

Table 30. SLSUX02 Return Data in Parameter List

Name	Description
UX02ACS	ACS to allocate in if return code UX02ASUB is issued.
UX02ESO	Esoteric to substitute if return code UX02ESUB is issued.
UX02LABT	Label type if return code UX02LIB, UX02NLIB, UX02LIBP, UX02ESUB, or UX02ASUB is issued.
UX02SNAM	Scratch subpool name if return code UX02LIB, UX02NLIB, UX02LIBP, UX02ESUB, UX02LS, UX02LO, or UX02ASUB is issued.
UX02SSUB	Scratch subpool index if return code UX02LIB, UX02NLIB, UX02LIBP, UX02ESUB, UX02LS, UX02LO, or UX02ASUB is issued.
Note: If you define scratch subpools by using SCRPOOL statements in SLSSYSxx PARMLIB member (the preferred method), specify UX02SNAM. If you define scratch subpools by using SLSUX03, specify UX02SSUB.	

Programming Considerations

1. The StorageTek-supplied version of SLSUX02 sets return code UX02IACT.
2. Because the exit executes as an extension to the common allocation SSREQ, it cannot issue dynamic allocation requests.

Parameter List

Description

The user exit is called for a nonspecific allocation request. The return code from the user exit indicates the technique which SMC allocation should use for the unit selection(s). When the allocation technique indicates a library drive, the user exit can qualify the selection by a scratch subpool, or a scratch subpool and label type.

Record Layout

The record layout for SLSUX02 parameter list is presented in Table 31.

Table 31. SLSUX02P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX02P - USER EXIT 02 PARAMETER LIST. FUNCTION: SLSUX02P MAPS THE DATA AREA PASSED IN AS INPUT TO SLSUX02. THE PARAMETER LIST IS BUILT BY HSC COMMON ALLOCATION SSREQ FUNCTION ROUTINE. THE USER EXIT IS CALLED FOR A NON-SPECIFIC ALLOCATION REQUEST. THE RETURN CODE FROM THE USER EXIT INDICATES THE TECHNIQUE WHICH HSC ALLOCATION SHOULD USE FOR THE UNIT SELECTION(S). WHEN THE ALLOCATION TECHNIQUE INDICATES A LIBRARY DRIVE, THE USER EXIT CAN QUALIFY THE SELECTION BY A SCRATCH SUBPOOL OR A SCRATCH SUBPOOL AND LABEL TYPE. ALSO, IN CONJUNCTION WITH REMOTE LIBRARY SUPPORT THE USER EXIT PROVIDES THE ABILITY TO PERFORM ESOTERIC SUBSTITUTION FOR A GIVEN DD STATEMENT. THE USER EXIT ALSO HAS THE ABILITY TO OVERRIDE THE SYSTEM-WIDE LSMPREF VALUE ALONE OR IN CONJUNCTION WITH ESOTERIC OR ACS SUBSTITUTION TECHNIQUES. RETURN CODES IN R15 : 0 - NO USER TECHNIQUE SELECTED, CONTINUE NORMALLY 4 - CONDITIONALLY SELECT LIBRARY DRIVES 8 - CONDITIONALLY SELECT NON-LIBRARY DRIVES 12 - PERFORM ACS PREFERENCE TECHNIQUE 16 - ESOTERIC SUBSTITUTION USING USER SUPPLIED ESOTERIC NAME 20 - ESOTERIC SUBSTITUTION USING USER SUPPLIED ACS ID 24 - OVERRIDE LSMPREF USING USER SUPPLIED VALUE 28 - OVERRIDE LOWSCR USING USER SUPPLIED VALUE 32 - SELECT VIRTUAL DRIVES 64 - USER EXIT 02 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINES EXECUTES IN THE ENVIRONMENT OF THE SCHEDULER ALLOCATION ROUTINES EXCEPT FOR THE EXECUTION KEY WHICH HAS BEEN REDUCED TO TCB KEY VIA THE SYNCH.					
0	(0)	STRUCTURE		SLSUX02P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX02UX02	ACRONYM
4	(4)	SIGNED-FWORD	4	UX02LEN	LENGTH OF UX02 PARAMETER LIST

Table 31. SLSUX02P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
8	(8)	A-ADDR	1	UX02SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX02SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX02KEY	STORAGE KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	RESERVED
RETURN CODE EQUATES					
0	(00)	CONST		UX02HSC	HSC DEFAULT SCRATCH TECHNIQUE
4	(04)	CONST		UX02LIB	USE LIBRARY DRIVES
8	(08)	CONST		UX02NLIB	USE NON-LIBRARY DRIVES
12	(0C)	CONST		UX02LIBP	USE LIBRARY PREFERENCE TECHNIQUE
16	(10)	CONST		UX02ESUB	ESOTERIC SUBSTITUTION REQUESTED
20	(14)	CONST		UX02ASUB	SUBSTITUTE USING USER SUPPLIED ACS
24	(18)	CONST		UX02LS	OVERRIDE LSMPREF ONLY
28	(1C)	CONST		UX02LO	OVERRIDE LOWSCR ONLY
32	(20)	CONST		UX02VIRT	USE VIRTUAL DRIVES
64	(40)	CONST		UX02IACT	UX02 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX02JOBN	JOBNAME
20	(14)	CHARACTER	8	UX02STPN	STEPNAME
28	(1C)	CHARACTER	8	UX02PRSN	PROCSTEPNAME
36	(24)	CHARACTER	8	UX02DDN	DD NAME
44	(2C)	A-ADDR	4	UX02JACC	ADDRESS OF JOB ACCOUNTING INFO
48	(30)	A-ADDR	4	UX02SACC	ADDRESS OF STEP ACCOUNTING INFO
52	(34)	CHARACTER	44	UX02DSN	DATASET NAME
96	(60)	HEXSTRING	1	UX02SSUB	SCRATCH SUBPOOL
97	(61)	BITSTRING	1	UX02LABT	LABEL TYPE
0	(00)	CONST		UX02LBDF	LIBRARY DEFAULT LABEL TYPE
1	(01)	CONST		UX02LBSL	STANDARD LABEL (SL)
2	(02)	CONST		UX02LBAL	ANSI LABEL (AL)

Table 31. SLSUX02P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
3	(03)	CONST		UX02LBNL	NON-LABELED (NL)
4	(04)	CONST		UX02LBNS	NON-STANDARD LABEL (NSL)
98	(62)	CHARACTER	3	UX02XPDT	DATASET EXPIRATION DATE FROM JFCB
101	(65)	HEXSTRING	3	-RESERVED-	Reserved
104	(68)	A-ADDR	4	UX02USER	UX02 USER WORD
108	(6C)	CHARACTER	8	UX02ESO	ESOTERIC TO SUBSTITUTE IN PLACE OF WHAT WAS SPECIFIED IN THE JCL
116	(74)	HEXSTRING	1	UX02ACS	ACS ID TO SUBSTITUTE IN PLACE OF WHAT WAS SPECIFIED IN THE JCL
117	(75)	CHARACTER	13	UX02SNAM	SCRATCH SUBPOOL NAME
132	(84)	A-ADDR	4	UX02JFCB	ADDRESS OF JFCB
136	(88)	BITSTRING	1	UX02LSMP	LSMPREF OVERRIDE
0	(00)	CONST		UX02LSNO	NONE
1	(01)	CONST		UX024410	4410 = CIMARRON
EQU 2 RESERVED					
3	(03)	CONST		UX029360	9360 = WOLFCREEK
4	(04)	CONST		UX029310	9310 = POWDERHORN
137	(89)	BITSTRING	1	UX02LOWS	LOWSCR OVERRIDE
0	(00)	CONST		UX02LONO	NONE
255	(FF)	CONST		UX02LOAN	ANY
144	(90)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
144	(90)	LENGTH		UX02LSTL	LENGTH OF USER EXIT 02 PARM LIST

Cross Reference

Name	Len	Offset Value
UX02ACS	000001	74
UX02ASUB	-	14
UX02DDN	000008	24
UX02DSN	000044	34
UX02ESO	000008	6C
UX02ESUB	-	10
UX02HSC	-	00
UX02IACT	-	40
UX02JACC	000004	2C
UX02JFCB	000004	84
UX02JOBN	000008	0C
UX02KEY	000001	09
UX02LABT	000001	61
UX02LBAL	-	02
UX02LBDF	-	00
UX02LBNL	-	03
UX02LBNS	-	04
UX02LBSL	-	01
UX02LEN	000004	04
UX02LIB	-	04
UX02LIBP	-	0C
UX02LO	-	1C
UX02LOAN	-	FF
UX02LONO	-	00
UX02LOWS	000001	89
UX02LS	-	18
UX02LSMP	000001	88
UX02LSNO	-	00
UX02LSTL	-	90
UX02NLIB	-	08
UX02PRSN	000008	1C

Name	Len	Offset Value
UX02SACC	000004	30
UX02SNAM	000013	75
UX02SPID	-	E6
UX02SSUB	000001	60
UX02STPN	000008	14
UX02SUBP	000001	08
UX02USER	000004	68
UX02UX02	000004	00
UX02VIRT	-	20
UX02XPDT	000003	62
UX024410	-	01
UX029310	-	04
UX029360	-	03

Scratch Subpool User Exit (SLSUX03)

Functional Description

The Scratch Subpool User Exit allows you to define multiple scratch subpools, or scratch subpools of different label types.

Notes:

1. The preferred method for defining scratch subpools involves using the Scratch Subpool (SCRPOol) control statement to define subpool names for HSC in PARMLIB. For more information on using the Scratch Subpool control statement, refer to “Scratch Subpool Control Statement” on page 102.
2. If scratch subpools are defined in both PARMLIB and SLSUX03, the PARMLIB definitions are used.

SLSUX03 is usually used with SLSUX01 and SLSUX02 to implement scratch subpooling. Each user exit’s roles are as follows:

- SLSUX03 defines the scratch subpools — it associates a particular group or range of VOLSERs as members in a particular subpool. The subpool is identified by either a name or a number.
- SLSUX01 is invoked for each Mount request and is used to inform the HSC which subpool to choose the scratch volume from for the request. SLSUX01 influences choice of an appropriate scratch volume.
- SLSUX02 is invoked as part of the process of allocating a drive to satisfy each mount request for a scratch volume. When a subpool is returned by SLSUX02, the HSC preferences allocation of drives attached to LSMs that contain the most scratch volumes of the designated scratch subpool.

The combination of the user exit functionality described permits mounting of scratch tapes from specified scratch subpools in response to scratch mount requests and minimizes the number of pass-thrus required to satisfy the request.

Programming Considerations

Message Resulting From User Exit Failures

Any errors or inconsistencies in returns from the user exit, such as attempting to return more entries than initially specified or subpool entry definitions being returned out of order (by subpool index) cause display of a console error message and terminate HSC initialization. The following message is displayed if an error is detected:

```
SLSxxxxI - Module SLSVINIT return code 40Fx40Fx
```

The return code, 40Fx40Fx, in the message can have any of the following possible values:

40F540F5	Incorrect number of subpool entries/indices returned.
40F640F6	Subpool entries returned out of subpool index order.

40F740F7	Invalid volume serial number range.
40F840F8	Invalid label type.
40F940F9	Subpool already defined.

Special Considerations

Different hosts in a multi-host complex may have different subpool definitions; separate initializations of the tape management system may change subpool definitions. Each time a tape management system's scratch subpool definitions change, the HSC should also be reinitialized, perhaps with a new Scratch Subpool User Exit.

Restrictions and Limitations

It is permissible to READ and/or WRITE files in this user exit. Users may want to include DD statements in the HSC startup procedure for any tape management system data sets that may need to be referenced.

Parameter List

Description

The parameter list is passed to the Scratch Subpool User Exit to obtain the scratch subpool definitions for the installation. The user exit is called recursively until a return code indicates that the user exit has completed/terminated.

On the initial call, if an installation's user exit is going to return scratch subpool definitions, the fields defining the number of subpools and number of subpool entries must be supplied with the first subpool entry definition. After that, each subsequent call to the user exit returns a single subpool entry (i.e. a volume serial number range and label type for a subpool index). Entries must be returned in subpool index order starting with 1 to a maximum of 255.

Note: If the subpool name (UX03SNAM) is not provided (is blank), the subpool index is used as the name. The subpool index is converted to three EBCDIC decimal digits and placed in the left most three positions of the subpool name.

Record Layout

The record layout for SLSUX03 parameter list is presented in Table 32.

Table 32. SLSUX03P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX03P - SCRATCH SUBPOOL USER EXIT PARAMETER LIST FUNCTION: THIS PARAMETER LIST IS PASSED TO THE SCRATCH SUBPOOL USER EXIT TO OBTAIN THE SCRATCH SUBPOOL DEFINITIONS FOR THE INSTALLATION. THE USER EXIT IS CALLED RECURSIVELY UNTIL A RETURN CODE INDICATES THAT THE USER EXIT HAS COMPLETED/TERMINATED. ON THE INITIAL CALL, IF AN INSTALLATION'S USER EXIT IS GOING TO RETURN SCRATCH SUBPOOL DEFINITIONS, THE FIELDS DEFINING THE NUMBER OF SUBPOOLS AND NUMBER OF SUBPOOL ENTRIES MUST BE SUPPLIED ALONG WITH THE FIRST SUBPOOL ENTRY DEFINITION. AFTER THAT, EACH SUBSEQUENT CALL TO THE USER EXIT RETURNS A SINGLE SUBPOOL ENTRY (I.E. A VOLUME SERIAL NUMBER RANGE AND LABEL TYPE FOR A SUBPOOL INDEX). ENTRIES MUST BE RETURNED IN SUBPOOL INDEX ORDER STARTING WITH 1 TO A MAXIMUM OF 255. SPECIAL CONSIDERATIONS: THE USER FIELD (UX03USER) IS PROVIDED FOR USE BY THE USER EXIT ROUTINE. ANY VALUE STORED IN THAT FIELD WILL BE KEPT OVER THE RECURSIVE CALLS TO THE EXIT.					
0	(0)	STRUCTURE		SLSUX03P	SUBPOOL USER EXIT PARM LIST.
0	(0)	CHARACTER	4	UX03HDR	EYECATCHER.
4	(4)	A-ADDR	4	UX03USER	USER FIELD.
8	(8)	BITSTRING	1	UX03STAT	USER EXIT CALL STATUS.
0	(00)	CONST		UX03INIT	INITIAL CALL TO USER EXIT.
1	(01)	CONST		UX03SECD	SECONDARY CALL TO USER EXIT.
9	(9)	HEXSTRING	1	UX03SUBN	NUMBER OF SUBPOOLS.
10	(A)	SIGNED-HWORD	2	UX03ENTN	NUMBER OF SUBPOOL ENTRIES.
12	(C)	HEXSTRING	1	UX03SUBP	SUBPOOL INDEX.
13	(D)	CHARACTER	6	UX03LOVS	LOW VOLSER.
19	(13)	CHARACTER	6	UX03HIVS	HIGH VOLSER.
25	(19)	BITSTRING	1	UX03LABL	LABEL TYPE.
0	(00)	CONST		UX03LBDF	LIBRARY DEFAULT LABEL.
1	(01)	CONST		UX03LBSL	STANDARD LABEL (SL).
2	(02)	CONST		UX03LBAL	ANSI LABEL (AL).
3	(03)	CONST		UX03LBNL	NON-LABELED (NL)
4	(04)	CONST		UX03LBNS	NON-STANDARD LABEL (NSL).
26	(1A)	HEXSTRING	1	-RESERVED-	RESERVED.

Table 32. SLSUX03P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
27	(1B)	CHARACTER	13	UX03SNAM	SUBPOOL NAME.
40	(28)	CHARACTER	8	UX03OWNR	SUBPOOL OWNER.
48	(30)	AREA	8	-RESERVED-	PAD TO DOUBLE WORD.
48	(30)	LENGTH		UX03PL	LENGTH OF PARM LIST.

Cross Reference

Name	Len	Offset Value
UX03ENTN	000002	0A
UX03HDR	000004	00
UX03HIVS	000006	13
UX03INIT	-	00
UX03LABL	000001	19
UX03LBAL	-	02
UX03LBDF	-	00
UX03LBNL	-	03
UX03LBNS	-	04
UX03LBSL	-	01
UX03LOVS	000006	0D
UX03OWNR	000008	28
UX03PL	-	30
UX03SECD	-	01
UX03SNAM	000013	1B
UX03STAT	000001	08
UX03SUBN	000001	09
UX03SUBP	000001	0C
UX03USER	000004	04

JES3 Scratch Allocation User Exit (SLSUX04)

Functional Description

The JES3 Scratch Allocation User Exit enables you to request modification of the actions the SMC takes during allocation of a nonspecific (scratch) volume DD statement which references cartridge tape devices on a JES3 system. This exit can be used to:

- request allocation of library drives
- request allocation of nonlibrary drives
- request allocation to prefer certain LSM types over others (LSMpref)
- supply scratch subpool information for allocation (when using library transports)
- change esoteric (unit name) used for device allocation
- request allocation of a particular ACS.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX04 is applicable in JES3 during the POSTSCAN phase of the converter/interpreter scheduling element, the JES3 MDS function, and dynamic allocation. This exit is called for every nonspecific (scratch) volume requested on a cartridge tape device.

SLSUX04 executes as an extension of JES3 dynamic allocation and JES3 common allocation processing. It executes in the HSC address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX04P.

Entry Specifications

Upon entry to SLSUX04, the register contents are as listed in Table 33 on page 425.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX04 are as listed in Table 34 on page 425.

Return Codes

The return code from the user exit indicates the technique which SMC allocation should use for the unit selection during drive exclusion. If device type selected is a library device,

the user exit may qualify that selection during drive prioritization and drive exclusion by specifying a scratch subpool or a scratch subpool and label type.

Return codes for SLSUX04 are listed in Table 33 on page 425.

Table 33. SLSUX04 Return Codes in Register 15

Return Code	Name	Description
0	UX04HSC	Take default HSC allocation action.
4	UX04LIB	Use library drives.
8	UX04NLIB	Use nonlibrary drives.
12	UX04REPL	Change the esoteric (unit name) to be used for the allocation.
16	UX04SACS	Request the allocation of the specified ACS.
20	UX04LS	Change the LSMPREF parameter value
32	UX04VIRT	Select a virtual drive.
64	UX04IACT	User exit is not operational.

Table 34. SLSUX04 Return Data in Parameter List

Name	Description
UX04ACS	ACS to allocate in if return code UX04SACS is issued.
UX04ESOT	Esoteric to substitute if return code UX04REPL is issued.
UX04LABT	Label type if return code UX04HSC or UX04LIB is issued.
UX04SNAM	Scratch subpool name if return code UX04HSC or UX04LIB is issued.
UX04SSUB	Scratch subpool index if return code UX04HSC or UX04LIB is issued.
Note: If you define scratch subpools by using SCRPOOL statements in SLSSYSxx PARMLIB member (the preferred method), specify UX04SNAM. If you define scratch subpools using SLSUX03, specify UX04SSUB.	

Programming Considerations

1. The StorageTek-supplied version of SLSUX04 sets return code 64.

Parameter List

Description

The parameter list is built during drive exclusion and during drive prioritization. The user exit is called when a nonspecific allocation request occurs during drive exclusion for normal or dynamic allocation (UX04CFLG = 0). The user exit is also called when a nonspecific allocation request occurs during drive prioritization processing (UX04CFLG = UX04DIRA).

Record Layout

The record layout for SLSUX04 parameter list is presented in Table 35.

Table 35. SLSUX04P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX04P -USER EXIT 04 PARAMETER LIST. FUNCTION: THE PARAMETER LIST IS BUILT DURING DEVICE SEPARATION AND DURING DIRECTED ALLOCATION. THE USER EXIT IS CALLED WHEN A NON-SPECIFIC ALLOCATION REQUEST OCCURS DURING DEVICE SEPARATION FOR NORMAL OR DYNAMIC ALLOCATION (UX04CFLG = 0). THE USER EXIT IS ALSO CALLED WHEN A NON-SPECIFIC ALLOCATION REQUEST OCCURS DURING DIRECTED ALLOCATION PROCESSING (UX04CFLG = UX04DIRA). THE RETURN CODE FROM THE USER EXIT INDICATES THE TECHNIQUE WHICH HSC ALLOCATION SHOULD USE FOR THE UNIT SELECTION DURING DEVICE SEPARATION. IF DEVICE TYPE SELECTED IS A LIBRARY DEVICE, THE USER EXIT MAY QUALIFY THAT SELECTION DURING DIRECTED ALLOCATION AND DEVICE SEPARATION BY SPECIFYING A SCRATCH SUBPOOL OR A SCRATCH SUBPOOL AND LABEL TYPE. THE CUSTOMER NOW HAS THE OPTION TO REPLACE THE UNIT NAME SPECIFIED IN THE JCL WITH AN ESOTERIC. THE ESOTERIC SHOULD NOT CONTAIN DEVICES OUTSIDE THE DEVICES CONTAINED WITHIN THE UNIT NAME. RETURN CODES IN R15 : 0 - NO USER TECHNIQUE SELECTED, CONTINUE NORMALLY 4 - IF THE UNIT INITIALLY SPANNED LIBRARY AND NON-LIBRARY DRIVES, SELECT LIBRARY DRIVES 8 - IF THE UNIT INITIALLY SPANNED LIBRARY AND NON-LIBRARY DRIVES, SELECT NON-LIBRARY DRIVES 12 - REPLACE UNIT NAME WITH ESOTERIC PROVIDED IN FIELD UX04ESOT 16 - REPLACE UNIT NAME WITH ESOTERIC ASSOCIATED WITH ACS NUMBER PROVIDED IN FIELD UX04ACS 20 - PREFERENCE DRIVES ASSOCIATED WITH THE LSMPREF VALUE PROVIDED 64 - USER EXIT 04 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINES EXECUTES IN THE ENVIROMENT OF THE HSC ADDRESS SPACE.					
0	(0)	STRUCTURE		SLSUX04P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX04UX04	ACRONYM

Table 35. SLSUX04P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
4	(4)	SIGNED-FWORD	4	UX04LEN	LENGTH OF UX04 PARAMETER LIST
8	(8)	A-ADDR	1	UX04SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX04SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX04KEY	STORAGE KEY
10	(A)	A-ADDR	1	UX04CFLG	UX04 CALLER FLAG
		1... .... X’80’		UX04DIRA	UX04 CALL FROM DIRECTED ALLOCATION
		.... X’00’		UX04CI	UX04 CALL FROM CONVERTER/INTERPRETER
11	(B)	A-ADDR	1	UX04FLAG	UX04 GENERAL FLAG
		1... .... X’80’		UX04UAFF	ELEMENT RESIDES ON UNITAFF CHAIN ON ONLY IF UX04DIRA OFF
		.1.. .... X’40’		UX04GAFF	ELEMENT RESIDES ON GDGALL CHAIN ON ONLY IF UX04DIRA OFF
RETURN CODE EQUATES					
0	(00)	CONST		UX04HSC	HSC DEFAULT SCRATCH TECHNIQUE
4	(04)	CONST		UX04LIB	USE LIBRARY DRIVES
8	(08)	CONST		UX04NLIB	USE NON-LIBRARY DRIVES
12	(0C)	CONST		UX04REPL	USE ESOTERIC PROVIDED
16	(10)	CONST		UX04SACS	USE ACS NUMBER PROVIDED
20	(14)	CONST		UX04LS	OVERRIDE LSMPREF ONLY
24	(18)	CONST		UX04VIRT	SELECT VIRTUAL DRIVES
64	(40)	CONST		UX04IACT	UX04 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX04JOBN	JOBNAME
20	(14)	CHARACTER	8	UX04STPN	STEPNAME
28	(1C)	CHARACTER	8	UX04PRSN	PROCSTEPNAME
36	(24)	CHARACTER	8	UX04DDN	DD NAME
44	(2C)	CHARACTER	44	UX04DSN	DATASET NAME
88	(58)	HEXSTRING	1	UX04SSUB	SCRATCH SUBPOOL
89	(59)	BITSTRING	1	UX04LABT	LABEL TYPE
0	(00)	CONST		UX04LBDF	LIBRARY DEFAULT LABEL TYPE
1	(01)	CONST		UX04LBSL	STANDARD LABEL (SL)

Table 35. SLSUX04P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
2	(02)	CONST		UX04LBAL	ANSI LABEL (AL)
3	(03)	CONST		UX04LBNL	NON-LABELED (NL)
4	(04)	CONST		UX04LBNS	NON-STANDARD LABEL (NSL)
92	(5C)	SIGNED-FWORD	4	UX04USER	WORD RESERVED FOR CUSTOMER USE UX04USER PRESERVED ACROSS CALLS
96	(60)	CHARACTER	8	UX04MAIN	JES3 PROCESSOR WHERE JOB SETUP
104	(68)	CHARACTER	8	UX04UNIT	JCL UNIT NAME
112	(70)	CHARACTER	8	UX04ESOT	AREA TO RETURN ESOTERIC NAME
120	(78)	SIGNED-FWORD	4	UX04ACS	AREA TO RETURN ACS NUMBER FORMAT: 000000AA AA = ACS NUMBER
124	(7C)	CHARACTER	13	UX04SNAM	SCRATCH SUBPOOL NAME
137	(89)	BITSTRING	1	UX04LSMP	LSMPREF OVERRIDE
0	(00)	CONST		UX04LSNO	NONE
1	(01)	CONST		UX044410	4410 = CIMARRON
EQU 2 RESERVED					
3	(03)	CONST		UX049360	9360 = WOLFCREEK
4	(04)	CONST		UX049310	9310 = POWDERHORN
138	(8A)	HEXSTRING	3	-RESERVED-	RESERVED
144	(90)	SIGNED-FWORD	4	UX04RSV2	RESERVED FOR FUTURE USE
148	(94)	SIGNED-FWORD	4	UX04RSV3	RESERVED FOR FUTURE USE
152	(98)	SIGNED-FWORD	4	UX04RSV4	RESERVED FOR FUTURE USE
156	(9C)	SIGNED-FWORD	4	UX04RSV5	RESERVED FOR FUTURE USE
160	(A0)	SIGNED-FWORD	4	UX04RSV6	RESERVED FOR FUTURE USE
164	(A4)	SIGNED-FWORD	4	UX04RSV7	RESERVED FOR FUTURE USE
168	(A8)	SIGNED-FWORD	4	UX04RSV8	RESERVED FOR FUTURE USE
176	(B0)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
176	(B0)	LENGTH		UX04LSTL	LENGTH OF USER EXIT 04 PARM LIST

Cross Reference

Name	Len	Offset Value
UX04ACS	000004	78
UX04CFLG	000001	0A
UX04CI	-	00
UX04DDN	000008	24
UX04DIRA	-	80
UX04DSN	000044	2C
UX04ESOT	000008	70
UX04FLAG	000001	0B
UX04GAFF	-	40
UX04HSC	-	00
UX04IACT	-	40
UX04JOBN	000008	0C
UX04KEY	000001	09
UX04LABT	000001	59
UX04LBAL	-	02
UX04LBDF	-	00
UX04LBNL	-	03
UX04LBNS	-	04
UX04LBSL	-	01
UX04LEN	000004	04
UX04LIB	-	04
UX04LS	-	14
UX04LSMP	000001	89
UX04LSNO	-	00
UX04LSTL	-	B0
UX04MAIN	000008	60
UX04NLIB	-	08
UX04PRSN	000008	1C
UX04REPL	-	0C
UX04RSV2	000004	90
UX04RSV3	000004	94

Name	Len	Offset Value
UX04RSV4	000004	98
UX04RSV5	000004	9C
UX04RSV6	000004	A0
UX04RSV7	000004	A4
UX04RSV8	000004	A8
UX04SACS	-	10
UX04SNAM	000013	7C
UX04SPID	-	E6
UX04SSUB	000001	58
UX04STPN	000008	14
UX04SUBP	000001	08
UX04UAFF	-	80
UX04UNIT	000008	68
UX04USER	000004	5C
UX04UX04	000004	00
UX04VIRT	-	18
UX044410	-	01
UX049310	-	04
UX049360	-	03

PGMI Authorization User Exit (SLSUX05)

Functional Description

The Programmatic Interface Authorization User Exit performs authorization checking. If the user exit disables itself (setting return code UX05NOPR) or abends, the HSC allows all users to issue the QUERY and READ requests. The remaining requests can only be issued by APF-authorized, key 0-7, or supervisor state requestors.

If desired, an installation can use the SLSUX05 to perform different authorization (e.g., use RACF or similar product).

Environment

SLSUX05 is invoked for all requests received from the programmatic interface. This does not include HSC internal requests (e.g., job processing, utilities). The user exit should evaluate the request and set a return code to indicate if the HSC should permit the request to be executed. The exit is called from a non-space switch PC in the requestor's address space, under the requestor's RB.

Your systems programming staff may replace the default user exit with one designed to implement your systems specific needs.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX05P.

Entry Specifications

Upon entry to SLSUX05, the register contents are as listed in Table 24.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX05 are as listed in Table 25.

Return Codes

Return codes for SLSUX05 are listed in Table 36.

Table 36. SLSUX05 Return Codes in Register 15

Return Code	Name	Description
0	UX05ALOW	Allow the request.
4	UX05DENY	Deny the request.
64	UX05NOPR	User exit not operational. HSC will not call the exit again.

Programming Considerations

A user word is provided in the parameter list. The contents of the word are passed from invocation to invocation of the user exit, and the user exit may change the contents. After an IPL or HSC COLD start, it is initially zero; otherwise it survives across HSC startups. If this user word is used as a pointer, the area pointed to should be in common storage.

The user exit is called once during HSC initialization. In that case the pointer to SLSXREQM (UX05REQA) is zero. This permits the user exit to initialize the user word, if not already initialized.

Note: The user word may not be zero if this is not the first HSC initialization after an IPL or HSC COLD start.

There is no serialization provided. The user exit could be executing simultaneously under two TCBs. The user exit may want to serialize updates to any work area the user word may point to.

Parameter List

Record Layout

The record layout for SLSUX05 parameter list is presented in Table 37.

Table 37. SLSUX05P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX05P - USER EXIT 05 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT BY USER INTERFACE ROUTINES. THE EXIT ROUTINE SHOULD EXAMINE THE PARAMETER LIST. IF THE USER SHOULD BE ALLOWED TO ISSUE THE REQUEST, REGISTER 15 SHOULD BE SET TO UX05ALOW. IF THE REQUEST IS TO BE DENIED, UX05DENY SHOULD BE SET. IF THE EXIT IS NOT TO BE CALLED AGAIN, UX05NOPR SHOULD BE SET.					
0	(0)	STRUCTURE		SLSUX05P	EXIT 5 PARAMETER LIST.
0	(0)	A-ADDR	4	UX05HDR	EYECATCHER.
‘UX05’	(E4E7F0F5)	CHAR CONST		UX05ID	
4	(4)	A-ADDR	4	UX05LEN	BYTE LENGTH OF THIS LIST.
230	(E6)	CONST		UX05SPID	SUBPOOL ID.
8	(8)	A-ADDR	4	UX05REQA	SLSXREQM PARM LIST ADDRESS.
12	(C)	SIGNED-FWORD	4	UX05USER	USER WORD. INITIALLY ZERO. PASSED FROM INVOCATION TO INVOCATION. IT CAN BE USED AS AN ANCHOR FOR A USER CONTROL BLOCK.
16	(10)	SIGNED-FWORD	4	UX05RESV(2)	RESERVED.

Table 37. SLSUX05P Record Format

Dec	Hex	Type	Length	Label	Description
24	(18)	LENGTH		UX05L	BYTE LENGTH OF PARAMETER LIST.
THE FOLLOWING RETURN CODES ARE SET BY THE EXIT, SLSUX05.					
		.... X’00’		UX05ALOW	ALLOW THE REQUEST.
		.... .1.. X’04’		UX05DENY	DENY THE REQUEST.
		.1.. .... X’40’		UX05NOPR	USER EXIT NOT OPERATIONAL. HSC WILL NOT CALL THE EXIT AGAIN.

Cross Reference

Name	Len	Offset Value
UX05ALOW	-	00
UX05DENY	-	04
UX05HDR	000004	00
UX05ID	-	‘CVAL’
UX05L	-	18
UX05LEN	000004	04
UX05NOPR	-	40
UX05REQA	000004	08
UX05RESV	000004	10
UX05SPID	-	E6
UX05USER	000004	0C

Insert/Delete User Exit (SLSUX06)

Functional Description

The Insert/Delete User Exit provides you a way to obtain information when a volume is added to or deleted from the control data set.

At HSC initialization, a separate server task is attached that drives the user exit code. When a volume is inserted or deleted, a parameter list is built to describe the action. The server task is then posted to invoke the user code and pass the parameter list along. This parameter list shows the type of entry (insert, delete or HSC purge) and information on the volume, such as: VOLSER, location, status, date/time for insert or last use, and number of times selected.

At HSC termination, the server task is notified that termination is in progress. It creates a dummy parameter list with the UX06FUNC=UX06PURG bit on and passes it to the user code for clean up.

The installation-written exit routine, which replaces the StorageTek-supplied routine, must be named SLSUX06 and must be link-edited into an HSC library. Standard IBM OS linkage conventions must be observed.

Environment

SLSUX06 is applicable in both JES2 and JES3 environments. It executes in the HSC address space.

Note: This exit is **not** active during reconfiguration.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX06P.

Entry Specifications

Upon entry to SLSUX06, the register contents are as listed in Table 24 on page 399.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX06 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX06 are listed in Table 38.

Table 38. SLSUX06 Return Codes in Register 15

Return Code	Name	Description
0	UX06OK	Normal return.
64	UX06NOPR	Cancel exit.
255	UX06INV	Invalid function code passed.

Programming Considerations

The parameter list (SLSUX06P) is obtained from user key storage.

On initial entry, the UX06USER fullword is set to zero. If the user wants information to be maintained across all calls to the exit, they can GETMAIN a work area storage and place the address of that area in UX06USER. This is the only field in the parameter list that is maintained across exit calls. At termination (UX06FUNC=UX06PURG), the user must release any resources being held and FREEMAIN any obtained storage.

The exit routine should examine the UX06FUNC flag byte to determine the correct entry type.

Example:

```
UX06FUNC = UX06INS  - volume inserted in database
UX06FUNC = UX06DEL  - volume deleted from database
UX06FUNC = UX06PURG - purge call, cleanup before return
```

Program Attributes

The program attributes of SLSUX06 are as described in “Program Attributes” on page 400 with the following exceptions:

```
RMODE=24, AMODE=24
```

Special Considerations

Since the user code is invoked under a separate TCB, problems are not encountered in the HSC if the exit has problems. It may open files, do I/O, or obtain resources. Upon receiving an entry type of UX06PURG in the parameter list, the user code must clean up resources and terminate.

If the user code is passed an invalid function type, it should return UX06INV in R15.

If the user code decides it does not want to be called again, it should perform all necessary clean up and return UX06NOPR in R15.

The HSC server that invokes the user code enables MVS Dump Analysis and Elimination (DAE) to suppress duplicate SVC dumps. If user code is being tested that abends the same and a dump is needed, it may be necessary to temporarily turn off DAE on the system or to EDIT SYS1.DAE and remove the dump entry that is suppressing the dump.

Restrictions and Limitations

The following restrictions and limitations apply:

- The HSC must be recycled to reactivate the exit.
- If the exit is deactivated or an abend occurs, any transactions not processed are lost.
- The user exit is entered in 24-bit addressing. This is a restriction when calling TMS functions.
- The user exit must be assembled using the HSC and CA-1 (TMS) macro libraries.

Your systems programming staff may replace the default user exit with one designed to implement your system's specific needs.

Parameter List

Description

This parameter list is passed to the Insert/Delete User Exit to pass information about the VOLSER being added or deleted from the control data set.

On the first call, the user area may initialize by issuing a GETMAIN and saving the address in a user fullword provided in this PLIST. That user area is maintained across all calls to the exit. The initial call may be for an insert or delete. Initial call can never be for a purge. If the exit has never been invoked by purge time, it is not called.

The exit is invoked for three actions:

Insert Call	When a VOLSER is added to the control data set, information from the VAR record is passed in this PLIST and flag UX06FUNC is set to UX06INS.
Delete Call	When a VOLSER is deleted from the control data set, information from the VAR record is passed in this PLIST and flag UX06FUNC is set to UX06DEL.
Purge Call	When the HSC is purged, a dummy PLIST is passed and flag UX06FUNC is set to UX06PURG.

Record Layout

The record layout for SLSUX06 parameter list is presented in Table 39.

Table 39. SLSUX06P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX06P - INSERT/DELETE EXIT PARAMETER LIST FUNCTION: THIS PARAMETER LIST IS PASSED TO THE INSERT/DELETE USER EXIT TO PASS INFORMATION ABOUT THE VOLSER BEING ADDED TO OR DELETED FROM THE DATABASE. ON THE FIRST CALL TO THE USER CODE, IT MAY INITIALIZE BY ISSUING A GETMAIN AND SAVING THE ADDRESS IN A USER FULLWORD PROVIDED IN THIS PLIST. THAT USER WORD WILL BE MAINTAINED ACROSS ALL CALLS TO THE USER CODE. THE INITIAL CALL MAY BE FOR AN INSERT OR DELETE. INITIAL CALL CAN NEVER BE FOR A PURGE. IF THE USER CODE HAS NEVER BEEN INVOKED BY PURGE TIME, IT WILL NOT BE CALLED. THE USER CODE WILL BE INVOKED FOR THREE (3) ACTIONS: INSERT CALL - WHEN A VOLSER IS ADDED TO THE DATABASE, INFORMATION FROM THE VAR RECORD WILL BE PASSED IN THIS PLIST AND FLAG UX06FUNC WILL BE SET TO UX06INS. DELETE CALL - WHEN A VOLSER IS DELETED FROM THE DATABASE, INFORMATION FROM THE VAR RECORD WILL BE PASSED IN THIS PLIST AND FLAG UX06FUNC WILL BE SET TO UX06DEL. PURGE CALL - WHEN THE HSC IS PURGED, A DUMMY PLIST WILL BE PASSED AND FLAG UX06FUNC WILL BE SET TO UX06PURG. SPECIAL CONSIDERATIONS: THE USER FIELD (UX06USER) IS PROVIDED FOR USE BY THE USER EXIT ROUTINE. ANY VALUE STORED IN THAT FIELD WILL BE KEPT OVER THE RECURSIVE CALLS TO THE EXIT.					
0	(0)	STRUCTURE		SLSUX06P	USER EXIT PLIST
0	(0)	CHARACTER	4	UX06ID	BLOCK ID
4	(4)	AREA	4	UX06DESC	FULLWORD ALIGN & LENGTH
4	(4)	A-ADDR	1	UX06SPID	SUBPOOL ID
5	(5)	A-ADDR	3	UX06LEN	BLOCK LENGTH
8	(8)	SIGNED-FWORD	4	UX06FWD	FORWARD CHAIN POINTER
12	(C)	SIGNED-FWORD	4	UX06USER	USERWORD MAINTAINED ACROSS CALLS
16	(10)	SIGNED-FWORD	4	UX06MODE	RESERVED
20	(14)	BITSTRING	1	UX06FUNC	EXIT FUNCTION FLAG
		1... .... X’80’		UX06INS	VOLUME INSERTED IN DATABASE
		.1.. .... X’40’		UX06DEL	VOLUME DELETED FROM DATABASE

Table 39. SLSUX06P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		..1. .... X’20’		UX06PURG	PURGE CALL, CLEANUP BEFORE RETURN
21	(15)	BITSTRING	1	UX06FLAG	RESERVED USE BY HSC
		1... .... X’80’		UX6F1TRA	RESERVED
22	(16)	HEXSTRING	2	-RESERVED-	RESERVED
24	(18)	A-ADDR	4	-RESERVED-(2)	RESERVED
32	(20)	CHARACTER	6	UX06VOL	VOLUME SERIAL
38	(26)	BITSTRING	1	UX06FLGS	VOLUME STATUS FLAGS
		1... .... X’80’		UX06SCR	VOLUME IS SCRATCH
		.1.. .... X’40’		UX06SEL	VOLUME IS SELECTED
		..1. .... X’20’		UX06ELAB	CARTRIDGE HAS EXTERNAL LABEL
		...1 .... X’10’		UX06OCR	EXTERNAL LABEL OCR READABLE
		.... 1... X’08’		UX06INUS	DATABASE VOLUME RECORD VALID
39	(27)	HEXSTRING	1	UX06LOCK	OWNING HOST ID
40	(28)	A-ADDR	2	-RESERVED-	RESERVED
42	(2A)	A-ADDR	1	UX06LOCT	LOCATION TYPE (NOT CURRENTLY USED)
43	(2B)	HEXSTRING	5	UX06LOC	CARTRIDGE LOCATION
THE FOLLOWING DATE/TIMES ARE TOD DATE/TIMES OBTAINED BY USING THE FIRST FULLWORD OF A 64-BIT TIME FROM A ‘TIME STCK’ (STORE CLOCK) INSTRUCTION.					
48	(30)	SIGNED-FWORD	4	UX06DATI	DATE/TIME VOLUME INSERTED
52	(34)	SIGNED-FWORD	4	UX06DATL	DATE/TIME LAST SELECTED
56	(38)	SIGNED-FWORD	4	UX06SCNT	VOLUME SELECTED COUNT
60	(3C)	SIGNED-FWORD	4	-RESERVED-(4)	RESERVED
80	(50)	AREA	8	-RESERVED-	PAD TO DOUBLE WORD
		.... X’00’		UX06OK	NORMAL RETURN
		.1.. .... X’40’		UX06NOPR	CANCEL EXIT
		1111 1111 X’FF’		UX06INV	INVALID FUNCTION CODE PASSED
80	(50)	LENGTH		UX06L	LENGTH OF PARMLIST

Cross Reference

Name	Len	Offset Value
UX06DATI	000004	30
UX06DATL	000004	34
UX06DEL	-	40
UX06DESC	000004	04
UX06ELAB	-	20
UX06FLAG	000001	15
UX06FLGS	000001	26
UX06FUNC	000001	14
UX06FWD	000004	08
UX06ID	000004	00
UX06INS	-	80
UX06INUS	-	08
UX06INV	-	FF
UX06L	-	50
UX06LEN	000003	05
UX06LOC	000005	2B
UX06LOCK	000001	27
UX06LOCT	000001	2A
UX06MODE	000004	10
UX06NOPR	-	40
UX06OCR	-	10
UX06OK	-	00
UX06PURG	-	20
UX06SCNT	000004	38
UX06SCR	-	80
UX06SEL	-	40
UX06SPID	000001	04
UX06USER	000004	0C
UX06VOL	000006	20
UX6F1TRA	-	80

User Exit Maintenance User Exit (SLSUX07)

Functional Description

The User Exit Maintenance User Exit allows you to maintain the user exit words passed to each HSC defined user exit. SLSUX07 is implemented to provide greater flexibility in user exit processing.

A unique user exit word exists for each user exit with the exception of User Exit 03 (SLSUX03). These words are used to anchor information and are typically GETMAINed areas, switches, flags, etc. This information is retained across multiple invocations of that exit.

User exit words are passed to the user exits within a parameter list passed in general purpose register one. The word is essentially ‘‘owned’’ by that user exit and remains untouched by the HSC across invocations of the user exit.

The user exit word can be used by the given user exit for any purpose deemed necessary. The user exit words are left intact at HSC initialization and HSC termination unless COLD or RESET is specified at HSC startup time, or the default SLSUX07, which returns a 64 in register 15, is used. **The default name, SLSUX07, must be used.**

This exit is entered once during HSC initialization and once during HSC termination. Upon entry, SLSUX07 is presented with a parameter list containing the user exit words for **all** of the user exits known to the HSC. These words are used by User Exit 07 to process user exit words on behalf of the associated user exit, for example, cleanup switches, flags, FREEMAINs, etc. This makes the various other exits easier to maintain by centralizing data area lookup and initialization logic into a common location.

The default SLSUX07, clears all user exit words during HSC initialization and at HSC termination. Dynamic user word structures may need to change between startup and termination of the HSC.

It is the users responsibility to coordinate the synchronization of the user exits, and if necessary, to dynamically load the new cleanup SLSUX07 prior to the termination of HSC.

Environment

SLSUX07 is applicable in both JES2 and JES3 environments. It executes in the HSC address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX07P.

Entry Specifications

Upon entry to SLSUX07, the register contents are as listed in Table 24 on page 399.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX07 are as listed in Table 25 on page 400.

Return Codes

Table 40. SLSUX07 Return Codes in Register 15

Return Code	Name	Description
0	UX07DONE	Normal completion.
64	UX07IACT	Error return / user exit inactive.

Parameter List

Record Layout

The record layout for SLSUX07 parameter list is presented in Table 41.

Table 41. SLSUX07P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX07P USER EXIT 07 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT BY THE DYNAMIC USER EXIT SERVICE AND CONTAINS A POINTER TO EACH USER EXIT USER WORD. IT ALSO CONTAINS A FLAG BYTE TO INDICATE WHETHER THIS CALL IS FOR HSC INITIALIZATION OR TERMINATION. THE USER SHOULD THIS EXIT TO FREEMAIN/GETMAIN ANCHOR BLOCKS AND OPEN/CLOSE DATASETS.					
0	(0)	STRUCTURE		SLSUX07P	EXIT TERMINATION PARAMETER LIST.
0	(0)	CHARACTER	1	UX07CALL	CALL CODE.
‘1’	(F1)	CHAR CONST		UX07INIT	INITIALIZE CALL.
‘2’	(F2)	CHAR CONST		UX07TERM	TERMINATION CALL.
1	(1)	CHARACTER	3	UX07RSV1	RESERVED
4	(4)	SIGNED-FWORD	4	UX07UX01	USER WORD - WTO INTERCEPT EXIT
8	(8)	SIGNED-FWORD	4	UX07UX02	USER WORD - JES2 SCRATCH ALLOCATE
12	(C)	SIGNED-FWORD	4	UX07UX04	USER WORD - JES3 SCRATCH ALLOCATE
16	(10)	SIGNED-FWORD	4	UX07UX05	USER WORD - PROGRAMMATIC AUTHORIZE

Table 41. SLSUX07P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
20	(14)	SIGNED-FWORD	4	UX07UX06	USER WORD - INSERT/DELETE CDS EXIT
24	(18)	SIGNED-FWORD	4	UX07UX07	USER WORD - INIT/TERM OF USER EXITS
28	(1C)	SIGNED-FWORD	4	UX07UX08	USER WORD - SPECIFIC ALLOCATION
32	(20)	SIGNED-FWORD	4	UX07UX09	USER WORD - JES2 DEFER ALLOCATION
36	(24)	SIGNED-FWORD	4	UX07UX10	USER WORD - JES2 AFFINITY SEPARATE
40	(28)	SIGNED-FWORD	4	UX07UX11	USER WORD - JES3 DEFER ALLOCATION
44	(2C)	SIGNED-FWORD	4	UX07UX12	USER WORD - JES3 AFFINITY SEPARATE
48	(30)	SIGNED-FWORD	4	UX07UX13	USER WORD - JES3 ESOTERIC REPLACE
52	(34)	SIGNED-FWORD	4	UX07UX14	USER WORD - VOLUME ACCESS
56	(38)	SIGNED-FWORD	4	UX07UX15	USER WORD - COMMAND ACCESS
15	(0F)	CONST		UX07NUMW	NUMBER OF USER WORDS IN PARMLIST.
60	(3C)	SIGNED-FWORD	4	UX07RS16	RESERVED USER WORD 16
64	(40)	SIGNED-FWORD	4	UX07RS17	RESERVED USER WORD 17
68	(44)	SIGNED-FWORD	4	UX07RS18	RESERVED USER WORD 18
72	(48)	SIGNED-FWORD	4	UX07RS19	RESERVED USER WORD 19
76	(4C)	SIGNED-FWORD	4	UX07RS20	RESERVED USER WORD 20
		.... X’00’		UX07DONE	RETURN CODE 0
		.1.. .... X’40’		UX07IACT	RETURN CODE 64
80	(50)	LENGTH		UX07L	LENGTH OF PARAMETER LIST.

Cross Reference

Name	Len	Offset Value
UX07CALL	000001	00
UX07DONE	-	00
UX07IACT	-	40
UX07INIT	-	‘CVAL’
UX07L	-	50
UX07NUMW	-	0F
UX07RSV1	000003	01
UX07RS16	000004	3C
UX07RS17	000004	40
UX07RS18	000004	44
UX07RS19	000004	48
UX07RS20	000004	4C
UX07TERM	-	‘CVAL’
UX07UX01	000004	04
UX07UX02	000004	08
UX07UX04	000004	0C
UX07UX05	000004	10
UX07UX06	000004	14
UX07UX07	000004	18
UX07UX08	000004	1C
UX07UX09	000004	20
UX07UX10	000004	24
UX07UX11	000004	28
UX07UX12	000004	2C
UX07UX13	000004	30
UX07UX14	000004	34
UX07UX15	000004	38

JES2 Specific Volume Allocation User Exit (SLSUX08)

Functional Description

The JES2 Specific Volume Allocation User Exit enables you to request modification of the actions the SMC takes during allocation of a specific volume DD statement which references cartridge tape devices on a JES2 system. This exit can be used to:

- change esoteric (unit name) used for device allocation
- request allocation of a particular ACS
- request allocation of nonlibrary drives
- request allocation of library drives
- bypass drive exclusion logic.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX08 is applicable in JES2 during device allocation. It executes in the job's address space.

This exit is called for every allocation request for a specific volume on a cartridge tape device on a JES2 system.

Conditions when Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX08P.

Execution Attributes

Shared enqueues held on major name SYSIEFSD, minor names Q4, CHNGDEVS, DDRTPUR, and DDRDA.

Entry Specifications

Upon entry to SLSUX08, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX08 are as listed in Table 25 on page 400.

Return Codes

Table 42. SLSUX08 Return Codes in Register 15

Return Code	Name	Description
0	UX08HJCL	Honor unit information in JCL.
4	UX08ESUB	Change the esoteric (unit name) to be used for the allocation.
8	UX08SVOL	Request allocation to use library drives indicated by the SPECVOL parameter of the ALLOC command.
12	UX08NLIB	Request allocation to use nonlibrary drives.
16	UX08ASUB	Request the allocation of the specified ACS.
20	UX08BSEP	Bypass drive exclusion
64	UX08IACT	User exit is not operational.

Table 43. SLSUX08 Return Data in Parameter List

Name	Description
UX08ACS	ACS to allocate in if return code UX08ASUB is issued.
UX08ESO	Esoteric to substitute if return code UX08ESUB is issued.

Programming Considerations

1. A default SLSUX08 is supplied by StorageTek in the SAMPLIB on the distribution tape. It disables itself after its first invocation.
2. Because the exit executes as an extension to the common allocation SSREQ, it cannot issue dynamic allocation requests.

Parameter List

Record Layout

The record layout for SLSUX08 parameter list is presented in Table 44.

Table 44. SLSUX08P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX08P - USER EXIT 08 PARAMETER LIST. FUNCTION: SLSUX08P MAPS THE DATA AREA PASSED IN AS INPUT TO SLSUX08. THE PARAMETER LIST IS BUILT BY HSC COMMON ALLOCATION SSREQ FUNCTION ROUTINE. THE USER EXIT IS CALLED FOR A SPECIFIC ALLOCATION REQUEST. IN CONJUNCTION WITH REMOTE LIBRARY SUPPORT THE USER EXIT PROVIDES THE ABILITY TO PERFORM ESOTERIC SUBSTITUTION FOR A GIVEN DD STATEMENT. THE RETURN CODE FROM THE USER EXIT INDICATES WHETHER A SUBSTITUTE ESOTERIC IS BEING PROVIDED, OR IF THE UNIT INFORMATION SPECIFIED IN THE INVOKING JCL SHOULD BE USED. RETURN CODES IN R15 : 0 - NO SUBSTITUTE ESOTERIC PROVIDED 4 - ESOTERIC SUBSTITUTION USING USER SUPPLIED ESOTERIC NAME 8 - ESOTERIC SUBSTITUTION USING SPECVOL SETTINGS 12 - DIRECT ALLOCATION TO NON-LIB DRIVES 16 - ESOTERIC SUBSTITUTION USING USER SUPPLIED ACS ID 64 - USER EXIT 08 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINES EXECUTES IN THE ENVIRONMENT OF THE SCHEDULER ALLOCATION ROUTINES EXCEPT FOR THE EXECUTION KEY WHICH HAS BEEN REDUCED TO TCB KEY VIA THE SYNCH.					
0	(0)	STRUCTURE		SLSUX08P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX08UX08	ACRONYM
4	(4)	SIGNED-FWORD	4	UX08LEN	LENGTH OF UX08 PARAMETER LIST
8	(8)	A-ADDR	1	UX08SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX08SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX08KEY	STORAGE KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	RESERVED RETURN CODE EQUATES
0	(00)	CONST		UX08HJCL	USE UNIT INFORMATION PROVIDED VIA JCL
4	(04)	CONST		UX08ESUB	ESOTERIC SUBSTITUTION REQUESTED
8	(08)	CONST		UX08SVOL	PERFORM SUBSTITUTION VIA SPECVOL
12	(0C)	CONST		UX08NLIB	DIRECT ALLOCATION TO NON-LIB DRIVES

Table 44. SLSUX08P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
16	(10)	CONST		UX08ASUB	SUBSTITUTE USING USER SUPPLIED ACS ID
20	(14)	CONST		UX08BSEP	BYPASS DEVICE SEPARATION
64	(40)	CONST		UX08IACT	UX08 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX08JOBN	JOBNAME
20	(14)	CHARACTER	8	UX08STPN	STEPNAME
28	(1C)	CHARACTER	8	UX08PRSN	PROCSTEPNAME
36	(24)	CHARACTER	8	UX08DDN	DD NAME
44	(2C)	A-ADDR	4	UX08USER	UX08 USER WORD
48	(30)	A-ADDR	4	UX08JACC	ADDRESS OF JOB ACCOUNTING INFO
52	(34)	A-ADDR	4	UX08SACC	ADDRESS OF STEP ACCOUNTING INFO
56	(38)	CHARACTER	44	UX08DSN	DATASET NAME
100	(64)	A-ADDR	4	UX08VOLP	POINTER TO VOLUME INFORMATION
104	(68)	SIGNED-FWORD	4	UX08NUMV	NUMBER OF VOLUMES IN DATASET
108	(6C)	CHARACTER	8	UX08ESO	ESOTERIC TO SUBSTITUTE IN PLACE OF WHAT WAS SPECIFIED IN THE JCL
116	(74)	HEXSTRING	1	UX08ACS	ACS ID FOR SUBSTITUTION
117	(75)	CHARACTER	3	UX08XPDT	DATASET EXPIRATION DATE FROM JFCB
120	(78)	BITSTRING	1	UX08LABT	LABEL TYPE FROM JFCB **Note:** This field is taken from the JFCBLTYP field in the JFCB. Other bits may be set on in the byte beside the label type bits indicated below.
		.1.. .... X’40’		UX08LBAL	ANSI LABEL (AL)
		.... .1.. X’04’		UX08LBNS	NON-STANDARD LABEL (NSL)
		.... ..1. X’02’		UX08LBSL	STANDARD LABEL (SL)
		....1 X’01’		UX08LBNL	NON-LABELED (NL)
121	(79)	HEXSTRING	3	-RESERVED-	Reserved
128	(80)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD

Table 44. SLSUX08P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
128	(80)	LENGTH		UX08FIXL	LENGTH OF FIXED SECTION OF PARM LIST
0	(0)	STRUCTURE		SLSUX08V	VOLUME SECTION OF PARAMETER LIST
THE FOLLOWING AREA IS POINTED TO BY UX08VOLP. IT CONSISTS OF THE VOLUME SERIAL AND LOCATION OF EACH VOLUME IN THE DATA SET. THE NUMBER OF VOLUME ENTRIES IN THE LIST IS PROVIDED BY UX08NUMV					
0	(0)	CHARACTER	6	UX08VLSR	VOLUME SERIAL
6	(6)	BITSTRING	1	UX08VLOC	VOLUME LOCATION
		1... .... X’80’		UX08VLIB	VOLUME RESIDES IN LIBRARY
		.1.. .... X’40’		UX08VNLB	VOLUME RESIDES OUTSIDE LIBRARY
7	(7)	HEXSTRING	2	UX08LSM	IF VOLUME IN LIBRARY, THIS FIELD CONTAINS LIBRARY LOCATION IN ACS/LSM FORMAT ‘AALL’ THIS VALUE IS HEXADECIMAL
16	(10)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
16	(10)	LENGTH		UX08VOLL	LENGTH OF VOLUME ENTRY

Cross Reference

Name	Len	Offset Value
UX08ACS	000001	74
UX08ASUB	-	10
UX08BSEP	-	14
UX08DDN	000008	24
UX08DSN	000044	38
UX08ESO	000008	6C
UX08ESUB	-	04
UX08FIXL	-	80
UX08HJCL	-	00
UX08IACT	-	40
UX08JACC	000004	30
UX08JOBN	000008	0C
UX08KEY	000001	09
UX08LABT	000001	78
UX08LBAL	-	40
UX08LBNL	-	01
UX08LBNS	-	04
UX08LBSL	-	02
UX08LEN	000004	04
UX08LSM	000002	07
UX08NLIB	-	0C
UX08NUMV	000004	68
UX08PRSN	000008	1C
UX08SACC	000004	34
UX08SPID	-	E6
UX08STPN	000008	14
UX08SUBP	000001	08
UX08SVOL	-	08
UX08USER	000004	2C
UX08UX08	000004	00
UX08VLIB	-	80

Name	Len	Offset Value
UX08VLOC	000001	06
UX08VLSR	000006	00
UX08VNLB	-	40
UX08VOLL	-	10
UX08VOLP	000004	64
UX08XPDT	000003	75

Deferred Mount User Exit (SLSUX09)

Functional Description

The Deferred Mount User Exit is invoked during MVS allocation processing to allow the user to determine whether a mount should be deferred. The exit is only invoked during static allocation. Dynamic allocation requests are not deferred. Checkpoint/restart data sets used for restart are always deferred.

Notes:

- For information on JES3 deferral, refer to "JES3 Deferred Mount User Exit (SLSUX11)" on page 464.
- Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

If you request defer in the JCL, the mount of the cartridge is deferred until the data set is opened. If you do not request defer in your JCL, the cartridge is mounted at step allocation time. If the data set is not opened, the cartridge is mounted and dismounted without actually being used.

The HSC ALLOC command and control statement provides a Defer option to enable or disable MVS deferred mount processing for library mounts. Refer to ''Allocation (ALLOC) Command and Control Statement'' in the *HSC Operator's Guide* for details on the ALLOC command.

- Setting Defer(ON) allows you to override the JCL and always request deferred mount processing.
- Setting Defer(OFf) does not override your JCL or JECL statements requesting MVS or JES3 deferred processing.
- Setting Defer(JEs3) allows you operate in a manner similar to previous versions of the HSC; a volume is not mounted until step execution begins (JES3 only).

When deferred mount processing is in effect, a cartridge is only mounted when the data set on the cartridge is opened. If the data set is not opened, the cartridge is not mounted. The LSM robot is then free to perform other necessary tasks. If the volume is required, it is mounted at open time and the job waits until the cartridge is mounted before proceeding.

Cartridges that are mounted are selected by the HSC. Without deferred mounting, scratch volumes that are never used, are mounted and removed from the scratch list. This causes the scratch list to be depleted more quickly than if the HSC did not mount and select these volumes.

Deferred mounting can reduce the number of mounts and dismounts the robot must perform, but may increase the time required to run a job. SLSUX09 provides you with the flexibility to allow or disallow the Defer option on an individual mount request.

If you require some data sets be mounted prior to open time for performance reasons and your data center normally operates in deferred mode, SLSUX09 allows you to override deferred mounting for an individual mount request.

A default SLSUX09 is supplied by StorageTek, and is included as part of the SAMPLIB data set delivered to customers. The default exit disables itself after its first invocation.

Your systems programming staff may replace the default user exit with one designed to implement your systems specific needs.

Environment

SLSUX09 is applicable in both the JES2 and JES3 environments. It executes in the job's address space.

Conditions When Exit Routine is Executed

Parameter List

The the parameter list is mapped by macro SLSUX09P.

Entry Specifications

Upon entry to SLSUX09, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX09 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX09 are listed in Table 45.

Table 45. SLSUX09 Return Codes in Register 15

Return Code	Name	Description
0	UX09HSC	Process normally; exit does not influence defer status.
4	UX09DFR	Defer the mount.
8	UX09NDFR	Honor the JCL defer status.
64	UX09IACT	User exit is not operational.

Parameter List

Record Layout

The record layout for SLSUX09 parameter list is presented in Table 46.

Table 46. SLSUX09P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX09P -USER EXIT 09 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT BY HSC COMMON ALLOCATION SSREQ FUNCTION ROUTINE. THE USER EXIT IS CALLED FOR A LIBRARY VOLUME ALLOCATION REQUEST. THE RETURN CODE FROM THE USER EXIT INDICATES THE MVS DEFER STATUS OF THE REQUEST. USER EXIT 09 IS NOT INVOKED FOR DYNAMIC ALLOCATION REQUESTS. RETURN CODES IN R15 : 0 - PROCESS NORMALLY; EXIT DOES NOT INFLUENCE MVS DEFER STATUS 4 - DEFER THE MOUNT 8 - HONOR THE JCL DEFER STATUS 64 - USER EXIT 09 NOT USED SPECIAL CONSIDERATIONS: THE EXIT ROUTINE EXECUTES IN THE ENVIRONMENT OF THE SCHEDULER ALLOCATION ROUTINES, EXCEPT THE EXECUTION KEY HAS BEEN REDUCED TO TCB KEY VIA THE SYNCH.					
0	(0)	STRUCTURE		SLSUX09P	ALLOCATION USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX09UX09	ACRONYM
4	(4)	SIGNED-FWORD	4	UX09LEN	LENGTH OF UX09 PARAMETER LIST
8	(8)	A-ADDR	1	UX09SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX09SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX09KEY	STORAGE KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	RESERVED
12	(C)	SIGNED-FWORD	4	UX09USER	WORD RESERVED FOR CUSTOMER USE INITIALLY SET TO ZERO. IT IS PASSED FROM INVOCATION TO INVOCATION AND MAY BE USED TO ANCHOR A USER CONTROL BLOCK.
16	(10)	CHARACTER	8	UX09JOBN	JOBNAME
24	(18)	CHARACTER	8	UX09STPN	STEPNAME
32	(20)	CHARACTER	8	UX09PRSN	PROCSTEPNAME
40	(28)	CHARACTER	8	UX09PGMN	EXEC=PGMNAME
48	(30)	CHARACTER	8	UX09DDN	DD NAME
56	(38)	CHARACTER	44	UX09DSN	DATASET NAME

Table 46. SLSUX09P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
100	(64)	SIGNED-FWORD	4	UX09RSV1	RESERVED FOR DEVELOPMENT
104	(68)	SIGNED-FWORD	4	UX09RSV2	RESERVED FOR DEVELOPMENT
108	(6C)	SIGNED-FWORD	4	UX09RSV3	RESERVED FOR DEVELOPMENT
112	(70)	SIGNED-FWORD	4	UX09RSV4	RESERVED FOR DEVELOPMENT
116	(74)	BITSTRING	1	UX09DDCH	DATASET CHARACTERISTICS
		1... .... X’80’		UX09SPEC	SPECIFIC VOLUME REQUEST
		.1.. .... X’40’		UX09NSPC	NON-SPECIFIC VOLUME REQUEST
RETURN CODE EQUATES					
0	(00)	CONST		UX09HSC	EXIT DOES NOT INFLUENCE DEFER
4	(04)	CONST		UX09DFR	DEFER THE MOUNT
8	(08)	CONST		UX09NDFR	HONOR THE USER’S JCL
64	(40)	CONST		UX09IACT	UX09 IS NOT OPERATIONAL
120	(78)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
120	(78)	LENGTH		UX09LSTL	LENGTH OF USER EXIT 09 PARM LIST

Cross Reference

Name	Len	Offset Value
UX09DDCH	000001	74
UX09DDN	000008	30
UX09DFR	-	04
UX09DSN	000044	38
UX09HSC	-	00
UX09IACT	-	40
UX09JOBN	000008	10
UX09KEY	000001	09
UX09LEN	000004	04
UX09LSTL	-	78
UX09NDFR	-	08
UX09NSPC	-	40
UX09PGMN	000008	28
UX09PRSN	000008	20
UX09RSV1	000004	64
UX09RSV2	000004	68
UX09RSV3	000004	6C
UX09RSV4	000004	70
UX09SPEC	-	80
UX09SPID	-	E6
UX09STPN	000008	18
UX09SUBP	000001	08
UX09USER	000004	0C
UX09UX09	000004	00

JES2 Unit Affinity Separation User Exit (SLSUX10)

Functional Description

The JES2 Unit Affinity Separation User Exit enables you to request modification of the actions the SMC takes during allocation of a unit affinity chain or GDG ALL chain which references cartridge tape devices on a JES2 system. This exit can be used to

- override the setting of the SMC ALLOCDef command SEPLvl parameter
- request allocation of library drives for the chain
- request allocation of nonlibrary drives for the chain
- change the esoteric (unit name) used to allocate the chain
- request allocation of a particular ACS for the chain.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX10 is applicable in JES2 during device allocation. It executes in the job's address space.

This exit is called for every unit affinity chain or GDG ALL chain that requires allocation.

Conditions when Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX10P.

Execution Attributes

Shared enqueues held on major name SYSIEFSD, minor names Q4, CHNGDEVS, DDRTPUR, and DDRDA.

Entry Specifications

Upon entry to SLSUX10, the register contents are as listed in Table 24 on page 399.

Condition on Return From User Exit

Return Specifications

Return specifications for SLSUX10 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX10 are listed in Table 47.

Table 47. SLSUX10 Return Codes in Register 15

Return Code	Name	Description
0	UX10PLIB	Perform separation according to current setting of ALLOC command.
4	UX10NSEP	Do not separate the affinity chain.
8	UX10SEP	Separate the affinity chain.
12	UX10LDRV	Do not separate the chain and allocate library drives.
16	UX10NDRV	Do not separate the chain and allocate nonlibrary drives.
20	UX10ESUB	Do not separate the chain and substitute the returned esoteric.
24	UX10ASUB	Do not separate the chain and allocate in the specified ACS.
64	UX10IACT	User exit is not operational.

Table 48. SLSUX10 Return Data in Parameter List

Name	Description
UX10ACS	ACS to allocate in if return code UX10ASUB is issued.
UX10ESO	Esoteric to substitute if return code UX10ESUB is issued.

Programming Considerations

1. A default SLSUX10 is supplied by StorageTek and is included as part of the SAMPLIB data set delivered to customers. The default exit disables itself after its first invocation.
2. Because the exit executes as an extension to the common allocation SSREQ, it cannot issue dynamic allocation requests.
3. This exit can request esoteric substitution (or ACS specification) or separation, but not both. The two requests are mutually exclusive.

Performance Considerations

Unit affinity separation results in more tape devices being allocated to job steps requesting unit affinity between library and nonlibrary volumes, or volumes in different ACSs.

Increased resource allocation may affect the overall performance for the entire job mix of an MVS environment.

Parameter List

Record Layout

The record layout for SLSUX10 parameter list is presented in Table 49.

Table 49. SLSUX10P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX10P - USER EXIT 10 PARAMETER LIST. FUNCTION: SLSUX10P MAPS THE DATA AREA PASSED IN AS INPUT TO SLSUX10. THE PARAMETER LIST IS BUILT BY HSC COMMON ALLOCATION SSREQ FUNCTION ROUTINE. THE USER EXIT IS CALLED FOR EACH UNIT AFFINITY CHAIN OR UNQUALIFIED GDG SPECIFIED IN THE INVOKING JCL. SLSUX10 PROVIDES THE ABILITY TO REQUEST UNIT AFFINITY SEPARATION FOR DATASETS WHICH BELONG TO A SINGLE AFFINITY CHAIN OR AN UNQUALIFIED GDG AND THE REQUIRED VOLUMES RESIDE IN DIFFERENT PHYSICAL LOCATIONS (E.G., INSIDE AND OUTSIDE AN ACS, IN DIFFERENT ACS'S, ETC.). RETURN CODES IN R15 : 0 - PERFORM UNIT AFFINITY SEPARATION AS SPECIFIED VIA HSC PARMLIB 4 - DO NOT PERFORM UNIT AFFINITY SEPARATION 8 - PERFORM UNIT AFFINITY SEPARATION 12 - DO NOT PERFORM AFFINITY SEPARATION, AND CHOOSE LIBRARY DRIVES 16 - DO NOT PERFORM AFFINITY SEPARATION, AND CHOOSE NON-LIBRARY DRIVES 20 - DO NOT PERFORM AFFINITY SEPARATION, AND PERFORM ESOTERIC SUBSTITUTION USING USER SUPPLIED ESOTERIC NAME 24 - DO NOT PERFORM AFFINITY SEPARATION, AND PERFORM ESOTERIC SUBSTITUTION USING USER SUPPLIED ACS ID 64 - USER EXIT 10 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINES EXECUTES IN THE ENVIRONMENT OF THE SCHEDULER ALLOCATION ROUTINES EXCEPT FOR THE EXECUTION KEY WHICH HAS BEEN REDUCED TO TCB KEY VIA THE SYNCH.					
0	(0)	STRUCTURE		SLSUX10P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX10UX10	ACRONYM
4	(4)	SIGNED-FWORD	4	UX10LEN	LENGTH OF UX10 PARAMETER LIST
8	(8)	A-ADDR	1	UX10SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX10SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX10KEY	STORAGE KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	RESERVED
RETURN CODE EQUATES					

Table 49. SLSUX10P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
0	(00)	CONST		UX10PLIB	PERFORM UNIT AFFINITY SEPARATION AS SPECIFIED VIA HSC PARMLIB
4	(04)	CONST		UX10NSEP	DO NOT PERFORM UNIT AFFINITY SEPARATION (RETURN CODE 4 OVERRIDES HSC PARMLIB)
8	(08)	CONST		UX10SEP	PERFORM UNIT AFFINITY SEPARATION (RETURN CODE 8 OVERRIDES HSC PARMLIB)
12	(0C)	CONST		UX10LDRV	DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE LIBRARY DRIVES
16	(10)	CONST		UX10NDRV	DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE NON-LIBRARY DRIVES
20	(14)	CONST		UX10ESUB	DO NOT PERFORM AFFINITY SEPARATION AND USE ESOTERIC PROVIDED
24	(18)	CONST		UX10ASUB	DO NOT PERFORM AFFINITY SEPARATION AND USE ACS ID PROVIDED
64	(40)	CONST		UX10IACT	UX10 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX10JOBN	JOBNAME
20	(14)	CHARACTER	8	UX10STPN	STEPNAME
28	(1C)	CHARACTER	8	UX10PRSN	PROCSTEPNAME
36	(24)	A-ADDR	4	UX10USER	UX10 USER WORD
40	(28)	A-ADDR	4	UX10JACC	ADDRESS OF JOB ACCOUNTING INFO
44	(2C)	A-ADDR	4	UX10SACC	ADDRESS OF STEP ACCOUNTING INFO
48	(30)	SIGNED-FWORD	4	UX10DCNT	NUMBER OF DSNS IN AFFINITY CHAIN
52	(34)	CHARACTER	8	UX10ESO	ESOTERIC TO SUBSTITUTE
60	(3C)	HEXSTRING	1	UX10ACS	ACS ID TO SUBSTITUTE
64	(40)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
64	(40)	LENGTH		UX10FIXL	LENGTH OF FIXED PORTION OF USER EXIT 10 PARM LIST
0	(0)	STRUCTURE		SLSUX10D	DATASET SECTION OF PARAMETER LIST

Table 49. SLSUX10P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
THE FOLLOWING AREA IMMEDIATELY FOLLOWS THE SLSUX10P FIXED DATA AREA. THIS AREA REPEATS ONCE FOR EACH DD STATEMENT IN THE AFFINITY CHAIN. THE NUMBER OF DD STATEMENTS IN THE AFFINITY CHAIN IS STORED IN FIELD UX10DCNT.					
0	(0)	CHARACTER	8	UX10DDN	DD NAME
8	(8)	CHARACTER	44	UX10DSN	DATASET NAME
52	(34)	A-ADDR	4	UX10VOLP	POINTER TO VOLUME INFORMATION
56	(38)	SIGNED-FWORD	4	UX10VCNT	NUMBER OF VOLUMES IN DATASET
60	(3C)	CHARACTER	3	UX10XPDT	DATASET EXPIRATION DATE FROM JFCB
63	(3F)	BITSTRING	1	UX10LABT	LABEL TYPE FROM JFCB
		.1.. .... X’40’		UX10LBAL	ANSI LABEL (AL)
		.... .1.. X’04’		UX10LBNS	NON-STANDARD LABEL (NSL)
		.... ..1. X’02’		UX10LBSL	STANDARD LABEL (SL)
		....1 X’01’		UX10LBNL	NON-LABELED (NL)
64	(40)	BITSTRING	1	UX10GDGI	GDG INFORMATION
		1... .... X’80’		UX10GDG	DATASET IS PART OF GDG ALL
		.1.. .... X’40’		UX10NGDG	DATASET IS GDG SINGLE
65	(41)	HEXSTRING	14	-RESERVED-	RESERVED - FORMALLY SUBPOOLING
80	(50)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
80	(50)	LENGTH		UX10DSNL	LENGTH OF VARIABLE DATASET SECTION OF PARM LIST
0	(0)	STRUCTURE		SLSUX10V	VOLUME SECTION OF PARM LIST
THE FOLLOWING AREA IS POINTED TO BY UX10VOLP. FOR A SPECIFIC REQUEST, UX10VSER CONTAINS THE VOLUME SERIAL. FOR A NONSPECIFIC REQUEST, UX10VSER CONTAINS CL6’SCRTCH’. IF THE SPECIFIC VOLUME RESIDES IN THE LIBRARY, UX10LSM WILL CONTAIN IT’S LIBRARY LOCATION. FOR ALL OTHER REQUESTS UX10LSM WILL CONTAIN X’0000’.					
0	(0)	CHARACTER	6	UX10VSER	VOLUME SERIAL
6	(6)	BITSTRING	1	UX10VLOC	VOLUME LOCATION
		1... .... X’80’		UX10VLIB	SPECIFIC VOL. INSIDE LIBRARY
		.1.. .... X’40’		UX10VNLB	SPECIFIC VOL. OUTSIDE LIBRARY
		..1. .... X’20’		UX10VSCR	NON-SPECIFIC VOLUME REQUEST

Table 49. SLSUX10P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
7	(7)	HEXSTRING	2	UX10LSM	IF SPECIFIC VOL. INSIDE LIBRARY, THIS FIELD CONTAINS LIBRARY LOCATION IN ACS/LSM FORMAT ‘AALL THIS VALUE IS HEXADECIMAL.
16	(10)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
16	(10)	LENGTH		UX10VOLL	LENGTH OF VOLUME ENTRY

Cross Reference

Name	Len	Offset Value
UX10ACS	000001	3C
UX10ASUB	-	18
UX10DCNT	000004	30
UX10DDN	000008	00
UX10DSN	000044	08
UX10DSNL	-	50
UX10ESO	000008	34
UX10ESUB	-	14
UX10FIXL	-	40
UX10GDG	-	80
UX10GDGI	000001	40
UX10IACT	-	40
UX10JACC	000004	28
UX10JOBN	000008	0C
UX10KEY	000001	09
UX10LABT	000001	3F
UX10LBAL	-	40
UX10LBNL	-	01
UX10LBNS	-	04
UX10LBSL	-	02
UX10LDRV	-	0C
UX10LEN	000004	04
UX10LSM	000002	07
UX10NDRV	-	10
UX10NGDG	-	40
UX10NSEP	-	04
UX10PLIB	-	00
UX10PRSN	000008	1C
UX10SACC	000004	2C
UX10SEP	-	08
UX10SPID	-	E6

Name	Len	Offset Value
UX10STPN	000008	14
UX10SUBP	000001	08
UX10USER	000004	24
UX10UX10	000004	00
UX10VCNT	000004	38
UX10VLIB	-	80
UX10VLOC	000001	06
UX10VNLB	-	40
UX10VOLL	-	10
UX10VOLP	000004	34
UX10VSCR	-	20
UX10VSER	000006	00
UX10XPDT	000003	3C

JES3 Deferred Mount User Exit (SLSUX11)

Functional Description

The JES3 Deferred Mount User Exit is invoked during JES3 Converter/Interpreter (C/I) processing to allow the user to determine whether a mount should be JES3 deferred. The exit is only invoked during static allocation. Dynamic allocation requests are not deferred. Checkpoint/restart data sets used for restart are not deferred.

Note:

- For information on MVS deferral, refer to "Deferred Mount User Exit (SLSUX09)" on page 451.
- Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

In previous releases of HSC in the JES3 environment, mount requests for library devices were JES3 deferred automatically. JES3 deferral means that the volume is not mounted before step execution begins. Any mount set up by JES3 must be JES3 deferred before it can be MVS deferred.

Note: MVS deferred allocation implies JES3 deferred allocation in the JES3 environment. JES3 deferral, however, does not imply MVS deferral.

The HSC ALLOC Defer command and control statement enables you to allow or disallow JES3 deferral and take full advantage of JES3 preexecution setup. Refer to ''Allocation (ALLOC) Command and Control Statement'' in the *HSC Operator's Guide* for details on the ALLOC command.

- Setting Defer(ON) or Defer(JEs3) automates JES3 defer processing.
  - Defer(ON) enables deferred mount processing which overrides the JCL and defers all library mounts until the data set on the cartridge is opened. If the data set is not opened, the cartridge is not mounted. The robot is then free to perform other necessary tasks. When a volume is required, it is mounted at open time and the job waits until the cartridge is mounted before proceeding.
  - Defer(JEs3) allows you to operate in a manner similar to previous versions of the HSC. A volume is not mounted until step execution begins.

Note: StorageTek does not recommend running with Defer(OFf).

A default SLSUX11 is supplied by StorageTek and is included as part of the SAMPLIB data set delivered to customers. The default exit disables itself after its first invocation.

Your systems programming staff may replace the default user exit with one designed to implement your systems specific needs.

Environment

SLSUX11 is applicable in a JES3 environment. It executes in the JES3 address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX11P.

Entry Specifications

Upon entry to SLSUX11, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX11 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX11 are listed in Table 50.

Table 50. SLSUX11 Return Codes in Register 15

Return Code	Name	Description
0	UX11HSC	Process normally; exit does not influence JES3 defer status.
4	UX11DFR	JES3 defer the mount.
64	UX11IACT	User exit is not operational.

The Main Device Scheduler (MDS) verify process is bypassed for this request.

Parameter List

Record Layout

The record layout for SLSUX11 parameter list is presented in Table 51.

Table 51. SLSUX11P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX11P -USER EXIT 11 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT DURING DEVICE SEPARATION. THE USER EXIT IS INVOKED FOR A LIBRARY VOLUME ALLOCATION REQUEST. THE RETURN CODE FROM THE USER EXIT INDICATES THE JES3 DEFER STATUS OF THE REQUEST. USER EXIT 11 IS NOT INVOKED FOR DYNAMIC ALLOCATION REQUESTS. RETURN CODES IN R15 : 0 - PROCESS NORMALLY; EXIT DOES NOT INFLUENCE JES3 DEFER STATUS 4 - JES3 DEFER THE MOUNT 8 - HONOR THE JES3 DEFER STATUS 64 - USER EXIT 11 NOT USED SPECIAL CONSIDERATIONS: THE EXIT ROUTINE EXECUTES IN THE ENVIRONMENT OF THE HSC ADDRESS SPACE.					
0	(0)	STRUCTURE		SLSUX11P	ALLOCATION USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX11UX11	ACRONYM
4	(4)	SIGNED-FWORD	4	UX11LEN	LENGTH OF UX11 PARAMETER LIST
8	(8)	A-ADDR	1	UX11SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX11SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX11KEY	STORAGE KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	RESERVED
12	(C)	SIGNED-FWORD	4	UX11USER	WORD RESERVED FOR CUSTOMER USE INITIALLY SET TO ZERO. IT IS PASSED FROM INVOCATION TO INVOCATION AND MAY BE USED TO ANCHOR A USER CONTROL BLOCK.
16	(10)	CHARACTER	8	UX11JOBN	JOBNAME
24	(18)	CHARACTER	8	UX11STPN	STEPNAME
32	(20)	CHARACTER	8	UX11PRSN	PROCSTEPNAME
40	(28)	CHARACTER	8	UX11DDN	DD NAME
48	(30)	CHARACTER	44	UX11DSN	DATASET NAME
92	(5C)	SIGNED-FWORD	4	UX11RSV1	RESERVED FOR DEVELOPMENT
96	(60)	SIGNED-FWORD	4	UX11RSV2	RESERVED FOR DEVELOPMENT

Table 51. SLSUX11P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
100	(64)	SIGNED-FWORD	4	UX11RSV3	RESERVED FOR DEVELOPMENT
104	(68)	SIGNED-FWORD	4	UX11RSV4	RESERVED FOR DEVELOPMENT
108	(6C)	BITSTRING	1	UX11DDCH	DATASET CHARACTERISTICS
		1... .... X’80’		UX11SPEC	SPECIFIC VOLUME REQUEST
		.1.. .... X’40’		UX11NSPC	NON-SPECIFIC VOLUME REQUEST
RETURN CODE EQUATES					
0	(00)	CONST		UX11HSC	EXIT DOES NOT INFLUENCE JES3 DEFER
4	(04)	CONST		UX11DFR	JES3 DEFER THE MOUNT
64	(40)	CONST		UX11IACT	UX11 IS NOT OPERATIONAL
112	(70)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
112	(70)	LENGTH		UX11LSTL	LENGTH OF USER EXIT 11 PARM LIST

Cross Reference

Name	Len	Offset Value
UX11DDCH	000001	6C
UX11DDN	000008	28
UX11DFR	-	04
UX11DSN	000044	30
UX11HSC	-	00
UX11IACT	-	40
UX11JOBN	000008	10
UX11KEY	000001	09
UX11LEN	000004	04
UX11LSTL	-	70
UX11NSPC	-	40
UX11PRSN	000008	20
UX11RSV1	000004	5C
UX11RSV2	000004	60
UX11RSV3	000004	64
UX11RSV4	000004	68
UX11SPEC	-	80
UX11SPID	-	E6
UX11STPN	000008	18
UX11SUBP	000001	08
UX11USER	000004	0C
UX11UX11	000004	00

JES3 Unit Affinity Separation User Exit (SLSUX12)

Functional Description

The JES3 Unit Affinity Separation User Exit enables you to request modification of the actions the SMC takes during allocation of a unit affinity chain or GDG ALL chain which references cartridge tape devices on a JES3 system using setup. (JES3 systems not using setup must use exit 10 to perform this function.) This exit can be used to:

- override the setting of the SMC ALLOCDef command SEPLvl parameter.
- request allocation of library drives for the chain
- request allocation of nonlibrary drives for the chain
- change the esoteric (unit name) used to allocate the chain
- request allocation of a particular ACS for the chain.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX12 is applicable in JES3 with setup, during the POSTSCAN phase of the converter/interpreter scheduling element. It executes in the JES3 address space.

This exit is called for every unit affinity chain or GDG ALL chain.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX12P.

Entry Specifications

Upon entry to SLSUX12, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX12 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX12 are listed in Table 52.

Table 52. SLSUX12 Return Codes in Register 15

Return Code	Name	Description
0	UX12HSC	Perform separation according to current setting of ALLOC command.
4	UX12LIB	Do not separate the chain and allocate library drives.
8	UX12NLIB	Do not separate the chain and allocate nonlibrary drives.
12	UX12REPL	Do not separate the chain and substitute the returned esoteric.
16	UX12SACS	Do not separate the chain and allocate in the the specified ACS.
20	UX12SEP	Separate the chain.
64	UX12IACT	User exit is not operational.

Table 53. SLSUX12 Return Data in Parameter List

Name	Description
UX12ACS	ACS to allocate in if return code UX12SACS is issued.
UX12ESOT	Esoteric to substitute if return code UX12REPL is issued.

Programming Considerations

1. Unit affinity separation may cause the number of units which the requester needs to allocate to increase. Separation may prevent successful allocation processing if the number of units required exceeds the number available.
2. A default SLSUX12 is supplied by StorageTek and is included as part of the SAMPLIB data set delivered to customers. The default exit disables itself after its first invocation.

Parameter List

Record Layout

The record layout for SLSUX12 parameter list is presented in Table 54.

Table 54. SLSUX12P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX12P -USER EXIT 12 PARAMETER LIST. FUNCTION: THE PARAMETER LIST IS BUILT DURING DEVICE SEPARATION. THE USER EXIT IS CALLED TO ALLOW THE CUSTOMER TO DETERMINE WHETHER AN AFFINITY CHAIN OF DD STATEMENTS SHOULD SHARE THE SAME UNIT AS SPECIFIED, OR WHETHER THE CHAIN SHOULD BE BROKEN. THIS BREAK ALLOWS ALLOCATION OF TRANSPORTS IN THE SAME PHYSICAL LOCATION AS THE TAPE VOLUMES REQUIRED. RETURN CODES IN R15 : 0 - USE THE DEFAULT SEPARATION SPECIFIED BY THE INSTALLATION VIA THE ALLOC COMMAND. 4 - DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE LIBRARY TRANSPORTS 8 - DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE NON-LIBRARY TRANSPORTS 12 - DO NOT PERFORM AFFINITY SEPARATION AND REPLACE UNIT NAME WITH CUSTOMER SUPPLIED ESOTERIC (UX12ESOT) 16 - DO NOT PERFORM AFFINITY SEPARATION AND USE TRANSPORTS FROM ACS NUMBER SUPPLIED IN UX12ACS 20 - PERFORM AFFINITY SEPARATION 64 - USER EXIT 12 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINE EXECUTES IN THE ENVIRONMENT OF THE HSC ADDRESS SPACE.					
0	(0)	STRUCTURE		SLSUX12P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX12UX12	ACRONYM
4	(4)	SIGNED-FWORD	4	UX12LEN	LENGTH OF UX12 PARAMETER LIST
8	(8)	A-ADDR	1	UX12SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX12SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX12KEY	STORAGE KEY
10	(A)	A-ADDR	2	-RESERVED-	RESERVED
RETURN CODE EQUATES					
0	(00)	CONST		UX12HSC	USE CURRENT HSC AFFINITY SETTING
4	(04)	CONST		UX12LIB	DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE LIBRARY DRIVES
8	(08)	CONST		UX12NLIB	DO NOT PERFORM AFFINITY SEPARATION AND CHOOSE NON-LIBRARY DRIVES

Table 54. SLSUX12P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
12	(0C)	CONST		UX12REPL	DO NOT PERFORM AFFINITY SEPARATION AND USE ESOTERIC PROVIDED
16	(10)	CONST		UX12SACS	DO NOT PERFORM SEPARATION AND CHOOSE ACS SPECIFIED IN UX12ACS FOR ALLOCATION OF DEVICES
20	(14)	CONST		UX12SEP	PERFORM AFFINITY SEPARATION
64	(40)	CONST		UX12IACT	UX12 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX12JOBN	JOBNAME
20	(14)	CHARACTER	8	UX12STPN	STEPNAME
28	(1C)	CHARACTER	8	UX12PRSN	PROCSTEPNAME
36	(24)	SIGNED-FWORD	4	UX12DCNT	NUMBER OF DDS IN AFFINITY CHAIN
40	(28)	CHARACTER	8	UX12UNIT	UNIT NAME
48	(30)	CHARACTER	8	UX12ESOT	ESOTERIC TO REPLACE UNIT NAME
56	(38)	SIGNED-FWORD	4	UX12ACS	ACS TO USE WITH RETURN CODE 4 FORMAT: 000000AA AA = ACS NUMBER
60	(3C)	SIGNED-FWORD	4	UX12USER	WORD RESERVED FOR CUSTOMER USE UX12USER IS PRESERVED ACROSS CALLS
64	(40)	CHARACTER	8	UX12MAIN	JES3 PROCESSOR WHERE JOB SETUP
72	(48)	BITSTRING	1	UX12AFF	TYPE OF AFFINITY
		1... .... X’80’		UX12GDG	GDG AFFINITY
		.1.. .... X’40’		UX12UAFF	UNIT=AFF= AFFINITY
73	(49)	HEXSTRING	3	-RESERVED-	RESERVED FOR DEVELOPMENT
76	(4C)	LENGTH		UX12FIXL	LENGTH OF FIXED AREA
THE FOLLOWING AREA IMMEDIATELY FOLLOWS THE SLSUX12P DATA AREA. THIS AREA REPEATS ONCE FOR EACH DD STATEMENT IN THE AFFINITY CHAIN. THE NUMBER OF DD STATEMENTS IN THE AFFINITY CHAIN IS STORED IN FIELD UX12DCNT.					
0	(0)	STRUCTURE		SLSUX12D	SECTION OF PARM LIST
0	(0)	CHARACTER	8	UX12DDN	DD NAME
8	(8)	CHARACTER	44	UX12DSN	DATASET NAME

Table 54. SLSUX12P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
52	(34)	SIGNED-FWORD	4	UX12NUMV	NUMBER OF VOLUMES IN DATASET (NUMBER OF VOLUME ENTRIES IN THE LIST POINTED TO BY UX12VOLP).
56	(38)	BITSTRING	1	UX12LABT	LABEL TYPE
0	(00)	CONST		UX12LBDF	LIBRARY DEFAULT LABEL TYPE
1	(01)	CONST		UX12LBSL	STANDARD LABEL (SL)
2	(02)	CONST		UX12LBAL	ANSI LABEL (AL)
3	(03)	CONST		UX12LBNL	NON-LABELED (NL)
4	(04)	CONST		UX12LBNS	NON-STANDARD LABEL (NSL)
57	(39)	HEXSTRING	1	UX12SSUB	SCRATCH SUBPOOL NUMBER
58	(3A)	CHARACTER	13	UX12SNAM	SCRATCH SUBPOOL NAME
71	(47)	HEXSTRING	1	-RESERVED-	RESERVED
72	(48)	SIGNED-FWORD	4	UX12VOLP	POINTER TO VOLUME INFORMATION
76	(4C)	LENGTH		UX12VARL	LENGTH OF FIXED AREA
0	(0)	STRUCTURE		SLSUX12V	SECTION OF PARM LIST
THE FOLLOWING AREA IS POINTED TO BY UX12VOLP IT CONSISTS OF THE VOLUME SERIAL AND LOCATION OF EACH VOLUME IN THE DATA SET. THE NUMBER OF VOLUME ENTRIES IN THE LIST IS PROVIDED BY UX12NUMV					
0	(0)	CHARACTER	6	UX12VLSR	VOLUME SERIAL
6	(6)	BITSTRING	1	UX12VREQ	VOLUME REQUESTED
		1... .... X’80’		UX12SPEC	SPECIFIC VOLUME REQUESTED
		.1.. .... X’40’		UX12NSPC	NON-SPECIFIC VOLUME REQUESTED
7	(7)	BITSTRING	1	UX12VLOC	VOLUME LOCATION
		1... .... X’80’		UX12VLIB	VOLUME RESIDES IN LIBRARY
		.1.. .... X’40’		UX12VNLB	VOLUME RESIDES OUTSIDE LIBRARY
8	(8)	HEXSTRING	2	UX12AALL	IF VOLUME IN LIBRARY, THIS FIELD CONTAINS LIBRARY LOCATION IN ACS/LSM FORMAT ‘AALL’ THIS VALUE IS HEXADECIMAL
12	(C)	AREA	4	-RESERVED-	
12	(0C)	LENGTH		UX12VLTL	LENGTH OF VOLUME ENTRY

Cross Reference

Name	Len	Offset Value
UX12AALL	000002	08
UX12ACS	000004	38
UX12AFF	000001	48
UX12DCNT	000004	24
UX12DDN	000008	00
UX12DSN	000044	08
UX12ESOT	000008	30
UX12FIXL	-	4C
UX12GDG	-	80
UX12HSC	-	00
UX12IACT	-	40
UX12JOBN	000008	0C
UX12KEY	000001	09
UX12LABT	000001	38
UX12LBAL	-	02
UX12LBDF	-	00
UX12LBNL	-	03
UX12LBNS	-	04
UX12LBSL	-	01
UX12LEN	000004	04
UX12LIB	-	04
UX12MAIN	000008	40
UX12NLIB	-	08
UX12NSPC	-	40
UX12NUMV	000004	34
UX12PRSN	000008	1C
UX12REPL	-	0C
UX12SACS	-	10
UX12SEP	-	14
UX12SNAM	000013	3A
UX12SPEC	-	80

Name	Len	Offset Value
UX12SPID	-	E6
UX12SSUB	000001	39
UX12STPN	000008	14
UX12SUBP	000001	08
UX12UAFF	-	40
UX12UNIT	000008	28
UX12USER	000004	3C
UX12UX12	000004	00
UX12VARL	-	4C
UX12VLIB	-	80
UX12VLOC	000001	07
UX12VLSR	000006	00
UX12VLTL	-	0C
UX12VNLB	-	40
UX12VOLP	000004	48
UX12VREQ	000001	06

JES3 Specific Volume Allocation User Exit (SLSUX13)

Functional Description

The JES3 Specific Volume Allocation User Exit enables the user to request modification of the actions the SMC takes during allocation of a specific volume DD statement which references cartridge tape devices on a JES3 system using setup. (JES3 systems not using setup must use SLSUX08 to perform these functions.) This exit can be used to:

- change esoteric (unit name) used for device allocation
- request allocation of a particular ACS
- request allocation of nonlibrary drives
- request allocation of library drives.

Note: Since allocation functions are performed by the SMC, this exit is actually invoked by the SMC. See the *SMC Configuration and Administration Guide* for more information.

Environment

SLSUX13 is applicable in JES3 with setup, during converter/interpreter execution and Main Device Scheduler execution for static allocation and during dynamic allocation. This exit is called for every DD statement that requests a specific (non-scratch) volume.

During C/I and MDS processing, this exit executes in the JES3 address space. During dynamic allocation, this exit executes in the job's address space.

Conditions when Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX13P.

Entry Specifications

Upon entry to SLSUX13, the register contents are as listed in Table 24 on page 399.

Conditions on Return From User Exit

Return Specifications

Return specifications for SLSUX13 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX13 are listed in Table 55.

Table 55. SLSUX13 Return Codes in Register 15

Return Code	Name	Description
0	UX13HSC	Perform normal SMC allocation.
4	UX13LIB	Select library drives.

Table 55. SLSUX13 Return Codes in Register 15

Return Code	Name	Description
8	UX13NLIB	Select nonlibrary drives.
12	UX13REPL	Replace unit name with a different esoteric.
16	UX13SACS	Request the allocation in the specified ACS.
64	UX13IACT	User exit is not operational.

Table 56. SLSUX13 Return Data in Parameter List

Name	Description
UX13ACS	ACS to allocate in if return code UX13ASUB is issued.
UX13ESOT	Esoteric to substitute if return code UX13REPL is issued.

Programming Considerations

1. A default SLSUX13 is supplied by StorageTek in the SAMPLIB data set on the distribution tape. It disables itself after its first invocation.

Parameter List

Record Layout

The record layout for SLSUX13 parameter list is presented in Table 57

Table 57. SLSUX13P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX13P -USER EXIT 13 PARAMETER LIST. FUNCTION: THE PARAMETER LIST IS BUILT DURING DEVICE SEPARATION. THE USER EXIT IS CALLED TO ALLOW THE CUSTOMER TO REPLACE THE UNITNAME FOR THIS DD REQUEST WITH AN ESOTERIC. THE RETURN CODE FROM THE USER EXIT INDICATES WHETHER A CUSTOMER-SPECIFIED ESOTERIC SHOULD BE USED. RETURN CODES IN R15 : 0 - NORMAL HSC DEVICE SEPARATION 4 - SELECT LIBRARY ESOTERIC 8 - SELECT NON-LIBRARY ESOTERIC 12 - REPLACE UNIT NAME WITH CUSTOMER SUPPLIED ESOTERIC (UX13ESOT) 16 - REPLACE UNIT NAME WITH ESOTERIC FOR ACS NUMBER SUPPLIED IN UX13ACS 64 - USER EXIT 13 NOT USED SPECIAL CONSIDERATIONS: THIS EXIT ROUTINE EXECUTES IN THE ENVIRONMENT OF THE HSC ADDRESS SPACE.					
0	(0)	STRUCTURE		SLSUX13P	USER EXIT PARAMETER LIST.
0	(0)	CHARACTER	4	UX13UX13	ACRONYM

Table 57. SLSUX13P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
4	(4)	SIGNED-FWORD	4	UX13LEN	LENGTH OF UX13 PARAMETER LIST
8	(8)	A-ADDR	1	UX13SUBP	SUBPOOL NUMBER
230	(E6)	CONST		UX13SPID	SUBPOOL ID
9	(9)	A-ADDR	1	UX13KEY	STORAGE KEY
10	(A)	A-ADDR	2	-RESERVED-	RESERVED
RETURN CODE EQUATES					
0	(00)	CONST		UX13HSC	HSC DEVICE SEPARATION
4	(04)	CONST		UX13LIB	CHOOSE LIBRARY DRIVES
8	(08)	CONST		UX13NLIB	CHOOSE NON-LIBRARY DRIVES
12	(0C)	CONST		UX13REPL	USE ESOTERIC PROVIDED
16	(10)	CONST		UX13SACS	CHOOSE ACS PROVIDED IN UX13ACS
64	(40)	CONST		UX13IACT	UX13 IS NOT OPERATIONAL
12	(C)	CHARACTER	8	UX13JOBN	JOBNAME
20	(14)	CHARACTER	8	UX13STPN	STEPNAME
28	(1C)	CHARACTER	8	UX13PRSN	PROCSTEPNAME
36	(24)	CHARACTER	8	UX13DDN	DD NAME
44	(2C)	CHARACTER	8	UX13UNIT	UNIT NAME
52	(34)	CHARACTER	8	UX13ESOT	ESOTERIC TO REPLACE UNIT NAME
60	(3C)	SIGNED-FWORD	4	UX13ACS	ACS SELECTED FOR ALLOCATION FORMAT: 000000AA AA = ACS NUMBER
64	(40)	CHARACTER	44	UX13DSN	DATASET NAME
108	(6C)	BITSTRING	1	UX13LABT	LABEL TYPE
0	(00)	CONST		UX13LBDF	LIBRARY DEFAULT LABEL TYPE
1	(01)	CONST		UX13LBSL	STANDARD LABEL (SL)
2	(02)	CONST		UX13LBAL	ANSI LABEL (AL)
3	(03)	CONST		UX13LBNL	NON-LABELED (NL)
4	(04)	CONST		UX13LBNS	NON-STANDARD LABEL (NSL)
112	(70)	SIGNED-FWORD	4	UX13USER	WORD RESERVED FOR CUSTOMER USE UX13USER IS PRESERVED ACROSS CALLS

Table 57. SLSUX13P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
116	(74)	CHARACTER	8	UX13MAIN	JES3 PROCESSOR WHERE JOB SETUP
124	(7C)	SIGNED-FWORD	4	UX13NUMV	NUMBER OF VOLUMES IN DATASET (NUMBER OF VOLUME ENTRIES IN THE LIST POINTED TO BY UX13VOLP).
128	(80)	SIGNED-FWORD	4	UX13VOLP	POINTER TO VOLUME INFORMATION
132	(84)	BITSTRING	1	UX13FLG1	UX13 FLAG
		1... .... X’80’		UX13UAFF	ELEMENT RESIDES ON UNIT AFFCHAIN
		.1.. .... X’40’		UX13GAFF	ELEMENT RESIDES ON GDGALL CHAIN
133	(85)	HEXSTRING	3	-RESERVED-	RESERVED FOR FUTURE USE
136	(88)	SIGNED-FWORD	4	UX13RSV2	RESERVED FOR FUTURE USE
140	(8C)	SIGNED-FWORD	4	UX13RSV3	RESERVED FOR FUTURE USE
144	(90)	SIGNED-FWORD	4	UX13RSV4	RESERVED FOR FUTURE USE
148	(94)	SIGNED-FWORD	4	UX13RSV5	RESERVED FOR FUTURE USE
152	(98)	SIGNED-FWORD	4	UX13RSV6	RESERVED FOR FUTURE USE
156	(9C)	SIGNED-FWORD	4	UX13RSV7	RESERVED FOR FUTURE USE
160	(A0)	SIGNED-FWORD	4	UX13RSV8	RESERVED FOR FUTURE USE
164	(A4)	SIGNED-FWORD	4	UX13RSV9	RESERVED FOR FUTURE USE
168	(A8)	AREA	8	-RESERVED-	ROUND OUT TO DOUBLE WORD
168	(A8)	LENGTH		UX13LSTL	LENGTH OF USER EXIT 13 PARM LIST
THE FOLLOWING AREA IS POINTED TO BY UX13VOLP IT CONSISTS OF THE VOLUME SERIAL AND LOCATION OF EACH VOLUME IN THE DATA SET. THE NUMBER OF VOLUME ENTRIES IN THE LIST IS PROVIDED BY UX13NUMV					
0	(0)	STRUCTURE		SLSUX13V	SECTION OF PARAMETER LIST
0	(00)	OFFSET		UX13VLST	VOLUME LIST
0	(0)	CHARACTER	6	UX13VLSR	VOLUME SERIAL
6	(6)	BITSTRING	1	UX13VLOC	VOLUME LOCATION
		1... .... X’80’		UX13VLIB	VOLUME RESIDES IN LIBRARY
		.1.. .... X’40’		UX13VNLB	VOLUME RESIDES OUTSIDE LIBRARY

Table 57. SLSUX13P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
7	(7)	HEXSTRING	2	UX13AALL	IF VOLUME IN LIBRARY, THIS FIELD CONTAINS LIBRARY LOCATION IN ACS/LSM FORMAT ‘AALL’ THIS VALUE IS HEXADECIMAL
9	(09)	LENGTH		UX13VLTL	LENGTH OF VOLUME ENTRY

Cross Reference

Name	Len	Offset Value
UX13AALL	000002	07
UX13ACS	000004	3C
UX13DDN	000008	24
UX13DSN	000044	40
UX13ESOT	000008	34
UX13FLG1	000001	84
UX13GAFF	-	40
UX13HSC	-	00
UX13IACT	-	40
UX13JOBN	000008	0C
UX13KEY	000001	09
UX13LABT	000001	6C
UX13LBAL	-	02
UX13LBDF	-	00
UX13LBNL	-	03
UX13LBNS	-	04
UX13LBSL	-	01
UX13LEN	000004	04
UX13LIB	-	04
UX13LSTL	-	A8
UX13MAIN	000008	74
UX13NLIB	-	08
UX13NUMV	000004	7C
UX13PRSN	000008	1C
UX13REPL	-	0C
UX13RSV2	000004	88
UX13RSV3	000004	8C
UX13RSV4	000004	90
UX13RSV5	000004	94
UX13RSV6	000004	98
UX13RSV7	000004	9C

Name	Len	Offset Value
UX13RSV8	000004	A0
UX13RSV9	000004	A4
UX13SACS	-	10
UX13SPID	-	E6
UX13STPN	000008	14
UX13SUBP	000001	08
UX13UAFF	-	80
UX13UNIT	000008	2C
UX13USER	000004	70
UX13UX13	000004	00
UX13VLIB	-	80
UX13VLOC	000001	06
UX13VLSR	000006	00
UX13VLST	-	00
UX13VLTL	-	09
UX13VNLB	-	40
UX13VOLP	000004	80

Volume Access User Exit (SLSUX14)

Functional Description

The Volume Access User Exit enables you to invoke security checking for volume access at mount and eject time.

Security checking for volume access occurs when SLSUX14 is enabled and there is a request for a mount or eject of a given volume. If the volume access check is successful, no user notification occurs. If the requestor is notified, the information presented in the messages can include:

- job (for PGMI, Utilities and Job/Mount processing)
- operator request
- user-supplied data in EBCDIC.

Note: This exit is not called for:

- duplicate/unlabeled volumes being ejected by audit
- volumes being ejected by the init-cart utility
- any unlabeled volumes found in the LSM playground.

Environment

This exit has no dependencies on JES2 or JES3. It executes in the HSC address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX14P.

Entry Specifications

Upon entry to SLSUX14, the register contents are listed in Table 24 on page 399.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX14 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX14 are listed in Table 58.

Table 58. SLSUX14 Return Codes in Register 15

Return Code	Name	Description
0	UX14OK	Perform function
4	UX14NWRT	Write protect mount

Table 58. SLSUX14 Return Codes in Register 15

Return Code	Name	Description
8	UX14PWRD	HSC password check
12	UX14RJCT	Function reject
16	UX14RACF	HSC RACROUTE check (TAPEVOL)
20	UX14RACL	HSC RACROUTE check use UX14RCLS
64	UX14IACT	User exit is disabled

Table 59. SLSUX14 Return Data in Parameter List

Name	Description
UX14PSWD	Blank padded password
UX14RCLS	RACF class to use for RACROUTE

Programming Considerations

You can still issue RACROUTE from within Volume Access User Exit or you can specify that HSC is to do a RACROUTE via an exit return code. You are provided with the following information:

- job name
- job request
- volume ID
- location
- issuer

The RACF user ID and group ID are provided, if they are available.

This information is extracted from the ACEE of the requestor and is sufficient to issue a RACROUTE request. If it is not available, the fields are binary zeros.

Note: For operator commands, MVS provides the information in the UTOKEN pointed to by the CIB and SSCM. However, this UTOKEN information is encrypted and is not usable.

You are provided with the following job processing-related information:

- program name
- data set name
- expiration date
- retention period.

If the information is not available, the fields are binary zeros.

You can use the information provided to affect the function in the following ways:

- allow the function to proceed
- make a mount write disabled (virtual thumbwheel)
- reject the function
- request or provide a password
- tell the HSC to issue a RACROUTE (optionally specifying the RACF class to use).

An audit trail message is issued in the event of a:

- command reject
- exit disabled (first time only)
- volume mount that is changed to write disabled via virtual thumbwheel
- password failure.

An operator prompt is generated when a password is requested. In all cases user information can be passed back to give a reason for the request or rejection.

To secure SLSUX14, the UEXIT command must also be secure. This is to ensure that SLSUX14 is not replaced by another UEXIT LOAD or disabled by UEXIT DISABLE.

SLSUX14 is dynamically loadable as long as it is in the SLSUEXIT DD data set.

SLSSYA*xx* Parmlib with UEXIT command

```
/*  */
CDSDEF DSN1=SLS.HSC.DBASEPRM,+
        DSN2=SLS.HSC.DBASESEC,+
        DSN3=SLS.HSC.DBASESBY

JRNDEF DSN1=SLS.MVS2.JOURNAL1,+
       DSN2=SLS.MVS1.JOURNAL2,HOSTID=MVS1

JRNDEF DSN1=SLS.MVS2.JOURNAL1,+
       DSN2=SLS.MVS2.JOURNAL2,HOSTID=MVS2

SET OUTPUT MIXED

OPTION DIALOG(BOTH)

ALLOC UNITAFF(SEP)

COMMPATH HOST=MVS1 METHOD=CDS
COMMPATH HOST=MVS2 METHOD=CDS

CAPPREF 1,010,MVS1
CAPPREF 1,010,MVS2

UEXIT 14 LOAD=UX14VACC

UEXIT 15 LOAD=UX15CMDS

DISPLAY ACS

DISPLAY ALLOC

DISPLAY OPTION

UEXIT (1-15) QUERY
```

Additional loads of SLSUX14 (and SLSUX15) are done dynamically through the UEXIT command if you are allowed to complete the command based on the SLSUX15 and/or security package rules.

UEXIT Command to Load an Exit

```
UEXIT 14 LOAD=UX14NEW
```

Restrictions and Limitations

Security Profile:

If SLSUX14 states that the HSC is to do security checking by returning UX14RACF or UX14RACL, the RACROUTE is issued for volume access based on job or user criteria. The following example shows a RACF TAPEVOL class profile and permission command set that would be matched against the HSC RACROUTE.

Example of RACF Profile and Permission Commands

```
*************************************************************
*  Define a profile in the TAPEVOL class for volume 111111 *
*  (No general access allowed)                             *
*******************************************************
RDEFINE TAPEVOL 111111 UACC(NONE)
*******************************************************
* Permit user FRED*1 to have read access to volume 111111*
*******************************************************
PERMIT 111111 CLASS(TAPEVOL) ID(FRED*1) ACCESS(READ)
*************************************************************
```

A check is made for UPDATE authority. If access is allowed, the request is allowed; otherwise, a check is made for READ authority. If this is allowed, the tape is mounted write-protected. If neither UPDATE nor READ is allowed, the request is denied.

Notes:

1. UPDATE authority is required to eject a volume.
2. RACF 1.8.1 must be installed to have SLSUX14 perform RACF checking.

Parameter List

Description

The parameter list is built by request programs for volumes requiring mount and cap services from the LMU. The user should examine the information passed and inform HSC how mounts, enters, and ejects should occur.

When control is returned to the request processor routine, action will be taken based on the return code set in register 15.

Record Layout

The record layout for SLSUX14 parameter list is presented in Table 60.

Table 60. SLSUX14P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX14P USER EXIT 14 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT BY THE REQUEST PROGRAMS FOR VOLUMES REQUIRING MOUNT AND CAP SERVICES FROM THE LMU. THE USER SHOULD EXAMINE THE INFORMATION PASSED AND INFORM HSC HOW MOUNTS, ENTERS AND EJECTS SHOULD OCCUR. WHEN CONTROL IS RETURNED TO THE REQUEST PROCESSOR ROUTINE, ACTION WILL BE TAKEN BASED ON THE RETURN CODE SET IN REGISTER 15. SPECIAL CONSIDERATIONS: DEVICE NUMBER IS IN DEVICE NUMBER ON THE HOSTID SPECIFIED BY UX14HOST					
0	(0)	STRUCTURE		SLSUX14P	ACCESS USER PARAMETER LIST.

Table 60. SLSUX14P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
0	(0)	BITSTRING	1	UX14FUNC	REQUESTED FUNCTION
1	(01)	CONST		UX14MNT	MOUNT
2	(02)	CONST		UX14EJCT	EJECT
1	(1)	BITSTRING	1	UX14TYPE	REQUEST TYPE
0	(00)	CONST		UX14UNKN	UNKNOWN
1	(01)	CONST		UX14HSC	HSC INITIATED
2	(02)	CONST		UX14JOBP	JOB PROCESSING REQUEST
3	(03)	CONST		UX14UTIL	UTILITY REQUEST
4	(04)	CONST		UX14PGMI	PROGRAMMATIC REQUEST
5	(05)	CONST		UX14OPER	OPERATOR REQUEST
6	(06)	CONST		UX14TMI	TMI REQUEST
99	(63)	CONST		UX14LSTA	LIBRARYSTATION REQUEST
2	(2)	BITSTRING	1	UX14STAT	REQUEST STATUS
		1... .... X’80’		UX14WDSB	WRITE DISABLE IS SET.
3	(3)	BITSTRING	1	UX14FLG1	FLAG BYTE
		1... .... X’80’		UX14F1SC	SCRATCH REQUEST
		.1.. .... X’40’		UX14F1TV	‘TO’ DEVICE NUMBER VALID
		..1. .... X’20’		UX14F1FV	‘FROM’ DEVICE NUMBER VALID
4	(4)	CHARACTER	6	UX14VOLS	VOLUME SERIAL NUMBER OF CARTRIDGE.
10	(A)	HEXSTRING	2	-RESERVED-	RESERVED.
12	(C)	CHARACTER	8	UX14HOST	HOSTID.
20	(14)	CHARACTER	13	UX14SNAM	SCRATCH SUBPOOL NAME (IF AVAIL)
33	(21)	HEXSTRING	3	-RESERVED-	RESERVED.
36	(24)	HEXSTRING	1	UX14SSUB	SCRATCH SUBPOOL NUMBER.
37	(25)	HEXSTRING	3	-RESERVED-	RESERVED.
40	(28)	HEXSTRING	4	UX14WORD	USER EXIT WORD
THIS IS THE LOCATION THE VOLUME IS BEING MOVED FROM					
44	(2C)	HEXSTRING	2	UX14UNT1	‘FROM’ DEVICE NUMBER
46	(2E)	BITSTRING	1	UX14FTYP	‘FROM’ LOCATION TYPE

Table 60. SLSUX14P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
1	(01)	CONST		UX14CELL	‘FROM’ IS A CELL
2	(02)	CONST		UX14CAPC	‘FROM’ IS A CAP CELL
3	(03)	CONST		UX14DRIV	‘FROM’ IS A DRIVE
47	(2F)	HEXSTRING	1	UX14FACS	FROM ACS
48	(30)	HEXSTRING	1	UX14FLSM	FROM LSM
49	(31)	HEXSTRING	1	UX14FPNL	FROM PANEL IF UX14FTYP IS UX14DRIV
50	(32)	HEXSTRING	1	UX14FROW	FROM ROW IF UX14FTYP IS UX14CELL
51	(33)	HEXSTRING	1	UX14FCOL	FROM COL IF UX14FTYP IS UX14CELL
52	(34)	HEXSTRING	1	UX14FCAP	FROM CAP IF UX14FTYP IS UX14CAPC
53	(35)	HEXSTRING	3	-RESERVED-	RESERVED.
THIS IS THE LOCATION THE VOLUME IS BEING MOVED TO					
56	(38)	HEXSTRING	2	UX14UNT2	‘TO’ DEVICE NUMBER
58	(3A)	HEXSTRING	1	UX14TTYP	‘TO’ LOCATION TYPE EQUS AS UX14FTYP
59	(3B)	HEXSTRING	1	UX14TACS	TO ACS
60	(3C)	HEXSTRING	1	UX14TLSM	TO LSM
61	(3D)	HEXSTRING	1	UX14TPNL	TO PANEL IF UX14TTYP IS UX14DRIV
62	(3E)	HEXSTRING	1	UX14TROW	TO ROW IF UX14TTYP IS UX14CELL
63	(3F)	HEXSTRING	1	UX14TCOL	TO COL IF UX14TTYP IS UX14CELL
64	(40)	HEXSTRING	1	UX14TCAP	TO CAP IF UX14TTYP IS UX14CAPC
65	(41)	HEXSTRING	3	-RESERVED-	RESERVED. SECURITY INFO
68	(44)	CHARACTER	8	UX14RUSR	RACF USERID
76	(4C)	CHARACTER	8	UX14RGRP	RACF GROUP
84	(54)	SIGNED-FWORD	4	-RESERVED-	RESERVED.
THE FOLLOWING FIELDS ARE FOR OPERATOR REQUESTS					
88	(58)	HEXSTRING	4	UX14CONS	CONSOLE ID.
92	(5C)	HEXSTRING	8	UX14CNAM	CONSOLE NAME
100	(64)	HEXSTRING	8	UX14USID	USER ID.

Table 60. SLSUX14P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
108	(6C)	SIGNED-FWORD	4	-RESERVED-	RESERVED.
THE FOLLOWING FIELDS ARE FOR JOB PROCESSING REQUESTS					
112	(70)	CHARACTER	8	UX14JOBN	JOB NAME.
120	(78)	CHARACTER	8	UX14STEP	STEPNAME.
128	(80)	CHARACTER	8	UX14PGNM	PROGRAM NAME.
136	(88)	CHARACTER	44	UX14DSN	DATASET NAME.
180	(B4)	CHARACTER	3	UX14EXPD	EXPIRATION DATE.
183	(B7)	CHARACTER	2	UX14RETN	RETENTION PERIOD.
185	(B9)	HEXSTRING	3	-RESERVED-	RESERVED.
188	(BC)	SIGNED-FWORD	4	-RESERVED-(2)	RESERVED.
THE FOLLOWING CAN BE RETURNED BY THE EXIT.					
196	(C4)	CHARACTER	8	UX14PSWD	BLANK PADDED PASSWORD
204	(CC)	CHARACTER	9	UX14RCLS	RACF CLASS TO USE FOR RACROUTE 1 BYTE LENGTH FOLLOWED BY CLASS
213	(D5)	CHARACTER	32	UX14UMSG	USER INFORMATION
248	(F8)	SIGNED-FWORD	4	-RESERVED-(2)	RESERVED.
THE FOLLOWING EQUATES ARE RETURN CODES					
0	(00)	CONST		UX14OK	PERFORM FUNCTION
4	(04)	CONST		UX14NWRT	WRITE PROTECT MOUNT
8	(08)	CONST		UX14PWRD	HSC PASSWORD CHECK.
12	(0C)	CONST		UX14RJCT	FUNCTION REJECT
16	(10)	CONST		UX14RACF	HSC RACROUTE CHECK (TAPEVOL)
20	(14)	CONST		UX14RACL	HSC RACROUTE CHECK USE UX14RCLS
64	(40)	CONST		UX14IACT	USER EXIT IS DISABLED
256	(100)	AREA	4	-RESERVED-	(PADDING TO FULL WORD BOUNDARY)
256	(100)	LENGTH		UX14L	LENGTH OF PARAMETER LIST.

Cross Reference

Name	Len	Offset Value
UX14CAPC	-	02
UX14CELL	-	01
UX14CNAM	000008	5C
UX14CONS	000004	58
UX14DRIV	-	03
UX14DSN	000044	88
UX14EJCT	-	02
UX14EXPD	000003	B4
UX14FACS	000001	2F
UX14FCAP	000001	34
UX14FCOL	000001	33
UX14FLG1	000001	03
UX14FLSM	000001	30
UX14FPNL	000001	31
UX14FROW	000001	32
UX14FTYP	000001	2E
UX14FUNC	000001	00
UX14F1FV	-	20
UX14F1SC	-	80
UX14F1TV	-	40
UX14HOST	000008	0C
UX14HSC	-	01
UX14IACT	-	40
UX14JOBN	000008	70
UX14JOBP	-	02
UX14L	-	100
UX14LSTA	-	63
UX14MNT	-	01
UX14NWRT	-	04
UX14OK	-	00
UX14OPER	-	05

Name	Len	Offset Value
UX14PGMI	-	04
UX14PGNM	000008	80
UX14PSWD	000008	C4
UX14PWRD	-	08
UX14RACF	-	10
UX14RACL	-	14
UX14RCLS	000009	CC
UX14RETN	000002	B7
UX14RGRP	000008	4C
UX14RJCT	-	0C
UX14RUSR	000008	44
UX14SNAM	000013	14
UX14SSUB	000001	24
UX14STAT	000001	02
UX14STEP	000008	78
UX14TACS	000001	3B
UX14TCAP	000001	40
UX14TCOL	000001	3F
UX14TLSM	000001	3C
UX14TMI	-	06
UX14TPNL	000001	3D
UX14TROW	000001	3E
UX14TTYP	000001	3A
UX14TYPE	000001	01
UX14UMSG	000032	D5
UX14UNKN	-	00
UX14UNT1	000002	2C
UX14UNT2	000002	38
UX14USID	000008	64
UX14UTIL	-	03
UX14VOLS	000006	04
UX14WDSB	-	80

Name	Len	Offset Value
UX14WORD	000004	28

Command Authorization User Exit (SLSUX15)

Functional Description

The Command Authorization User Exit is used to ensure command security. A tier level presentation is used with the actual command string. Information to issue CMDAUTH from the exit is provided. This information includes:

- User
- Request
- Console
- Command
- Command string
- Command tier level: minimum to maximum

  1. Query
  2. Update
  3. Control

- CIB address or SSCM address
- RACF UTOKEN

This information is used to:

- permit the use of the command
- supply and request a password
- reject the command
- request that HSC process CMDAUTH for the command.

You can use the default values that the HSC provides or the security matrix within the table together with the command string. Table 61 shows the minimum generic security levels.

Table 61. Command Security Level

Command	Minimum Level
ALLOC	Update
CAPPREF	Update
CDS	Control
CLEAN	Control
COMMPATH	Update
DIAG	Query
DISMOUNT	Control
DISPLAY	Query
DRAIN	Control
EJECT	Control

Table 61. Command Security Level (Continued)

Command	Minimum Level
ENTER	Control
F	Control
JOURNAL	Update
LIST	Query
LOAD	Query
LS	Query
MN	Update
MNTD	Update
MODIFY	Control
MONITOR	Update
MOUNT	Control
MOVE	Control
OPTION	Update
PM	Update
RECOVER	Control
RELEASE	Control
RETRY	Control
SENTER	Control
SRVLEV	Control
STOPMN	Update
SWITCH	Control
TRACE	Query
TREQDEF	Update
UEXIT	Update
UNITDEF	Update
VARY	Control
VIEW	Update
VOLDEF	Update
WARN	Update

Environment

This exit has no dependencies on JES2 or JES3. It executes in the HSC address space.

Conditions When Exit Routine is Executed

Parameter List

The parameter list is mapped by macro SLSUX15P.

Execution Attributes

Shared enqueues held on major name SYSIEFSD, minor names Q4, CHNGDEVS, DDRTPUT, and DDRDA.

Entry Specifications

Upon entry to SLSUX15, the register contents are listed in Table 24 on page 399.

Conditions on Return To HSC From User Exit

Return Specifications

Return specifications for SLSUX15 are as listed in Table 25 on page 400.

Return Codes

Return codes for SLSUX15 are listed in Table 62.

Table 62. SLSUX15 Return Codes in Register 15

Return Code	Name	Description
0	UX15OK	Perform function
4	UX15PWRD	Check password through HSC
8	UX15RJCT	Function reject
12	UX15CHKA	Check authority through CMDAUTH
64	UX15IACT	Exit disabled

Table 63. SLSUX15 Return Data in Parameter List

Name	Description
UX15PSWD	Blank padded user password
UX15UDTA	User information

Programming Considerations

You can use the HSC default values provided for each command or define a new security matrix within a table you create and use in conjunction with the command string provided in SLSUX15. Parsing the command string past the first operand (the command) is your responsibility.

An audit trail is issued in the event of a rejected command, disabled exit, or password failure. An operator prompt is issued when a password is requested. Once the password is received, it is made unreadable. The operator's response is also made unreadable and compared with the encrypted password from the exit. After the compare, both are erased.

Note: The Command Authorization User Exit does not include control statements executed during HSC PARMLIB read or any HSC utilities. Security for PARMLIB access and utility jobs must be defined through your security packages.

The HSC programmatic interface (PGMI) is not because it can be controlled through SLSUX05.

SLSUX15 is dynamically loadable as long as it is in the SLSUEXIT DD data set.

SLSSYA*xx* Parmlib with UEXIT command

```
/*   */
CDSDEF DSN1=SLS.HSC.DBASEPRM,+
       DSN2=SLS.HSC.DBASESEC,+
       DSN3=SLS.HSC.DBASESBY

JRNDEF DSN1=SLS.MVS2.JOURNAL1,+
       DSN2=SLS.MVS1.JOURNAL2,HOSTID=MVS1

JRNDEF DSN1=SLS.MVS2.JOURNAL1,+
       DSN2=SLS.MVS2.JOURNAL2,HOSTID=MVS2

OPTION OUTPUT(MIXED)

OPTION DIALOG(BOTH)

ALLOC UNITAFF(SEP)

COMMPATH HOST=MVS1 METHOD=CDS
COMMPATH HOST=MVS2 METHOD=CDS

CAPPREF 1,010,MVS1
CAPPREF 1,010,MVS2

UEXIT 15 LOAD=UX15VACC

UEXIT 15 LOAD=UX15CMDS

DISPLAY ACS

DISPLAY ALLOC

DISPLAY OPTION

UEXIT (1-15) QUERY
```

Additional loads of SLSUX15 (and SLSUX14) are done dynamically through the UEXIT command if you are allowed to complete the command based on the SLSUX15 and/or security package rules.

UEXIT Command to Load an Exit

```
UEXIT 15 LOAD=UX15NEW
```

Restrictions and Limitations

Security Profile:

If SLSUX15 sets a return code of UX15CHKA, a CMDAUTH is issued for command authorization based on user criteria. The following example shows a RACF OPERCMDS class profile and permission command set that would be matched against the HSC CMDAUTH.

Example of RACF Profile and Permission Commands

```
*********************************************************************
*       Define a profile in the OPERCMDS class for Mount command    *
*                 (No general access allowed)                       *
*********************************************************************
RDEFINE OPERCMDS subsysname.MOUNT.* UACC(NONE)
*********************************************************************
*      Permit user FRED01 to have read access to volume 111111      *
*********************************************************************
PERMIT subsysname.MOUNT.* CLASS(OPERCMDS) ID(FRED01) ACCESS(UPDATE)
*********************************************************************
```

Parameter List

Description

The parameter list is built and provides users with the capability to check command authority with whatever security mechanism are currently in place. When control is returned to the request processor routine, action will be taken based on the return code set in register 15.

Record Layout

The record layout for SLSUX15 parameter list is presented in Table 64.

Table 64. SLSUX15P Record Format

Dec	Hex	Type	Length	Label	Description
SLSUX15P USER EXIT 15 PARAMETER LIST. FUNCTION: PARAMETER LIST IS BUILT AND PROVIDES USERS WITH THE CAPABILITY TO CHECK COMMAND AUTHORITY WITH WHATEVER SECURITY MECHANISM THEY HAVE IN PLACE. WHEN CONTROL IS RETURNED TO THE REQUEST PROCESSOR ROUTINE, ACTION WILL BE TAKEN BASED ON THE RETURN CODE SET IN REGISTER 15.					
0	(0)	STRUCTURE		SLSUX15P	ACCESS USER PARAMETER LIST.
0	(0)	CHARACTER	8	UX15CMND	COMMAND BEING PROCESSED.
8	(8)	HEXSTRING	4	UX15WORD	USER EXIT WORD
12	(C)	HEXSTRING	4	UX15UTOK	SECURITY USER TOKEN
16	(10)	BITSTRING	1	UX15TIER	SECURITY TIER LEVEL
2	(02)	CONST		UX15READ	QUERY (READ)
4	(04)	CONST		UX15UPDT	POLICY SETTING (UPDATE)
6	(06)	CONST		UX15CNTL	ALL FUNCTIONS (CONTROL)
17	(11)	BITSTRING	1	UX15TYPE	TYPE OF REQUEST.

Table 64. SLSUX15P Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
1	(01)	CONST		UX15CMD	COMMAND.
18	(12)	HEXSTRING	2	-RESERVED-	RESERVED.
20	(14)	SIGNED-FWORD	4	-RESERVED-(8)	RESERVED.
THE FOLLOWING FIELD ARE OPERATOR COMMAND SPECIFIC.					
52	(34)	CHARACTER	4	UX15SSYS	SUBSYSTEM NAME.
56	(38)	A-ADDR	4	UX15CIB	POINTER TO CIB
60	(3C)	A-ADDR	4	UX15SSCM	POINTER TO SSCB
64	(40)	HEXSTRING	4	UX15CONS	CONSOLE ID.
68	(44)	HEXSTRING	8	UX15CART	CART TOKEN.
76	(4C)	HEXSTRING	8	UX15CNAM	CONSOLE NAME.
84	(54)	HEXSTRING	8	UX15USID	USER ID.
92	(5C)	CHARACTER	256	UX15STRG	COMMAND STRING.
348	(15C)	HEXSTRING	1	UX15PRFX	COMMAND PREFIX
349	(15D)	HEXSTRING	3	-RESERVED-	RESERVED.
352	(160)	SIGNED-FWORD	4	-RESERVED-(24)	RESERVED.
THE FOLLOWING FIELD MAY BE SUPPLIED BY THE USER					
448	(1C0)	HEXSTRING	8	UX15PSWD	BLANK PADDED USER PASSWORD
456	(1C8)	CHARACTER	32	UX15UDTA	USER INFORMATION
488	(1E8)	SIGNED-FWORD	4	-RESERVED-(8)	RESERVED.
THE FOLLOWING EQUATES ARE RETURN CODES					
0	(00)	CONST		UX15OK	PERFORM FUNCTION
4	(04)	CONST		UX15PWRD	CHECK PASSWORD THRU HSC.
8	(08)	CONST		UX15RJCT	FUNCTION REJECT
12	(0C)	CONST		UX15CHKA	CHECK AUTHORITY THRU CMDAUTH
64	(40)	CONST		UX15IACT	EXIT DISABLED.
520	(208)	AREA	4	-RESERVED-	(PADDING TO FULL WORD BOUNDARY)
520	(208)	LENGTH		UX15L	LENGTH OF PARAMETER LIST.

Cross Reference

Name	Len	Offset Value
UX15CART	000008	44
UX15CHKA	-	0C
UX15CIB	000004	38
UX15CMD	-	01
UX15CMND	000008	00
UX15CNAM	000008	4C
UX15CNTL	-	06
UX15CONS	000004	40
UX15IACT	-	40
UX15L	-	208
UX15OK	-	00
UX15PRFX	000001	15C
UX15PSWD	000008	1C0
UX15PWRD	-	04
UX15READ	-	02
UX15RJCT	-	08
UX15SSCM	000004	3C
UX15SSYS	000004	34
UX15STRG	000256	5C
UX15TIER	000001	10
UX15TYPE	000001	11
UX15UDTA	000032	1C8
UX15UPDT	-	04
UX15USID	000008	54
UX15UTOK	000004	0C
UX15WORD	000004	08

Appendix A. Macros, Control Statements, Utilities, and Commands Syntax Reference

Syntax Flow Diagrams

Syntax is illustrated using flow diagrams. These can include the following elements:

- syntax – the diagram itself.
- items – individual elements inside the diagram. Items can be keywords, variables, delimiters, operators, fragment references, and separators.
- groups – a collection of items or other groups.

The following sections describe syntax flow diagram features and include some generic examples.

Specifying Commands

Commands are composed of command names, keyword parameters, and positional parameters. Command names initiate command execution, keyword parameters are operands that contain keywords and their related values, and positional parameters are operands that are identified by their position in the command string rather than by keywords.

- Keyword parameters can be specified in any order. The HSC accepts (tolerates) multiple occurrences of a keyword. The value assigned to a keyword reflects the last occurrence of a keyword within a command.
- Positional parameters must be entered in the order shown in the syntax diagram.
- Uppercase letters indicate the minimum abbreviation for the command name, keyword, or positional parameter.

Variables

Variables are italicized.

Delimiters

If a comma (,), a semicolon (;), or other delimiter is shown with an element of the syntax diagram, it must be entered as part of the statement or command.

Flow Lines

Syntax diagrams consist of horizontal and vertical lines and the text of a command, control statement, macro, or utility.

```
►►──COMMAND/MACRO/UTILITY──────────────────────────────────────────────────►◄
```

or

```
►►──┬─Item1──────┬──────────────────────────────────────────────────────────►◄
    ├─Item2──────┤
    └─Item3──────┘
```

Diagrams are read left to right and top to bottom. Arrows indicate flow and direction.

- a statement begins with ►►
- a statement ends with ►◄
- diagrams continuing to the next line begin with ►
- fragments begin and end with |

```
►►──COMMAND/UTILITY NAME──Item1(variable1)──Item2(┬─variable2──────┬─)──────►
                                                  ├─variable3──────┤
                                                  └─variable4──────┘
►──Item3(variable5)────────────────────────────────────────────────────────►◄
```

Single Required Choice

Branch lines, without repeat arrows, indicate that a **single** choice must be made. If one of the items from which a choice is being made is on the base line of the diagram, a single choice is required.

```
►►──┬─Item1──────┬──────────────────────────────────────────────────────────►◄
    ├─Item2──────┤
    └─Item3──────┘
```

Single Optional Choice

If the first item is on the line below the base line, a single choice of items in the stack is optional.

```
►►──────────────────────────────────────────────────────────────►◄
   │──Item1──────────│
   │──Item2──────────│
   └──Item3──────────┘
```

Defaults

Default values and parameters appear above the syntax diagram line. In the following example, if a value is not specified with the command, Default Value is used by the HSC.

```
      ┌─Default Value─┐
►►────┼───────────────┼──────────────────────────────────────────►◄
      ├─Value2────────┤
      └─Value3────────┘
```

Some keyword parameters provide a choice of values in a stack. When the stack contains a default value, the keyword and the value choices are placed below the baseline to indicate that they are optional, and the default value appears above the keyword line. In the following example, if the keyword is not specified with the command, Keyword(Default Value) is used by the HSC.

```
►►──────────────────────────────────────────────────────────────►◄
   │              ┌─Default Value─┐│
   └─Keyword──────┼─Value2────────┼┘
                  └─Value3────────┘
```

Repeat Symbol

A repeat symbol indicates that more than one choice can be made or that a single choice can be made more than once. The repeat symbol shown in this example indicates that a comma is required as the repeat separator.

```
      ┌─,──────────────┐
►►────┼─variable───────┼──────────────────────────────────────────►◄
```

Syntax Continuation (Fragments)

Fragment references direct you to parts (fragments) of the syntax that contain more detail than can be shown in the main syntax diagram.

```
►►─COMMAND/UTILITY NAME──────┤ Fragment Reference  ├──────────────────────────►◄
```

Fragment:

```
├─Item1(──┬─variable1──┬──,──┬─variable3──┬──)──────────────────────────────►
         └─variable2──┘     └─variable4──┘

►─Item2(──┬─variable5──┬──,──┬─variable7──┬──)──────────────────────────────┤
          └─variable6──┘     └─variable8──┘
```

Library Identification

Each ACS, LSM, and CAP is assigned a unique identification number during LIBGEN. Use this number in HSC commands and utilities when identifying a specific ACSid, LSMid, or CAPid.

- ACSid (*acs-id*) is a hexadecimal value from 00 through FF that identifies the LMU.

  An *acs-id* is the result of defining the SLIALIST macro during a LIBGEN. See ‘‘LIBGEN Macros’’ in the *HSC Configuration Guide* for information about the SLIALIST macro. The first ACS listed in this macro acquires a hexadecimal identifier of 00, the second ACS listed acquires a hexadecimal identifier of 01, and so forth until all ACSs are identified.

- An LSM number (*l*) is a hexadecimal value from 0 through F. It differentiates an LSM from every other LSM connected to the same LMU.

  An LSM number is the result of defining the SLIACS macro LSM parameter. See ‘‘LIBGEN Macros’’ in the *HSC Configuration Guide* for information about the SLIACS macro. The first LSM listed for an ACS acquires a hexadecimal number of 0, the second LSM listed for an ACS acquires a hexadecimal number of 1, and so forth.

- An LSMid (*lsm-id*) is the concatenation of the ACSid and the LSM number. It differentiates an LSM from every other LSM in a library.
- A CAP number is a hexadecimal value from 00 to 02. The CAP number identifies a specific CAP in an LSM that has more than one CAP.
- A CAPid (*cap-id*)is a hexadecimal value made up of the LSMid and the CAP number separated by a colon. Refer to “How to Specify a CAPid” on page 508 for more information.

Some HSC commands and utilities require, or optionally allow, the user to specify a host identifier or a VOLSER.

- The *host-id* for a given host is the identifier specified in the HOSTID parameter of the SLILIBRY macro in the LIBGEN: the SMF system identifier for JES2, or the main processor name for JES3. Valid characters for a HOSTID are A-Z, 0-9, #, $, and @.
- A VOLSER (*volser*) identifies a volume serial number consisting of one to six characters. Valid characters are A-Z, 0-9, # (crosshatch), $, ¥ (yen character), and optional trailing blanks. Leading blanks are not allowed.

How to Specify a CAPid

A CAPid specifies a particular CAP in the library. Each CAP is identified by the LSMid of the LSM that the CAP is attached to and a CAP number to distinguish it from other CAPs in that LSM.

CAP configurations differ based on the LSM type. The following configurations are possible:

LSM (Model 4410) and PowderHorn LSM (Model 9310)
can be configured with either the standard 21-cell CAP or an enhanced CAP. An enhanced CAP contains two 40-cell magazine-style CAPs and a one-cell priority CAP (PCAP). The 40-cell CAPs function independently.

WolfCreek LSM (Models 9360-050, 9360-075, and 9360-100)
configured with a WolfCreek CAP which contains a 20-cell magazine-style CAP and a PCAP. An optional 30-cell, magazine-style CAP, called a WolfCreek optional CAP, may be added to the WolfCreek CAP.

TimberWolf LSM (Model 9740)
configured with either a 14-cell permanent rack or a 10-cell removable magazine.

CAPid Formats

There are two formats that can be used to specify a CAPid:

- *AAL*, where *AA* is the ACSid and *L* is the LSM number. This format is referred to as the *lsm-id*.
- *AAL:CC*, where *AAL* is the LSMid and *CC* is the CAP number. This format is referred to as the *cap-id*.

Caution:

Do not use a colon as the MVS command delimiter because the system will process the colon in the new CAPid format as the end of the command. All information following the colon in an HSC command will not be processed.

The appropriate format to use is determined by the CAP hardware and the command being specified.

- The *AAL* format can be specified in the following situations:
  - to specify a standard CAP
  - to allow the HSC to select a CAP based on CAP preference.

- The *AAL*:*CC* format can be specified for any CAP hardware in any command that accepts a CAPid. This is the preferred format. Valid CAP numbers are:

  00 indicates one of the following:

  - a 21-cell standard CAP
  - the right-hand 40-cell CAP of an enhanced CAP
  - the 20-cell CAP of a WolfCreek CAP
  - a 14-cell or 10-cell removable magazine 9740 TimberWolf CAP

  01 indicates one of the following:

  - the left-hand 40-cell CAP of an enhanced CAP
  - the 30-cell CAP of a WolfCreek optional CAP.

  02 indicates the PCAP in either an enhanced CAP or a WolfCreek CAP.

Note: Refer to the individual command explanations for additional information on specifying CAPids.

Ranges And Lists

HSC commands and utilities often allow the user to specify ranges and lists of elements.

1. An inclusive range is indicated by a pair of elements of the same length and data type, joined by a dash. The first element **must** be strictly less than the second element.

   - A hexadecimal range consists of a pair of hexadecimal numbers (for example, 0A2-0AD, or 000-0FC).
   - A decimal range consists of a pair of decimal numbers (for example, 1-9, or 010-094). Leading zeros are not required.
   - A numeric VOLSER range (*vol-range*) consists of a pair of VOLSER elements containing a decimal numeric portion of 1 to 6 digits (for example, ABC012-ABC025, or X123CB-X277CB). The decimal portion is referred to as an incremental range. The following additional restrictions apply:

     - The character positions of the incremental portion of both range elements must match.
     - The non-incremental characters of the first element must be identical to those of the second element.
     - You cannot increment two portions of a range element. If 111AAA is the first element, you cannot specify 112AAB for the second element.
     - If a VOLSER range contains more than one decimal portion, only the right most portion is valid as the incremental range. For example:

       A00B00 the largest range that can be specified is A00B00 through A00B99.

       A0B0CC the largest range that can be specified is A0B0CC through A0B9CC.

       000XXX the largest range that can be specified is 000XXX through 999XXX.

Note: A VOLSER range for most operator commands is limited to 100 entries. If a larger range is entered, only the first 100 VOLSERs in the range are acted on. If HSC utilities are used, the entire range is processed.

   - An alphabetic VOLSER range (*vol-range*) consists of a pair of VOLSER elements containing an incremental portion of 1 to 6 characters (for example, 000AAA-000ZZZ, or 9AAA55-9ZZZ55). This portion is referred to as an incremental range. The following additional restrictions apply:

     - The character positions of the incremental portion of both range elements must match.
     - The non-incremental characters of the first element must be identical to those of the second element.

- You cannot increment two portions of a range element. If 111AAA is the first element, you cannot specify 112AAB for the second element.
- The alphabetic portion of the VOLSER range is defined as being from character A to Z. To increment multi-character sequences, each character increments to Z. For instance, ACZ is part of the AAA-AMM range. Examples are:

A00A0-A99A0	increments VOLSERs A00A0 through A09A0, then A10A0 through A99A0.
9AA9A-9ZZ9A	increments VOLSERs 9AA9A through 9AZ9A, then 9BA9A through 9ZZ9A.
111AAA-111ZZZ	increments VOLSERs 111AAA through 111AAZ, then 111ABA through 111ZZZ.
999AM8- 999CM8	increments VOLSERs 999AM8 through 999AZ8, then 999BA8 through 999CM8
A3BZZ9- A3CDE9	increments VOLSERs A3BZZ9 through A3CAA9, then A3CAB9 through A3CDE9
AAAAAA-AAACCC	increments VOLSERs AAAAAA through AAAAAZ, then AAAABA through AAACCC
CCCNNN-DDDNNN	increments VOLSERs CCCNNN through CCCNNZ, then CCCNOA through DDDNNN*

* **Caution:** This is a very large range.

The number of volumes in an alphabetic VOLSER range depends on the number of elements in the incrementing portion of the VOLSER range. For an A to Z range in each character position, the number of volumes can be calculated by 26 to the power of the number of positions that are being incremented.

A-Z	26^1	26
AA-ZZ	26^2	676
AAA-ZZZ	26^3	17,576
AAAA-ZZZZ	26^4	456,976
AAAAA-ZZZZZ	26^5	11,881,376
AAAAAA-ZZZZZZ	26^6	308,915,776

Note: For most operator commands, a VOLSER range is limited to 100 entries. If a large range is entered, only the first 100 VOLSERs are acted upon. If HSC utilities are used, the entire range is processed.

2. A list consists of one or more elements. If more than one element is specified, the elements **must** be separated by a comma or a blank, and the entire list enclosed in parentheses.
   - For some HSC operator commands, an element may consist of a single item or a range. Refer to the individual command explanations for valid list entries.
   - In general, HSC utilities **do not allow** ranges to be specified in a list. The exception to this is a VOLSER list (*vol-list*) which does allow ranges to be specified. For VOLATTR control statements, you can use wildcard characters (%, ?, or *) to identify a list of VOLSERs.

Control Statement Syntax Conventions

The control statement for each utility program consists of a command (indicating the utility function) followed by parameters, as applicable, in 80-character card-image records. The standard syntax conventions for control statements are as follows:

- The only valid control statement information area is from column 2 to column 72. Columns 73-80 are ignored.
- Parameters are separated by one or more blanks or a comma.
- A value is associated with a parameter by an equal sign (=) or by enclosing the value in parentheses, and concatenating it immediately after the parameter. # Case (upper or lower) is ignored in actual control statements.
- Control statements may be interspersed with comments designated by an asterisk (*) in column one.

  To allow for continuation, comments in the job stream must start with /* and end with */. Comments cannot be nested, and mixing the two comment styles (* and /*) is not allowed.

  For definition data sets (VOLATTRs, UNITATTRs and TAPEREQs) comments **must** be in the new format (/*...*/). Asterisk (*) comments are not allowed. A /*...*/ comment in the first line is **not** required for definition data sets.

- A control statement is terminated if the statement is not continued. Control statements must have a /*...*/ comment as the **first** control statement in the PARMLIB member. A PARMLIB member that does not begin with a /*...*/ style comment is assumed to be in the old format. Comments in old format members must begin with an asterisk in column 1.

  In contrast to utility control statements, PARMLIB control statements may begin in column 1. Columns 73-80 are ignored.

- The 80-character card-image records use conventional continuation rules.
  - A space and a dash (–) following a parameter or parameter value indicates that a blank is to be inserted between the last nonblank character of this line and the first nonblank character of the next nonblank record.
  - A plus sign (+) specifies that the continued control information is to be concatenated directly after the character preceding the plus sign. The continued data starts at column two of the next nonblank record.

Note: You can use a continuation only after a new keyword or after the natural end of a value. Some examples follow.

The following examples illustrate continuations used correctly:

```
SCRPOOL NAME=STD36,RANGE+
(AAA000-AAA999,ZZZ000-ZZZ999)

SCRPOOL NAME=STD36,RANGE(AAA000-AAA999,-
ZZZ000-ZZZ999)
```

The following example illustrates a continuation used *incorrectly*:

```
SCRPOOL NAME=STD36,RANGE(AAA000-AAA999,ZZZ+
000-ZZZ999)
```

- Users must enter a nonblank character in column 72 (e.g., an X).
- PARMLIB control statements can be continued using the preceding continuation rules **only** if they are new format control statements.

- The maximum length of a control statement is 32,767 characters.
- The maximum length of a command (used as a command or in PARMLIB) is 126 characters.

MEDia, RECtech, and MODel Parameters

Table 65 describes the HSC commands and control statements that accept MEDia, MODel, and RECtech parameters.

Table 65. MEDia, RECtech, and MODel Cross-reference

Name	Type	Related Parameters	MEDia	RECtech	MODel	Description
Display Drive	Command	DETail	Yes	Yes	Yes	Displays the transports that are capable of the specified MEDia, RECtech, or MODel. When DETail is supplied, the MEDia and MODel are displayed for all transports.
Display SCRatch	Command	*acs-id*, *lsm-id*, SUBpool, DETail	Yes	Yes	No	Displays scratch counts that match the MEDia and/or RECtech. The scope of the display may be limited to MEDia and/or RECtech scratch counts within a subpool, ACS, or LSM. When DETail is supplied, all MEDia and RECtech information is displayed along with scratch counts.
Display THReshld	Command	*acs-id*, *lsm-id*, SUBpool, DETail	Yes	Yes*	No	Displays all scratch thresholds that match the MEDia and/or RECtech. The scope of the display may be limited to MEDia and/or RECtech scratch thresholds within a subpool, ACS, or LSM. When DETail is supplied, all MEDia and RECtech information is displayed along with scratch thresholds.
Display Volume	Command	DETail	No	No	No	Information on MEDia and RECtech is provided when the DETail parameter is supplied.
EJect, EJECt	Command and Utility	SUBpool, SCRTCH	Yes	Yes	No	Ejects scratches that match the MEDia and/or RECtech. If a subpool is supplied, those cartridges that match MEDia and/or RECtech within the subpool are ejected.

Table 65. MEDia, RECtech, and MODel Cross-reference (Continued)

Name	Type	Related Parameters	MEDia	RECtech	MODel	Description
Mount	Command	SUBpool, SCRTCH, PRIVAT	Yes	No	No	Mounts scratches that match the MEDia. If a SUBpool is supplied, a cartridge that matches MEDia within the subpool is mounted.
TAPEREQ	Control Statement	Various Job Criteria	Yes*	Yes*	Yes*	Processes which use this control statement correlate the MEDia, MODel, and RECtech parameters supplied by TAPEREQ to their definitions. The definition of MEDia is taken from either the VOLATTR control statement or the CDS. RECtech or MODel is taken from either UNITATTR control statements or eligible transports. For example, a volume has a known MEDia, so a transport must be found that matches the MEDia. RECtech or MODel aid transport selection when they match the MEDia. If MEDia is not supplied for a nonspecific request, then RECtech or MODel, when supplied, aid in defining which MEDia and subsequent volume is selected, provided that there are eligible transports with the RECtech or MODel attribute. Sometimes incompatibilities occur because of improper control statement definitions. When this happens, messages or unexpected results can occur.
UNITATTR	Control Statement	N/A	No	No	Yes	The transport model, which implies transport capabilities, and network information is defined by this control statement. Lists are used to define a pool of transports from which to select.

Table 65. MEDia, RECtech, and MODel Cross-reference (Continued)

Name	Type	Related Parameters	MEDia	RECtech	MODel	Description
VOLATTR	Control Statement	N/A	Yes	Yes	No	The MEDia of a given volume must be defined here and the desired RECtech to be used on this volume may also be expressed. Lists are used to define a pool of volumes from which to select. If VOLATTR is improperly defined, scratch counts may be incorrect or volume-to-transport incompatibilities may exist. These issues may result in various operator interactions and unexpected results.
WARN	Command	*acs-id*, *lsm-id*, SUBpool	Yes	Yes*	No	A scratch threshold warning value may be set or displayed for a given MEDia and RECtech. The scope of the change may optionally be limited to MEDia and RECtech scratch thresholds within a SUBpool, ACS, or LSM.

* Notes: Yes = Parameter exists. No = Parameter does not exist. * = Parameter can be a list.

LIBGEN Macros

The LIBGEN macros are shown below in alphabetical order. Refer to ‘‘Creating the Library Configuration File (LIBGEN)’’ in the *HSC Configuration Guide* for complete explanations of macro syntax and parameters, and the order in which they must be specified.

SLIACS macro

```
►►─acs0──SLIACS──┤ Additional Parameters ├──────────────────────────►◄
```

Additional Parameters:

```
├──ACSDRV=(esoteric0, ...,esoteric15)──────────────────────────────►
►──┬──────────────────────────────────┬──,LSM=(lsm0,lsm1, ...,lsm15)──┤
   └,STATION=(station0, ...,station15)┘
```

SLIALIST macro

```
►►─acslist──SLIALIST─acs0, acs1,.....acs255──────────────────────────►◄
```

SLIDLIST macro

```
►►─drvelst0──SLIDLIST──HOSTDRV=(drives0,...,drives15)────────────────►◄
```

SLIDRIVS macros

```
►►─drives0 SLIDRIVS ADDRESS=(addr0,addr1...)──────────────────────────►◄
```

SLIENDGN macro

```
►►─SLIENDGN──────────────────────────────────────────────────────────►◄
```

SLILIBRY macro

```
►►─SLILIBRY──HOSTID=(host-id0,host-id1,...,host-id15)──,ACSLIST=acslist──────►
►──┤ Optional Parameters ├──────────────────────────────────────────────────►◄
```

Optional Parameters:

```
├──┬──────────────────────────────┬──┬──────────────────────────┬──────────►
   │                ┌─CLN────┐    │  │              ┌─255────┐  │
   └─,CLNPRFX=──────┴─prefix───┴────┘  └─,SMF=────────┴─libtype──┴──┘

►──┬──────────────────────────────────┬──┬──────────────────────────────┬──►
   └─,NNLBDRV=(esoteric0,...,esoteric15)┘  │                ┌─NOSCRTCH─┐  │
                                           └─,DELDISP=──────┴─SCRTCH───┴──┘

►──┬──────────────────────────────┬──┬──────────────────────────┬──┬──────►
   │                ┌─STKALSQN─┐    │  │                ┌─.──────┐  │  │
   └─,MAJNAME=──────┴─qname────┴────┘  └─,COMPRFX=────────┴─commandchar┴──┘  └─,SCRLABL=──┬─SL──┬──┘
                                                                             ├─AL──┤
                                                                             ├─NL──┤
                                                                             └─NSL─┘

►──┬──────────────────────────┬──┤
   └─,EJCTPAS=password────────┘
```

SLILSM macro

```
►►─lsm0─SLILSM──┬──────────────────────────────────────────────────────────►
                │                                                          │
                │                  ┌─4410──────────────┐                   │
                └─TYPE=─┬─9310──────────────────────────┴─,─┘
                        ├─9360──┬──────────────────────┬──┤
                        │       └─-─┬─100─┬──────────┬──┘  │
                        │           ├─075─┤          │     │
                        │           └─050─┘          │     │
                        └─9740──────────────────────┴─────┘

►──DRIVE=(drvpane10,...,drvpane13)─,DRVELST=(drvelst0,...,drvelst3)──────────►

►──┬──────────────────────────────────────────────────────────────────────►
   └─,PASTHRU=((ptppane10,─┬─S─┬─),...,(ptppane13,─┬─S─┬─))─,ADJACNT=(lsm1,...,lsm4)┘
                           └─M─┘                   └─M─┘

►──┬──────────────────────────────────────────────────────────────────────►◄
   │                                  ┌──────────────────────────────────┐
   └─,DOOR=─┬─STD──┬──┬──────────────┴─,WINDOW=(wndpane10,...,wndpane13)──┘
            ├─ECAP─┤  │
            ├─WC1──┤  │
            └─WC2──┘  │
```

SLIRCVRY macro

```
►►─┬──────┬─SLIRCVRY──┬──────────────────────────────────────────────────►◄
   └─label─┘           │                  ┌─BOTH────┐
                       └─TCHIQE=─┬─NONE────┴──────────┘
                                 ├─SHADOW──┤
                                 ├─JOURNAL─┤
                                 ├─STANDBY─┤
                                 └─ALL─────┘
```

SLISTATN macro

```
►►─station0──SLISTATN ADDRESS=(addr0,...,addr15)──────────────────────────►◄
```

HSC Control Statements

Refer to Chapter 3, “HSC Control Statements and HSC Start Procedure” on page 83 for more information on control statement syntax and parameters.

Control Data Set Definition (CDSDEF) control statement

```
►►─CDSDEF──DSN1(dataset.name)──┬──────────────────────────────────┬──►
                               └─,VOL1(volser),UNIT1(unitname)────┘
►─,DSN2(dataset.name)──────────┬──────────────────────────────────┬──►
                               └─,VOL2(volser),UNIT2(unitname)────┘
►─,DSN2(dataset.name)──────────┬──────────────────────────────────┬──┬──────────┬──►◄
                               └─,VOL3(volser),UNIT3(unitname)────┘  └─,DISABLE─┘
```

EXECParm control statement

```
►►─EXECParm──┬──────────────────────────────┬──┬──────────────────┬──┬──────────────────┬──►
             │                ┌─Yes─┐       │  └─,Eid(gtfeid)─────┘  └─,Fid(gtffid)────┘
             └─MSGPRFX(───────┴─No──┴───)────┘
►──┬──────────────────────────┬──────────────────────────────────────────────────────────►◄
   └─,HOSTID(host-id)─────────┘
```

Journal Definition (JRNDEF) control statement

```
►►─JRNDEF──DSN1(dataset.name)──┬──────────────────────────────────┬──►
                               └─,VOL1(volser),UNIT1(unitname)────┘
►─,DSN2(dataset.name)──┬──────────────────────────────────┬──┬──────────────────────────┬──►
                       └─,VOL2(volser),UNIT2(unitname)────┘  │          ┌─Abend────┐    │
                                                             └─,FULL(───┴─Continue─┴─)──┘
►─,HOSTID(host-id)──────────────────────────────────────────────────────────────────────►◄
```

License Key Definition (LKEYDEF) command and control statement

```
►►─LKEYDEF──┬─DATASET(dataset.name)─┬──┬──────────────────┬──┬──────────────────┬──►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)─┘  └─UNIT(unitname)─┘
```

License Key Information (LKEYinfo) control statement

```
►►─LKEYINFO──PRODuct(product_identifier)──CUSTomer('customer_name')──────────►

►──SITEno(nnnnnnn)──EXPRdate(yyyyddd)──KEY(license_key_string)──────────►◄
```

LMUPATH control statement

```
►►─LMUPATH──ACS(aa)──LMUADDR(──┬──────────────────┬──┐──)──────────►◄
                               │ ┌──────────────┐ │
                               ├─lmu_hostname─────┤
                               └─nnn.nnn.nnn.nnn──┘
```

LMU Path Definition (LMUPDEF) command and control statement

```
►►─LMUPDEF─┬─DATASET(dataset.name)─┬──┬──────────────────┬──┬──────────────────┬──►
           └─DSN(dataset.name)─────┘  └─VOLume(volser)─┘  └─UNIT(unitname)─┘

►──┬──────────────────────────────────────────────────────────────────────┬──►◄
   │                  ┌──────────┐                                        │
   └─HOSTID(──┬─host-id─┬──)──────┘                                        │
              └─────────┘                                                  │
```

OPTion control statement

```
►►─OPTion──TITLE(identifying-string)──┬──────────────┬──────────────────►◄
                                      ├─TRACE────────┤
                                      └─TRACEF───────┘
```

Reconfiguration Definition (RECDEF) control statement

```
►►─RECDEF──────DSN1(dataset.name)──┬──────────────────────────────────────────────►
                                   └─,VOL1(volser),UNIT1(unitname)─┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   └─,DSN2(dataset.name)──┬──────────────────────────────────────────────┬──┘
                          └─,VOL2(volser),UNIT2(unitname)─┘
```

Scratch Subpool (SCRPOol) control statement

```
                                   ┌─,──────────────┐
►►─SCRPOol──NAME(subpool-name)──,RANGE(─subpool-range─)──,LABEL(─┬─SL──┬─)──►
                                                                 ├─NL──┤
                                                                 ├─AL──┤
                                                                 └─NSL─┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   │                   ┌─ALL──────────┐
   └─,HOSTID(──────────┼─host-id──────┼──┘
                       └─┌─,──────────┐
                         └─host-list──┘
```

Scratch Subpool Definition (SCRPDEF) command and control statement

```
►►─SCRPDEF─┬─DATASET(dataset.name)─┬──┬──────────────────┬──┬──────────────────┬──►
           └─DSN(dataset.name)─────┘  └─VOLume(volser)─┘  └─UNIT(unitname)─┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   │                   ┌─,──────────┐
   └─HOSTID(───────────┼─host-id────┼─)──┘
                       └────────────┘
```

Tape Request (TAPEREQ) control statement

```
►►─TAPEREQ──┬──────────────────────────────────────────────────────────────────────────────────────────────►
            │                   ┌─*─────────┐                                   ┌─*─────────┐
            ├─JOBname(──┬─*─────┬─jobname──┬─)─┤ ├─STEPname(──┬─*─────┬─stepname─┬─)─┤
            │           └─jobname─┘          │   │             └─stepname─┘          │   │
            │                                │   │                                   │   │
►───────────┬───────────────────────────────┬───┬───────────────────────────────────┬───┬───────────────────►
            │                   ┌─*─────────┐   │                   ┌─**────────┐   │   │
            ├─PROGram(──┬─*─────┬─program──┬─)─┤ ├─DATASET(──┬─**────┬─dataset──┬─)─┤   │
            │           └─program─┘          │   │             └─dataset─┘          │   │
            │                                │   │                                   │   │
            ├─PGMname(program-name)──────────┤   ├─DSN(dataset-name)─────────────────┤   │
            │                                │   │                                   │   │
►───────────┬───────────────────────────────┬───┬───────────────────────────────────┬───┬───────────────────►
            │                                │   │                                   │   │
            ├─DDName(DD-name)────────────────┤   ├─RETPD(──┬─GE─┬─,retention-period-)─┤   │
            │                                │   │         ├─EQ─┤                      │   │
            │                                │   │         ├─NE─┤                      │   │
            │                                │   │         ├─GT─┤                      │   │
            │                                │   │         ├─LT─┤                      │   │
            │                                │   │         └─LE─┘                      │   │
            │                                │   ├─EXPDT(──┬─GE─┬─,expiration-date-)───┤   │
            │                                │   │         ├─EQ─┤                      │   │
            │                                │   │         ├─NE─┤                      │   │
            │                                │   │         ├─GT─┤                      │   │
            │                                │   │         ├─LT─┤                      │   │
            │                                │   │         └─LE─┘                      │   │
►───────────┬───────────────────────────────┬───┬───────────────────────────────────┬───┬───────────────────►
            │                   ┌─*─────────┐   │                                   │   │
            ├─VOLType(──┬─Specific─┬─)─┤                                           │   │
            │           └─Nonspec──┘          │   │                                   │   │
```

Tape Request Control Statement (continued)

```
MEDia( LONGItud | Standard | CST | MEDIA1 | STD | 1 | 3480 | ECART | E | ECCST | ETAPE | Long | MEDIA2 | 3490E | ZCART | Z | HELical | DD3 | DD3A | DD3B | DD3C | STK1 | STK1R | R | STK2 | STK2P )

RECtech( LONGItud | 18track | 36track | 36Atrack | 36Btrack | 36Ctrack | HELical | DD3 | STK1R | STK1R34 | STK1R35 | STK1RA | STK1RA34 | STK1RA35 | STK1RB | STK1RB34 | STK1RB35 | STK2P | STK2P34 | STK2P35 | STK2PB | STK2PB34 | STK2PB35 )

MODel( 4480 | 4490 | 9490 | 9490EE | SD3 | 9840 | 98403 5 | T9840B | T9840B35 | T9940A | T9940A35 | T9940B | T9940B35 )

DEVTpref(-model1 [,model2 [,model3]] )

SCOPE( LIBrary | LSM )

SUBPool(subpool-name)

ESOTeric(esoteric-name)
```

Tape Request Definition (TREQDEF) command and control statement

```
►►─TREQDEF──┬─DATASET(dataset.name)─┬──┬──────────────────┬──┬──────────────────┬──►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)───┘  └─UNIT(unitname)───┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   └─HOSTID(──┬─host-id──┬──)─┘
              └──────────┘
              ,
```

Unit Attribute (UNITATTR) control statement

```
►►─UNITATTR──ADDRess(──┬─unit-address──────────────┬──)──┬──────────────────────────┬──►
                       ├─unit-address-range────────┤     └─MODel(──┬─4480──────┬──)─┘
                       └──┬──────────────────────┬──┘               ├─4490──────┤
                          └─unit-address-list────┘                  ├─9490──────┤
                          ,                                         ├─9490EE────┤
                                                                    ├─SD3───────┤
                                                                    ├─9840──────┤
                                                                    ├─984035────┤
                                                                    ├─T9840B────┤
                                                                    ├─T9840B35──┤
                                                                    ├─T9940A────┤
                                                                    ├─T9940A35──┤
                                                                    ├─T9940B────┤
                                                                    ├─T9940B35──┤
                                                                    └─IGNORE────┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   └─NETHOST(host-id)──┘
```

Unit Attribute Definition (UNITDEF) command and control statement

```
►►─UNITDEF──┬─DATASET(dataset.name)─┬──┬──────────────────┬──┬──────────────────┬──►
            └─DSN(dataset.name)─────┘  └─VOLume(volser)───┘  └─UNIT(unitname)───┘

►──┬──────────────────────────────────────────────────────────────────────────►◄
   └─HOSTID(──┬─host-id──┬──)─┘
              └──────────┘
              ,
```

User Exit (UEXIT) command and control statement

```
                                   ┌SLSUXnn┐        ┌,Enable┐
►►─UEXIT──┬──nn──┬──Load(──┬──────┬──)──┬──────┬──┬──────────────────────►◄
          │      │         └name──┘      └,Disable┘  │                  │
          │      ├──Enable──────────────────────────┤                  │
          │      │                                   │                  │
          │      └──Disable─────────────────────────┘                  │
          │                                                            │
          ├──nn──────────────────────┬──Query──────────────────────────┤
          ├──nn-range────────────────┤                                 │
          │                          │                                 │
          └──(──┬──nn-list──┬──)────┘                                 │
                │     ┌─,─┐ │                                          │
                ▼     │   ▼ │                                          │
```

Volume Attribute (VOLATTR) control statement

```
►►─VOLATTR──SERial(─┬─volser──────────┬─)──┬──────────────────────────────►
                    ├─vol-range───────┤    │
                    └─┬─,─────────┬─┐─┘    │
                      └─vol-list──┘ │      │
                                    │      └─MEDia(─┬─Standard──┬─)──┘
                                    │               ├─CST───────┤
                                    │               ├─MEDIA1────┤
                                    │               ├─STD───────┤
                                    │               ├─1─────────┤
                                    │               ├─3480──────┤
                                    │               ├─ECART─────┤
                                    │               ├─E─────────┤
                                    │               ├─ECCST─────┤
                                    │               ├─ETAPE─────┤
                                    │               ├─Long──────┤
                                    │               ├─MEDIA2────┤
                                    │               ├─3490E─────┤
                                    │               ├─ZCART─────┤
                                    │               ├─Z─────────┤
                                    │               ├─DD3A──────┤
                                    │               ├─DD3B──────┤
                                    │               ├─DD3C──────┤
                                    │               ├─DD3D──────┤
                                    │               ├─STK1R─────┤
                                    │               ├─STK1U─────┤
                                    │               ├─R─────────┤
                                    │               ├─U─────────┤
                                    │               ├─STK2──────┤
                                    │               ├─STK2P─────┤
                                    │               └─STK2W─────┘
```

Volume Attribute (VOLATTR) control statement (continued)

```
►──┬──────────────
```

Utilities

Refer to Chapter 5, “Utility Functions” on page 181 for more information on utility syntax and parameters.

ACTIvities Report utility

```
►►─ACTIvities──┬──────────────────────────────────────────────────────►◄
               └─┤ Optional Parameters ├─┘
```

Optional Parameters:

```
├──┬──────────────────────────────────────────────────────────────────►
   │  ┌─TODAY──────┐   ┌─00:00:00──────┐
   └──BEGIN(─┤begin-date├──,──┤begin-time├──)──┘

►──┬──────────────────────────────────────────────────────────────────┤
   │  ┌─TODAY──────┐   ┌─23:59:59──────┐
   └──END(──┤end-date├──,──┤end-time├──)──┘
```

AUDIt utility

```
►►─AUDIt─┬─ALL──────────────────────────────────────────────────────────►◄
         │                                                  ┌─YES─┐
         └─ACS(acs-id)──┬──────────────────────────────┬──┬──────APPLy(──┤NO├──)──┘
                        └─┤ Optional Parameters ├─┘
```

Optional Parameters:

```
├──┬──────────────────────────────────────────────────────────────────►
   └─LSM(lsm-list)──┬──────────────────────────────────────────────────┬
                    └─PANel(panel-list)──┬──────────────────────────┬──┬
                                         └─ROW(row-list)──┬──────────┬──┬
                                                          └─COLumn(column-list)─┘

►──┬──────────────┬──┬──────────┬──┬──────────────────────────┬──┬──────┤
   └─CAP(cap-id)──┘  └─EMPTYCel─┘  └─DIAGScan(─┬─ONLY─┬─)──┘  └─INTRANs─┘
                                               └─ALSO─┘
```

BACKup utility

```
►►─BACKup──┬──────────────────────────────────────────────────────────────────────────────────────►◄
           │                                                                                        │
           │                                                                                        │
           │                                                                                        │
```

Eject Method 2 (continued):

```
►──┬──────────────────────────────────────────────────────────────────────────────────────────┬──┬──────────────────────────────────────────────────────────────────────────────────────────┬──┤
   │ MEDia( ┬─Standard─┬ )  │                                                                  │  │ RECtech( ┬─18track──────┬ )  │
   │        ├─CST───────┤    │                                                                  │  │          ├─36Atrack────┤    │
   │        ├─MEDIA1────┤    │                                                                  │  │          ├─36Btrack────┤    │
   │        ├─STD───────┤    │                                                                  │  │          ├─36Ctrack────┤    │
   │        ├─1─────────┤    │                                                                  │  │          ├─DD3─────────┤    │
   │        ├─348Ø──────┤    │                                                                  │  │          ├─STK1R───────┤    │
   │        ├─ECART─────┤    │                                                                  │  │          ├─STK1R34─────┤    │
   │        ├─E─────────┤    │                                                                  │  │          ├─STK1R35─────┤    │
   │        ├─ECCST─────┤    │                                                                  │  │          ├─STK1RA──────┤    │
   │        ├─ETAPE─────┤    │                                                                  │  │          ├─STK1RA34────┤    │
   │        ├─Long──────┤    │                                                                  │  │          ├─STK1RA35────┤    │
   │        ├─MEDIA2────┤    │                                                                  │  │          ├─STK1RB──────┤    │
   │        ├─349ØE─────┤    │                                                                  │  │          ├─STK1RB34────┤    │
   │        ├─ZCART─────┤    │                                                                  │  │          ├─STK1RB35────┤    │
   │        ├─Z─────────┤    │                                                                  │  │          ├─STK2P───────┤    │
   │        ├─DD3A──────┤    │                                                                  │  │          ├─STK2P34─────┤    │
   │        ├─DD3B──────┤    │                                                                  │  │          ├─STK2P35─────┤    │
   │        ├─DD3C──────┤    │                                                                  │  │          ├─STK2PB──────┤    │
   │        ├─STK1──────┤    │                                                                  │  │          ├─STK2PB34────┤    │
   │        ├─STK1R─────┤    │                                                                  │  │          └─STK2PB35────┘    │
   │        ├─R─────────┤    │                                                                  │  │                             │
   │        ├─STK2──────┤    │                                                                  │  │                             │
   │        └─STK2P─────┘    │                                                                  │  │                             │
```

INITialize Cartridge utility

```
►►─INITialize──┬─┤ Optional Parameters ├─┬──────────────────────────────────►◄
               └─────────────────────────┘

Optional Parameters:

├──┬──────────────┬──────────────────────────────────────────────────────►
   └─CAP(cap-id)──┘

►──┬──────────────────────────────────────────────────────────────────────►
   │                 ┌─IEHINITT──┐                                        │
   └──────PROGram(───┴─prog-name─┴──)─VERIFY(parameter-name)──────────────┘

►──┬──────────────────────────────────────────────────────────────────────┤
   │                 ┌─SYSIN─────┐                                        │
   │   ┌─────────────┬─────────────────────────────────────────────────┐  │
   └───┴─CNTLDD(───┴─dd-name───┴──)──┘   └─OPTion(──┬─EJEct───┬──)──┘
                                                     └─SCRatch─┘
```

Journal OFFLoad utility

```
►►─OFFLoad──────────────────────────────────────────────────────────────►◄
```

MERGEcds utility

```
►►─MERGEcds──┬──────────────┬──┬──────────┬──────────────────────────────►◄
             └─VALIDate─────┘  └─ALL──────┘
```

MOVe utility

```
►►─MOVe─┤ Parameters ├──────────────────────────────────────────►◄

 Parameters:

├──┬─Flsm(lsm-id)─Panel(panel-list)──┬──────────────────────────►
   │                                 └─Row(row-list)─┬──────────┬─┤
   │                                                 └─Column(column-list)─┘
   └─Volume(vol-list)──────────────────────────────────────────┘

►─TLsm(lsm-list)─┬──────────────┬──────────────────────────────┤
                 └─TPanel(panel)─┘
```

Reconfiguration utility

```
►►──┬─START─┬──reconfig-procname──────────────────────────────►◄
    └─S─────┘
```

REPLace utility

```
►►─REPLaceall─┬──────────────────────────────────────────────────►◄
              │                  ┌──────────┐
              └─VOLser(──┬──vol-list──┬──)──┘
                         ↓ ,          │
```

RESTore utility

```
►►─RESTore──┬──────────────────────────────┬──────────────────────────►◄
            │                ┌─YES─┐       │                 ┌─NO────┐
            └─APPly(──┬─NO──┬──)──┘       └─GENerate(──┬─YES───┬──)──┘
                      ↓ ,   │                          ├─Only──┤
                            │                          └─Short─┘
```

SCRAtch utility

```
►►─SCRAtch──VOLser(──┬─vol-list─┬──)──────────────────────────────────►◄
                     └──────────┘
                     ↑ ,
```

Scratch Conversion utility

```
►►─PARM=──'──┬──────────────────────────────┬──'──────────────────────────►◄
             └┤ Optional Parameters ├────────┘
```

Optional Parameters:

```
                                                  ┌─00001──────────────────────┐
                                                  ├─1900001────────────────────┤
  ┌─TMS──┐                                        ├─,──────────────────────────┤
├─┤ ,    ├──┬──,──────────────────────────────┬──┤ TODAY────────────────────┤
  ├─TLMS─┤  │                                  │  ├─yyddd1──┬──────────────┬──┤
  └─RMM──┘  └─SCRPOOL(─┬─SL──┬──)──────────────┘  │          └─-yyddd2──────┘  │
                       ├─NL──┤                    └─yyyyddd1──┬──────────────┬──┘
                       ├─NSL─┤                                └─-yyyyddd2────┘
                       ├─AL──┤
                       └─SUL─┘

►──┬──,──────┬──┬──,──────────┬──────────────────────────────────────────┤
   └─MIXED───┘  └─LIBONLY─────┘
```

Scratch Redistribution (SCREdist) utility

```
►►─SCREdist──ACS(acs-id)──┬──────────────────────────────────────┬──┬──────────────────────────────────────┬──►
                          │                ┌──────────┐          │  │                                      │
                          │                ↓          │          │  │                                      │
                          └──LSM(──────────lsm-list────)─────────┘  └──SUBpool(subpool-name)───────────────┘

►──┬──────────────────────────┬──┬──────────────────────────────────────────────────────────────────────►◄
   │                          │  │                                                                        │
   └──BALtol(tolerance-value)─┘  └──MEDia(──┬─LONGItud──┬─)──┬──RECtech(──┬─LONGItud──┬─)──┘
                                            │─Standard──│    │            │─18track───│
                                            │─CST───────│    │            │─36track───│
                                            │─MEDIA1────│    │            │─36Atrack──│
                                            │─STD───────│    │            │─36Btrack──│
                                            │─1─────────│    │            │─36Ctrack──│
                                            │─3480──────│    │            │─HELical───│
                                            │─ECART─────│    │            │─DD3───────│
                                            │─E─────────│    │            │─STK1R─────│
                                            │─ECCST─────│    │            │─STK1R34───│
                                            │─ETAPE─────│    │            │─STK1R35───│
                                            │─Long──────│    │            │─STK1RA────│
                                            │─MEDIA2────│    │            │─STK1RA34──│
                                            │─3490E─────│    │            │─STK1RA35──│
                                            │─ZCART─────│    │            │─STK1RB────│
                                            │─Z─────────│    │            │─STK1RB34──│
                                            │─HELical───│    │            │─STK1RB35──│
                                            │─DD3───────│    │            │─STK2P─────│
                                            │─DD3A──────│    │            │─STK2P34───│
                                            │─DD3B──────│    │            │─STK2P35───│
                                            │─DD3C──────│    │            │─STK2PB────│
                                            │─STK1──────│    │            │─STK2PB34──│
                                            │─STK1R─────│    │            └─STK2PB35──┘
                                            │─R─────────│    │
                                            │─STK2──────│    │
                                            └─STK2P─────┘    │
```

SET utility

```
►►─SET──┤ Options ├──────────────────────────────────────────►◄
```

Options:

```
├─ACSDRV(esoteric)─,FORACS(acs-id)──┬──────────────────────┬──┤
                                    └─,FORHOST(host-id)────┘

├─CDSLVL─┬─CONVERT(210)─┬──────────────────────────────────────┤
         └─REGRESS(200)─┘

├─CLNPRFX(prefix)──────────────────────────────────────────────┤

├─COMPRFX(cmdhex)──────────────────────────────────────────────┤

├─DELDISP(─┬─SCRTCH───┬─)──────────────────────────────────────┤
          └─NOSCRTCH─┘

├─EJCTPAS(─┬──────────┬─)─┬──────────────────────┬──────────────┤
          └─newpswd────┘   └─,OLDPASS(oldpswd)────┘

├─FREEZE(─┬─ON──┬─),FORLSMID(lsm-id)·,FORPANEL(panel)──────────┤
          └─OFf─┘

├─HOSTID(newhost),FORHOST(oldhost)─────────────────────────────┤

├─HSCLEVEL(OFF),FORHOST(host-id)───────────────────────────────┤

├─MAJNAME(qname)───────────────────────────────────────────────┤

├─NEWHOST(newhost),LIKEHOST(model-host)────────────────────────┤

├─NNLBDRV(─┬──────────┬─)─┬──────────────────────┬──────────────┤
          └─esoteric───┘   └─,FORHOST(host-id)────┘

├─SCRLABL(─┬─SL─┬─)──────────────────────────────────────────────┤
          ├─AL─┤
          ├─NL─┤
          └─NSL┘
```

SET Utility (continued)

```
►►─SET──┤ Options ├──────────────────────────────────────────────────►◄

 Options:

├─SLIDRIVS(──┬──────────────────────────┬──),FORLSMID(lsm-id),FORPANEL(panel)──────►
             └─addr0──┬──────────────────┬─┘
                      └─,...addr19───────┘

►──┬──────────────────────────────────────────────────────────────────┤
   └─,FORHOST(host-id)──┘

├─SLISTATN(──┬──────────────────────┬──),FORACS(acs-id)──┬──────────────────────┬──┤
             └─stat1,...,stat16─────┘                    └─,FORHOST(host-id)────┘

├─SMF(libtype)──────────────────────────────────────────────────────────┤

├─TCHNIQE(──┬─NONE────────┬──)──────────────────────────────────────────┤
            ├─JOURNAL─────┤
            ├─SHADOW──────┤
            ├─BOTH────────┤
            ├─STANDBY─────┤
            └─ALL─────────┘
```

UNSCratch utility

```
                          ┌──,──────────┐
►►─UNSCratch──VOLser(──────┴─vol-list────┴──)──────────────────────────►◄
```

Unselect utility

```
►►─UNSElect──VOLser(volser)──┬──────────────┬──────────────────────────►◄
                             └─,FORCE───────┘
```

Volume Report (VOLRpt) utility

```
►►─VOLRpt─┬─ACS(acs-id)──────────────────────────────────────┬──┬──SORT(─┬─VOL─┬─)─┬─ASCend──┬──►
          │                  ┌──────────┐                    │  │        ├─INS─┤   └─DEScend─┘
          │                  ↓          │                    │  │        ├─LOC─┤
          │                  ├─,────────┤                    │  │        ├─SEL─┤
          │                  │          │                    │  │        └─USE─┘
          │                  └─lsm-list─┘                    │  │
          │                  ┌──────────┐                    │  └──NOSORT──────────────────────┘
          │                  ↓          │                    │
          │                  ├─,────────┤                    │
          │                  │          │                    │
          │                  └─lsm-list─┘                    │
          │                  ┌──────────┐                    │
```

Operator Commands

Refer to “Operator commands’’ in the *HSC Operator’s Guide* for complete explanations of command syntax and parameters.

Allocation (ALLOC) command and control statement

```
►►─ALLOC──┬─Defer(─┬─OFf──┬─)──┬──────────────────────────────────►◄
          │        │ON────│    │
          │        └─JES3─┘    │
          │                    │
          │─Fetch(1)─(─┬─OFf──┬─)──│
          │            │ON────│    │
          │            └─NONLib─┘  │
          │                    │
          │─LOWscr(─┬─NONE─┬─)──│
          │         └─ANY──┘    │
          │                    │
          │─LSMpref(─┬─NONE─┬─)──│
          │          │4410──│    │
          │          │9310──│    │
          │          └─9360─┘    │
          │                    │
          │─SCRtech(─┬─COUNT─┬─)──│
          │          └─ROTATE─┘   │
          │                    │
          │─Specvol─┬──────────┬──│
          │         │─(acs-id)─│  │
          │         │─(acs-range)─│
          │         │─(┌─,─┐─acs-list─)─│
          │                    │
          └─Zeroscr(─┬─OFf──┬─)──│
            │        └─ON───┘    │
            │                    │
            └─HOSTID(host-id)────┘
```

Note:

(1) This parameter applies only in JES3 with SETUP environments

CAP Preference (CAPPref) command and control statement

```
►►─CAPPref──prefvlue──┬─lsm-id──────────┬──┬──────────┬──┬──────────┬──►◄
                      │─cap-id──────────│  │─host-id──│  │─AUTO─────│
                      │─cap-range───────│  │          │  │─MANual───│
                      │─(┌─,─┐─cap-list─)─│  │          │  │          │
                      └─────────────────┘  └──────────┘  └──────────┘
```

CDs Enable/Disable command

```
►►─CDs─┬─Enable─DSn(dsn)──┬──────────┬──┬──────────────────────────────────────┬──►◄
       │                  └─NEWLoc───┘  └─NEWVol(volser),NEWUnit(unitname)─┘
       │
       ├─Disable─┬─DSn(dsn)──┬──────────────────────────────────────────────────┤
       │         ├─Primary───┤
       │         ├─SEcndry───┤
       │         └─STandby───┘
       │
       └─EXpand──────────────────────────────────────────────────────────────────┘
```

CLean command

```
►►─CLean─┬─dev-id──────────────┬──┬──────────────┬──────────────────────────►◄
         ├─dev-range───────────┤  └─host-id──────┘
         │          ┌──,──────┐
         └─(────────┴─dev-list┴──)┘
```

Communications Path (COMMPath) command and control statement

```
►►─COMMPath──────HOSTid(host-id)──────────────────────────────────────►
   │
   ├─METHod(─┬─CDS──────────┬─)─┬─────────────────────────────────┬─┬─────────────────────────┬─►◄
   │         ├─LMU──────────┤   └─LMUpath(─┬─acs-id──────┬─)─┘   │ └─VTAMpath(name)────────┘
   │         ├─LMU,acs-id───┤              ├─acs-range────┤       │
   │         └─VTAM─────────┘              └─┬─,─────────┬─┘       │
   │                                           └─acs-list──┘         │
   ├─LMUpath(─┬─acs-id──────┬─)─┬─────────────────────────┬─────────┤
   │          ├─acs-range───┤   └─VTAMpath(name)─────────┘         │
   │          └─┬─,─────────┬─┘                                     │
   │            └─acs-list──┘                                       │
   ├──────VTAMpath(name)────────────────────────────────────────────┤
   └──────DELete──┬──────────────────────────────────────────────┬──┤
                  │ └─LMUpath(─┬─acs-id──────┬─)─┬─────────────┬─┘  │
                  │            ├─acs-range───┤   └─VTAMpath─┬─────┬─┘  │
                  │            └─┬─,─────────┬─┘               └─(name)─┘
                  │              └─acs-list──┘                         │
                  └──VTAMpath─┬─────────┬──────────────────────────────┘
                              └─(name)──┘
```

DISMount command

```
►►─DISMount──┬─,─────────┬─devaddr─┬─────────┬──────────────────────►◄
             └─volser────┘         └─host-id─┘
```

Display command

```
►►─Display──┬─┤ Options ├─┬──────────────────────────────────────────►◄
```

Options:

```
├─Acs──┬──────────────────┬──────────────────────────────────────────┤
      │─acs-id───────────│
      │─acs-range────────│
      │   ┌─,──────────┐ │
      └─(─▼─acs-list───┘─)─┘

├─ALl──────────────────────────────────────────────────────────────────┤

├─ALLOC────────────────────────────────────────────────────────────────┤

      ┌─(all CAPs)─┐
├─Cap──┼────────────┼──────────────────────────────────────────────────┤
      │─acs-id─────│
      │─lsm-id─────│
      └─cap-id─────┘

├─CDS──────────────────────────────────────────────────────────────────┤

├──┬─CMd─────────┬──command-name──────────────────────────────────────┤
   └─COmmand─────┘

├──COMMPath──┬──────────────────────────────────────────────────────┤
             │          ┌─*──────────────┐
             └─HOSTid(──┼─ALL────────────┼─)─┘
                        │─host-id────────│
                        │   ┌─,────────┐ │
                        └─▼─host-list──┘─┘
```

Display command (continued)

```
►►─Display──┬──────────────────────────────────────────────────────────────►◄
            └─┤ Options ├─┘

Options:
├──DRives──┬─Library──────┬──┬─ACtive──────┬──┬──────────────────────────►
           ├─Nonlib───────┤  ├─Idle────────┤  └─DETail──┘
           ├─Both─────────┤  └─ALl─────────┘
           ├─ACS(acs-id)──┤
           └─LSM(lsm-id)──┘
►──┬──────────────────────────────────────────────────────────────────────►
   └─MEDia(──┬─LONGItud──┬─)──┘
             ├─Standard──┤
             ├─CST───────┤
             ├─MEDIA1────┤
             ├─STD───────┤
             ├─1─────────┤
             ├─3480──────┤
             ├─ECART─────┤
             ├─E─────────┤
             ├─ECCST─────┤
             ├─ETAPE─────┤
             ├─Long──────┤
             ├─MEDIA2────┤
             ├─3490E─────┤
             ├─ZCART─────┤
             ├─Z─────────┤
             ├─HELical───┤
             ├─DD3───────┤
             ├─DD3A──────┤
             ├─DD3B──────┤
             ├─DD3C──────┤
             ├─DD3D──────┤
             ├─STK1──────┤
             ├─STK1R─────┤
             ├─R─────────┤
             ├─STK1U─────┤
             ├─U─────────┤
             ├─STK2──────┤
             ├─STK2P─────┤
             └─STK2W─────┘

   ├─RECtech(──┬─LONGItud──┬─)──┤
               ├─18track───┤
               ├─36track───┤
               ├─36Atrack──┤
               ├─36Btrack──┤
               ├─36Ctrack──┤
               ├─HELical───┤
               ├─DD3───────┤
               ├─STK1R─────┤
               ├─STK1R34───┤
               ├─STK1R35───┤
               ├─STK1RA────┤
               ├─STK1RA34──┤
               ├─STK1RA35──┤
               ├─STK1RB────┤
               ├─STK1RB34──┤
               ├─STK1RB35──┤
               ├─STK2P─────┤
               ├─STK2P34───┤
               ├─STK2P35───┤
               ├─STK2PB────┤
               ├─STK2PB34──┤
               ├─STK2PB35──┤
               └─IGNORE────┘
   └─MODel(──┬─4480────┬─)──┘
             ├─4490────┤
             ├─9490────┤
             ├─9490EE──┤
             ├─SD3─────┤
             ├─9840────┤
             ├─984035──┤
             ├─T9840B──┤
             ├─T9840B35┤
             ├─T9940A──┤
             ├─T9940A35┤
             ├─T9940B──┤
             ├─T9940B35┤
             └─IGNORE──┘
►──┬──────────────────────────────────────────────────────────────────────┤
   └─Unit(──┬─unit-address─────────┬─)──┘
            └─unit-address range───┘
```

Display command (continued)

```
►►─Display──┬──────────────────────────────────────────────────────────►◄
            └─┤ Options ├─┘
```

Options:

```
├─┬─EXceptns──┬──────────────────────────────────────────────────────────┤
  └─X─────────┘

├─LKEYDEF──────────────────────────────────────────────────────────────┤

├─LMUPDEF──────────────────────────────────────────────────────────────┤

├─LSM──┬──────────────────┬──────────────────────────────────────────┤
       ├─lsm-id───────────┤
       ├─lsm-range────────┤
       └─(──┬──────────┬──)──┘
            ↓ ,        │
            └─lsm-list─┘

├─┬─Message──┬──────msgnum──────────────────────────────────────────────┤
  └─Msg──────┘

├─MNTD─────────────────────────────────────────────────────────────────┤

├─MONitor──┬──────────┬──────────┬──────────────────────────────────────┤
           └─,PGMI────┘          └─,L(──┬──────┬──)──┘
                                        │ cc   │
                                        └─name─┘

├─OPTion───────────────────────────────────────────────────────────────┤

├─Requests─────────────────────────────────────────────────────────────┤
```

Display command (continued)

```
►►─Display──┬──────────┬──────────────────────────────────────────►◄
            └─ Options ─┘
Options:
├──SCRatch──┬──────────┬──┬──────────────────────────┬──┬──────────┬──►
            ├─acs-id───┤  └─SUBpool(subpool-name)────┘  └─DETail────┘
            └─lsm-id───┘
►──┬──────────────────────────────────────────────────┬──┬──────────────────────────────────────────────────┬──┤
   └─MEDia(──┬─LONGItud──┬─)──┘   └─RECtech(──┬─LONGItud──┬─)──┘
             ├─Standard──┤                    ├─18track───┤
             ├─CST───────┤                    ├─36track───┤
             ├─MEDIA1────┤                    ├─36Atrack──┤
             ├─STD───────┤                    ├─36Btrack──┤
             ├─1─────────┤                    ├─36Ctrack──┤
             ├─348Ø──────┤                    ├─HELical───┤
             ├─ECART─────┤                    ├─DD3───────┤
             ├─E─────────┤                    ├─STK1R─────┤
             ├─ECCST─────┤                    ├─STK1R34───┤
             ├─ETAPE─────┤                    ├─STK1R35───┤
             ├─Long──────┤                    ├─STK1RA────┤
             ├─MEDIA2────┤                    ├─STK1RA34──┤
             ├─349ØE─────┤                    ├─STK1RA35──┤
             ├─ZCART─────┤                    ├─STK1RB────┤
             ├─Z─────────┤                    ├─STK1RB34──┤
             ├─HELical───┤                    ├─STK1RB35──┤
             ├─DD3───────┤                    ├─STK2P─────┤
             ├─DD3A──────┤                    ├─STK2P34───┤
             ├─DD3B──────┤                    ├─STK2P35───┤
             ├─DD3C──────┤                    ├─STK2PB────┤
             ├─STK1──────┤                    ├─STK2PB34──┤
             ├─STK1R─────┤                    └─STK2PB35──┘
             ├─R─────────┤
             ├─STK2──────┤
             └─STK2P─────┘
├─SCRPDEF──────────────────────────────────────────────────────────────────────────────────────────────────────────┤

├─SRVlev───────────────────────────────────────────────────────────────────────────────────────────────────────────┤

├─Status───────────────────────────────────────────────────────────────────────────────────────────────────────────┤
```

Display command (continued)

```
►►─Display──┬─┤ Options ├─┬──────────────────────────────────────────►◄
            └─────────────┘

Options:

├─THReshld──┬─────────┬──┬──────────────────────────┬──┬──────────┬──►
            │ acs-id  │  │ SUBpool(subpool-name)    │  │ DETail   │
            │ lsm-id  │  │                          │  │          │

►──┬──────────────────────────────────┬──┬──────────────────────────────┤
   │ MEDia(─┬─LONGItud─┬─)             │  │ RECtech(─┬─LONGItud─┬─)       │
   │        ├─Standard─┤               │  │          ├─18track──┤         │
   │        ├─CST──────┤               │  │          ├─36track──┤         │
   │        ├─MEDIA1───┤               │  │          ├─36Atrack─┤         │
   │        ├─STD──────┤               │  │          ├─36Btrack─┤         │
   │        ├─1────────┤               │  │          ├─36Ctrack─┤         │
   │        ├─3480─────┤               │  │          ├─HELical──┤         │
   │        ├─ECART────┤               │  │          ├─DD3──────┤         │
   │        ├─E────────┤               │  │          ├─STK1R────┤         │
   │        ├─ECCST────┤               │  │          ├─STK1R34──┤         │
   │        ├─ETAPE────┤               │  │          ├─STK1R35──┤         │
   │        ├─Long─────┤               │  │          ├─STK1RA───┤         │
   │        ├─MEDIA2───┤               │  │          ├─STK1RA34─┤         │
   │        ├─3490E────┤               │  │          ├─STK1RA35─┤         │
   │        ├─ZCART────┤               │  │          ├─STK1RB───┤         │
   │        ├─Z────────┤               │  │          ├─STK1RB34─┤         │
   │        ├─HELical──┤               │  │          ├─STK1RB35─┤         │
   │        ├─DD3──────┤               │  │          ├─STK2P────┤         │
   │        ├─DD3A─────┤               │  │          ├─STK2P34──┤         │
   │        ├─DD3B─────┤               │  │          ├─STK2P35──┤         │
   │        ├─DD3C─────┤               │  │          ├─STK2PB───┤         │
   │        ├─STK1─────┤               │  │          ├─STK2PB34─┤         │
   │        ├─STK1R────┤               │  │          └─STK2PB35─┘         │
   │        ├─R────────┤               │  │                               │
   │        ├─STK2─────┤               │  │                               │
   │        └─STK2P────┘               │  │                               │
   └───────────────────────────────────┘  └───────────────────────────────┘
```

Display command (continued)

```
►►─Display──┬─┤ Options ├─┬──────────────────────────────────────────►◄
            └─────────────┘

 Options:

├─TREQDEF──────────────────────────────────────────────────────────┤

├─UNITDEF──────────────────────────────────────────────────────────┤

├─VOLDEF───────────────────────────────────────────────────────────┤

├──┬─Volser─┬──┬─volser──────────┬──┬──────────────────────────────┤
   └─Volume─┘  ├─vol-range───────┤  └─DETail──────┘
               └─(──┬─vol-list─┬─)─┘
                    ↓ ,        ↑
```

Options:

DRAin CAP command

```
                                          ┌─ENter─┐
►►─DRAin──┬─lsm-id──────────────┬──────────┤       ├──────────────────►◄
          ├─cap-id──────────────┤          └─EJect─┘
          └─(──┬─cap-list─┬─)──┘
               ↓ ,        ↑
```

EJect command

```
►►─EJect──┬─Option 1─┬──────────────────────────────────────────►◄
          └─Option 2─┘

Option 1:
├──┬─volser──────────┬──┬─00──────────────────┬──────────────────┤
   ├─vol-range───────┤  ├─acs-id─────────────┤
   └─(──┬─vol-list─┬─)─┘ ├─lsm-id─────────────┤
        ↓ ,        ↑     ├─cap-id─────────────┤
                         └─(──┬─cap-list─┬─)──┘
                              ↓ ,        ↑

Option 2:
├─SCRTCH──┬─────────────────────┬──┬──────────────────────┬──┬──────────────────────┬──►
          ├─acs-id──────────────┤  └─SUBpool(subpool-name)─┘  └─VOLCNT(count)──────┘
          ├─lsm-id──────────────┤
          ├─cap-id──────────────┤
          └─(──┬─cap-list─┬─)──┘
               ↓ ,        ↑

►──┬─MEDia(──┬─LONGItud──┬─)──┬──┬─RECtech(──┬─LONGItud──┬─)──┬──────────────┤
   │         ├─Standard──┤    │  │           ├─18track───┤    │
   │         ├─CST───────┤    │  │           ├─36track───┤    │
   │         ├─MEDIA1────┤    │  │           ├─36Atrack──┤    │
   │         ├─STD───────┤    │  │           ├─36Btrack──┤    │
   │         ├─1─────────┤    │  │           ├─36Ctrack──┤    │
   │         ├─3480──────┤    │  │           ├─HELical───┤    │
   │         ├─ECART─────┤    │  │           ├─DD3───────┤    │
   │         ├─E─────────┤    │  │           ├─STK1R─────┤    │
   │         ├─ECCST─────┤    │  │           ├─STK1R34───┤    │
   │         ├─ETAPE─────┤    │  │           ├─STK1R35───┤    │
   │         ├─Long──────┤    │  │           ├─STK1RA────┤    │
   │         ├─MEDIA2────┤    │  │           ├─STK1RA34──┤    │
   │         ├─3490E─────┤    │  │           ├─STK1RA35──┤    │
   │         ├─ZCART─────┤    │  │           ├─STK1RB────┤    │
   │         ├─Z─────────┤    │  │           ├─STK1RB34──┤    │
   │         ├─HELical───┤    │  │           ├─STK1RB35──┤    │
   │         ├─DD3───────┤    │  │           ├─STK2P─────┤    │
   │         ├─DD3A──────┤    │  │           ├─STK2P34───┤    │
   │         ├─DD3B──────┤    │  │           ├─STK2P35───┤    │
   │         ├─DD3C──────┤    │  │           ├─STK2PB────┤    │
   │         ├─STK1──────┤    │  │           ├─STK2PB34──┤    │
   │         ├─STK1R─────┤    │  │           └─STK2PB35──┘    │
   │         ├─R─────────┤    │  │                            │
   │         ├─STK2──────┤    │  │                            │
   │         └─STK2P─────┘    │  │                            │
   └──────────────────────────┘  └────────────────────────────┘
```

ENter command

```
                 ┌00──────┐
►►─ENter─────────┼────────┼──┬──────────┬──────────────────────────────►◄
                 ├acs-id──┤  └─SCRatch──┘
                 ├cap-id──┤
                 └lsm-id──┘
```

Journal command

```
►►─Journal─Full(─┬─ABEND────┬─)──────────────────────────────────────►◄
                 └─Continue──┘
```

MODify command

```
►►─┬─MODify─┬──┬─CAP─┬─cap-id─┬─┬─ONline──┬──────────────────────────►◄
   └─F──────┘  │     └─lsm-id─┘ └─OFFline─┘
               │
               └─┬─LSM─┬─┬─lsm-id──────────┬─┬─ONline──────────┬──┬
                 │     ├─lsm-range───────┤ └─OFFline─┬─────────┬┘
                 │     └─(─┬─lsm-list─┬─)─┘           └─FORCE──┘
                 │         ↓ ,        │
                 │         └──────────┘
```

MONITOR command

```
►►─┬─MONITOR─┬─PGMI─┬──────────────────┬──────────────────────────────►◄
   └─MN──────┘      └─,L(─┬─────────┬─)─┘
                          ├─cc──────┤
                          └─name────┘
```

Mount command

```
►►─Mount──────────────────────────────────────────────────────────────►

►┬──────volser──devaddr──┬──────────────────────────────────────────┬──►◄
 │                       │┌──────────────────────────────────────────┐│
 │                       └┤ ,                                        ├┘
 │                        └─host-id──┘ └─Readonly──┘
 │
 └─SCRTCH─┬─devaddr──┬──host-id──┬──SUBpool(subpool-name)──┬──MEDia(──┬──LONGItud──┬──)┘
   PRIVAT─┘          └──────────┘                         │          ├──Standard──┤
                                                          │          ├──CST───────┤
                                                          │          ├──MEDIA1────┤
                                                          │          ├──STD───────┤
                                                          │          ├──1─────────┤
                                                          │          ├──348Ø──────┤
                                                          │          ├──ECART─────┤
                                                          │          ├──E─────────┤
                                                          │          ├──ECCST─────┤
                                                          │          ├──ETAPE─────┤
                                                          │          ├──Long──────┤
                                                          │          ├──MEDIA2────┤
                                                          │          ├──349ØE─────┤
                                                          │          ├──ZCART─────┤
                                                          │          ├──Z─────────┤
                                                          │          ├──HELical───┤
                                                          │          ├──DD3───────┤
                                                          │          ├──DD3A──────┤
                                                          │          ├──DD3B──────┤
                                                          │          ├──DD3C──────┤
                                                          │          ├──STK1──────┤
                                                          │          ├──STK1R─────┤
                                                          │          ├──R─────────┤
                                                          │          ├──STK2──────┤
                                                          │          └──STK2P─────┘
```

Mount/Dismount Options (MNTD) command and control statement

```
                  ,
                  ┌──────────────────────────────────────────────────────────┐
►►─MNTD─┬─AUtocln(─┬─OFf─┬─)──────────────────────────────────────────────┬──┬──────────────────────────────────────────────────►◄
        │          └─ON──┘                                                │  │  └─HOSTID(host-id)──┘
        ├─Dismount(─┬─Auto───┬─)──────────────────────────────────────────┤
        │           └─Manual─┘                                            │
        ├─EJctauto(─┬─ON──┬─)─┬──────────────────────────────────────────┤
        │           ├─MSg─┤   └─ACS(acs-id)──┘                            │
        │           └─OFf─┘                                               │
        ├─Float(────┬─OFf─┬─)─┬──────────────────────────────────────────┤
        │           └─ON──┘   └─ACS(acsid)──┘                             │
        ├─MAXclean(count)─────────────────────────────────────────────────┤
        ├─MMount(───┬─Delete─┬─)──────────────────────────────────────────┤
        │           └─Reply──┘                                            │
        ├─MOuntmsg(─┬─Roll───┬─)──────────────────────────────────────────┤
        │           └─Noroll─┘                                            │
        ├─PASSTHRU(count)─────────────────────────────────────────────────┤
        ├─Scratch(──┬─Manual─┬─)──────────────────────────────────────────┤
        │           └─Auto───┘                                            │
        ├─SCRDISM(──┬─CURRENT─┬─)─────────────────────────────────────────┤
        │           └─ARCHIVE─┘                                           │
        ├─Unload(───┬─Noscr───┬─)──────────────────────────────────────────┤
        │           └─Scratch─┘                                           │
        └─VOLWatch(─┬─OFf─────┬─)──────────────────────────────────────────┘
                    └─ON──────┘
```

MOVe command

```
►►─MOVe──┬──Flsm(lsm-id)─Panel(pp)──┬─Row(row-list)──┬──────────┬──────────────►
         │                          │                │ Column(cc) │
         │                          │                └──────────┘
         │                          └─Row(rr)──┬──────────────┬──┘
         │                                     │ Column(column-list) │
         │                                     └──────────────┘
         │
         └──Volume(──┬─volser──────────┬──)──────────────────────────────────┘
                     │─vol-range───────┤
                     │   ┌──────────┐  │
                     │   ↓ ,        │  │
                     └───────vol-list─┘

►──TLsm(──┬─lsm-id──────────┬──)──┬──────────┬──►◄
          │   ┌──────────┐  │     │ TPanel(pp) │
          │   ↓ ,        │  │     └──────────┘
          └───────lsm-list─┘
```

OPTion command and control statement

```
                  ┌──────────────────────────────────────────────────────────┐
                  ↓ ,                                                        │
►►─OPTion──┬──Dialog(──┬─Both──────┬──)──┬──────────────────────────────────┬──►◄
           │           │─Log───────┤     │                                  │
           │           │─Console───┤     │                                  │
           │           └─Off───────┘     │                                  │
           │                             │                                  │
           │──DISCmsg(──┬─SHow────────┬──)──┬──────────────────────────────┤
           │            └─SUppress────┘     │ ACS(acs-id)                  │
           │                                └──────────────────────────────┘
           │──EJLimit(count)──────────────────────────────────────────────────
           │
           │──ENTdup(──┬─Manual──────┬──)──────────────────────────────────
           │           └─Auto────────┘
           │
           │──LOGging(──┬─Standard────┬──)──────────────────────────────────
           │            └─Extended────┘
           │
           │──Output(──┬─Upper───────┬──)──────────────────────────────────
           │           └─Mixed───────┘
           │
           │──Repath(──┬─Yes─────────┬──)──────────────────────────────────
           │           │─No──────────┤
           │           └─Reply───────┘
           │
           │──Viewtime(count)─────────────────────────────────────────────────
           │
           └──Warnmsg(minutes)────────────────────────────────────────────────
                                                                              │
                                                                              │
                                                                              │
```

RECover Host command

```
►►─RECover──host-id──┬──────────┬──────────────────────────────────►◄
                     └─FORCE────┘
```

RELease CAP command

```
►►─RELease──cap-id──────────────────────────────────────────────────►◄
```

SENter command

```
►►─SENter──┬─cap-id─┬──────────────────────────────────────────────►◄
           └─lsm-id─┘
```

SRVlev (Service Level) command

```
►►─SRVlev──┬─BASE─┬──────────────────────────────────────────────────►◄
           └─FULL─┘
```

Stop Monitoring (STOPMN) command

```
►►──┬─STOPMN─┬──PGMI──┬──────────────────────────────────────────────►◄
    └─PM─────┘        └─,L(──┬──────┬──)──┘
                             ├─cc───┤
                             └─name─┘
```

SWitch command

```
►►─SWitch──┬──────────────────────┬──────────────────────────────────►◄
           └─Acs acs-id(1)────────┘
```

Note:

(1) ACS *acs-id* is optional in a single-ACS environment; it is required in a multiple-ACS environment.

TRace command

```
►►─TRace──┬──────────────────────────────────────────────────────────►◄
          ├──comp-name──────────────────────────────────────────────┤
          │      ┌─,──────┐
          ├──────▼─comp-list──────────────────────────────────────────┤
          │
          └──OFF──┬──comp-name──────────────────────────────────────┤
                  │      ┌─,──────┐
                  └──────▼─comp-list──┘
```

TRACELKP command

```
►►─TRACELKP──┬──────────────────────┬──────────────────────────────►◄
             ├─table-name───────────┤
             │      ┌─,──────┐
             ├──────▼─table-list────┤
             └─OFF──table-name──────┘
```

User Exit (UEXIT) command and control statement

```
►►─UEXIT──┬──nn──┬──Load(──┬─SLSUXnn─┬──)──┬─,Enable──┬──────────────────────►◄
          │      │         └─name─────┘     └─,Disable─┘                       │
          │      ├──Enable──────────────────────────────────────────────────────┤
          │      └──Disable─────────────────────────────────────────────────────┤
          │                                                                     │
          ├──nn──────────────────────────┬──Query──────────────────────────────┤
          ├──nn-range────────────────────┤                                     │
          │                              │                                     │
          └──(──┬─,──────┬──)────────────┘                                     │
                └─nn-list┘                                                     │
```

Vary Station command

```
►►─Vary──┬──ACS──┬──acs-id────────────────┬──┬──ONline──────────────────────►◄
         │       ├──acs-range─────────────┤  │
         │       │                        │  └──OFFline──┬──────────┬──────────┤
         │       └──(──┬─,──────┬──)──────┤              └──FORCE───┘          │
         │             └─acs-list┘        │                                   │
         │                                │                                   │
         │                                │                                   │
         └──┬──────────┬──┬──dev-id────────┤                                   │
            │          │  ├──dev-range─────┤                                   │
            └──STation─┘  │                │                                   │
                          └──(──┬─,──────┬──)──┘                                   │
                                └─dev-list┘
```

VIew command

```
                                                                                  ┌─Column(00)─┐
                          ┌─CAPID(000:00)─┐   ┌─Row(00)────┐
►►─VIew─┬─CAp──────────────┼───────────────┼───┼────────────┼───────────────────┼────────────┼──────────────────►
        │                 ├─CAPID(cap-id)─┤   └─Row(rr)────┘                   └─Column(cc)─┘
        │                 └─Lsm(lsm-id)───┘
        │
        │                 ┌─Lsm(000)────┐   ┌─Panel(00)───┐   ┌─Row(00)────┐   ┌─Column(00)─┐
        ├─CEll────────────┼─────────────┼───┼─────────────┼───┼────────────┼───┼────────────┼──────────────────┤
        │                 └─Lsm(lsm-id)─┘   └─Panel(pp)───┘   └─Row(rr)────┘   └─Column(cc)─┘
        │
        ├─DRive──Address(xxx)──┬──────────────────┬──────────────────────────────────────────────────────────────
        │                      └─Host(host-id)────┘
        │
        │                 ┌─Lsm(000)────┐   ┌─Column(00)─┐
        ├─PLaygrnd────────┼─────────────┼───┼────────────┼──────────────────────────────────────────────────────
        │                 └─Lsm(lsm-id)─┘   └─Column(cc)─┘
        │
        │                 ┌─Lsm(000)────┐                   ┌─Column(0)──┐
        └─PTp─────────────┼─────────────┼───┬──────────┬────┼────────────┼──────────────────────────────────────┤
                          └─Lsm(lsm-id)─┘   └─Xlsm(1)───┘    └─Column(c)───┘

►──┬──────────────────┬──────────────────────────────────────────────────────────────────────────────────────►◄
   └─Time(ttt)────────┘
```

Warn command

```
►►─Warn-SCRatch─┬─acs-id──┬──┬──────────────────────────┬─THReshld(threshold-value)──►
                └─lsm-id──┘  └─SUBpool(subpool-name)────┘

►──┬──────────────────────────────────────────────────────────────────────────────►◄
   │                                                  ┌─,──────────────────┐
   └─MEDia(─┬─LONGItud──────┬─)─RECtech(─┬─LONGItud──┬─)┘
            ├─Standard──────┤            ├─18track───┤
            ├─CST───────────┤            ├─36Atrack──┤
            ├─MEDIA1────────┤            ├─36Btrack──┤
            ├─STD───────────┤            ├─36Ctrack──┤
            ├─1─────────────┤            ├─HELical───┤
            ├─348Ø──────────┤            ├─DD3──────┤
            ├─ECART─────────┤            ├─STK1R────┤
            ├─E─────────────┤            ├─STK1R34──┤
            ├─ECCST─────────┤            ├─STK1R35──┤
            ├─ETAPE─────────┤            ├─STK1RA───┤
            ├─Long──────────┤            ├─STK1RA34─┤
            ├─MEDIA2────────┤            ├─STK1RA35─┤
            ├─349ØE─────────┤            ├─STK1RB───┤
            ├─ZCART─────────┤            ├─STK1RB34─┤
            ├─Z─────────────┤            ├─STK1RB35─┤
            ├─DD3───────────┤            ├─STK2P────┤
            ├─DD3A──────────┤            ├─STK2P34──┤
            ├─DD3B──────────┤            ├─STK2P35──┤
            ├─DD3C──────────┤            ├─STK2PB───┤
            ├─STK1──────────┤            ├─STK2PB34─┤
            ├─STK1R─────────┤            └─STK2PB35─┘
            ├─R─────────────┤
            ├─STK2──────────┤
            └─STK2P─────────┘
```

HSC Diagnostic Commands

LIst command

```
►►─LIst──┬─data-structure──┬──────────────────────────────────►◄
         │                 │
         └─address─┬─16────┬┘
                   └─size──┘
```

TRace command

```
►►─TRace──┬──────────────────────────────────────────────────►◄
          │
          ├──comp-name──────────────────────────────────────┤
          │
          │   ┌─,──────┐
          ├──►┴─comp-list──────────────────────────────────┤
          │
          └──OFF──┬─comp-name──┬──────────────────────────┤
                  │   ┌─,──────┐│
                  └──►┴─comp-list┴┘
```

Appendix B. Record Formats

Overview

This appendix provides the record formats for the HSC SMF, LOGREC, Volume Report, and Batch API records. These records are mapped by SMP/E-distributed macros.

Each record format contains the following information:

- decimal representation
- hexadecimal representation
- type
- length
- label information
- description.

Some important points to remember when referencing record formats are:

- Types **"Constant (CONST),'' "Character Constant (CHAR CONST),'' "BITMAP,''** and **"Length (LENGTH)''** contain values in the Decimal and Hexadecimal columns.
- Type **"AREA''** contains offsets in the Decimal and Hexadecimal columns. The Length is the length of an area. (An area defines an area of storage only.)
- Type **"STRUCTURE''** contains zeros in both the Decimal and Hexadecimal columns and the Label column contains a DSECT name. The Length is blank.
- With Label **"name (Rep count),''** the Length is equal to the length of one element. The total length of the entire field is found by multiplying the Length times the Rep count.
- If the Label equals -RESERVED-, there is not a label for that particular field.
- Type **"Offset''** contains an offset in the Decimal and Hexadecimal columns and the Length is always blank.

Table 66 provides a key to the SMF record format tables.

Table 66. Key to Record Format Tables

Dec	Hex	Type	Length
values		CONSTANT CHAR CONST BITMAP LENGTH	
offset		AREA	length
0	(0)	STRUCTURE	blank
offset		CHARACTER HEXSTRING BITSTRING SIGNED-FWORD SIGNED-HWORD SHORT-FLOAT LONG-FLOAT A-ADDR Y-ADDR S-ADDR V-ADDR PACKED-DEC ZONED-DEC EXTENDED FLOAT	length (length of one element)
offset		OFFSET	blank

Mapping Macros for SMF Records

Mapping macros for SMF records are listed in Table 67 on page 563.

Mapping Macros for LOGREC Records

Mapping macros for LOGREC records are listed in Table 78 on page 589.

Mapping Macros for Volume Report and Batch API Records

Mapping macros for Volume Report and Batch API records are listed in Table 93 on page 626.

Mapping Macros for Batch API Records

Mapping macros for Batch API Records available only through the Batch API are listed in Table 100 on page 657.

SMF Records

SMF Mapping Macros

Table 67. Mapping Macros for SMF Records

Macro	Description
SLSDVAR	Volume Attribute Record Data Length (within other SMF records)
SLSSFHDR	SMF Record Header Information
SLSSBLOS	SMF LSM Operations Statistics
SLSSCAPJ	SMF CAP Eject Record
SLSSCAPN	SMF CAP Enter Record
SLSSVSTA	SMF Vary Station Record
SLSSMLSM	SMF Modify LSM Record
SLSSLSB	SMF LMU ATHS Statistics Buffer
SLSSMF07	SMF Move Detail Record
SLSSMF08	SMF View Detail Record

SLSDVAR

Table 68. SLSDVAR Record Format

Dec	Hex	Type	Length	Label	Description
SLSDVAR - Distributed Volume Attribute Record Length FUNCTION: Pass the HSC Volume Attribute Record Length(VARL) for other Distributed HSC Macros to use as needed.					
0	(0)	HEXSTRING	40	SLSDVAR	Volume Attribute Record
40	(28)	LENGTH		VARL	Length of SLSDVAR(VAR)

Cross Reference

Name	Len	Offset Value
SLSDVAR	000040	00
VARL	-	28

SLSSFHDR

Table 69. SLSSFHDR Record Format

Dec	Hex	Type	Length	Label	Description
SLSSFHDR - SMF RECORD HEADER MAP FUNCTION: MAPS THE STANDARD SMF RECORD HEADER AS DEFINED IN THE IBM SMF MANUAL (GC28-1153). IBM PROVIDES NO MAPPING MACRO. MAPS THE ACHS EXTENSIONS TO THE HEADER. SYMBOLICS: &TYPE - USED TO SELECT A VALID SMF RECORD TYPE 1 - BLOS STATISTICS 2 - VARY STATION COMMAND 3 - MODIFY LSM COMMAND 4 - LMU READ STATISTICS 5 - CARTRIDGE EJECT 6 - CARTRIDGE ENTER 7 - MOVE DETAIL 8 - VIEW STATISTICS 9 - (VTCS) SUBSYSTEM CONFIGURATION CHANGE ---------- THE FOLLOWING VTCS SUBTYPES DO NOT SUPPORT DSECT GENERATION BY THIS SLSSFHDR.MACRO. ---------- 10 - (VTCS) SUBSYSTEM PERFORMANCE REQUEST 11 - (VTCS) CHANNEL INTERFACE PERFORMANCE REQUEST 12 - (VTCS) STATE SAVE 13 - (VTCS) VTV MOUNT REQUEST 14 - (VTCS) VTV DISMOUNT REQUEST 15 - (VTCS) VTV DELETE REQUEST 16 - (VTCS) RTD MOUNT REQUEST 17 - (VTCS) RTD DISMOUNT REQUEST 18 - (VTCS) VTV TO MVC REQUEST 19 - (VTCS) RECALL VTV FROM MVC REQUEST 20 - (VTCS) RTD PERFORMANCE REQUEST 21 - (VTCS) RTD VARY REQUEST 22 - (VTCS) HOST INITIATED MIM EVENT 23 - (VTCS) CHANGE OF SCRATCH DELETION POLICY 24 - (VTCS) MVC MEDIA DISCONTINUED USAGE EVENT 25 - (VTCS) MVC USAGE RECORDING 26 - (VTCS) VTV MOVEMENT 27 - (VTCS) VTV SCRATCH EVENT 28 - (VTCS) REPLICATE VTV TO CLUSTERED VTSS REQUEST					
0	(0)	STRUCTURE		SLSSFHDR	RECORD HEADER
0	(0)	SIGNED-HWORD	2	OSHDRECL	RECORD LENGTH
2	(2)	SIGNED-HWORD	2	OSHDDESC	SEGMENT DESCRIPTOR
4	(4)	BITSTRING	1	OSHDFLAG	SYSTEM INDICATOR FLAGS
		.1.. .... X’40’		OSHDSTV	Subtypes are valid
5	(5)	HEXSTRING	1	OSHDRCTY	SMF RECORD TYPE
6	(6)	HEXSTRING	4	OSHDTIME	TIME RECORD WAS WRITTEN. BINARY HUNDREDTHS OF SECONDS.
10	(A)	HEXSTRING	4	OSHDDATE	DATE RECORD WAS WRITTEN. FORMAT: X’0CYYDDDF’. THE DATE/TIME FIELDS ARE SET BY SLSSWSMF MODULE.
14	(E)	CHARACTER	4	OSHDSID	SYSTEM ID

Table 69. SLSSFHDR Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
18	(12)	CHARACTER	4	OSHDSSID	SUBSYSTEM ID
22	(16)	SIGNED-HWORD	2	OSHDRSTY	RECORD SUBTYPE. If adding new record subtype(s), change field OSHDMAXS and add an entry in the HSSUBS table of SLUPERF. Then reassemble modules SLSOOSMF, SLSOWSMF, and SLUPERF.
1	(01)	CONST		OSHDBLOS	BLOS STATISTICS SUBTYPE
2	(02)	CONST		OSHDVSTA	VARY STATION COMMAND SUBTYPE
3	(03)	CONST		OSHDMLSM	MODIFY LSM COMMAND SUBTYPE
4	(04)	CONST		OSHDLRST	LMU READ STATISTICS SUBTYPE
5	(05)	CONST		OSHDEJCT	CARTRIDGE EJECT SUBTYPE
6	(06)	CONST		OSHDENTR	CARTRIDGE ENTER SUBTYPE
7	(07)	CONST		OSHDRC07	MOVE DETAIL SUBTYPE
8	(08)	CONST		OSHDVIEW	VIEW STATISTICS
9	(09)	CONST		OSHDLS09	(VTCS) Subsystem Configuration Change
SLSSFHDR.mac will NOT generate DSECTS for the following VTCS SMF SUBTYPEs.					
10	(0A)	CONST		OSHDVT10	(VTCS) Subsystem Performance Request
11	(0B)	CONST		OSHDVT11	(VTCS) Channel Interface Performance Rqst
12	(0C)	CONST		OSHDVT12	(VTCS) State Save
13	(0D)	CONST		OSHDVT13	(VTCS) VTV MOUNT Request
14	(0E)	CONST		OSHDVT14	(VTCS) VTV DISMOUNT Request
15	(0F)	CONST		OSHDVT15	(VTCS) VTV DELETE Request
16	(10)	CONST		OSHDVT16	(VTCS) RTD MOUNT Request
17	(11)	CONST		OSHDVT17	(VTCS) RTD DISMOUNT Request
18	(12)	CONST		OSHDVT18	(VTCS) VTV to MVC Request
19	(13)	CONST		OSHDVT19	(VTCS) RECALL VTV from MVC Request
20	(14)	CONST		OSHDVT20	(VTCS) RTD PERFORMANCE Request
21	(15)	CONST		OSHDVT21	(VTCS) RTD VARY Request
22	(16)	CONST		OSHDVT22	(VTCS) HOST Initiated MIM Event
23	(17)	CONST		OSHDVT23	(VTCS) CHANGE of SCRATCH DELETION Policy
24	(18)	CONST		OSHDVT24	(VTCS) MVC Media DISCONTINUED USAGE Event
25	(19)	CONST		OSHDVT25	(VTCS) MVC USAGE Recording
26	(1A)	CONST		OSHDVT26	(VTCS) VTV MOVEMENT

Table 69. SLSSFHDR Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
27	(1B)	CONST		OSHDVT27	(VTCS) VTV SCRATCH Event
28	(1C)	CONST		OSHDVT28	(VTCS) REPLICATE VTV->CLUSTERED VTSS Rqst
28	(1C)	CONST		OSHDMAXS	MAXIMUM RECORD SUBTYPE VALUE
24	(18)	LENGTH		OSHDL	LENGTH OF FIXED PORTION OF OSHDR
24	(18)	OFFSET		SLSSTYPE	DEFINE EACH SMF SUBTYPE

Cross Reference

Name	Len	Offset Value
OSHDBLOS	-	01
OSHDDATE	000004	0A
OSHDDESC	000002	02
OSHDEJCT	-	05
OSHDENTR	-	06
OSHDFLAG	000001	04
OSHDL	-	18
OSHDLRST	-	04
OSHDMAXS	-	1C
OSHDMLSM	-	03
OSHDRCTY	000001	05
OSHDRC07	-	07
OSHDRECL	000002	00
OSHDRSTY	000002	16
OSHDSID	000004	0E
OSHDSSID	000004	12
OSHDSTV	-	40
OSHDTIME	000004	06
OSHDVIEW	-	08
OSHDVSTA	-	02
OSHDVT09	-	09
OSHDVT10	-	0A
OSHDVT11	-	0B
OSHDVT12	-	0C
OSHDVT13	-	0D
OSHDVT14	-	0E
OSHDVT15	-	0F
OSHDVT16	-	10
OSHDVT17	-	11
OSHDVT18	-	12
OSHDVT19	-	13

Name	Len	Offset Value
OSHDVT20	-	14
OSHDVT21	-	15
OSHDVT22	-	16
OSHDVT23	-	17
OSHDVT24	-	18
OSHDVT25	-	19
OSHDVT26	-	1A
OSHDVT27	-	1B
OSHDVT28	-	1C
SLSSTYPE	-	18

SLSSBLOS

Table 70. SLSSBLOS Record Format

Dec	Hex	Type	Length	Label	Description
SLSSBLOS - LSM OPERATIONS STATISTICS FUNCTION: CONTAINS PERFORMANCE STATISTICS FOR THE LSM. THE SAME STRUCTURE IS USED TO CREATE THE SMF PERFORMANCE RECORD, HOWEVER THE CONTROL BLOCK HEADER IS ELIMINATED, AND ONLY THE FIXED AND MULTIPLE SECTIONS GENERATED. THE FIXED SECTION OF THE RECORD IS OSHDL OFF THE BEGINNING OF THE SMF RECORD. THE MULTIPLE SECTION IS BLOSLSSL OFF THE FIXED SECTION, AND THE FIELD BLOSKNT IN THE SMF RECORD DEFINES THE NUMBER OF MULTIPLE SECTIONS TO FOLLOW SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSBLOS	LSM OPERATIONS STATISTICS DATA AREA
START OF SMF FIXED PORTION					
0	(0)	SIGNED-HWORD	2	BLOSKNT	COUNT OF BLOS DATA AREAS TO FOLLOW
ZERO IN “IN MEMORY” VERSION.					
2	(02)	LENGTH		BLOSLSSL	LENGTH OF FIXED SMF PORTION.
START OF SMF MULTIPLE SECTION.					
2	(2)	A-ADDR	1	BLOSTYP0	TYPE OF STATISTIC FLAGS
		1... .... X’80’		BLOSMSS	MOUNT SCRATCH
		.1.. .... X’40’		BLOSMNS	MOUNT NON-SCRATCH
		..1. .... X’20’		BLOSDSS	DISMOUNT SCRATCH
		...1 .... X’10’		BLOSDNS	DISMOUNT NON-SCRATCH
		.... 1... X’08’		BLOSSWS	SWAP
		.... .1.. X’04’		BLOSMOV	MOVE
		.... ..1. X’02’		BLOSNTR	ENTER
		....1 X’01’		BLOSEJT	EJECT
3	(3)	A-ADDR	1	-RESERVED-	*** RESERVED
4	(4)	SIGNED-FWORD	4	BLOSSOPC	SAME LSM OPERATION COUNT
8	(8)	SIGNED-FWORD	4	BLOSSTIM	SAME LSM ELAPSED TIME. BINARY INTEGER COUNT, IN MILLISECONDS - THOUSANDTHS OF SECONDS.
12	(C)	SIGNED-FWORD	4	BLOSDOPC	DIFFERENT LSM OPERATION COUNT

Table 70. SLSSBLOS Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
16	(10)	SIGNED-FWORD	4	BLOSDTIM	DIFFERENT LSM ELAPSED TIME
20	(14)	SIGNED-FWORD	4	BLOSPTRU	PASSTHRU COUNT
22	(16)	LENGTH		BLOSVL	LENGTH OF DATA SECTION
20	(14)	LENGTH		BLOSVL1	LENGTH OF COUNTER SECTION
24	(18)	LENGTH		BLOSL	BLOS LENGTH

Cross Reference

Name	Len	Offset Value
BLOSDNS	-	10
BLOSDOPC	000004	0C
BLOSDSS	-	20
BLOSDTIM	000004	10
BLOSEJT	-	01
BLOSKNT	000002	00
BLOSL	-	18
BLOSLSSL	-	02
BLOSMNS	-	40
BLOSMOV	-	04
BLOSMSS	-	80
BLOSNTR	-	02
BLOSPTRU	000004	14
BLOSSOPC	000004	04
BLOSSTIM	000004	08
BLOSSWS	-	08
BLOSTYP0	000001	02
BLOSVL	-	16
BLOSVL1	-	14
SLSSBLOS	000002	00

SLSSCAPJ

Table 71. SLSSCAPJ Record Format

Dec	Hex	Type	Len	Label	Description
SLSSCAPJ - CAP EJECT SMF RECORD FUNCTION: USED TO HOLD INFORMATION PASSED TO THE ALS SMF WRITER SERVICE ROUTINE FOR THE CARTRIDGE EJECT EVENT. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA YES - PRODUCE A DSECT LISTING NO - NO DSECT					
6	(6)	AREA	2	SLSSCAPJ	CAP EJECT SMF RECORD SUBTYPE
6	(6)	HEXSTRING	6	CJSMFDES	DESTINATION CAP LOCATION
12	(C)	HEXSTRING	40	CJSMFVAR	VOL ATTRIBUTE RECORD FOR CARTRIDGE
46	(2E)	LENGTH		CJSMFL	LENGTH OF EJECT RECORD

Cross Reference

Name	Len	Offset Value
CJSMFDES	000006	06
CJSMFL	-	2E
CJSMFVAR	000040	0C
SLSSCAPJ	000002	06

SLSSCAPN

Table 72. SLSSCAPN Record Format

Dec	Hex	Type	Length	Label	Description
SLSSCAPN - CAP ENTER SMF RECORD FUNCTION: USED TO HOLD INFORMATION PASSED TO THE ALS SMF WRITER SERVICE ROUTINE FOR THE CARTRIDGE ENTER EVENT. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
6	(6)	AREA	2	SLSSCAPN	CAP ENTER SMF RECORD SUBTYPE
6	(6)	HEXSTRING	6	CNSMFSRC	SOURCE CAP LOCATION
12	(C)	HEXSTRING	40	CNSMFVAR	VOL ATTRIBUTE RECORD FOR CARTRIDGE
46	(2E)	LENGTH		CNSMFL	LENGTH OF EJECT RECORD

Cross Reference

Name	Len	Offset Value
CNSMFL	-	2E
CNSMFSRC	000006	06
CNSMFVAR	000040	0C
SLSSCAPN	000002	06

SLSSVSTA

Table 73. SLSSVSTA Record Format

Dec	Hex	Type	Length	Label	Description
SLSSVSTA - VARY STATION SMF RECORD SUBTYPE MAP FUNCTION: CONTAINS A RECORD OF SUCCESSFUL SUBSYSTEM VARY COMMANDS. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSVSTA	VARY STATION SMF RECORD SUBTYPE
0	(0)	SIGNED-FWORD	4	SVSTFLAG	FLAGS
0	(0)	A-ADDR	1	SVSTFLG0	TYPE OF STATISTIC FLAGS
		1... .... X’80’		SVSTVON	VARY ON
		.1.. .... X’40’		SVSTVOF	VARY OFF
		..1. .... X’20’		SVSTFOR	VARY FORCE
		...1 .... X’10’		SVSTACS	SET ACS MODE
		.... 1... X’08’		SVSTSTBY	STATION ON STANDBY
		.... .1.. X’04’		SVSTVACS	ACS VARY REQUESTED
1	(1)	A-ADDR	3	-RESERVED-	*** RESERVED
FOR STATION VARY:					
4	(4)	HEXSTRING	2	SVSTATID	STATION ID
6	(6)	HEXSTRING	2	SVSTUNID	MVS UNIT NUMBER
FOR ACS VARY:					
4	(4)	HEXSTRING	1	SVSTACID	ACS ID
5	(5)	A-ADDR	3	-RESERVED-	*** UNUSED FOR VARY ACS
8	(08)	LENGTH		SVSTL	LENGTH OF DATA SECTION

Cross Reference

Name	Len	Offset Value
SLSSVSTA	000002	00
SVSTACID	000001	04
SVSTACS	-	10
SVSTATID	000002	04
SVSTFLAG	000004	00
SVSTFLG0	000001	00
SVSTFOR	-	20
SVSTL	-	08
SVSTSTBY	-	08
SVSTUNID	000002	06
SVSTVACS	-	04
SVSTVOF	-	40
SVSTVON	-	80

SLSSMLSM

Table 74. SLSSMLSM Record Format

Dec	Hex	Type	Length	Label	Description
SLSSMLSM - MODIFY LSM SMF RECORD SUBTYPE MAP FUNCTION: CONTAINS A RECORD OF SUCCESSFUL SUBSYSTEM MODIFY COMMANDS. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSMLSM	MODIFY LSM SMF RECORD SUBTYPE
0	(0)	SIGNED-FWORD	4	SMLSFLAG	FLAGS
0	(0)	A-ADDR	1	SMLSFLG0	TYPE OF STATISTIC FLAGS
		1... .... X’80’		SMLSVON	MODIFY ON
		.1.. .... X’40’		SMLSVOF	MODIFY OFF
		..1. .... X’20’		SMLSFOR	MODIFY FORCE
1	(1)	A-ADDR	3	-RESERVED-	RESERVED
4	(4)	HEXSTRING	2	SMLSATID	LSM ID
6	(06)	LENGTH		SMLSL	LENGTH OF DATA SECTION

Cross Reference

Name	Len	Offset Value
SLSSMLSM	000002	00
SMLSATID	000002	04
SMLSFLAG	000004	00
SMLSFLG0	000001	00
SMLSFOR	-	20
SMLSL	-	06
SMLSVOF	-	40
SMLSVON	-	80

SLSSLSB

Table 75. SLSSLSB Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLSB - LMU STATISTICS BUFFER DATA BLOCK FUNCTION: THE CALLER OF THE SLSLRSTA FUNCTION SUPPLIES THE ADDRESS OF A DATA BUFFER TO BE FILLED IN WITH THE RESPONSE DATA FROM AN LMU READ STATISTICS REQUEST. THE DATA AREA CONTAINS 16 ENTRIES, ONE FOR EACH LSM CONFIGURED TO THE LMU. INFORMATION SUPPLIED ABOUT EACH LSM INCLUDES: 1) LSM ARM UTILIZATION PERCENTAGE. 2) LSM NUMBER MASTER PASSTHRU PORT ONE IS CONNECTED TO. 3) LSM NUMBER MASTER PASSTHRU PORT TWO IS CONNECTED TO. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLSB	LMU ATHS STATISTICS BUFFER
0	(0)	HEXSTRING	2	LSBMON	MONTH
2	(2)	HEXSTRING	2	LSBDAY	DAY
4	(4)	HEXSTRING	2	LSBHR	HOUR
6	(6)	HEXSTRING	2	LSBMIN	MINUTE
8	(8)	HEXSTRING	2	LSBSEC	SECOND
10	(A)	HEXSTRING	20	LSBLSBE(16)	ONE FOR EACH LSM
330	(14A)	HEXSTRING	1	LSBACS	ACS ID RANGE IS X’00’ TO X’FF’
331	(14B)	HEXSTRING	3	-RESERVED-	*** RESERVED
336	(150)	SIGNED-FWORD	4	-RESERVED-	*** RESERVED
340	(154)	LENGTH		LSBL	SIZE OF LSB
DSECT DESCRIBING EACH LSM STATISTICS BUFFER					
0	(0)	STRUCTURE		SLSSLSBE	STATISTICS BUFFER.
0	(0)	SIGNED-FWORD	4	LSBEARMU	ARM UTILIZATION PERCENTAGE.
4	(4)	SIGNED-FWORD	4	LSBECNT1	PASSTHRU PORT 1 USAGE COUNT.
8	(8)	SIGNED-FWORD	4	LSBECNT2	PASSTHRU PORT 2 USAGE COUNT.
12	(C)	HEXSTRING	1	LSBECON1	PASSTHRU PORT 1 CONNECTIVITY.
12	(C)	HEXSTRING	1	LSBECON2	PASSTHRU PORT 2 CONNECTIVITY.

Table 75. SLSSLSB Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
LSBECON1 AND LSBECON2 HAVE THE FOLLOWING MAPPING: BYTE 0 - RESERVED BYTE 1 - ACSID BYTE 2 - SLAVE LSMID BYTE 3 - RESERVED BYTE 4 - RESERVED BYTE 5 - RESERVED					
12 20	(C) (14)	SIGNED-FWORD LENGTH	4	-RESERVED-(2) LSBEL	*** RESERVED SIZE OF LSBE.

Cross Reference

Name	Len	Offset Value
LSBACS	000001	14A
LSBDAY	000002	02
LSBEARMU	000004	00
LSBECNT1	000004	04
LSBECNT2	000004	08
LSBECON1	000001	0C
LSBECON2	000001	0C
LSBEL	-	14
LSBHR	000002	04
LSBL	-	154
LSB		
LSBE	000020	0A
LSBMIN	000002	06
LSBMON	000002	00
LSBSEC	000002	08
SLSSLSB	000002	00

SLSSMF07

Table 76. SLSSMF07 Record Format

Dec	Hex	Type	Length	Label	Description
DSECT: SLSSMF07 - HSC RECORD TYPE 7 MAPPING MACRO FUNCTION: MAPS THE SUBTYPE 7 SMF RECORD PRODUCED BY THE HSC. THIS IS PRODUCED FOR EACH SUCCESSFUL MOVE INITIATED BY THE HSC. THESE RECORDS WERE ORIGINALLY DESIGNED TO PROVIDE OUR FIELD AND MARKETING STAFFS WITH STATISTICAL CARTRIDGE MOVEMENT, LMU TIMING, AND ROBOTICS TIMING INFORMATION. THESE RECORDS REPORT MOVEMENT SOURCE, DESTINATION, LMU TIMES, AND ROBOTICS TIMES. THESE RECORDS ALSO CONTAIN VALUABLE SYSTEM ID AND JOB INFORMATION. USAGE TIPS: TO FIND ENTER ACTIVITY WITH THE SLSSMF07 RECORDS: • FIND ALL SLSSMF07 MOVE DETAIL RECORDS WITH A SOURCE IDENTIFIER (SMF07SRI) = “CAP”(SMF07SCP). • YOU CAN DETERMINE THE LIBRARY CARTRIDGE MOVEMENT TYPE THAT INITIATED THE ENTER BY CHECKING SMF07TYP. TO FIND EJECT ACTIVITY WITHIN THE SLSSMF07 RECORDS: • FIND ALL SLSSMF07 MOVE DETAIL RECORDS WITH A DESTINATION IDENTIFIER(SMF07DEI) = “CAP”(SMF07TCP). • YOU CAN DETERMINE THE LIBRARY CARTRIDGE MOVEMENT TYPE THAT INITIATED THE EJECT BY CHECKING SMF07TYP.					
0	(0)	AREA	1	SLSSMF07	MOVE DETAIL SMF RECORD SUBTYPE
THIS DSECT MAPS THE SUBTYPE 7 RECORD PRODUCED BY THE HSC FOR EACH SUCCESSFUL MOVE IF SUBTYPE 7 RECORDING IS ENABLED.					
0	(0)	BITSTRING	1	SMF07TYP	TYPE OF RECORD
		1... .... X’80’		SMF07MSS	MOUNT SCRATCH
		.1.. .... X’40’		SMF07MNS	MOUNT NON-SCRATCH
		..1. .... X’20’		SMF07DSS	DISMOUNT SCRATCH
		...1 .... X’10’		SMF07DNS	DISMOUNT NON-SCRATCH
		.... 1... X’08’		SMF07SWS	SWAP
		.... .1.. X’04’		SMF07MOV	MOVE
		.... ..1. X’02’		SMF07NTR	ENTER
		....1 X’01’		SMF07EJT	EJECT
1	(1)	BITSTRING	1	SMF07RQS	REQUESTOR IDENTIFIER
		.... X’00’		SMF07UNK	UNKNOWN
		....1 X’01’		SMF07HSC	HSC INITIATED (E.G. AUTOMATIC CLEANING OF A DRIVE)
		.... ..1. X’02’		SMF07JOB	JOB PROCESSING INITIATED
		.... ..11 X’03’		SMF07UTL	HSC UTILITY INITIATED
		.... .1.. X’04’		SMF07PRG	HSC PROGRAMMATIC INTERFACE

Table 76. SLSSMF07 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.... .1.1 X'05'		SMF07OPR	HSC OPERATOR COMMAND INITIATED
		.... .11. X'06'		SMF07TMI	VM TMI INTERFACE
2	(2)	BITSTRING	1	SMF07FLG	FLAG BYTE
		1... .... X'80'		SMF07DSV	SMF07DRS CONTAINS A DRIVE DEVICE NUM
		.1.. .... X'40'		SMF07DTV	SMF07DRT CONTAINS A DRIVE DEVICE NUM
		..1. .... X'20'		SMF07CNV	SMF07CON CONTAINS VALID DATA
		...1 .... X'10'		SMF07LMD	LMU DATA IS AVAILABLE
		.... 1... X'08'		SMF07PRF	PERFORMANCE SIGNIFICANTLY IMPACTED BY LMU RETRY
3	(3)	HEXSTRING	4	SMF07TTM	TIME IN HUNDREDTHS THE REQUEST WAS WAS RECEIVED BY THE HSC. ONLY
7	(7)	HEXSTRING	4	SMF07TDT	DATE THE REQUEST WAS RECEIVED BY THE HSC (0CYYDDDF)
11	(B)	HEXSTRING	4	SMF07LTM	TIME IN HUNDREDTHS THE REQUEST WAS WAS RECEIVED BY THE LMU SERVER
15	(F)	HEXSTRING	4	SMF07LDT	DATE THE REQUEST WAS RECEIVED BY THE LMU SERVER
19	(13)	HEXSTRING	4	SMF07NRD	INTERVAL IN HUNDREDTHS THE REQUEST WAS QUEUED BECAUSE A LSM WAS NOT READY.
23	(17)	HEXSTRING	4	SMF07CPO	INTERVAL IN HUNDREDTHS OF A SECOND THE REQUEST WAS DELAYED DUE TO CAP OPERATIONS. THIS INCLUDES THE WAIT TIME FOR THE DOOR TO OPEN, CLOSE THE DOOR, DOOR, FILL OR EMPTY THE CAP, CLOSE THE DOOR, AND SCAN THE CAP. HEX 'FFFFFFFF' INDICATES COUNTER OVERFLOW

Table 76. SLSSMF07 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
27	(1B)	CHARACTER	8	SMF07US1	THIS SHOULD ALWAYS ONLY CONTAIN DISPLAYABLE EBCDIC (INC BLANKS). JOBNAME IF REQ FROM JOB PROCESSING, HSC UTILITY, OR HSC PROGRAMATIC INTERFACE, OR HSC INITIATED. ‘CONSOLE’ IF INITIATED BY THE OPERATOR VIRTUAL MACHINE NAME THE IUCV RECEIVED FROM (VM TMS INTERFACE)
35	(23)	CHARACTER	8	SMF07US2	THIS SHOULD ALWAYS ONLY CONTAIN DISPLAYABLE EBCDIC (INC BLANKS). SMFID (JES2) IF REQ FROM JOB PROCESSING, HSC UTILITY, OR HSC MAIN PROCESSOR NAME (JES3). IF REQ FROM JOB PROCESSING, HSC UTILITY, OR HSC. THE CONSOLEID IN DISPLAYABLE FORMAT IF INITIATED BY THE OPERATOR NODE NAME (VM TMS INTERFACE)
43	(2B)	HEXSTRING	4	SMF07CON	CONSOLEID IF INITIATED BY THE OPERATOR
47	(2F)	CHARACTER	1	SMF07LBL	LABEL MODIFIER
‘1’	(F1)	CHAR CONST		SMF07MVV	VERIFY LABEL VOLSER
‘2’	(F2)	CHAR CONST		SMF07MVU	VERIFY UNLABELED CARTRIDGE
‘3’	(F3)	CHAR CONST		SMF07MBV	BYPASS LABEL VERIFICATION
‘4’	(F4)	CHAR CONST		SMF07MRC	RECOVERY CARTRIDGE
‘5’	(F5)	CHAR CONST		SMF07VMT	VERIFY MEDIA AND BYPASS VOLSER
‘6’	(F6)	CHAR CONST		SMF07VMV	VERIFY MEDIA AND VOLSER
‘7’	(F7)	CHAR CONST		SMF07VMU	VERIFY MEDIA AND UNREADABLE LBL
48	(30)	CHARACTER	6	SMF07VOL	VOLSER BEING MOVED NOTE - ROW AND COLUMN COORDINATES HAVE DIFFERENT MEANINGS FOR CELLS, CAPS, AND DRIVES.
54	(36)	CHARACTER	1	SMF07SF1	SOURCE MODIFIER
‘1’	(F1)	CHAR CONST		SMF07SFN	NORMAL
‘2’	(F2)	CHAR CONST		SMF07SFI	ONLY SMF07SAC AND SMF07SLS VALID
55	(37)	CHARACTER	1	SMF07SRI	SOURCE IDENTIFIER

Table 76. SLSSMF07 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
‘1’	(F1)	CHAR CONST		SMF07SCE	CELL
‘2’	(F2)	CHAR CONST		SMF07SCP	CAP
‘3’	(F3)	CHAR CONST		SMF07SDR	DRIVE
56	(38)	HEXSTRING	1	SMF07SAC	SOURCE ACS
57	(39)	HEXSTRING	1	SMF07SLS	SOURCE LSM
58	(3A)	HEXSTRING	1	SMF07SPN	SOURCE PANEL
59	(3B)	HEXSTRING	1	SMF07SRO	SOURCE ROW
60	(3C)	HEXSTRING	1	SMF07SCO	SOURCE COLUMN
61	(3D)	CHARACTER	1	SMF07DEI	DESTINATION IDENTIFIER
‘1’	(F1)	CHAR CONST		SMF07TCE	CELL
‘2’	(F2)	CHAR CONST		SMF07TCP	CAP
‘3’	(F3)	CHAR CONST		SMF07TDR	DRIVE
‘5’	(F5)	CHAR CONST		SMF07TDW	DRIVE (WRITE PROTECT)
62	(3E)	HEXSTRING	1	SMF07TAC	DESTINATION ACS
63	(3F)	HEXSTRING	1	SMF07TLS	DESTINATION LSM
64	(40)	HEXSTRING	1	SMF07TPN	DESTINATION PANEL
65	(41)	HEXSTRING	1	SMF07TRO	DESTINATION ROW
66	(42)	HEXSTRING	1	SMF07TCO	DESTINATION COLUMN
67	(43)	HEXSTRING	2	SMF07DRS	SOURCE DRIVE DEVICE NUMBER INVOLVED WITH THE REQUEST. VALID ONLY IF SMF07DSV IS ON.
69	(45)	HEXSTRING	2	SMF07DRT	DESTINATION DRIVE DEVICE NUMBER INVOLVED WITH THE REQUEST. VALID ONLY IF SMF07DTV IS ON.
71	(47)	HEXSTRING	4	SMF07STM	TIME IN HUNDREDTHS THE REQUEST WAS SENT TO THE LMU
75	(4B)	HEXSTRING	4	SMF07SDT	DATE THE REQUEST WAS SENT TO THE LMU IN THE FORM 0CYYDDF.
79	(4F)	HEXSTRING	4	SMF07ETM	TIME IN HUNDREDTHS THE LMU INDICATED THE REQUEST WAS COMPLETE
83	(53)	HEXSTRING	4	SMF07EDT	DATE THE LMU INDICATED THE REQUEST WAS COMPLETE.
87	(57)	BITSTRING	1	SMF07TNM	NUMBER OF LSMS USED

Table 76. SLSSMF07 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
88	(58)	LENGTH		SMF07SL	LENGTH OF NON-LMU PORTION OF SUBRECORD
THIS MAPS THE DATA RETURNED BY THE LMU. IT IS ONLY AVAILABLE IF SMF07LMD IS ON. NOTE THAT THE LMU TIMES ARE ONLY VALID TO A TENTH OF A SECOND. THE HSC CONVERTS THE TIMES TO HUNDREDTHS TO BE CONSISTENT WITH OTHER TIMES.					
88	(58)	HEXSTRING	4	SMF07LTO	INTERVAL IN HUNDREDTHS OF A SECOND THE LMU HAD THE REQUEST. HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
92	(5C)	HEXSTRING	4	SMF07DWT	INTERVAL IN HUNDREDTHS OF A SECOND OF DRIVE WAIT TIME. HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
96	(60)	HEXSTRING	4	SMF07DRO	INTERVAL IN HUNDREDTHS OF DESTINATION LSM ROBOTICS TIME HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
100	(64)	HEXSTRING	4	SMF07DRQ	INTERVAL IN HUNDREDTHS OF DESTINATION LSM ROBOTICS QUEUE TIME. HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
104	(68)	HEXSTRING	4	SMF07ORO	INTERVAL IN HUNDREDTHS OF ALL OTHER LSM ROBOTICS TIME HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
108	(6C)	HEXSTRING	4	SMF07ORQ	INTERVAL IN HUNDREDTHS OF ALL OTHER LSM ROBOTICS QUEUE TIME. HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
112	(70)	HEXSTRING	4	SMF07PRO	INTERVAL IN HUNDREDTHS OF PASSTHRU ROBOTICS TIME HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
116	(74)	HEXSTRING	4	SMF07PRQ	INTERVAL IN HUNDREDTHS OF ALL PASSTHRU ROBOTICS QUEUE TIME. HEX ‘FFFFFFFF’ INDICATES LMU COUNTER OVERFLOW
120	(78)	LENGTH		SMF07L	LENGTH OF FIXED PORTION OF SUBRECORD

Cross Reference

Name	Len	Offset Value
SLSSMF07	000001	00
SMF07CNV	-	20
SMF07CON	000004	2B
SMF07CPO	000004	17
SMF07DEI	000001	3D
SMF07DNS	-	10
SMF07DRO	000004	60
SMF07DRQ	000004	64
SMF07DRS	000002	43
SMF07DRT	000002	45
SMF07DSS	-	20
SMF07DSV	-	80
SMF07DTV	-	40
SMF07DWT	000004	5C
SMF07EDT	000004	53
SMF07EJT	-	01
SMF07ETM	000004	4F
SMF07FLG	000001	02
SMF07HSC	-	01
SMF07JOB	-	02
SMF07L	-	78
SMF07LBL	000001	2F
SMF07LDT	000004	0F
SMF07LMD	-	10
SMF07LTM	000004	0B
SMF07LTO	000004	58
SMF07MBV	-	‘CVAL’
SMF07MNS	-	40
SMF07MOV	-	04
SMF07MRC	-	‘CVAL’
SMF07MSS	-	80

Name	Len	Offset Value
SMF07MVU	-	‘CVAL’
SMF07MVV	-	‘CVAL’
SMF07NRD	000004	13
SMF07NTR	-	02
SMF07OPR	-	05
SMF07ORO	000004	68
SMF07ORQ	000004	6C
SMF07PRF	-	08
SMF07PRG	-	04
SMF07PRO	000004	70
SMF07PRQ	000004	74
SMF07RQS	000001	01
SMF07SAC	000001	38
SMF07SCE	-	‘CVAL’
SMF07SCO	000001	3C
SMF07SCP	-	‘CVAL’
SMF07SDR	-	‘CVAL’
SMF07SDT	000004	4B
SMF07SFI	-	‘CVAL’
SMF07SFN	-	‘CVAL’
SMF07SF1	000001	36
SMF07SL	-	58
SMF07SLS	000001	39
SMF07SPN	000001	3A
SMF07SRI	000001	37
SMF07SRO	000001	3B
SMF07STM	000004	47
SMF07SWS	-	08
SMF07TAC	000001	3E
SMF07TCE	-	‘CVAL’
SMF07TCO	000001	42
SMF07TCP	-	‘CVAL’

Name	Len	Offset Value
SMF07TDR	-	‘CVAL’
SMF07TDT	000004	07
SMF07TDW	-	‘CVAL’
SMF07TLS	000001	3F
SMF07TMI	-	06
SMF07TNM	000001	57
SMF07TPN	000001	40
SMF07TRO	000001	41
SMF07TTM	000004	03
SMF07TYP	000001	00
SMF07UNK	-	00
SMF07US1	000008	1B
SMF07US2	000008	23
SMF07UTL	-	03
SMF07VMT	-	‘CVAL’
SMF07VMU	-	‘CVAL’
SMF07VMV	-	‘CVAL’
SMF07VOL	000006	30

SLSSMF08

Table 77. SLSSMF08 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSMF08 - HSC RECORD TYPE 8 MAPPING MACRO FUNCTION: MAPS THE SUBTYPE 8 SMF RECORD PRODUCED BY THE HSC. THIS IS PRODUCED FOR EACH SUCCESSFUL VIEW COMMAND INITIATED BY THE HSC. SPECIAL CONSIDERATIONS: This data represents a record that is written out to the SMF data set.					
0	(0)	AREA	1	SLSSMF08	VIEW DETAIL SMF RECORD SUBTYPE
THIS DSECT MAPS THE SUBTYPE 8 RECORD PRODUCED BY THE HSC FOR EACH SUCCESSFUL VIEW COMMAND WHEN SUBTYPE 8 RECORDING IS ENABLED.					
0	(0)	A-ADDR	1	SMF08ACS	ACS id.
1	(1)	A-ADDR	1	SMF08LSM	LSM number.
2	(2)	A-ADDR	1	SMF08CID	CAP id.
3	(3)	A-ADDR	1	SMF08MAG	MAG number.
4	(4)	A-ADDR	1	SMF08TYP	Type of VIEW completed.
		....1 X’01’		SMF08CEL	Storage, diag., or playgrnd cell.
		.... ..1. X’02’		SMF08CAP	CAP cell.
		.... ..11 X’03’		SMF08DRV	Cartridge drive.
		.... .1.. X’04’		SMF08PTP	pass-thru port cell.
5	(5)	AREA	1	SMF08PNL	Panel number (if SMF08TYP 1 or 3).
5	(5)	A-ADDR	1	SMF08LSM2	Connecting LSM (if SMF08TYP is 4).
6	(6)	AREA	1	SMF08ROW	Row number (if SMF08TYP 1 or 2).
6	(6)	AREA	1	SMF08XPT	Transport number (if SMF08TYP 3).
6	(6)	A-ADDR	1	SMF08SLT	PTP Slot number (if SMF08TYP 4).
7	(7)	A-ADDR	1	SMF08COL	Column number (if SMF08TYP 1 or 2)
8	(8)	A-ADDR	1	SMF08RTM	Requested VIEW time.
9	(9)	A-ADDR	1	SMF08VTM	Actual VIEW time.
10	(A)	CHARACTER	8	SMF08HST	Host name (if SMF08TYP 3).
18	(12)	HEXSTRING	2	SMF08CUA	Drive address (if SMF08TYP 3).
20	(14)	LENGTH		SMF08L	VIEW subtype 8 SMF record length.

Cross Reference

Name	Len	Offset Value
SLSSMF08	000001	00
SMF08ACS	000001	00
SMF08CAP	-	02
SMF08CEL	-	01
SMF08CID	000001	02
SMF08COL	000001	07
SMF08CUA	000002	12
SMF08DRV	-	03
SMF08HST	000008	0A
SMF08L	-	14
SMF08LSM	000001	01
SMF08LSM2	000001	05
SMF08MAG	000001	03
SMF08PNL	000001	05
SMF08PTP	-	04
SMF08ROW	000001	06
SMF08RTM	000001	08
SMF08SLT	000001	06
SMF08TYP	000001	04
SMF08VTM	000001	09
SMF08XPT	000001	06

LOGREC Records

LOGREC Mapping Macros

Table 78. Mapping Macros for LOGREC Records

Macro	Description
SLSSLHDR	LOGREC Header Layout
SLSSVLG1	LOGREC Volume/Cell Force Unselect Record
SLSSBLOG	LOGREC Initialization/Termination Record
SLSSLLG1	LOGREC LMU Driver Format 1
SLSSLLG2	LOGREC LMU Driver Format 2
SLSSLLG3	LOGREC LMU Driver Format 3
SLSSLLG4	LOGREC LMU Driver Format 4
SLSSLLG5	LOGREC Dual LMU Status Change
SLSSLLG6	LOGREC Robotics Motion & Soft Fail Counts Record
SLSSDJLR	LOGREC Database/Journaling
SLSSPSWI	LOGREC Primary/Shadow Switch Record
SLSSRL00	LOGREC Recovery Record 1
SLSSRL01	LOGREC Recovery Record 2
SLSSHLG1	LOGREC Host Communications Format 1

LOGREC Record Formats

SLSSLHDR

Table 79. SLSSLHDR Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLHDR - LOGREC RECORD HEADER MAP FUNCTION: MAPS THE STANDARD LOGREC RECORD HEADER AS DEFINED IN THE EREP MANUAL (GC28-1378). IBM PROVIDES NO MAPPING MACRO. MAPS THE ACHS EXTENSIONS TO THE HEADER. SYMBOLICS: &TYPE - USED TO SELECT A VALID LOGREC SUBTYPE 4001 - VOL/CELL FORCE UNSELECT RECORD 5000 - INIT/TERM LOGREC RECORD 6501 - LMU DRIVER LOGREC FORMAT 1 6502 - LMU DRIVER LOGREC FORMAT 2 6503 - LMU DRIVER LOGREC FORMAT 3 6504 - LMU DRIVER LOGREC FORMAT 4 6505 - DUAL LMU STATUS CHANGE RECORD 6506 - R+ Robotic Motion & Softfail Counts 7000 - DATABASE JOURNALLING LOGREC RECORD 7001 - DATABASE PRIMARY SHADOW SWITCH LOGREC RECORD 8500 - RECOVERY ERDS RECORD 0 8501 - RECOVERY ERDS RECORD 1 9201 - HOST COMMUNICATIONS LOGREC FORMAT 1					
0	(0)	STRUCTURE		SLSSLHDR	RECORD HEADER MAP
0	(0)	BITSTRING	1	OLHDKEY1	CLASS/SOURCE
		.1.. .... X’40’		OLHDSOFT	SOFTWARE DETECTED ERROR
1	(1)	BITSTRING	1	OLHDKEY2	SYSTEM RELEASE LEVEL
		1... .... X’80’		OLHDVS2	VS2 OR LATER RELEASE LEVEL
2	(2)	BITSTRING	1	OLHDSMS	RECORD INDEPENDENT SWITCHES
		.... 1... X’08’		OLHDTFLG	TIME MACRO USED
3	(3)	BITSTRING	1	OLHDSW2	RECORD DEPENDANT SWITCHES
		..1. .... X’20’		OLHDERF	RECORD CONTAINS AN ERROR ID
4	(4)	HEXSTRING	2	-RESERVED-	*** RESERVED
6	(6)	HEXSTRING	1	OLHDCDCT	RECORD COUNT
7	(7)	HEXSTRING	1	-RESERVED-	*** RESERVED
8	(8)	HEXSTRING	4	OLHDDATE	SYSTEM DATE OF ERROR
12	(C)	HEXSTRING	4	OLHDTIME	SYSTEM TIME OF ERROR
16	(10)	HEXSTRING	8	OLHDCPID	CPU ID
24	(18)	CHARACTER	8	OLHDJBID	JOB ID
MAP FIELDS FROM REAL SDWA					

Table 79. SLSSLHDR Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
32	(20)	OFFSET		OLHDERID	ERROR ID
32	(20)	HEXSTRING	400	OLHDRSDW	SDWA
32	(20)	CONST		SLSSTYPE	HSC software error subtype LOGREC data overlays SDWA area.
432	(1B0)	HEXSTRING	3	OLHDRARA	SDWARA
435	(1B3)	HEXSTRING	1	OLHDRRAL	SDWAURAL (LENGTH OF VRA)
436	(1B4)	HEXSTRING	6	OLHDRVRA	VRA (ALIGN TO DOUBLE WORD+4)
442	(1BA)	HEXSTRING	152	OLHDRRC1	SDWARC1 (RECORABLE EXT 1)
594	(252)	HEXSTRING	16	OLHDRRC2	SDWARC2 (RECORABLE EXT 2)
610	(262)	HEXSTRING	32	OLHDRRC3	SDWARC3 (RECORABLE EXT 2)
642	(282)	HEXSTRING	2	OLHDRTYP	RECORD TYPE or Subtype number
642	(282)	CONST		LTYPAREA	HSC SOFTWARE ERROR RECORD TYPE
16385	(4001)	CONST		LTYP4001	- VOL/CELL FORCE UNSELECT RECORD
20480	(5000)	CONST		LTYP5000	- INIT/TERM LOGREC RECORD
25857	(6501)	CONST		LTYP6501	- LMU DRIVER LOGREC FORMAT 1
25858	(6502)	CONST		LTYP6502	- LMU DRIVER LOGREC FORMAT 2
25859	(6503)	CONST		LTYP6503	- LMU DRIVER LOGREC FORMAT 3
25860	(6504)	CONST		LTYP6504	- LMU DRIVER LOGREC FORMAT 4
25861	(6505)	CONST		LTYP6505	- DUAL LMU STATUS CHANGE RECORD
25862	(6506)	CONST		LTYP6506	- R+ Robotic Motion & Softfail Counts
28672	(7000)	CONST		LTYP7000	- DATABASE JOURNALING LOGREC RECORD
28673	(7001)	CONST		LTYP7001	- DATABASE PRIMARY SHADOW SWITCH RECORD
34048	(8500)	CONST		LTYP8500	- RECOVERY ERDS RECORD 0
34049	(8501)	CONST		LTYP8501	- RECOVERY ERDS RECORD 1
37377	(9201)	CONST		LTYP9201	- HOST COMMUNICATIONS LOGREC FORMAT 1
644	(284)	HEXSTRING	4	OLHDSTC	STC RECORD X’FEEDFACE’
648	(288)	HEXSTRING	4	OLHDETIM	TIMESTAMP

Table 79. SLSSLHDR Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
652	(28C)	LENGTH		OLHDL	LENGTH OF FIXED PORTION OF OLHD

Cross Reference

Name	Len	Offset Value
LTYPAREA	-	282
LTYP4001	-	4001
LTYP5000	-	5000
LTYP6501	-	6501
LTYP6502	-	6502
LTYP6503	-	6503
LTYP6504	-	6504
LTYP6505	-	6505
LTYP6506	-	6506
LTYP7000	-	7000
LTYP7001	-	7001
LTYP8500	-	8500
LTYP8501	-	8501
LTYP9201	-	9201
OLHDCDCT	000001	06
OLHDCPID	000008	10
OLHDDATE	000004	08
OLHDERF	-	20
OLHDERID	-	20
OLHDETIM	000004	288
OLHDJBID	000008	18
OLHDKEY1	000001	00
OLHDKEY2	000001	01
OLHDL	-	28C
OLHDRARA	000003	1B0
OLHDRRAL	000001	1B3
OLHDRRC1	000152	1BA
OLHDRRC2	000016	252
OLHDRRC3	000032	262
OLHDRSDW	000400	20
OLHDRTYP	000002	282

Name	Len	Offset Value
OLHDRVRA	000006	1B4
OLHDSMS	000001	02
OLHDSOFT	-	40
OLHDSTC	000004	284
OLHDSW2	000001	03
OLHDTFLG	-	08
OLHDTIME	000004	0C
OLHDVS2	-	80
SLSSTYPE	-	20

SLSSVLG1

Table 80. SLSSVLG1 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSVLG1 - VOL/CELL LOGREC RECORD FORMAT 1 FUNCTION: MAPS LOGREC RECORD CREATED WHEN A VOLUME IS FORCE UNSELECTED SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSVLG1	VOL/CELL FORCE UNSELECT RECORD
16385	(4001)	CONST		VLG1SUBT	SUBTYPE X'4001'.
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	VLG1HDR	IDENTIFIER 'VLG1 '
4	(4)	A-ADDR	4	VLG1LEN	LENGTH OF THE VLG1
8	(8)	A-ADDR	1	VLG1SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	VLG1KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
VLG1 BODY					
12	(C)	CHARACTER	8	VLG1HOST	HOSTID REQUESTING FORCE UNSELECT
20	(14)	CHARACTER	8	VLG1JOBN	JOBNAME PERFORMING FORCE UNSELECT
28	(1C)	CHARACTER	6	VLG1VOLS	VOLSER FORCE UNSELECTED
34	(22)	CHARACTER	8	VLG1OWNR	HOSTID THAT HAD THE VOL SELECTED
42	(2A)	HEXSTRING	12	-RESERVED-	*** RESERVED
54	(36)	LENGTH		VLG1L	

Cross Reference

Name	Len	Offset Value
SLSSVLG1	000002	00
VLG1HDR	000004	00
VLG1HOST	000008	0C
VLG1JOBN	000008	14
VLG1KEY	000001	09
VLG1L	-	36
VLG1LEN	000004	04
VLG1OWNR	000008	22
VLG1SP	000001	08
VLG1SUBT	-	4001
VLG1VOLS	000006	1C

SLSSBLOG

Table 81. SLSSBLOG Record Format

Dec	Hex	Type	Length	Label	Description
SLSSBLOG - INIT/TERM LOGREC RECORD FUNCTION: THIS MAPS THE LOGREC RECORD CREATED BY SLSBINIT WHENEVER THE SUBSYSTEM IS INITIALIZED OR TERMINATED, NORMALLY OR ABNORMALLY SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSBLOG	INIT/TERM LOGREC RECORD
20480	(5000)	CONST		BLOGID	RECORD TYPE 5000
0	(0)	AREA	4	BLOGFLAG	FLAGS
0	(0)	BITSTRING	1	BLOGFLG0	FLAG1 BYTE
		1... .... X’80’		BLOGSTRT	SUBSYSTEM START RECORD
		.1.. .... X’40’		BLOGSHTD	SUBSYSTEM SHUTDOWN RECORD
		..1. .... X’20’		BLOGABND	SUBSYSTEM ABNORMAL SHUTDOWN
		...1 .... X’10’		BLOGCNCL	SUBSYSTEM WAS CANCELED
		.... 1... X’08’		BLOGRECO	RECONFIG STARTED
1	(1)	HEXSTRING	3	-RESERVED-	*** RESERVED
4	(4)	SIGNED-FWORD	4	-RESERVED-	*** RESERVED
8	(08)	LENGTH		BLOGL	LENGTH OF BLOG

Cross Reference

Name	Len	Offset Value
BLOGABND	-	20
BLOGCNCL	-	10
BLOGFLAG	000004	00
BLOGFLG0	000001	00
BLOGID	-	5000
BLOGL	-	08
BLOGRECO	-	08
BLOGSHTD	-	40
BLOGSTRT	-	80
SLSSBLOG	000002	00

SLSSLLG1

Table 82. SLSSLLG1 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG1 - LMU DRIVER LOGREC RECORD FORMAT ONE FUNCTION: MAPS LOGREC RECORD CREATED WHEN AN INVALID RESPONSE IS RECEIVED FROM THE LMU					
0	(0)	AREA	2	SLSSLLG1	LMU DRIVER LOGREC FORMAT ONE
25857	(6501)	CONST		LLG1SUBT	SUBTYPE X’6501’
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	LLG1HDR	IDENTIFIER ‘LLG1 ‘
4	(4)	A-ADDR	4	LLG1LEN	LENGTH OF THE LLG1
8	(8)	A-ADDR	1	LLG1SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	LLG1KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
LLG1 BODY					
12	(C)	HEXSTRING	1	LLG1ACS	ACSID OF REQUEST
13	(D)	HEXSTRING	2	LLG1STN	STATION RECEIVING RESPONSE
15	(F)	BITSTRING	1	LLG1ECD	ERROR CODE
		.... .1.. X’04’		LLG1NTCT	CAN’T HAVE INTERMEDIATE RESP
		.... 1... X’08’		LLG1NTNM	SEQUENCE NUMBER NOT NUMERIC
		.... 11.. X’0C’		LLG1NLRQ	NO LRQ WAS FOUND
		...1 .... X’10’		LLG1INVR	INVALID RESPONSE WAS FOUND
		...1 .1.. X’14’		LLG1RNTN	NON NUMERIC RESPONSE COUNT FOUND
		...1 1... X’18’		LLG1ERSP	ERROR RESPONSE RECEIVED
		...1 11.. X’1C’		LLG1DBKE	DEBLOCKING ERROR
		..1. .... X’20’		LLG1UNKB	UNKNOWN BROADCAST TYPE
		..1. .1.. X’24’		LLG1ACKE	ACK ERROR
		..1. 1... X’28’		LLG1INVB	INVALID BROADCAST WAS FOUND
NOTE THAT ERRORS 1-99 ARE SENT TO LMU AS A BLOCK ERROR ACK					
16	(10)	BITSTRING	1	LLG1RCDE	ERROR SUBCODE (SEE LRQRSCDE)

Table 82. SLSSLLG1 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
1	(01)	CONST		LLG1NUNR	UNRECOGNIZABLE TRANSMISSION
2	(02)	CONST		LLG1NSOB	NO START OF BLOCK CHARACTER
3	(03)	CONST		LLG1NEOB	NO END OF BLOCK CHARACTER
4	(04)	CONST		LLG1NSOT	NO START OF TRANSACTION CHARACTER
5	(05)	CONST		LLG1NEOT	NO END OF TRANSACTION CHARACTER
6	(06)	CONST		LLG1NING	INTERFACE NOT GROUPED TO A HOST
7	(07)	CONST		LLG1NHNL	HOST-ID NOT IN LEGAL RANGE
8	(08)	CONST		LLG1NSHP	ILLEGAL SET HOST PATH OPTION
9	(09)	CONST		LLG1NCJI	CAN’T JOIN INT; ANOTHER HOST HAS
10	(0A)	CONST		LLG1NWHI	WRONG HOST-ID
11	(0B)	CONST		LLG1NNUM	NON-NUMERIC BLOCK HEADER
12	(0C)	CONST		LLG1SNOB	STANDBY LMU CANNOT ACCEPT B BLOCK
13	(0D)	CONST		LLG1SWAT	SWITCHOVER ALREADY ACTIVE
50	(32)	CONST		LLG1NWSN	WRONG SEQUENCE NUMBER THIS STN
51	(33)	CONST		LLG1ILGL	SLAVE LMU ACKED B BLOCK
52	(34)	CONST		LLG1ERTP	NON-NUMERIC ACK ERROR TYPE
100	(64)	CONST		LLG1BBLK	BAD BLOCK
132	(84)	CONST		LLG1ITYP	TRANSACTION TYPE IS INVALID
17	(11)	HEXSTRING	44	LLG1RQST	REQUEST
61	(3D)	HEXSTRING	32	LLG1RSPN	RESPONSE
93	(5D)	HEXSTRING	1	LLG1HDFL	R PLUS (R+) HARDFAIL INDICATOR.
94	(5E)	HEXSTRING	5	-RESERVED-	RESERVED FOR FUTURE USE
99	(63)	CHARACTER	2	LLG1LMLV	LMU INTERFACE LEVEL
101	(65)	BITSTRING	1	LLG1STYP	STATION TYPE
		1... .... X’80’		LLG1STHN	STATION IS A NETWORK HOSTNAME

Table 82. SLSSLLG1 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.1.. .... X'40'		LLG1STTC	STATION IS A NETWORK IP ADDRESS
FOR TCP/IP HOSTNAME ADDRESS:					
102	(66)	CHARACTER	24	LLG1SHNM	STATION NETWORK HOST NAME
FOR TCP/IP NETWORK ADDRESS:					
126	(7E)	HEXSTRING	4	LLG1STCP	STATION NETWORK IP ADDRESS
130	(82)	HEXSTRING	22	-RESERVED-	RESERVED FOR FUTURE USE
152	(98)	LENGTH	LLG1L		

Cross Reference

Name	Len	Offset Value
LLG1ACKE	-	24
LLG1ACS	000001	0C
LLG1BBLK	-	64
LLG1DBKE	-	1C
LLG1ECD	000001	0F
LLG1ERSP	-	18
LLG1ERTP	-	34
LLG1HDFL	000001	5D
LLG1HDR	000004	00
LLG1ILGL	-	33
LLG1INVB	-	28
LLG1INVR	-	10
LLG1ITYP	-	84
LLG1KEY	000001	09
LLG1L	-	98
LLG1LEN	000004	04
LLG1LMLV	000002	63
LLG1NCJI	-	09
LLG1NEOB	-	03
LLG1NEOT	-	05
LLG1NHNL	-	07
LLG1NING	-	06
LLG1NLRQ	-	0C
LLG1NNUM	-	0B
LLG1NSHP	-	08
LLG1NSOB	-	02
LLG1NSOT	-	04
LLG1NTCT	-	04
LLG1NTNM	-	08
LLG1NUNR	-	01
LLG1NWHI	-	0A

Name	Len	Offset Value
LLG1NWSN	-	32
LLG1RCDE	000001	10
LLG1RNTN	-	14
LLG1RQST	000044	11
LLG1RSPN	000032	3D
LLG1SHNM	000024	66
LLG1SNOB	-	0C
LLG1SP	000001	08
LLG1STCP	000004	7E
LLG1STHN	-	80
LLG1STN	000002	0D
LLG1STTC	-	40
LLG1STYP	000001	65
LLG1SUBT	-	6501
LLG1SWAT	-	0D
LLG1UNKB	-	20
SLSSLLG1	000002	00

SLSSLLG2

Table 83. SLSSLLG2 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG2 - LMU DRIVER LOGREC RECORD FORMAT TWO FUNCTION: MAPS LOGREC RECORD CREATED WHEN AN INVALID BLOCK IS RECEIVED FROM THE LMU SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLLG2	LMU DRIVER LOGREC FORMAT TWO
25858	(6502)	CONST		LLG2SUBT	SUBTYPE X’6502’
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	LLG2HDR	IDENTIFIER ‘LLG2 ‘
4	(4)	A-ADDR	4	LLG2LEN	LENGTH OF THE LLG2
8	(8)	A-ADDR	1	LLG2SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	LLG2KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
LLG2 BODY					
12	(C)	HEXSTRING	1	LLG2ACS	ACSID OF BLOCK
13	(D)	HEXSTRING	2	LLG2STN	STATION RECEIVING BLOCK
15	(F)	BITSTRING	1	LLG2ECD	ERROR CODE
		.... .1.. X’04’		LLG2DBKE	DEBLOCKING ERROR
16	(10)	BITSTRING	1	LLG2RCDE	ERROR SUBCODE
124	(7C)	CONST		LLG2BLNN	BLOCK LENGTH IS NOT NUMERIC
136	(88)	CONST		LLG2ISEQ	INVALID SEQUENCE NUM
17	(11)	HEXSTRING	64	LLG2IBLK	INPUT BLOCK
81	(51)	HEXSTRING	64	LLG2OBLK	OUTPUT BLOCK
145	(91)	BITSTRING	1	LLG2STYP	STATION TYPE
		1... .... X’80’		LLG2STHN	STATION IS A NETWORK HOSTNAME
		.1.. .... X’40’		LLG2STTC	STATION IS A NETWORK IP ADDRESS
FOR TCP/IP HOSTNAME ADDRESS:					
146	(92)	CHARACTER	24	LLG2SHNM	STATION NETWORK HOST NAME

Table 83. SLSSLLG2 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
FOR TCP/IP NETWORK ADDRESS:					
160	(AA)	HEXSTRING	4	LLG2STCP	STATION NETWORK IP ADDRESS
174	(AE)	HEXSTRING	26	-RESERVED-	RESERVED FOR FUTURE USE
200	(C8)	LENGTH		LLG2L	

Cross Reference

Name	Len	Offset Value
LLG2ACS	000001	0C
LLG2BLNN	-	7C
LLG2DBKE	-	04
LLG2ECD	000001	0F
LLG2HDR	000004	00
LLG2IBLK	000064	11
LLG2ISEQ	-	88
LLG2KEY	000001	09
LLG2L	-	C8
LLG2LEN	000004	04
LLG2OBLK	000064	51
LLG2RCDE	000001	10
LLG2SHNM	000024	92
LLG2SP	000001	08
LLG2STCP	000004	AA
LLG2STHN	-	80
LLG2STN	000002	0D
LLG2STTC	-	40
LLG2STYP	000001	91
LLG2SUBT	-	6502
SLSSLLG2	000002	00

SLSSLLG3

Table 84. SLSSLLG3 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG3 - LMU DRIVER LOGREC RECORD FORMAT THREE FUNCTION: DEFINES FORMAT OF DOOR OPEN LOGREC RECORD SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLLG3	LMU DRIVER LOGREC FORMAT THREE
25859	(6503)	CONST		LLG3SUBT	SUBTYPE X'6503'
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	LLG3HDR	IDENTIFIER 'LLG3 '
4	(4)	A-ADDR	4	LLG3LEN	LENGTH OF THE LLG3
8	(8)	A-ADDR	1	LLG3SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	LLG3KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
LLG3 BODY					
12	(C)	HEXSTRING	2	LLG3LSM	LSM ID
14	(0E)	LENGTH		LLG3L	

Cross Reference

Name	Len	Offset Value
LLG3HDR	000004	00
LLG3KEY	000001	09
LLG3L	-	0E
LLG3LEN	000004	04
LLG3LSM	000002	0C
LLG3SP	000001	08
LLG3SUBT	-	6503
SLSSLLG3	000002	00

SLSSLLG4

Table 85. SLSSLLG4 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG4 - LMU DRIVER LOGREC RECORD FORMAT FOUR FUNCTION: DEFINES FORMAT OF LMU DEGRADED RECORD SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLLG4	LMU DRIVER LOGREC FORMAT FOUR
25860	(6504)	CONST		LLG4SUBT	SUBTYPE X'6504'
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	LLG4HDR	IDENTIFIER 'LLG4'
4	(4)	A-ADDR	4	LLG4LEN	LENGTH OF THE LLG4
8	(8)	A-ADDR	1	LLG4SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	LLG4KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
LLG4 BODY					
12	(C)	HEXSTRING	2	LLG4DEVC	LSM ID (FF FOR LMU)
14	(E)	HEXSTRING	1	LLG4COND	1 (PWR DWN) OR 2 (DEGRD)
16	(10)	SIGNED-FWORD	4	LLG4FSC	FSC
20	(14)	LENGTH		LLG4L	

Cross Reference

Name	Len	Offset Value
LLG4COND	000001	0E
LLG4DEVC	000002	0C
LLG4FSC	000004	10
LLG4HDR	000004	00
LLG4KEY	000001	09
LLG4L	-	14
LLG4LEN	000004	04
LLG4SP	000001	08
LLG4SUBT	-	6504
SLSSLLG4	000002	00

SLSSLLG5

Table 86. SLSSLLG5 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG5 - DUAL LMU STATUS CHANGE LOGREC RECORD FUNCTION: DEFINES FORMAT OF DUAL LMU STATUS CHANGE LOGREC RECORD SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLLG5	DUAL LMU STATUS CHANGE LOGREC RECORD
25861	(6505)	CONST		LLG5SUBT	SUBTYPE X'6505'
STANDARD SLS CONTROL BLOCK HEADER DEFINITION					
0	(0)	CHARACTER	4	LLG5HDR	IDENTIFIER 'LLG5'
4	(4)	A-ADDR	4	LLG5LEN	LENGTH OF THE LLG5
8	(8)	A-ADDR	1	LLG5SP	SUBPOOL NUMBER
9	(9)	A-ADDR	1	LLG5KEY	PROTECTION KEY
10	(A)	SIGNED-HWORD	2	-RESERVED-	*** RESERVED
LLG5 BODY					
12	(C)	HEXSTRING	1	LLG5ACS	ACS ID
13	(D)	HEXSTRING	2	LLG5STN	Station number
15	(F)	CHARACTER	1	LLG5OMST	Old Master LMU ID/Config Status
0 = Dual LMU Not Configured Before A = LMU A Was Master LMU Before B = LMU B Was Master LMU Before					
16	(10)	CHARACTER	1	LLG5OSLV	Old Standby LMU Status
0 = Dual LMU Not Configured Before 1 = Standby LMU Was prev ready 2 = Standby LMU Was prev not ready					
17	(11)	CHARACTER	1	LLG5NMST	New Master LMU ID/Config Status
0 = Dual LMU Is Not Configured Now A = LMU A Is Master LMU Now B = LMU B Is Master LMU Now					
18	(12)	CHARACTER	1	LLG5NSLV	New Standby LMU Status
0 = Dual LMU Is Not Configured Now 1 = Standby LMU Is ready 2 = Standby LMU Is not ready					
19	(13)	BITSTRING	1	LLG5STYP	STATION TYPE

Table 86. SLSSLLG5 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		1... .... X’80’ .1.. .... X’40’		LLG5STHN LLG5STTC	STATION IS A NETWORK HOSTNAME STATION IS A NETWORK IP ADDRESS
FOR TCP/IP HOSTNAME ADDRESS:					
20	(14)	CHARACTER	24	LLG5SHNM	STATION NETWORK HOSTNAME
FOR TCP/IP NETWORK ADDRESS:					
44 48 72	(2C) (30) (48)	HEXSTRING HEXSTRING LENGTH	4 24 	LLG5STCP -RESERVED- LLG5L	STATION NETWORK IP ADDRESS RESERVED FOR FUTURE USE

Cross Reference

Name	Len	Offset Value
LLG5ACS	000001	0C
LLG5HDR	000004	00
LLG5KEY	000001	09
LLG5L	-	48
LLG5LEN	000004	04
LLG5NMST	000001	11
LLG5NSLV	000001	12
LLG5OMST	000001	0F
LLG5OSLV	000001	10
LLG5SHNM	000024	14
LLG5SP	000001	08
LLG5STCP	000004	2C
LLG5STHN	-	80
LLG5STN	000002	0D
LLG5STTC	-	40
LLG5STYP	000001	13
LLG5SUBT	-	6505
SLSSLLG5	000002	00

SLSSLLG6

Table 87. SLSSLLG6 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSLLG6 - Robotic Motion & Softfail Counts LOGREC Record FUNCTION: DEFINES FORMAT OF Robotic Motion & Softfail Counts Record SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSLLG6	Robotic motion & softfail counts
25862	(6506)	CONST		LLG6SUBT	Subtype X’6506’
Standard SLS control block header definition					
0	(0)	CHARACTER	4	LLG6HDR	Eyeball characters
4	(4)	A-ADDR	4	LLG6LEN	Length of variable part of record
8	(8)	A-ADDR	1	LLG6SP	Subpool Number
9	(9)	A-ADDR	1	LLG6KEY	Protection Key
10	(A)	SIGNED-HWORD	2	-RESERVED-	Reserved for future use
LLG6 Body					
12	(C)	HEXSTRING	1	LLG6ACS	ACS ID (binary 0-255)
13	(D)	HEXSTRING	1	-RESERVED-	Reserved
14	(E)	BITSTRING	1	LLG6FLG1	1st byte of LSM configuration flags.
		1... .... X’80’		LLG6L0AV	LSM 0 Configured if flag is on.
		.1.. .... X’40’		LLG6L1AV	LSM 1 Configured if flag is on.
		..1. .... X’20’		LLG6L2AV	LSM 2 Configured if flag is on.
		...1 .... X’10’		LLG6L3AV	LSM 3 Configured if flag is on.
		.... 1... X’08’		LLG6L4AV	LSM 4 Configured if flag is on.
		.... .1.. X’04’		LLG6L5AV	LSM 5 Configured if flag is on.
		.... ..1. X’02’		LLG6L6AV	LSM 6 Configured if flag is on.
		....1 X’01’		LLG6L7AV	LSM 7 Configured if flag is on.
15	(F)	BITSTRING	1	LLG6FLG2	2nd byte of LSM configuration flags.
		1... .... X’80’		LLG6L8AV	LSM 8 Configured if flag is on.
		.1.. .... X’40’		LLG6L9AV	LSM 9 Configured if flag is on.
		..1. .... X’20’		LLG6L10AV	LSM 10 Configured if flag is on.
		...1 .... X’10’		LLG6L11AV	LSM 11 Configured if flag is on.

Table 87. SLSSLLG6 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.... 1... X’08’		LLG6L12AV	LSM 12 Configured if flag is on.
		.... .1.. X’04’		LLG6L13AV	LSM 13 Configured if flag is on.
		.... ..1. X’02’		LLG6L14AV	LSM 14 Configured if flag is on.
		....1 X’01’		LLG6L15AV	LSM 15 Configured if flag is on.
16	(10)	SIGNED-FWORD	4	LLG6L0RM	LSM 0 Robotic Motions Started
20	(14)	SIGNED-FWORD	4	LLG6L0SF	LSM 0 Softfails Recovered
24	(18)	SIGNED-FWORD	4	LLG6L1RM	LSM 1 Robotic Motions Started
28	(1C)	SIGNED-FWORD	4	LLG6L1SF	LSM 1 Softfails Recovered
32	(20)	SIGNED-FWORD	4	LLG6L2RM	LSM 2 Robotic Motions Started
36	(24)	SIGNED-FWORD	4	LLG6L2SF	LSM 2 Softfails Recovered
40	(28)	SIGNED-FWORD	4	LLG6L3RM	LSM 3 Robotic Motions Started
44	(2C)	SIGNED-FWORD	4	LLG6L3SF	LSM 3 Softfails Recovered
48	(30)	SIGNED-FWORD	4	LLG6L4RM	LSM 4 Robotic Motions Started
52	(34)	SIGNED-FWORD	4	LLG6L4SF	LSM 4 Softfails Recovered
56	(38)	SIGNED-FWORD	4	LLG6L5RM	LSM 5 Robotic Motions Started
60	(3C)	SIGNED-FWORD	4	LLG6L5SF	LSM 5 Softfails Recovered
64	(40)	SIGNED-FWORD	4	LLG6L6RM	LSM 6 Robotic Motions Started
68	(44)	SIGNED-FWORD	4	LLG6L6SF	LSM 6 Softfails Recovered
72	(48)	SIGNED-FWORD	4	LLG6L7RM	LSM 7 Robotic Motions Started
76	(4C)	SIGNED-FWORD	4	LLG6L7SF	LSM 7 Softfails Recovered
80	(50)	SIGNED-FWORD	4	LLG6L8RM	LSM 8 Robotic Motions Started
84	(54)	SIGNED-FWORD	4	LLG6L8SF	LSM 8 Softfails Recovered
88	(58)	SIGNED-FWORD	4	LLG6L9RM	LSM 9 Robotic Motions Started
92	(5C)	SIGNED-FWORD	4	LLG6L9SF	LSM 9 Softfails Recovered
96	(60)	SIGNED-FWORD	4	LLG6L10RM	LSM 10 Robotic Motions Started
100	(64)	SIGNED-FWORD	4	LLG6L10SF	LSM 10 Softfails Recovered
104	(68)	SIGNED-FWORD	4	LLG6L11RM	LSM 11 Robotic Motions Started
108	(6C)	SIGNED-FWORD	4	LLG6L11SF	LSM 11 Softfails Recovered
112	(70)	SIGNED-FWORD	4	LLG6L12RM	LSM 12 Robotic Motions Started
116	(74)	SIGNED-FWORD	4	LLG6L12SF	LSM 12 Softfails Recovered

Table 87. SLSSLLG6 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
120	(78)	SIGNED-FWORD	4	LLG6L13RM	LSM 13 Robotic Motions Started
124	(7C)	SIGNED-FWORD	4	LLG6L13SF	LSM 13 Softfails Recovered
128	(80)	SIGNED-FWORD	4	LLG6L14RM	LSM 14 Robotic Motions Started
132	(84)	SIGNED-FWORD	4	LLG6L14SF	LSM 14 Softfails Recovered
136	(88)	SIGNED-FWORD	4	LLG6L15RM	LSM 15 Robotic Motions Started
140	(8C)	SIGNED-FWORD	4	LLG6L15SF	LSM 15 Softfails Recovered
144	(90)	LENGTH		LLG6L	

Cross Reference

Name	Len	Offset Value
LLG6ACS	000001	0C
LLG6FLG1	000001	0E
LLG6FLG2	000001	0F
LLG6HDR	000004	00
LLG6KEY	000001	09
LLG6L	-	90
LLG6LEN	000004	04
LLG6L0AV	-	80
LLG6L0RM	000004	10
LLG6L0SF	000004	14
LLG6L1AV	-	40
LLG6L1RM	000004	18
LLG6L1SF	000004	1C
LLG6L10AV	-	20
LLG6L10RM	000004	60
LLG6L10SF	000004	64
LLG6L11AV	-	10
LLG6L11RM	000004	68
LLG6L11SF	000004	6C
LLG6L12AV	-	08
LLG6L12RM	000004	70
LLG6L12SF	000004	74
LLG6L13AV	-	04
LLG6L13RM	000004	78
LLG6L13SF	000004	7C
LLG6L14AV	-	02
LLG6L14RM	000004	80
LLG6L14SF	000004	84
LLG6L15AV	-	01
LLG6L15RM	000004	88
LLG6L15SF	000004	8C

Name	Len	Offset Value
LLG6L2AV	-	20
LLG6L2RM	000004	20
LLG6L2SF	000004	24
LLG6L3AV	-	10
LLG6L3RM	000004	28
LLG6L3SF	000004	2C
LLG6L4AV	-	08
LLG6L4RM	000004	30
LLG6L4SF	000004	34
LLG6L5AV	-	04
LLG6L5RM	000004	38
LLG6L5SF	000004	3C
LLG6L6AV	-	02
LLG6L6RM	000004	40
LLG6L6SF	000004	44
LLG6L7AV	-	01
LLG6L7RM	000004	48
LLG6L7SF	000004	4C
LLG6L8AV	-	80
LLG6L8RM	000004	50
LLG6L8SF	000004	54
LLG6L9AV	-	40
LLG6L9RM	000004	58
LLG6L9SF	000004	5C
LLG6SP	000001	08
LLG6SUBT	-	6506
SLSSLLG6	000002	00

SLSSDJLR

Table 88. SLSSDJLR Record Format

Dec	Hex	Type	Length	Label	Description
SLSSDJLR - DATABASE JOURNALING LOGREC MAP FUNCTION: TO MAP THE VARIABLE LENGTH AREA OF THE JOURNALLING ERDS LOG RECORD WHICH BEGINS AT LABEL OLHDRCRD OF OLHDR LOGREC MAPPING MACRO. SPECIFYING OLHDR TYPE=7000 WILL GENERATE THIS MAP VIA AN INNER MACRO CALL WITHIN OLHDR. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSDJLR	DATABASE JOURNALLING LOGREC MAP.
28672	(7000)	CONST		DJLRID	LOGREC SUBTYPE X’7000’ IS PLACED INTO FIELD OLHDRTYP OF OLHDR LOGREC MAP. ID NUMBER MATCHES CORRESPOND- ING MESSAGES FROM WMSGTXTD MACRO.
0	(0)	BITSTRING	1	DJLRFLG1	FLAG BYTE.
		1... .... X’80’		DJLRIO	I/O ERROR IMMEDIATELY FOLLOWING JOURNAL SWITCH.
		.1.. .... X’40’		DJLRBIO	BOTH JOURNALS HAVE I/O ERRORS.
		..1. .... X’20’		DJLRIOFL	ONE JOURNAL HAS AN I/O ERROR, AND THE OTHER IS 100% FULL.
		...1 .... X’10’		DJLRNRST	NEWLY CURRENT JOURNAL ISN’T RESET.
		.... 1... X’08’		DJLR4BYT	USE 4 BYTE UNIT NAME FIELDS
1	(1)	CHARACTER	8	DJLRDDN1	INITIAL JOURNAL’S DDNAME.
9	(9)	CHARACTER	44	DJLRDSN1	INITIAL JOURNAL’S DSNAME.
53	(35)	CHARACTER	6	DJLRVOL1	INITIAL JOURNAL’S VOLUME SERIAL.
59	(3B)	CHARACTER	3	DJLRUNT1	INITIAL JOURNAL’S UNIT NAME.
62	(3E)	CHARACTER	8	DJLRDDN2	ALTERNATE JOURNAL’S DDNAME.
70	(46)	CHARACTER	44	DJLRDSN2	ALTERNATE JOURNAL’S DSNAME.
114	(72)	CHARACTER	6	DJLRVOL2	ALTERNATE JOURNAL’S VOLUME SERIAL.
120	(78)	CHARACTER	3	DJLRUNT2	ALTERNATE JOURNAL’S UNIT NAME.

Table 88. SLSSDJLR Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
120	(78)	CHARACTER	4	DJLRUN42	ALTERNATE JOURNAL'S UNIT NAME
124	(7C)	CHARACTER	4	DJLRUN41	INITIAL JOURNAL'S UNIT NAME
128	(80)	AREA	8	-RESERVED-	FORCE THE LENGTH OF DJLR TO A
128	(80)	LENGTH		DJLRL	DOUBLE-WORD MULTIPLE FOR GETMAIN.

Cross Reference

Name	Len	Offset Value
DJLRBIO	-	40
DJLRDDN1	000008	01
DJLRDDN2	000008	3E
DJLRDSN1	000044	09
DJLRDSN2	000044	46
DJLRFLG1	000001	00
DJLRID	-	7000
DJLRIO	-	80
DJLRIOFL	-	20
DJLRL	-	80
DJLRNRST	-	10
DJLRUNT1	000003	3B
DJLRUNT2	000003	78
DJLRUN41	000004	7C
DJLRUN42	000004	78
DJLRVOL1	000006	35
DJLRVOL2	000006	72
DJLR4BYT	-	08
SLSSDJLR	000002	00

SLSSPSWI

Table 89. SLSSPSWI Record Format

Dec	Hex	Type	Length	Label	Description
SLSSPSWI - PRIMARY/SHADOW SWITCH LOGREC RECORD FUNCTION: THIS MAPS THE LOGREC RECORD CREATED BY SLSDRDSR WHENEVER THE SUBSYSTEM SWITCHES THE DATABASE FROM PRIMARY TO SHADOWING MODE SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSPSWI	
28673	(7001)	CONST		PSWITID	RECORD TYPE 7001
0	(0)	AREA	4	PSWITFLG	FLAGS
0	(0)	HEXSTRING	1	PSWPRFLG	PRIMARY FLAG BYTE
1	(1)	HEXSTRING	1	PSWSCFLG	SECONDARY FLAG BYTE
2	(2)	HEXSTRING	2	-RESERVED-	*** RESERVED
4	(4)	SIGNED-FWORD	4	PSWITERR	ERROR CAUSING SWITCH TO SHADOW
8	(8)	SIGNED-FWORD	4	PSWPRDCB	DCB OF PRIMARY DATABASE
12	(C)	SIGNED-FWORD	4	PSWPRUCB	UCB OF PRIMARY DATABASE
16	(10)	CHARACTER	6	PSWPRVOL	VOLUME SERIAL OF PRIMARY DB
22	(16)	CHARACTER	44	PSWPRQNM	QNAME OF PRIMARY DATABASE
68	(44)	SIGNED-FWORD	4	PSWSCDCB	DCB OF SECONDARY DATABASE
72	(48)	SIGNED-FWORD	4	PSWSCUCB	UCB OF SECONDARY DATABASE
76	(4C)	CHARACTER	6	PSWSCVOL	VOLUME SERIAL OF SECONDARY DB
82	(52)	CHARACTER	44	PSWSCQNM	QNAME OF SECONDARY DATABASE
128	(80)	SIGNED-FWORD	4	-RESERVED-	*** RESERVED
132	(84)	LENGTH		PSWITL	LENGTH OF PSWIT

Cross Reference

Name	Len	Offset Value
PSWITERR	000004	04
PSWITFLG	000004	00
PSWITID	-	7001
PSWITL	-	84
PSWPRDCB	000004	08
PSWPRFLG	000001	00
PSWPRQNM	000044	16
PSWPRUCB	000004	0C
PSWPRVOL	000006	10
PSWSCDCB	000004	44
PSWSCFLG	000001	01
PSWSCQNM	000044	52
PSWSCUCB	000004	48
PSWSCVOL	000006	4C
SLSSPSWI	000002	00

SLSSRL00

Table 90. SLSSRL00 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSRL00 - RECOVERY ERDS RECORD 00 FUNCTION: THIS MAPS THE LOGREC RECORD CREATED BY SLSRAURE. IT CONTAINS THE LSM ID OF AN LSM REQUIRING AUDIT SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSRL00	RECOVERY ERDS RECORD 0
34048	(8500)	CONST		RL00ID	EVENT = 8500
0	(0)	A-ADDR	2	RL00DEF	
2	(2)	CHARACTER	2	RL00LSMI	LSM REQUIRING AUDIT
8	(8)	LONG-FLOAT	8	-RESERVED-	*** RESERVED
16	(10)	LENGTH		RL00L	LENGTH OF RL00

Cross Reference

Name	Len	Offset Value
RL00DEF	000002	00
RL00ID	-	8500
RL00L	-	10
RL00LSMI	000002	02
SLSSRL00	000002	00

SLSSRL01

Table 91. SLSSRL01 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSRL01 - RECOVERY ERDS RECORD 01 FUNCTION: THIS MAPS THE LOGREC RECORD CREATED BY SLSRHRVC. IT CONTAINS THE HOST ID OF A HOST BEING RECOVERED. SYMBOLICS: &DSECT - DSECT OR CONTINUATION OF DATA AREA. YES - PRODUCE A DSECT LISTING NO - NO DSECT					
0	(0)	AREA	2	SLSSRL01	RECOVERY ERDS RECORD 1
34049	(8501)	CONST		RL01ID	EVENT = 8501
0	(0)	A-ADDR	2	RL01DEF	
2	(2)	CHARACTER	1	RL01TAGF	CROSS OR SAME HOST RECOVERY
3	(3)	CHARACTER	8	RL01HOST	HOST ID BEING RECOVERED
16	(10)	LONG-FLOAT	8	-RESERVED-	*** RESERVED
24	(18)	LENGTH		RL01L	LENGTH OF RL01

Cross Reference

Name	Len	Offset Value
RL01DEF	000002	00
RL01HOST	000008	03
RL01ID	-	8501
RL01L	-	18
RL01TAGF	000001	02
SLSSRL01	000002	00

SLSSHLG1

Table 92. SLSSHLG1 Record Format

Dec	Hex	Type	Length	Label	Description
SLSSHLG1 - Host Communications LOGREC format 1 FUNCTION: Defines the LOGREC record formatted for method switches.					
0	(0)	STRUCTURE		SLSSHLG1	Communications LOGREC format 1
37377	(9201)	CONST		HLG1SUBT	Subtype X'9201'
Standard SLS Control Block Header					
0	(0)	A-ADDR	4	HLG1HDR	Identifier
'HLG1'	(C8D3C7F1)	CHAR CONST		HLG1ID	Identifier 'HLG1'
4	(4)	A-ADDR	4	HLG1LEN	Length of control block
8	(8)	A-ADDR	1	HLG1SP	Subpool number
9	(9)	A-ADDR	1	HLG1KEY	Protection key
10	(A)	SIGNED-HWORD	2	-RESERVED-	Reserved for future use
HLG1 body					
12	(C)	SIGNED-FWORD	4	HLG1RC	Return code causing method switch
16	(10)	CHARACTER	8	HLG1LCLH	Hostid of local (executing) host
24	(18)	CHARACTER	8	HLG1SWTH	Hostid of host being switched
32	(20)	CHARACTER	8	HLG1INTH	Hostid of host initiating the switch
40	(28)	A-ADDR	4	HLG1PMTH	Previous communications method
40	(28)	A-ADDR	4	HLG1PLP	Previous LMUPATH (if specified)
40	(28)	A-ADDR	4	HLG1NMTH	New communications method
40	(28)	A-ADDR	4	HLG1NLP	New LMUPATH (if specified)
40	(28)	SIGNED-FWORD	4	-RESERVED-(4)	Reserved
Host Communications Services LOGREC flags					
56	(38)	A-ADDR	1	HLG1FLG1	Flag byte 1
		1... .... X'80'		HLG1ICMD	Initiated by operator command
		.1.. .... X'40'		HLG1IOTH	Initiated by other host (via message)

Table 92. SLSSHLG1 Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		..1. .... X’20’		HLG1IWRT	Initiated by WRITE function error
		...1 .... X’10’		HLG1IICN	Initiated by internal condition (meaning internal to HSC processing, for example, operator switched method for local host so method is switched for all other possible hosts)
57	(39)	A-ADDR	1	HLG1FLG2	Flag byte 2
58	(3A)	A-ADDR	2	-RESERVED-	Reserved
This is the header information of the module creating the LOGREC rec					
60	(3C)	CHARACTER	1	HLG1SLSI	SLSID information area
60	(3C)	A-ADDR	2	-RESERVED-	Reserved
64	(40)	SIGNED-FWORD	4	-RESERVED-(16)	reserved space
128	(80)	LENGTH		HLG1L	Size of the SLSSHLG1 record

Cross Reference

Name	Len	Offset Value
HLG1FLG1	000001	38
HLG1FLG2	000001	39
HLG1HDR	000004	00
HLG1ICMD	-	80
HLG1ID	-	‘CVAL’
HLG1IICN	-	10
HLG1INTH	000008	20
HLG1IOTH	-	40
HLG1IWRT	-	20
HLG1KEY	000001	09
HLG1L	-	80
HLG1LCLH	000008	10
HLG1LEN	000004	04
HLG1NLP	000004	28
HLG1NMTH	000004	28
HLG1PLP	000004	28
HLG1PMTH	000004	28
HLG1RC	000004	0C
HLG1SLSI	000001	3C
HLG1SP	000001	08
HLG1SUBT	-	9201
HLG1SWTH	000008	18

Volume Report and Batch API Records

Volume Report and Batch API Mapping Macros

These SMP/E-distributed macros map both Volume Report and Batch API records.

Refer to “Batch API Records” on page 657 to see SLUVDDAT and SLUVPDAT, which are used only by the Batch API.

Table 93. Mapping Macros for Volume Report and Batch API Records

Macro	Description
SLUVADAT	Flat File ACS/LSM Information DSECT
SLUVCDAT	Flat File Static Configuration Data DSECT
SLUVHDAT	Flat File Host Information DSECT
SLUVIDAT	Flat File CDS Information DSECT
SLUVSDAT	Flat File ACS Station Address DSECT
SLUVVDAT	Flat File Volume Data DSECT

Volume Report and Batch API Record Formats

SLUVADAT

Table 94. SLUVADAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVADAT - FLAT FILE ACS/LSM INFORMATION DSECT FUNCTION: DESCRIBES THE ACS/LSM INFORMATION WHICH MAY BE GENERATED TO THE FLAT FILE BY THE VOLUME REPORT UTILITY					
0	(0)	STRUCTURE		SLUVADAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C'A')
1	(1)	HEXSTRING	1	ACSNUMBR	ACS NUMBER
2	(2)	BITSTRING	1	ACSSTAT	STATUS FLAG
		1... .... X'80'		ACSDUALL	1... .... - DUAL LMU
3	(3)	HEXSTRING	1	-RESERVED-	***** RESERVED *****
4	(4)	SIGNED-FWORD	4	ACSHCNMP	HOST CONNECT MAP (REPRESENTS EACH HOST CONNECTED FROM LEFT TO RIGHT IN HOST INDEX ORDER)
8	(8)	CHARACTER	2	ACSL1CLV	LMU 1 COMPATIBILITY LEVEL (FUTURE)W90
10	(A)	HEXSTRING	2	-RESERVED-	
12	(C)	CHARACTER	2	ACSL2CLV	LMU 2 COMPATIBILITY LEVEL (FUTURE)W90
14	(E)	HEXSTRING	2	-RESERVED-	
16	(10)	HEXSTRING	24	ACSLTYPS	LSM TYPES IN THIS ACS (1 BYTE FOR EACH TYPE - MAY BE MAPPED WITH EQUATES FOUND IN THE LSMMAP DSECT BELOW)
40	(28)	SIGNED-HWORD	2	ACSNMLSM	NUMBER OF LSMS IN THIS ACS
44	(2C)	LENGTH		ACSFXLEN	LENGTH OF FIXED PORTION
44	(2C)	OFFSET		ACSLSMBG	BEGINNING OF LSM ENTRIES
ACSLSMS CONSISTS OF 1 ENTRY PER EACH LSM GENNED TO THIS ACS, EACH OF WHICH MAY BE MAPPED BY THE FOLLOWING DSECT:					
0	(0)	STRUCTURE		LSMMAP	
0	(0)	HEXSTRING	1	LSMNUMBR	LSM NUMBER
1	(1)	BITSTRING	1	LSMSTAT	LSM STATUS BYTE
		1... .... X'80'		LSMAUTO	1... .... - ON: AUTOMATIC MODE OFF: MANUAL MODE

Table 94. SLUVADAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.1.. .... X’40’		LSMOFFPN	.1.. .... - OFFLINE PENDING
		.... 1... X’08’		LSMPTPRO	.... 1... - PTPS REORDERED
		1111 1111 X’FF’		LSMNONEX	1111 1111 - NON-EXISTENT LSM
2	(2)	BITSTRING	1	LSMVCAMF	FLAG BYTE
		1... .... X’80’		LSMAUDIP	1... .... - AUDIT IN PROCESS
		.1.. .... X’40’		LSMVCAMR	.1.. .... - VCAM REFORMATTED
3	(3)	CHARACTER	8	LSMHSTID	HOST ID IF LSM LOCKED
12	(C)	SIGNED-HWORD	2	LSMMAXCL	MAX CELL COUNT IN THIS LSM
14	(E)	BITSTRING	1	LSMHWTYP	LSM HARDWARE TYPE
		....1 X’01’		LSMCIM	....1 - CIMARRON (4400)
		.... ..11 X’03’		LSMWOLF	.... ..11 - WOLFCREEK (9360)
		.... .1.. X’04’		LSMPOWDR	.... .1.. - POWDERHORN (9310)
		.... .11. X’06’		LSMTWLF	.... .11. - 9740/TIMBERWOLF
15	(F)	HEXSTRING	1	LSMPNTOT	TOTAL NUMBER OF PANELS
16	(10)	HEXSTRING	1	LSMCAPNO	NUMBER OF CAPS
17	(11)	HEXSTRING	1	LSMPTPNO	MAX. # PTPS THIS LSM
18	(12)	HEXSTRING	1	LSMNPGCS	NUMBER OF PLAYGROUND CELLS
19	(13)	HEXSTRING	1	LSMLIPNO	LAST INSIDE PANEL NUMBER
20	(14)	HEXSTRING	1	LSMLOPNO	LAST OUTSIDE PANEL NUMBER
21	(15)	HEXSTRING	1	LSMNDPPN	NUMBER OF DRIVES PER PANEL
22	(16)	HEXSTRING	1	LSMNXPRT	NUMBER OF TRANSPORTS IN THIS LSM
23	(17)	HEXSTRING	1	LSMIDPNO	INSIDE DOOR PANEL NUMBER
24	(18)	HEXSTRING	1	LSMODPNO	OUTSIDE DOOR PANEL NUMBER
25	(19)	HEXSTRING	1	LSMLCUPN	LCU PANEL NUMBER
26	(1A)	HEXSTRING	1	LSMNROPN	NUMBER OF ROWS PER OUTSIDE PANEL
27	(1B)	HEXSTRING	1	LSMNCOPN	NUMBER OF COLUMNS PER OUTSIDE PANEL
28	(1C)	HEXSTRING	1	LSMNRIPN	NUMBER OF ROWS PER INSIDE PANEL
29	(1D)	HEXSTRING	1	LSMNCIPN	NUMBER OF COLUMES PER INSIDE PANEL

Table 94. SLUVADAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
30	(1E)	HEXSTRING	1	LSMDPNUM	NUMBER OF DRIVE PANELS
31	(1F)	HEXSTRING	1	LSMNADLS	NUMBER OF ADJACENT LSMS
32	(20)	HEXSTRING	4	LSMADLSM	ADJACENT LSM NUMBERS (1 BYTE/LSM)
36	(24)	SIGNED-HWORD	2	LSMFRECL	NUMBER OF FREE CELLS
38	(26)	SIGNED-HWORD	2	LSMCLNNM	NUMBER OF CLEANER CARTRIDGES
40	(28)	SIGNED-HWORD	2	LSMNCLSL	NUMBER OF CLEANER CARTRIDGES SELECTED
42	(2A)	CHARACTER	6	LSMLCLVL	LOW CLEANER VOLSER
48	(30)	CHARACTER	6	LSMHCLVL	HIGH CLEANER VOLSER
54	(36)	CHARACTER	6	LSMLCLSL	LAST CLEANER SELECTED
60	(3C)	SIGNED-HWORD	2	LSMSCRCT	NUMBER OF SCRATCHES IN THIS LSM
64	(40)	HEXSTRING	6	LSMPANLS(20)	LSM PANEL ARRAY
184	(B8)	LENGTH		LSMENTLN	LENGTH OF LSM ENTRY
LSMPANLS CONTAINS AN ENTRY FOR EACH PANEL IN AN LSM (MAXIMUM 20), AND MAY BE MAPPED WITH THE FOLLOWING DSECT:					
0	(0)	STRUCTURE		LSMPNLE	
0	(0)	BITSTRING	1	LSMPNLTY	PANEL TYPE
		....1 X’01’		LSMCCPNL	....1 - CIMARRON CELL PANEL
		.... ..1. X’02’		LSMCCL10	.... ..1. - CIMARRON PANEL 10
		.... ..11 X’03’		LSMCDPNL	.... ..11 - CIMARRON DOOR PANEL
		.... .1.. X’04’		LSMCPTMP	.... .1.. - CIM PTP RIGHT (USUALLY MSTR)
		.... .1.1 X’05’		LSMCSTMP	.... .1.1 - CIM PTP LEFT (SLAVE) PNL
		.... .11. X’06’		LSMCDRVP	.... .11. - CIMARRON DRIVE PANEL
		.... .111 X’07’		LSMCDR10	.... .111 - CIMARRON DRIVE PNL 10
		.... 1... X’08’		LSMCLCUP	.... 1... - CIMARRON LCU PANEL
		.... 1..1 X’09’		LSMCNOCL	.... 1..1 - CIM. NO CELLS ON PANEL
		...1 .... X’10’		LSMCINPN	...1 .... - CIMARRON INSIDE PANEL
		...1 ...1 X’11’		LSMCIN19	...1 ...1 - CIMARRON PANEL 19
		...1 ..1. X’12’		LSMCISDR	...1 ..1. - CIMARRON INSIDE DOOR

Table 94. SLUVADAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.1.. .... X’13’		LSMCWDRV	.... 11.1 - CIMARRON WIDE DRIVE PANEL
		.1.. .... X’14’		LSMCWD10	.... 111. - CIMARRON WIDE DRIVE PNL 10
		..1. .... X’20’		LSMWPNL0	..1. .... - WOLF PANEL 0
		..1. ...1 X’21’		LSMW2PSL	..1. ...1 - WC PANEL 2 WITH PTP (SLAVE)
		..1. ..1. X’22’		LSMWP0PT	..1. ..1. - WOLF PANEL 0 W/PTP
		..1. ..11 X’23’		LSMW1NOD	..1. ..11 - WC PANEL WITHOUT DRIVE
		..1. .1.. X’24’		LSMWP1DR	..1. .1.. - WOLF PANEL 1 W/DRIVE
		..1. .1.1 X’25’		LSMWPNL2	..1. .1.1 - WOLF PANEL 2
		..1. .11. X’26’		LSMWP2PT	..1. .11. - WOLF PANEL 2 W/PTP
		..1. .111 X’27’		LSMWPNL3	..1. .111 - WOLF PANEL 3
		..1. 1... X’28’		LSMWP3DR	..1. 1... - WOLF PANEL 3 W/DRIVE
		..1. 1..1 X’29’		LSMWP41C	..1. 1..1 - WOLF PANEL 4 W/1 CAP
		..11 .... X’30’		LSMWP42C	..11 .... - WOLF PANEL 4 W/2 CAPS
		..11 ...1 X’31’		LSMW3NOC	..11 ...1 - WC PANEL 3 WITHOUT CELLS
		..11 ..1. X’32’		LSMW3DNC	..11 ..1. - WC PANEL 3 WITH DRIVES, WITHOUT CELLS
		..11 ..11 X’33’		LSMW3WIN	..11 ..11 - WC PANEL 3 WITH WINDOW
		..11 .1.1 X’35’		LSMW4CNC	..11 .1.1 - WC PANEL 4, 1 CAP WITHOUT CELLS
		..11 .11. X’35’		LSMW4CCN	..11 .11. - WC PANEL 4, 2 CAPS WITHOUT CELLS
		.1.. .... X’40’		LSMTNOCL	.1.. .... - (9740) PANEL WITH NO CELLS
		.1.. ...1 X’41’		LSMT4CCL	.1.. ...1 - (9740) PANEL WITH 4 COLUMNS OF CELLS & NO PTP
		.1.. .1.1 X’45’		LSMTPCAP	.1.. .1.1 - (9740) PANEL WITH CAP
		.1.. .11. X’46’		LSMTPDRV	.1.. .11. - (9740) PANEL WITH DRIVES
		.1.. .111 X’47’		LSMTP0PT	.1.. .111 - (9740) PANEL 0 WITH PTP
		.1.. 1... X’48’		LSMTP2PT	.1.. 1... - (9740) PANEL 2 WITH PTP
1	(1)	HEXSTRING	2	LSMPCCNT	COUNT OF CELLS FOR THIS PANEL

Table 94. SLUVADAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
3	(3)	BITSTRING	1	LSMPFLG	FLAG BYTE FOR PANEL STATUS
		1... .... X'80'		LSMPFRZ	PANEL IS FROZEN
4	(4)	HEXSTRING	2	-RESERVED-	******* RESERVED ********
3	(03)	LENGTH		LSMPFRZL	LENGTH OF FREEZE PANEL BYTES
6	(06)	LENGTH		LSMPNLEL	LENGTH OF PANEL ENTRY

Cross Reference

Name	Len	Offset Value
ACSDUALL	-	80
ACSFXLEN	-	2C
ACSHCNMP	000004	04
ACSLSMBG	-	2C
ACSLTYPS	000024	10
ACSL1CLV	000002	08
ACSL2CLV	000002	0C
ACSNMLSM	000002	28
ACSNUMBR	000001	01
ACSSTAT	000001	02
LSMADLSM	000004	20
LSMAUDIP	-	80
LSMAUTO	-	80
LSMCAPNO	000001	10
LSMCCL10	-	02
LSMCCPNL	-	01
LSMCDPNL	-	03
LSMCDRVP	-	06
LSMCDR10	-	07
LSMCIM	-	01
LSMCINPN	-	10
LSMCIN19	-	11
LSMCISDR	-	12

Name	Len	Offset Value
LSMCLCUP	-	08
LSMCLNNM	000002	26
LSMCNOCL	-	09
LSMCPTMP	-	04
LSMCSTMP	-	05
LSMCWDRV	-	13
LSMCWD10	-	14
LSMDPNUM	000001	1E
LSMENTLN	-	B8
LSMFRECL	000002	24
LSMHCLVL	000006	30
LSMHSTID	000008	03
LSMHWTYP	000001	0E
LSMIDPNO	000001	17
LSMLCLSL	000006	36
LSMLCLVL	000006	2A
LSMLCUPN	000001	19
LSMLIPNO	000001	13
LSMLOPNO	000001	14
LSMMAXCL	000002	0C
LSMNADLS	000001	1F
LSMNCIPN	000001	1D
LSMNCLSL	000002	28
LSMNCOPN	000001	1B
LSMNDPPN	000001	15
LSMNONEX	-	FF
LSMNPGCS	000001	12
LSMNRIPN	000001	1C
LSMNROPN	000001	1A
LSMNUMBR	000001	00
LSMNXPRT	000001	16
LSMODPNO	000001	18

Name	Len	Offset Value
LSMOFFPN	-	40
LSMPANLS	000006	40
LSMPCCNT	000002	01
LSMPFLG	000001	03
LSMPFRZ	-	80
LSMPFRZL	-	03
LSMPNLEL	-	06
LSMPNLTY	000001	00
LSMPNTOT	000001	0F
LSMPOWDR	-	04
LSMPTPNO	000001	11
LSMPTPRO	-	08
LSMSCRCT	000002	3C
LSMSTAT	000001	01
LSMTN0CL	-	40
LSMT4CCL	-	41
LSMTPCAP	-	45
LSMTPDRV	-	46
LSMTP0PT	-	47
LSMTP2PT	-	48
LSMTWLF	-	06
LSMVCAMF	000001	02
LSMVCAMR	-	40
LSMWOLF	-	03
LSMWPNL0	-	20
LSMWPNL2	-	25
LSMWPNL3	-	27
LSMW2PSL	-	21
LSMW1NOD	-	23
LSMWP0PT	-	22
LSMWP1DR	-	24
LSMWP2PT	-	26

Name	Len	Offset Value
LSMWP3DR	-	28
LSMWP41C	-	29
LSMWP42C	-	30
LSMW3NOC	-	31
LSMW3DNC	-	32
LSMW3WIN	-	33
LSMW4CNC	-	35
LSMW4CCN	-	36

SLUVCDAT

Table 95. SLUVCDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVCDAT - FLAT FILE STATIC CONFIGURATION DATA DSECT FUNCTION: DESCRIBES THE STATIC CONFIGURATION INFORMATION WHICH MAY BE GENERATED TO THE FLAT FILE BY THE VOLUME REPORT UTILITY					
0	(0)	STRUCTURE		SLUVCDAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C'C')
1	(1)	CHARACTER	3	CFGCCPFX	CLEANING CARTRIDGE PREFIX
4	(4)	SIGNED-FWORD	4	CFGTOTXP	TOTAL TRANSPORTS ALL LSMS (FUTURE)
8	(8)	CHARACTER	2	-RESERVED-	***RESERVED***
10	(A)	CHARACTER	2	-RESERVED-	***RESERVED***
12	(C)	SIGNED-HWORD	2	CFGNMACS	TOTAL DEFINED ACSS
14	(E)	SIGNED-HWORD	2	CFGTOTLS	TOTAL DEFINED LSMS
16	(10)	SIGNED-HWORD	2	CFGTOTCA	TOTAL CAPS FOR ALL LSMS
18	(12)	SIGNED-HWORD	2	CFGTOTDR	TOTAL DRIVES IN ALL LSMS
20	(14)	HEXSTRING	1	CFGSMFTY	SMF RECORD TYPE
21	(15)	CHARACTER	1	CFGCMDPF	COMMAND PREFIX CHARACTER
22	(16)	BITSTRING	1	CFGDDISP	DELETE DISPOSITION
		1... .... X'80'		CFGDDSCR	1... .... - SCRATCH
		.1.. .... X'40'		CFGDDNSC	.1.. .... - NON-SCRATCH
23	(17)	BITSTRING	1	CFGFLAG1	FLAGS
		1... .... X'80'		CFGLIBFX	1... .... - LIB. IS FIXED LOC.
		.1.. .... X'40'		CFGDISVF	.1.. .... - DISMOUNT VOL. FLOAT
		..1. .... X'20'		CFGCHKEP	..1. .... - CHECK EJECT PASSWORD
24	(18)	BITSTRING	1	CFGLANG	LANGUAGE TYPE
		1... .... X'80'		CFGENGLS	1... .... - ENGLISH
		.1.. .... X'40'		CFGITALN	.1.. .... - ITALIAN
		..1. .... X'20'		CFGGERMN	..1. .... - GERMAN
		...1 .... X'10'		CFGFRNCH	...1 .... - FRENCH
25	(19)	BITSTRING	1	CFGSCRLB	SCRATCH LABEL TYPE
		.... X'00'		CFGSCRSL	.... - SL (STANDARD)

Table 95. SLUVCDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		....1 X’01’		CFGSCRAL	....1 - AL (ANSI)
		.... ..1. X’02’		CFGSCRNL	.... ..1. - NL (NONLABELLED)
		.... ..11 X’03’		CFGSCRNS	.... ..11 - NSL (NON-STANDARD)
		.... .1.. X’04’		CFGSCRBL	.... .1.. - BLP (BYPASS LBL PROC)
		.... .1.1 X’05’		CFGSCRNA	.... .1.1 - LBL TYPE NOT AVAIL.
26	(1A)	LENGTH		CFGLNGTH	LENGTH OF RECORD
256	(100)	CONST		CFGMXLSM	MAXIMUM NUMBER OF ACSS

Cross Reference

Name	Len	Offset Value
CFGCCPFX	000003	01
CFGCHKEP	-	20
CFGCMDPF	000001	15
CFGDDISP	000001	16
CFGDDNSC	-	40
CFGDDSCR	-	80
CFGDISVF	-	40
CFGENGLS	-	80
CFGFLAG1	000001	17
CFGFRNCH	-	10
CFGGERMN	-	20
CFGITALN	-	40
CFGLANG	000001	18
CFGLIBFX	-	80
CFGLNGTH	-	1A
CFGMXLSM	-	100
CFGNMACS	000002	0C
CFGSCRAL	-	01
CFGSCRBL	-	04
CFGSCRLB	000001	19
CFGSCRNA	-	05
CFGSCRNL	-	02
CFGSCRNS	-	03
CFGSCRSL	-	00
CFGSMFTY	000001	14
CFGTOTCA	000002	10
CFGTOTDR	000002	12
CFGTOTLS	000002	0E
CFGTOTXP	000004	04

SLUVHDAT

Note: Field HSTLIBEN contains only the first 16 ACS esoterics.

Table 96. SLUVHDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVHDAT - FLAT FILE HOST INFORMATION DSECT FUNCTION: DESCRIBES THE HOST INFORMATION WHICH MAY BE WRITTEN TO THE FLAT FILE BY THE VOLUME REPORT UTILITY					
0	(0)	STRUCTURE		SLUVHDAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C'H')
1	(1)	HEXSTRING	2	HSTNHOST	NUMBER OF HOSTS GENNED
3	(03)	LENGTH		HSTFXLEN	FIXED PORTION LENGTH
3	(03)	OFFSET		HSTHOSTS	BEGINNING OF HOST DESCRIPTORS SECTION
HSTHOSTS CONSISTS OF 1 ENTRY PER GENNED HOST, EACH OF WHICH MAY BE MAPPED BY THE FOLLOWING DSECT:					
0	(0)	STRUCTURE		HSTHDMAP	
0	(0)	CHARACTER	8	HSTHNAME	HOST NAME
8	(8)	HEXSTRING	1	HSTINDEX	HOST INDEX NUMBER
9	(9)	BITSTRING	1	HSTFLAG1	HOST FLAG 1 - CDS OPERATING FLGS
		1... .... X'80'		HSTPRIAC	1... .... - PRIMARY ACTIVE
		.1.. .... X'40'		HSTSHDAC	.1.. .... - SHADOW ACTIVE
		..1. .... X'20'		HSTHSTAC	..1. .... - HOST ACTIVE
		...1 .... X'10'		HSTSBYAC	...1 .... - STANDBY ACTIVE
10	(A)	BITSTRING	1	HSTFLAG2	HOST FLAG 2 - OTHER OPER. FLGS
		1... .... X'80'		HSTRCVRR	1... .... - 'RECOVER' Q RESPONSE TO SLS0739
		.1.. .... X'40'		HSTRCVRH	.1.. .... - RECOVER ISSUED FOR THIS HOST
		..1. .... X'20'		HSTDELAY	..1. .... - DELAY ISSUED FOR THIS HOST
		...1 .... X'10'		HSTDEAD	...1 .... - THIS HOST ASSUMED DEAD
11	(B)	BITSTRING	1	HSTFLAG3	HOST FLAG 3 - HSC SOFTWARE RLSE
		..1. .... X'20'		HSTR110	..1. .... - HSC 1.1.0
		1... .... X'80'		HSTR120	1... .... - HSC 1.2.0

Table 96. SLUVHDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.1.. .... X’40’		HSTR200	.1.. .... - HSC 2.0.0
		...1 .... X’10’		HSTR201	...1 .... - HSC 2.0.1
		.... 1... X’08’		HSTR210	.... 1... - HSC 2.1.0
		.... .1.. X’04’		HSTR400	.... .1.. - HSC 4.0.0
		.... ..1. X’02’		HSTR410	.... ..1. - HSC 4.1.0
12	(C)	CHARACTER	8	HSTNONEN	NON-LIBRARY ESOTERIC NAMES
20	(14)	CHARACTER	8	HSTLIBEN(16)	LIBRARY ESOTERIC NAMES (BY ACS)
148	(94)	LENGTH		HSTHOSLN	LENGTH OF HOST ENTRY

Cross Reference

Name	Len	Offset Value
HSTDEAD	-	10
HSTDELAY	-	20
HSTFLAG1	000001	09
HSTFLAG2	000001	0A
HSTFLAG3	000001	0B
HSTFXLEN	-	03
HSTHNAME	000008	00
HSTHOSLN	-	94
HSTHOSTS	-	03
HSTHSTAC	-	20
HSTINDEX	000001	08
HSTLIBEN	000008	14
HSTNHOST	000002	01
HSTNONEN	000008	0C
HSTPRIAC	-	80
HSTRCVRH	-	40
HSTRCVRR	-	80
HSTR110	-	20
HSTR120	-	80
HSTR200	-	40
HSTR201	-	10
HSTR210	-	08
HSTR400	-	04
HSTR410	-	02
HSTSBYAC	-	10
HSTSHDAC	-	40

SLUVIDAT

Table 97. SLUVIDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVIDAT - FLAT FILE CDS INFORMATION DSECT FUNCTION: DESCRIBES THE CDS INFORMATION WHICH MAY BE GENERATED TO THE FLAT FILE BY THE VOLUME REPORT UTILITY.					
0	(0)	STRUCTURE		SLUVIDAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C'I')
1	(1)	BITSTRING	1	CDSRCVRY	CDS RECOVERY OPTIONS
		1... .... X'80'		CDSSECND	1... .... - SECONDARY
		.1.. .... X'40'		CDSSTDBY	.1.. .... - STANDBY
		..1. .... X'20'		CDSJOURN	..1. .... - JOURNAL
		111. .... X'E0'		CDSALL	111. .... - ALL
		1.1. .... X'A0'		CDSBOTH	1.1. .... - JOURNAL & SECONDARY
		.... X'00'		CDSNONE	.... - NONE
4	(4)	SIGNED-FWORD	4	CDSRSVD1	*** RESERVED ***
8	(8)	CHARACTER	8	CDSENQNM	CDS MAJOR ENQUEUE NAME
16	(10)	CHARACTER	8	CDSLEVEL	CDS LEVEL - VERSION/RELEASE/MOD LEVEL ('VV.RR.MM')
24	(18)	CHARACTER	8	CDSCDATE	DATE CDS CREATED (MM/DD/YY) NOTE: SINGLE DIGIT MONTH WILL HAVE A BLANK AS THE FIRST CHARACTER, E.G. ' 3/16/92'
32	(20)	CHARACTER	8	CDSCTIME	TIME CDS CREATED (HH:MM:SS)
40	(28)	CHARACTER	8	CDSBTIME	TIME LAST BACKED UP (HH:MM:SS)
48	(30)	CHARACTER	8	CDSBDATE	DATE LAST BACKED UP (MM/DD/YY)
56	(38)	CHARACTER	8	CDSRTIME	TIME WHEN RESTORED (HH:MM:SS)
64	(40)	CHARACTER	8	CDSRDATE	DATE WHEN RESTORED (MM/DD/YY)
72	(48)	CHARACTER	240	CDSNAMES	CDS DATASET INFORMATION
312	(138)	LENGTH		CDSLNGTH	LENGTH OF RECORD
CDSNAMES CONTAINS ONE ENTRY PER PRIMARY, SHADOW, AND STANDBY CDSS. EACH ENTRY MAY BE MAPPED BY THE FOLLOWING DSECT:					
0	(0)	STRUCTURE		CDSINFO	FOR CDSNAMES ENTRIES

Table 97. SLUVIDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
0	(0)	CHARACTER	44	CDSDSN	CDS DATASET NAME
44	(2C)	CHARACTER	6	CDSVOL	CDS VOLSER
50	(32)	HEXSTRING	2	-RESERVED-	*** RESERVED ***
52	(34)	CHARACTER	8	CDSUNIT	CDS UNIT NAME
60	(3C)	HEXSTRING	2	CDSSWCNT	CDS SWITCH COUNT
62	(3E)	HEXSTRING	2	-RESERVED-	*** RESERVED ***
64	(40)	HEXSTRING	4	-RESERVED-(4)	*** RESERVED ***
80	(50)	LENGTH		CDSINFOL	LENGTH OF CDS ENTRY

Cross Reference

Name	Len	Offset Value
CDSALL	-	E0
CDSBDATE	000008	30
CDSBOTH	-	A0
CDSBTIME	000008	28
CDSCDATE	000008	18
CDSCTIME	000008	20
CDSDSN	000044	00
CDSENQNM	000008	08
CDSINFOL	-	50
CDSJOURN	-	20
CDSLEVEL	000008	10
CDSLNGTH	-	138
CDSNAMES	000240	48
CDSNONE	-	00
CDSRCVRY	000001	01
CDSRDATE	000008	40
CDSRSVD1	000004	04
CDSRTIME	000008	38
CDSSECND	-	80
CDSSTDBY	-	40
CDSSWCNT	000002	3C
CDSUNIT	000008	34
CDSVOL	000006	2C

SLUVSDAT

Table 98. SLUVSDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVSDAT - FLAT FILE ACS STATION ADDRESS DSECT FUNCTION: MAP THE STATION ADDRESS INFORMATION BY HOST WITHIN ACS WHICH MAY BE WRITTEN TO THE FLAT FILE BY THE VOLUME REPORT UTILITY.					
0	(0)	STRUCTURE		SLUVSDAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C'H')
1	(1)	BITSTRING	1	STNACS	ACS NUMBER
2	(02)	LENGTH		STNFXLEN	LENGTH OF FIXED SECTION
2	(02)	OFFSET		STNSTNS	START OF ACS HOST/STATION ARRAY STNSTNS CONSISTS OF 1 ENTRY PER GENNED HOST, EACH OF WHICH MAY BE MAPPD BY THE FOLLOWING DSECT:
0	(0)	STRUCTURE		STNENTRY	
0	(0)	HEXSTRING	1	STNHINDX	HOST INDEX NUMBER
1	(1)	HEXSTRING	3	STNADDRS(16)	STATION ADDRESS ARRAY
49	(31)	LENGTH		STNENTLN	LENGTH OF HOST/STATION ENTRY STNADDRS CONSISTS OF 1 ENTRY FOR EACH OF 16 POSSIBLE STATION AD- DRESSES WHICH COULD BE ASSIGNED TO A GIVEN ACS:
0	(0)	STRUCTURE		STNADENT	
0	(0)	BITSTRING	1	STNFLAG	STATION FLAGS
		1... .... X'80'		STNONLIN	1... .... - STATION ONLINE
1	(1)	HEXSTRING	2	STNCUA	STATION CUA
3	(03)	LENGTH		STNADENL	LENGTH OF STATION ADDR ENTRY

Cross Reference

Name	Len	Offset Value
STNACS	000001	01
STNADDRS	000003	01
STNADENL	-	03
STNCUA	000002	01
STNENTLN	-	31
STNFLAG	000001	00
STNFXLEN	-	02
STNHINDX	000001	00
STNONLIN	-	80
STNSTNS	-	02

SLUVVDAT

To determine the HSC release that produced a volume report flat file, use the CDSDATA parameter to create flat file records with non-volume information.

Interrogate the CDSLEVEL field in the SLUVIDAT (CDS Information) record. A CDS at level 02.00.00 is reported by an HSC 2.0 or 2.0.1 VOLRpt. CDS level 02.01.00 is reported by an HSC 2.1, 4.0, 4.1, 5.0, or 5.1 VOLRpt.

The CDSDATA records are appended to the VOLDATA records. To interrogate the CDS level before processing the volume records, extract the CDSDATA and VOLDATA in different steps to create separate files.

Note:

1. The Batch API request formats the date fields VOLDTINS, VOLDTSEL, and VOLTMNT as ‘‘*yyyymmdd*.’’
2. The Batch API request does not report volume subpool labels or IDs. Fields VOLSPLBL and VOLSPID are blank-filled.

Table 99. SLUVVDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVVDAT - FLAT FILE VOLUME DATA DSECT FUNCTION: DESCRIBES THE VOLUME DATA WHICH MAY BE GENERATED TO THE FLAT FILE BY THE VOLUME REPORT UTILITY					
0	(0)	STRUCTURE		SLUVVDAT	
0	(0)	CHARACTER	1	-RESERVED-	RECORD TYPE (C’V’)
1	(1)	BITSTRING	1	VOLMEDIA	VOLUME MEDIA TYPE
‘1’	(F1)	CHAR CONST		VOLMEDST	STANDARD MEDIA
‘1’	(F1)	CHAR CONST		VOLMEDT1	(X’F1’) STANDARD MEDIA
‘A’	(C1)	CHAR CONST		VOLMEDTA	(X’C1’) HELICAL MEDIA “A”
‘B’	(C2)	CHAR CONST		VOLMEDTB	(X’C2’) HELICAL MEDIA “B”
‘C’	(C3)	CHAR CONST		VOLMEDTC	(X’C3’) HELICAL MEDIA “C”
‘D’	(C4)	CHAR CONST		VOLMEDTD	(X’C4’) HELICAL CLEANING CARTRIDGE
‘E’	(C5)	CHAR CONST		VOLMEDTE	(X’C5’) ECART MEDIA
‘J’	(D1)	CHAR CONST		VOLMEDTJ	(X’D1’) JCART MEDIA
‘P’	(D7)	CHAR CONST		VOLMEDTP	(X’D7’) STK2P MEDIA
‘R’	(D9)	CHAR CONST		VOLMEDTR	(X’D9’) STK1R MEDIA
‘U’	(E4)	CHAR CONST		VOLMEDTU	(X’E4’) STK1U CLEANING CARTRIDGE “U”

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
‘W’	(E7)	CHAR CONST		VOLMEDTW	(X’E7’) STK2W CLEANING CARTRIDGE “W”
‘Z’	(E9)	CHAR CONST		VOLMEDTZ	(X’E9’) ZCART MEDIA
2	(2)	BITSTRING	1	VOLFLAG1	VOLUME FLAG BYTE 1
		1... .... X’80’		VOLSCR	1... .... - VOLUME IS SCRATCH
		.1.. .... X’40’		VOLSEL	.1.. .... - VOLUME IS SELECTED
		..1. .... X’20’		VOLEXLBL	..1. .... - VOLUME HAS EXTERNAL LABEL
		...1 .... X’10’		VOLEXRD	...1 .... - EXTERNAL LABEL IS OCR READABLE
		.... 1... X’08’		VOLINUSE	.... 1... - THIS RECORD IS IN USE
		....1 X’01’		VOLNILIB	....1 - VOLUME NOT IN LIB.
3	(3)	HEXSTRING	1	VOLOHID	OWNING HOST ID
4	(4)	SIGNED-FWORD	4	VOLSELCT	VOLUME SELECTION COUNT
8	(8)	CHARACTER	6	VOLSER	VOLUME SERIAL NUMBER, LEFT JUSTIFIED AND BLANK FILLED.
14	(E)	CHARACTER	12	VOLHMLOC	HOME LOCATION
14	(E)	CHARACTER	2	VOLHMACS	READABLE HEXADECIMAL ACS NUMBER WHERE THE VOLUME RESIDES.
16	(10)	CHARACTER	1	VOLHMLSM	READABLE HEXADECIMAL LSM NUMBER IN VOLHMACS WHERE THE VOLUME RESIDES
17	(11)	CHARACTER	1	-RESERVED-	
18	(12)	CHARACTER	2	VOLHMPNL	DECIMAL NUMBER OF THE PANEL WITHIN VOLHMLSM WHERE THE VOLUME RESIDES.
20	(14)	CHARACTER	1	-RESERVED-	
21	(15)	CHARACTER	2	VOLHMROW	DECIMAL NUMBER OF THE ROW WITHIN VOLHMPNL WHERE THE VOLUME RESIDES.
23	(17)	CHARACTER	1	-RESERVED-	
24	(18)	CHARACTER	2	VOLHMCEL	DECIMAL NUMBER OF THE COLUMN WITHIN VOLHMROW WHERE THE VOLUME RESIDES.
26	(1A)	CHARACTER	3	VOLSPLBL	VOLUME SUBPOOL LABEL TYPE

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
'SL'	(E2D3)	CHAR CONST		VOLSPSL	STANDARD LABEL
'NL'	(D5D3)	CHAR CONST		VOLSPNL	NON-LABELLED
'AL'	(C1D3)	CHAR CONST		VOLSPAL	ANSI LABEL
'NSL'	(D5E2D3)	CHAR CONST		VOLSPNSL	NON-STANDARD LABEL
' '	(404040)	CHAR CONST		VOLSPNON	' SUBPOOL INFO NOT REQUESTED OR NOT AVAILABLE
29	(1D)	CHARACTER	13	VOLSPID	VOLUME SUBPOOL ID (13-BYTE NAME OF POOL IF USING SCRPOOL STATEMENTS; 3- BYTE SUBPOOL INDEX NUMBER IF USING SLSUX03)
42	(2A)	SIGNED-HWORD	2	VOLMXCLN	VOLUME MAXCLEAN VALUE
44	(2C)	SIGNED-FWORD	4	-RESERVED-(3)	* RESERVED *
THE FOLLOWING FIELDS: VOLTDINS, VOLTDSEL, VOLTDMNT CONTAIN THE HIGH-ORDER FULLWORD OF THE CPU TOD CLOCK VALUE WHEN THE VOLUME WAS (RESPECTIVELY) ENTERED INTO THE LIBRARY, LAST SELECTED, AND LAST MOUNTED. FOR EACH OF THESE FIELDS, THE LOW-ORDER BIT (BIT 31) HAS A VALUE EQUAL TO 2-TO-THE-20TH-POWER MICROSECONDS, OR 1.048576 SECONDS SINCE MIDNIGHT, JANUARY 1, 1900. THIS TIME IS UNCORRECTED FOR ANY LOCAL TIME ZONE OFFSET FROM GMT. THIS IS THE SAME FORMAT WHICH IS USED BY THE HSC TO SAVE THIS INFORMATION. THE VALUES IN FIELDS: VOLDTINS, VOLTMINS, VOLDTSEL, VOLTMSEL, VOLDTMNT, VOLTMMNT HAVE BEEN CORRECTED FOR LOCAL TIME OFFSET FROM GMT. THESE TIMES (AND POSSIBLY THE DATES) MAY THEREFORE BE DIFFERENT FROM VALUES CALCULATED USING THE TOD CONTENTS IN VOLTDINS, VOLTDSEL, AND VOLTDMNT.					
56	(38)	SIGNED-FWORD	4	VOLTDINS	TOD CLOCK VALUE WHEN VOLUME WAS INSERTED INTO THE LIBRARY
60	(3C)	SIGNED-FWORD	4	VOLTDSEL	TOD CLOCK VALUE WHEN VOLUME WAS LAST SELECTED
64	(40)	SIGNED-FWORD	4	VOLTDMNT	TOD CLOCK VALUE WHEN VOLUME WAS LAST MOUNTEDD
68	(44)	CHARACTER	8	VOLDTINS	DATE VOLUME INSERTED INTO THE LIBRARY FORMAT DETERMINED BY VOLD4YR
76	(4C)	CHARACTER	8	VOLTMINS	TIME VOLUME INSERTED INTO THE LIBRARY (HH:MM:SS)

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
84	(54)	CHARACTER	8	VOLDTSEL	DATE VOLUME LAST SELECTED FORMAT DETERMINED BY VOLD4YR
92	(5C)	CHARACTER	8	VOLTMSEL	TIME VOLUME LAST SELECTED (HH:MM::SS)
100	(64)	CHARACTER	8	VOLDTMNT	DATE VOLUME LAST MOUNTED FORMAT DETERMINED BY VOLD4YR
108	(6C)	CHARACTER	8	VOLTMMNT	TIME VOLUME LAST MOUNTED (HH:MM:SS)
116	(74)	BITSTRING	1	VOLFLAG3	VOLUME FLAG BYTE 3
		1... .... X'80'		VOLD4YR	INDICATES DATE FORMAT ON - YYYYMMDD FORMAT OFF - MM/DD/YY FORMAT
		..1. .... X'20'		VOLMNDSM	AFFECTS VOLDTMNT/VOLTMMNT FLDS ON - TIME/DATE LAST MOUNTED@02 OFF - TIME/DATE DISMOUNTED
		.... ..1. X'02'		VOLNOUSE	VOLUME NOT USABLE
117	(75)	HEXSTRING	3	-RESERVED-	RESERVED
120	(78)	LENGTH		VOLLNGTH	
THE FOLLOWING SECTION IS FILLED IN ONLY IF THE VOLUME WAS FOUND TO BE EITHER IN TRANSIT OR ERRANT.					
120	(78)	BITSTRING	1	VOLFLAG2	VOLUME FLAG BYTE 2
********** FOR IN-TRANSIT VOLUMES: **********					
		1... .... X'80'		VOLITUSE	1... .... - RECORD IN USE
		.1.. .... X'40'		VOLITACQ	.1.. .... - RECORD HAS BEEN ACQUIRED
********** FOR ERRANT VOLUMES: **********					
		1... .... X'80'		VOLERACT	1... .... - RECORD IS ACTIVE
		.1.. .... X'40'		VOLERLIL	.1.. .... - LOST IN LSM POSSIBLE
		..1. .... X'20'		VOLERSSC	..1. .... - SOURCE LOC. SCANNED
		...1 .... X'10'		VOLERDSC	...1 .... - DEST. LOC. SCANNED
		.... 1... X'08'		VOLERLSC	.... 1... - LOST IN LSM SCANNED

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
		.... .1.. X’04’		VOLERHSC	.... .1.. - HOME LSM SCANNED
121	(79)	BITSTRING	1	VOLITTAG	IN-TRANSIT TAG TYPE
		.... X’00’		VOLITOTH	.... - OTHER (OR NOT IN TRAN)
		....1 X’01’		VOLITCAP	....1 - CAP
		.... ..1. X’02’		VOLITCEL	.... ..1. - CELL
		.... .1.. X’04’		VOLITLSM	.... .1.. - LSM ID
		.... 1... X’08’		VOLITVOL	.... 1... - VOLUME
		.... 1.1. X’0A’		VOLITLOC	.... 1.1. - LIBRARY LOCATION (VOLITVOL+VOLITCEL)
122	(7A)	BITSTRING	1	VOLITRTN	RECOVERY ROUTINE FLAG (IN TRAN. ON)
		.... .1.. X’04’		VOLRRAUS	.... .1.. - AUDIT START
		.... 1... X’08’		VOLRRALD	.... 1... - AUDIT LOGICAL DELETE
		...1 .... X’10’		VOLRRMNT	...1 .... - MOUNT
		...1 .1.. X’14’		VOLRRDEJ	...1 .1.. - DISMOUNT EJECT
		...1 1... X’18’		VOLRRCLU	...1 1... - CLEANER UPDATE
		...1 11.. X’1C’		VOLRRCLS	...1 11.. - CLEANER SELECT
		..1. .... X’20’		VOLRRSCA	..1. .... - SCRATCH ADD
		..1. .1.. X’24’		VOLRRSCD	..1. .1.. - SCRATCH DELETE
		..1. 1... X’28’		VOLRRVDL	..1. 1... - VOLUME DELETE
		..1. 11.. X’2C’		VOLRRERR	..1. 11.. - ERRANT PROCESSING
		..11 .... X’30’		VOLRRCAP	..11 .... - CAP
		..11 .1.. X’34’		VOLRRCNL	..11 .1.. - CONFIG LSM
		..11 1... X’38’		VOLRRSUA	..11 1... - SCRATCH UPDATE ADD
		..11 11.. X’3C’		VOLRRSLV	..11 11.. - SELECTED VOLUME
		.1.. .... X’40’		VOLRRSRE	.1.. .... - SCRATCH REDISTRIBUTION
		.1.. .1.. X’44’		VOLRRMCT	.1.. .1.. - MOVE CARTRIDGE
123	(7B)	HEXSTRING	3	-RESERVED-	* RESERVED
126	(7E)	HEXSTRING	6	VOLSRCE	SOURCE LOCATION
132	(84)	HEXSTRING	6	VOLDEST	DESTINATION LOCATION
138	(8A)	CHARACTER	2	VOLLILSM	“LOST IN” LSM

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
140	(8C)	CHARACTER	8	VOLRECC	RECTECH CHAR FORM
148	(94)	CHARACTER	8	VOLMEDC	MEDIA CHAR FORM
156	(9C)	LENGTH		VOLIELEN	LENGTH OF MAIN VOLUME SECTION PLUS IN-TRANSIT/ERRANT INFORMATION
THE VOLSRCE AND VOLDEST FIELDS MAY BE MAPPED BY THE FOLLOWING DSECT.					
0	(0)	STRUCTURE		VOLLOC	
0	(0)	CHARACTER	1	VOLSTYPE	SOURCE TYPE
‘1’	(F1)	CHAR CONST		VOLSCELL	CELL
‘2’	(F2)	CHAR CONST		VOLSCAP	CAP
‘3’	(F3)	CHAR CONST		VOLSDRIV	DRIVE
‘4’	(F4)	CHAR CONST		VOLSOTHR	OTHER
1	(1)	HEXSTRING	1	VOLSACSN	ACS NUMBER
2	(2)	HEXSTRING	1	VOLSLSMN	LSM NUMBER
********** FOR “CELL” TYPES **********					
3	(3)	HEXSTRING	1	VOLSPNLN	PANEL NUMBER
4	(4)	HEXSTRING	1	VOLSROWN	ROW NUMBER
5	(5)	HEXSTRING	1	VOLSCOLN	COLUMN (CELL) NUMBER
********** FOR “CAP” TYPES **********					
3	(3)	HEXSTRING	2	VOLSCLOC	CAP LOCATION
5	(5)	HEXSTRING	1	-RESERVED-	RESERVED
********** FOR “DRIVE” TYPES **********					
3	(3)	HEXSTRING	1	VOLSDPNL	DRIVE PANEL NUMBER
4	(4)	HEXSTRING	1	VOLSDNUM	DRIVE NUMBER
5	(5)	HEXSTRING	1	-RESERVED-	RESERVED
3	(3)	HEXSTRING	1	VOLSDIDX	DRIVE INDEX NUMBER
4	(4)	HEXSTRING	1	-RESERVED-	RESERVED
5	(5)	BITSTRING	1	VOLSDFLG	DRIVE FORMAT FLAG

Table 99. SLUVVDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
6	(6)	1111 1111 X'FF' HEXSTRING	2	VOLSDFIX -RESERVED-	DRIVE IS DRIVE INDEX FORMAT RESERVED
FOR "OTHER" TYPES, THIS RECORD IS TREATED AS IF THE VOLUME WERE ERRANT.					

Cross Reference

Name	Len	Offset Value
VOLDEST	000006	84
VOLDTINS	000008	44
VOLDTMNT	000008	64
VOLDTSEL	000008	54
VOLD4YR	-	80
VOLERACT	-	80
VOLERDSC	-	10
VOLERHSC	-	04
VOLERLIL	-	40
VOLERLSC	-	08 V
VOLERSSC	-	20
VOLEXLBL	-	20
VOLEXRD	-	10
VOLFLAG1	000001	02
VOLFLAG2	000001	78
VOLFLAG3	000001	74
VOLHMACS	000002	0E
VOLHMCEL	000002	18
VOLHMLOC	000012	0E
VOLHMLSM	000001	10
VOLHMPNL	000002	12
VOLHMROW	000002	15
VOLIELEN	-	9C
VOLINUSE	-	08
VOLITACQ	-	40
VOLITCAP	-	01
VOLITCEL	-	02
VOLITLOC	-	0A
VOLITLSM	-	04
VOLITOTH	-	00
VOLITRTN	000001	7A

Name	Len	Offset Value
VOLITTAG	000001	79
VOLITUSE	-	80
VOLITVOL	-	08
VOLLILSM	000002	8A
VOLLNGTH	-	78
VOLMEDC	000008	94
VOLMEDIA	000001	01
VOLMEDST	-	‘CVAL’
VOLMEDTA	-	‘CVAL’
VOLMEDTB	-	‘CVAL’
VOLMEDTC	-	‘CVAL’
VOLMEDTD	-	‘CVAL’
VOLMEDTE	-	‘CVAL’
VOLMEDTJ	-	‘CVAL’
VOLMEDTP	-	‘CVAL’
VOLMEDTR	-	‘CVAL’
VOLMEDTU	-	‘CVAL’
VOLMEDTW	-	‘CVAL’
VOLMEDTZ	-	‘CVAL’
VOLMEDT1	-	‘CVAL’
VOLMNDSM	-	20
VOLMXCLN	000002	2A
VOLNILIB	-	01
VOLNOUSE	-	02
VOLOHID	000001	03
VOLRECC	000008	8C
VOLRRALD	-	08
VOLRRAUS	-	04
VOLRRCAP	-	30
VOLRRCLS	-	1C
VOLRRCLU	-	18
VOLRRCNL	-	34

Name	Len	Offset Value
VOLRRDEJ	-	14
VOLRRERR	-	2C
VOLRRMCT	-	44
VOLRRMNT	-	10
VOLRRSCA	-	20
VOLRRSCD	-	24
VOLRRSLV	-	3C
VOLRRSRE	-	40
VOLRRSUA	-	38
VOLRRVDL	-	28
VOLSACSN	000001	01
VOLSCAP	-	‘CVAL’
VOLSCELL	-	‘CVAL’
VOLSCLOC	000002	03
VOLSCOLN	000001	05
VOLSCR	-	80
VOLSDFIX	-	FF
VOLSDFLG	000001	05
VOLSDIDS	000001	03
VOLSDNUM	000001	04
VOLSDPNL	000001	03
VOLSDRIV	-	‘CVAL’
VOLSEL	-	40
VOLSELCT	000004	04
VOLSER	000006	08
VOLSLSMN	000001	02
VOLSOTHR	-	‘CVAL’
VOLSPAL	-	‘CVAL’
VOLSPID	000013	1D
VOLSPLBL	000003	1A
VOLSPNL	-	‘CVAL’
VOLSPNLN	000001	03

Name	Len	Offset Value
VOLSPNON	-	‘CVAL’
VOLSPNSL	-	‘CVAL’
VOLSPSL	-	‘CVAL’
VOLSRCE	000006	7E
VOLSROWN	000001	04
VOLSTYPE	000001	00
VOLTDINS	000004	38
VOLTDMNT	000004	40
VOLTDSEL	000004	3C
VOLTMINS	000008	4C
VOLTMMNT	000008	6C
VOLTMSEL	000008	5C

Batch API Records

Batch API Mapping Macros

These SMP/E-distributed macros map only Batch API records. Refer to “Volume Report and Batch API Records” on page 626 to see the records that map both Volume Report and Batch API.

Table 100. Mapping macros for Batch API Records

Macro	Description
SLUVDDAT	Batch API Drive Information DSECT
SLUVPDAT	Batch API CAP Information DSECT

Batch API Record Formats

SLUVDDAT

This record is produced only by the Batch API QCDS request. Refer to Appendix E, “Batch Application Program Interface (API)” on page 819 for more information.

Table 101. SLUVDDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVDDAT - QCDS DRIVE INFORMATION DSECT FUNCTION: MAPS THE DRIVE DATA PRODUCED BY THE QCDS READ REQUEST FOR THE CDS DRV RECORD AREA.					
0	(0)	STRUCTURE		SLUVDDAT	
0	(0)	CHARACTER	1	UVDRT	RECORD TYPE
1	(1)	BITSTRING	1	UVDFLAG1	STATUS FLAG:
		1... .... X’80’		UVDDCLN	DRIVE NEEDS CLEANING
2	(2)	BITSTRING	1	UVDFLAG2	MOUNT ERROR FLAG:
		1... .... X’80’		UVDBMNT	MOUNT ERROR
		.1.. .... X’40’		UVDOPRQ	OPER INTERV REQD BY UX01
		..1. .... X’20’		UVDV5310	IAT5310 ERROR MESSAGE ISSUED
3	(3)	BITSTRING	1	UVDFLAG3	SCRATCH MOUNT FLAG:
		1... .... X’80’		UVDSCR	SCRATCH MOUNT
		.1.. .... X’40’		UVDNSCR	NON-SCRATCH MOUNT
		..1. .... X’20’		UVD501E	IEC501E MSG PREVIOUSLY PROCESSED
		...1 .... X’10’		UVDRACF	RACF READ OPTION WAS SET
		.... 1... X’08’		UVDTMS7	MESSAGE IECTMS7 BEING PROCESSED
4	(4)	CHARACTER	2	UVDTYPE	DRIVE TYPE FROM LMU:
‘64’	(F6F4)	CHAR CONST		UVD4480	4480 DRIVE
‘32’	(F3F2)	CHAR CONST		UVDTIMB	TIMBERLINE DRIVE
‘33’	(F3F3)	CHAR CONST		UVD9491	9490EE DRIVE
‘16’	(F1F6)	CHAR CONST		UVDREDW	REDWOOD
‘08’	(F0F8)	CHAR CONST		UVDSILV	SILVERTON
‘06’	(F0F6)	CHAR CONST		UVD3590	T9940A ACTING AS A 3590
‘05’	(F0F5)	CHAR CONST		UVD3490E	T9940A ACTING AS A 3490E

Table 101. SLUVDDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
‘01’	(F0F1)	CHAR CONST		UVD984B4	T9840B ACTING AS A 3490E
‘07’	(F0F7)	CHAR CONST		UVD984B5	T9840B ACTING AS A 3590
‘09’	(F0F9)	CHAR CONST		UVD994B4	T9940B ACTING AS A 3490E
‘10’	(F1F0)	CHAR CONST		UVD994B5	T9940B ACTING AS A 3590
‘02’	(F0F2)	CHAR CONST		UVD9840	9840 DRIVE
‘03’	(F0F3)	CHAR CONST		UVD98405	9840 DRIVE ACTING AS A 3590
65535	(FFFF)	CONST		UVDNOLMU	LMU DRIVE TYPE NOT YET SET
6	(6)	AREA	4	UVDDRVID	DRIVEID:
6	(6)	HEXSTRING	1	UVDIDACS	DRIVEID ACS
7	(7)	HEXSTRING	1	UVDIDLSM	DRIVEID LSM
8	(8)	HEXSTRING	1	UVDIDPNL	DRIVEID PANEL
9	(9)	HEXSTRING	1	UVDIDNUM	DRIVEID NUMBER WITHIN PANEL
12	(C)	SIGNED-FWORD	4	UVDDEFIN	DRIVE IS DEFINED TO A HOST - BIT-MAP REPRESENTING EACH HOST THAT HAS THIS DRIVE DEFINED, READING FROM LEFT TO RIGHT IN HOST INDEX ORDER
16	(10)	SIGNED-HWORD	2	UVDNUNIT	NUMBER OF DRIVE UNITS (FOR UVDUNITN)
18	(12)	SIGNED-HWORD	2	UVDLUNIT	LENGTH OF DRIVE UNITS (FOR UVDUNITN)
20	(14)	SIGNED-HWORD	2	UVDUNITN(16)	MVS UNIT NUMBERS INDEXED BY HOST.
52	(34)	LENGTH		UVDLEN	RECORD LENGTH

Cross Reference

Name	Len	Offset Value
UVDBMNT	-	80
UVDDCLN	-	80
UVDDEFIN	000004	0C
UVDDRVID	000004	06
UVDFLAG1	000001	01

Name	Len	Offset Value
UVDFLAG2	000001	02
UVDFLAG3	000001	03
UVDIDACS	000001	06
UVDIDLSM	000001	07
UVDIDNUM	000001	09
UVDIDPNL	000001	08
UVDLEN	-	34
UVDLUNIT	000002	12
UVDNOLMU	-	FFFF
UVDNSCR	-	40
UVDNUNIT	000002	10
UVDOPRQ	-	40
UVDRACF	-	10
UVDREDW	-	‘CVAL’
UVDRT	000001	00
UVDSCR	-	80
UVDSILV	-	‘CVAL’
UVDTIMB	-	‘CVAL’
UVDTMS7	-	08
UVDTYPE	000002	04
UVDUNITN	000002	14
UVDV5310	-	20
UVD3490E	-	‘CVAL’
UVD3590	-	‘CVAL’
UVD4480	-	‘CVAL’
UVD501E	-	20
UVD9491	-	‘CVAL’
UVD984B4	-	‘CVAL’
UVD984B5	-	‘CVAL’
UVD9840	-	‘CVAL’
UVD98405	-	‘CVAL’
UVD994B4	-	‘CVAL’

Name	Len	Offset Value
UVD994B5	-	‘CVAL’

SLUVPDAT

This record is produced only by the Batch API QCDS request. Refer to Appendix E, “Batch Application Program Interface (API)” on page 819 for more information.

Table 102. SLUVPDAT Record Format

Dec	Hex	Type	Length	Label	Description
SLUVPDAT - QCDS CAP INFORMATION DSECT FUNCTION: MAPS THE CAP DATA PRODUCED BY THE QCDS READ REQUEST FOR THE CDS CAP RECORD AREA.					
0	(0)	STRUCTURE		SLUVPDAT	
0	(0)	CHARACTER	1	UVPRT	RECORD TYPE
1	(1)	BITSTRING	1	UVPFLAG1	CAP STATUS:
		1... .... X’80’		UVPF1ACT	CAP IS ACTIVE
		.1.. .... X’40’		UVPF1REC	CAP NEEDS RECOVERY
		..1. .... X’20’		UVPF1AUT	CAP IS IN AUTOMATIC MODE
		...1 .... X’10’		UVPF1LNK	CAP IS LINKED
		.... 1... X’08’		UVPF1ONL	CAP IS ONLINE
2	(2)	BITSTRING	1	UVPFLAG2	CAP MODE:
		1... .... X’80’		UVPF2ENT	CAP IS ENTERING
		.1.. .... X’40’		UVPF2DRA	CAP IS DRAINING
		..1. .... X’20’		UVPF2EJT	CAP IS EJECTING
		...1 .... X’10’		UVPF2CLN	CAP IS CLEANING
		.... 1... X’08’		UVPF2IDL	CAP IS IDLE
3	(3)	HEXSTRING	3	UVPID	CAP ID
6	(6)	CHARACTER	8	UVPJOBN	JOBNAME OF OWNER
14	(E)	CHARACTER	8	UVPHOST	HOSTID IF CAP IS ACTIVE
22	(16)	HEXSTRING	1	UVPHOSTI	HOST INDEX FOR CAPHOST
24	(18)	SIGNED-HWORD	2	UVPNCELL	NUMBER OF CELLS IN CAP
26	(1A)	HEXSTRING	1	UVPNROWS	NUMBER OF ROWS IN THIS CAP
27	(1B)	HEXSTRING	1	UVPNCOLS	NUMBER OF COLUMNS IN THIS CAP
28	(1C)	HEXSTRING	1	UVPNMAGS	NUMBER OF MAGAZINES IN THIS CAP
29	(1D)	HEXSTRING	1	UVPNMAGC	NUMBER OF CELLS PER MAGAZINE
30	(1E)	SIGNED-HWORD	2	UVPNPRIO	NUMBER OF CAP PRIORITY ELEMENTS

Table 102. SLUVPDAT Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
32	(20)	SIGNED-HWORD	2	UVPLPRIO	LENGTH OF CAP PRIORITY ELEMENTS
34	(22)	HEXSTRING	1	UVPPRITY(16)	CAP PRIORITY ELEMENTS, BY HOST INDEX
50	(32)	HEXSTRING	1	UVPPANEL	PANEL NUMBER OF CAP
51	(33)	BITSTRING	1	UVPTYPE	TYPE OF CAP:
		1... .... X’80’		UVPPCAP	PRIORITY CAP
		....1 X’01’		UVPCIM	CIMARRON
		.... ..1. X’02’		UVPCLIP	CLIPPER
		.... ..11 X’03’		UVPTWSTD	STANDARD WOLF CLIPPER
		.... .1.. X’04’		UVPTWOPT	OPTIONAL WOLF CLIPPER
		.... .1.1 X’05’		UVP9740	9740 CAP (CELLS SET AT VARY LSM)
52	(34)	LENGTH		UVPLEN	RECORD LENGTH

Cross Reference

Name	Len	Offset Value
UVPCIM	-	01
UVPCLIP	-	02
UVPFLAG1	000001	01
UVPFLAG2	000001	02
UVPF1ACT	-	80
UVPF1AUT	-	20
UVPF1LNK	-	10
UVPF1ONL	-	08
UVPF1REC	-	40
UVPF2CLN	-	10
UVPF2DRA	-	40
UVPF2EJT	-	20
UVPF2ENT	-	80
UVPF2IDL	-	08
UVPHOST	000008	0E
UVPHOSTI	000001	16
UVPID	000003	03
UVPJOBN	000008	06
UVPLEN	-	34
UVPLPRIO	000002	20
UVPNCELL	000002	18
UVPNCOLS	000001	1B
UVPNMAGC	000001	1D
UVPNMAGS	000001	1C
UVPNPRIO	000002	1E
UVPNROWS	000001	1A
UVPPANEL	000001	32
UVPPCAP	-	80
UVPPRITY	000001	22
UVPRT	000001	00
UVPTWOPT	-	04

Name	Len	Offset Value
UVPTWSTD	-	03
UVPTYPE	000001	33
UVP9740	-	05

Appendix C. Logging ACS Robotics Motion

Overview

StorageTek provides a way to monitor the reliability of ACS robotics motion. This appendix describes what information is logged and how that information is logged.

Information Being Logged

StorageTek logs robotic motion statistics in three categories:

- robotic Motion Start Counts
- temporary Motion Error Counts
- permanent Motion Errors.

Each category is described in the following paragraphs.

Note: Robotic motion start counts and temporary motion errors will only be recorded if OPTION LOGGING is set to EXTENDED.

Robotics Motion Start Counts

Each time an LSM robotics motion request is accepted by the LMU, the count of Robotics Motion Starts is incremented by one. This count represents the number of times the robot attempts to pick up a cartridge at one location, move it, and place it at another location. When the Catalog or VIew commands are used, the count is the number of times the robot hand is moved to a target location. The Robotics Motion Start Count is incremented at the start of each robotics motion. The motion itself may be successful, have a temporary error or have a permanent failure.

With the exception of LMU busy retries, motions retried by the HSC are counted as additional subsequent motions, since each attempted motion request could result in a hardware failure (hard fail) or temporary error.

Temporary Motion Error Counts

For each motion which is successful, but which had a temporary error, the count of Temporary Motion Errors is incremented by one. A temporary error is counted against any motion that contains a retry at some level which either impacts performance or may indicate that hardware is degraded. Temporary errors are currently counted at the LSM level against any motion requiring a panel ID recalibration to complete. Temporary errors are counted at the LMU level if a motion must be retried.

Permanent Motion Errors

Each time a permanent motion failure occurs, complete information concerning the failure is logged. A permanent error is counted against any motion which causes a Mount, DISMount, Swap, MOVe, Catalog, or VIew command to fail in such a way that user intervention is required to correct the situation.

How Information is Logged

The HSC periodically retrieves the statistics for robotics motions begun and temporary errors from the LMU. This information is logged to SYS1.LOGREC as software errors as shown in the Table 103. This record is a valid ‘‘Initiated and Temporary Error Motion Software Error Record’’ only under the following circumstances:

- if the Record Type Field (bytes 642-643) has value X’6506’ and
- the StorageTek identifier (X’FEEDFACE’ at bytes 644-647) is present.

Such a record is called an LLG6 record. Refer to Appendix B, “Record Formats” on page 561 to see the record layout for LLG6.

Table 103. Format for Total Motions and Temporary Error Counts

Initiated and Temporary Error Motion Software Error Record	
BYTE #	**Description of Field**
00-31	Standard HSC LOGREC header
00-00	X’40’ indicates software detected error
01-01	X’80’ indicates VS2 or later release level
02-02	X’08’ indicates TIME macro was used
03-03	X’20’ indicates record contains an error ID
04-05	Reserved
06-06	Record count
07-07	Reserved
08-11	System date of error
12-15	System time of error
16-23	CPU ID
24-31	Subsystem name
32-35	Eyeball characters ‘LLG6’
36-41	Proprietary data
42-43	Reserved
44-44	ACSid (binary)
45-45	Reserved

Table 103. Format for Total Motions and Temporary Error Counts (Continued)

Initiated and Temporary Error Motion Software Error Record	
BYTE #	**Description of Field**
46-46	LSM Configuration Flag 1st Byte X’80’ - LSM 0 exists if flag is on X’40’ - LSM 1 exists if flag is on X’20’ - LSM 2 exists if flag is on X’10’ - LSM 3 exists if flag is on X’08’ - LSM 4 exists if flag is on X’04’ - LSM 5 exists if flag is on X’02’ - LSM 6 exists if flag is on X’01’ - LSM 7 exists if flag is on
47-47	LSM Configuration Flag 2nd Byte X’80’ - LSM 8 exists if flag is on X’40’ - LSM 9 exists if flag is on X’20’ - LSM 10 exists if flag is on X’10’ - LSM 11 exists if flag is on X’08’ - LSM 12 exists if flag is on X’04’ - LSM 13 exists if flag is on X’02’ - LSM 14 exists if flag is on X’01’ - LSM 15 exists if flag is on
48-51	LSM 0 Robotic motions started (binary)
52-55	LSM 0 Temporary motion error counts (binary)
56-59	LSM 1 Robotic motions started (binary)
60-63	LSM 1 Temporary motion error counts (binary)
64-67	LSM 2 Robotic motions started (binary)
68-71	LSM 2 Temporary motion error counts (binary)
72-75	LSM 3 Robotic motions started (binary)
76-79	LSM 3 Temporary motion error counts (binary)
80-83	LSM 4 Robotic motions started (binary)
84-87	LSM 4 Temporary motion error counts (binary)
88-91	LSM 5 Robotic motions started (binary)
92-95	LSM 5 Temporary motion error counts (binary)
96-99	LSM 6 Robotic motions started (binary)
100-103	LSM 6 Temporary motion error counts (binary)
104-107	LSM 7 Robotic motions started (binary)
108-111	LSM 7 Temporary motion error counts (binary)
112-115	LSM 8 Robotic motions started (binary)
116-119	LSM 8 Temporary motion error counts (binary)
120-123	LSM 9 Robotic motions started (binary)

Table 103. Format for Total Motions and Temporary Error Counts (Continued)

Initiated and Temporary Error Motion Software Error Record	
BYTE #	**Description of Field**
124-127	LSM 9 Temporary motion error counts (binary)
128-131	LSM 10 Robotic motions started (binary)
132-135	LSM 10 Temporary motion error counts (binary)
136-139	LSM 11 Robotic motions started (binary)
140-143	LSM 11 Temporary motion error counts (binary)
144-147	LSM 12 Robotic motions started (binary)
148-151	LSM 12 Temporary motion error counts (binary)
152-155	LSM 13 Robotic motions started (binary)
156-159	LSM 13 Temporary motion error counts (binary)
160-163	LSM 14 Robotic motions started (binary)
164-167	LSM 14 Temporary motion error counts (binary)
168-171	LSM 15 Robotic motions started (binary)
172-175	LSM 15 Temporary motion error counts (binary)
176-641	Reserved
642-643	Record type X’6506’
644-647	StorageTek identifier X’FEEDFACE’
648-651	Timestamp Table

The HSC also makes a log entry for each permanent error, codes and indicates whether or not the errors are considered permanent errors.

The record format used to log a hard fail to SYS1.LOGREC is shown in Table 104. This record is a valid ‘‘Motion Hard Fail Software Error Record’’ only under the following conditions:

- if the Record Type Field (bytes 642-643) has a value of X’6501’,
- the StorageTek identifier (X’FEEDFACE’ at bytes 644-647) is present, and
- the character ‘H’ appears at the byte 113 location.

These records, regardless of whether the hard fail indicator is turned on, are LLG1 records.

Table 104. Record Format for a Hard Failure

Motion Hard Fail Software Error Record	
BYTE #	**Description of Field**
00-31	Standard HSC LOGREC header
00-00	X’40’ indicates software detected error
01-01	X’80’ indicates VS2 or later release level
02-02	X’08’ indicates TIME macro was used
03-03	X’20’ indicates record contains an error ID
04-05	Reserved
06-06	Record count
07-07	Reserved
08-11	System date of error
12-15	System time of error
16-23	CPU ID
24-31	Subsystem name
32-35	Eyeball characters ‘LLG1’
36-41	Proprietary data D-4
42-43	Reserved
44-44	ACSid (binary)
45-48	Proprietary data
49-85	Request data
49-58	Transaction header
49-52	Proprietary data
53-54	Host ID
55-57	Sequence number
58-58	Transaction Type, a ‘1’ indicates a request
59-59	Request type, ‘B’ = Mount request ‘C’ = Dismount request ‘D’ = Swap request ‘E’ = Move request ‘K’ = Catalog request ‘X’ = View request
60-61	Proprietary data

Table 104. Record Format for a Hard Failure (Continued)

Motion Hard Fail Software Error Record	
BYTE #	**Description of Field**
62-67	VOLSER of cartridge (this field is only valid if Request type, byte 59, is ‘B’, ‘C’, ‘D’ or ‘E’ and byte 60 has value character ‘1’)
68-89	Proprietary data
90-91	Host ID
92-94	Sequence number
95-95	Character ‘7’ indicates an error response
96-96	Response type, ‘B’ = Mount response ‘C’ = Dismount response ‘D’ = Swap response ‘E’ = Move response ‘K’ = Catalog response ‘X’ = View response
97-100	LMU Response Code (see Appendix A for definitions)
101-102	LSMid in error
103-112	Proprietary data
113-113	Character ‘H’ indicates a hard failure
114-641	Reserved
642-643	Record type X’6501’
644-647	StorageTek identifier X’FEEDFACE’
648-651	Timestamp

Logging Interval

When LMU 3.0 or 9315/9330 1.0 µ-software is properly installed in the ACS, the HSC identifies hard fails in LLG1 records and records robotic motion and temporary error counts in LLG6 records written to SYS1.LOGREC.

An LLG6 record is written to SYS1.LOGREC for each qualified ACS at the same interval that is defined for writing ACS-specific SMF records. A record is written not less than once in 24 hours, and always when the HSC is shutting down normally (assuming it has not been canceled).

An LLG1 record, which may or may not represent a hard fail, is written to SYS1.LOGREC for most operations requested by the HSC for which the LMU is unable to complete the HSC request. Operations that are automatically retried by the HSC are usually not errors, and some other states may be defined that are not logged as errors. See “LMU Response Codes” on page 675 for information on error and response codes. For

operations that do result in an error, only those that requested robotic motions are logged as hard fails with the appropriate indicator set in the record. Errors that do not represent failed robotic motions are software errors. These should be analyzed and reported to StorageTek.

Single-Host Environment

In a single-host environment, there is only one SYS1.LOGREC data set and only one copy of the HSC. In such an environment, everything is straightforward and easy to manage.

Recommended procedures in this environment are:

- Offload SYS1.LOGREC to a history data set, and
- Follow Computer Associates' CA-9/R+ Installation Instructions.

The extracted data for the reporting period may then be sent to the reliability measuring service for inclusion in their industry-wide report.

Multi-Host Environment

Data are interpreted differently in a multi-host environment than in a single-host environment. For this reason more explanation is necessary.

Since the LMU counts robotic motions started and temporary errors by LSM and not by host, when any host requests ACS statistics from an LMU, the data that is written to SYS1.LOGREC in an LLG6 record represents the total robotic motions started and temporary errors that occurred on each LSM since the last time that any R+ host requested ACS statistics from the LMU. The robotic motions started by all hosts are consolidated into one LLG6 record.

However, the robotic motions that end in a hard fail that are reported in LLG1 records are only logged to the SYS1.LOGREC of the R+ host that experienced the hard fail. Software failures are similarly logged only by the host that experienced the failure (an LLG1 record without the ''hard fail'' indicator).

Follow Computer Associates' published procedures for extracting data from all R+ hosts from the LOGREC history tapes and send the extracted data for the reporting period to the reliability measuring service for inclusion in their industry-wide report.

LMU Response Codes

The following tables contain a list of permanent error LMU response codes with associated

- descriptions
- indications of whether a console message is generated
- indications of whether a LOGREC record is cut
- indications of whether this response code is included as an R+ hard fail or if it is excluded.

Symbols used in the tables are as follows:

Code	Description
M	Console message posted
L	Record logged to SYS1.LOGREC
L+	Record sometimes logged to SYS1.LOGREC
H	Hard Fail logged to R+ Statistics
r	Retried by the Host.

Invalid Parameter Error Codes: 0101 - 0127

Table 105. LMU Response Codes 0101 thru 0127

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0101	Bad primary LSM	M	L	H	H	H	H	H	H
0102	Bad secondary LSM	M	L	H	H	H	H	H	H
0105	Undefined option or modifier	M	L	H	H	H	H	H	H
0106	Invalid LSM	M	L	H	H	H	H	H	H
0107	Invalid panel	M	L	H	H	H	H	H	H
0108	Invalid row	M	L	H	H	H	H	H	H
0109	Invalid column	M	L	H	H	H	H	H	H
0110	Invalid drive	M	L	H	H	H	H	H	H
0111	Invalid CAP row	M	L	H	H	H	H	H	H
0112	Invalid CAP column	M	L	H	H	H	H	H	H
0113	No cell at the specified address	M	L	H	H	H	H	H	H
0114	Label modifier option not legal	M	L	H	H	H	H	H	H
0115	Source modifier option not legal	M	L	H	H	H	H	H	H
0116	Source type illegal	M	L	H	H	H	H	H	H
0117	Destination type illegal	M	L	H	H	H	H	H	H
0118	Beginning address greater than end on catalog	M	L	H	H	H	H	H	H
0119	Invalid characters in VOLSER label	M	L	H	H	H	H	H	H
0120	Invalid request ID received	M	L	H	H	H	H	H	H
0121	Invalid transaction length	M	L	H	H	H	H	H	H
0122	Invalid host ID	M	L	H	H	H	H	H	H
0123	illegal characters in request	M	L	H	H	H	H	H	H
0124	Host ID doesn’t match current	M	L	H	H	H	H	H	H
0125	Duplicate sequence number active	M	L	-	-	-	-	-	-
0126	Transaction type not request or message ACK	M	L	H	H	H	H	H	H
0127	Invalid request code to cancel	M	L	H	H	H	H	H	H

Configuration Error Codes: 0201 - 0203

Table 106. LMU Response Codes 0201 thru 0203

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0201	LSM is not in static configuration	M	L	H	H	H	H	H	H
0202	Drive does not exist	M	L	H	H	H	H	H	H
0203	CAP does not exist	M	L	H	H	H	H	H	H

CAP Procedural Error Codes: 0301 - 0310

Table 107. LMU Response Codes 0301 thru 0310

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0301	CAP not reserved	M	L	H	H	H	H	H	H
0302	CAP already reserved	M	L	H	H	H	H	H	H
0303	CAP in Enter mode	M	L	H	H	H	H	H	H
0304	CAP in Eject mode	M	L	H	H	H	H	H	H
0305	CAP move active	M	L	H	H	H	H	H	H
0306	CAP door is open	M	L	H	H	H	H	H	H
0307	CAP catalog is in progress	M	L+	H	H	H	H	H	H
0309	Cannot unlock CAP, CAP door is not fully latched	M	L	H	H	H	H	H	H
0310	Cannot cancel enter on release request	M	L+	H	H	H	H	H	H

General Procedural Error Codes: 0401 - 0427

Table 108. LMU Response Codes 0401 thru 0427

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0401	LSM not ready	-	-	r	r	r	r	r	r
	if unlabeled or bypass label	M	-	r	r	r	r	r	r
	if not VARY and LSM offline	M	-	r	r	r	r	r	r
	else add to Temp Outage Queue	-	-	r	r	r	r	r	r
0402	LSM in maintenance mode	M	L	-	-	-	-	-	-
0403	LSM offline pending	M	-	-	-	-	-	-	-
0404	LSM offline	M	-	-	-	-	-	-	-
0405	Drive is full	M	L	-	H	-	H	H	H
0407	Multiple LSM requests in maintenance	M	L	H	H	H	H	H	H
0408	Path rejected due to full PTP deadlock	M	L	H	H	H	H	H	H
0410	Bad recovery on cartridge VOLSER	M	L	H	H	H	H	H	H
0411	Maximum requests allowed exceeded	-	-	r	r	r	r	r	r
0412	Quiesce host is already in progress	M	L	H	H	H	H	H	H
0413	Prior quiesce host override	M	L	H	H	H	H	H	H
0414	Maximum read VOLSER requests active	-	-	H	H	H	H	H	H
0416	Request canceled	M	-	-	-	-	-	-	-
0415	Cancel already pending against request	M	L	H	H	H	H	H	H
0419	VOLSER unexpectedly was readable	M	L	r	r	r	r	H	H
0420	Bad read of VOLSER	M	L+	r	r	r	r	H	H
0422	Cell full	M	L+	-	-	-	-	H	H
0423	Cell empty	M	L+	-	-	-	-	H	H
0424	Drive empty	M	L+	-	-	-	H	H	H
0425	Drive is active	M	L+	r	-	-	H	H	H

Table 108. LMU Response Codes 0401 thru 0427 (Continued)

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0426	Drive not rewound	M	L+	r	-	-	H	H	H
0427	Cartridge not mounted	M	L	H	-	-	H	H	H

LMU LAN Interface Error Codes: 0501 - 0512

Table 109. LMU Response Codes 0501 thru 0512

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0501	Transmission rejection: No LSM at node	M	L	H	H	H	H	H	H
0502	Transmission rejection: Bad LSMid	M	L	H	H	H	H	H	H
0503	Transmission rejection: LSM not communicating	M	-	r	r	r	r	r	r
0504	Transmission rejection: Transmission error	M	-	r	r	r	r	r	r
0505	Transmission rejection: No ACK	M	-	r	r	r	r	r	r
0506	Transmission rejection: No operational LAN	M	-	r	r	r	r	r	r
0507	Transmission rejection: No memory available	M	-	r	r	r	r	r	r
0508	Transmission rejection: Buffer overflow	M	-	r	r	r	r	r	r
0509	Transmission rejection: No response for command	M	L	H	H	H	H	H	H
0510	Transmission rejection: LSM forced offline	M	-	-	-	-	-	-	-
0511	Transmission rejection: Already active CAP Unlock	M	L	H	H	H	H	H	H
0512	Transmission rejection: This is a standby	M	L	H	H	H	H	H	H

LMU Logical Error Codes: 0601 - 0620

Table 110. LMU Response Codes 0601 thru 0620

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0601	Unknown allocation request	M	L	H	H	H	H	H	H
0602	Bad qualifier byte 0	M	L	H	H	H	H	H	H
0603	Bad qualifier byte 1	M	L	H	H	H	H	H	H
0604	Bad qualifier byte 2	M	L	H	H	H	H	H	H
0605	LSM online	M	L	H	H	H	H	H	H
0606	Offline pend overridden	M	L	H	H	H	H	H	H
0610	Unknown panel type from static configuration	M	L	H	H	H	H	H	H
0611	Internal logical problem detected	M	L	H	H	H	H	H	H
0612	Pass-thru port cell full	M	L	H	H	H	H	H	H
0613	Pass-thru port cell empty	M	L	H	H	H	H	H	H
0615	Dynamic task create found full mailbox	M	L	H	H	H	H	H	H
0616	Allocate pend timed out	M	L	H	H	H	H	H	H
0617	LSM command pend timed out	M	L	H	H	H	H	H	H
0620	Connecting LSM path is unavailable for unknown reason	M	L	H	H	H	H	H	H

LSM Robotics Error Codes: 0701 - 0718

Table 111. LMU Response Codes 0701 thru 0718

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0701	Arm not operational	M	L	H	H	H	H	H	H
0702	Hand not operational	M	L	H	H	H	H	H	H
0703	PTP not operational	M	L	H	H	H	H	H	H
0704	PTP does not exist	M	L	H	H	H	H	H	H
0705	CAP is not operational	M	L	H	H	H	H	H	H
0707	Necessary elements inoperational	M	L	H	H	H	H	H	H
0708	Failed robotics portion of move	M	L	H	H	H	H	H	H
0709	Bad PUT	M	L	H	H	H	H	H	H
0710	Bad GET	M	L	H	H	H	H	H	H
0711	Bad reach retraction	M	L	H	H	H	H	H	H
0712	Bad reach extension	M	L	H	H	H	H	H	H
0713	Error positioning PTP	M	L	H	H	H	H	H	H
0714	No hands are operative	M	L	H	H	H	H	H	H
0715	Drive didn’t detect cartridge on PUT	M	L	-	H	-	H	H	H
0716	Failed targeting portion of move	M	L	H	H	H	H	H	H
0717	Reach is in an unsafe position	M	L	H	H	H	H	H	H
0718	Failed during recalibration on cell	M	L	H	H	H	H	H	H

LSM Hardware Error Codes: 0801 - 0809

Table 112. LMU Response Codes 0801 thru 0809

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0801	LSM didn't respond to request	M	L	H	H	H	H	H	H
0804	CAP unlock solenoid has over-currented	M	L	H	H	H	H	H	H
0805	Unlock CAP failed	M	L	H	H	H	H	H	H
0806	Lock CAP failed	M	L	H	H	H	H	H	H
0807	Drive not communicating	M	L	-	-	-	H	H	H
0808	Tape unit interface failure	M	L	-	-	-	H	H	H
0809	Failed to transfer image into memory	M	L	H	H	H	H	H	H

LSM Logical Error Codes: 0901 - 0977

Table 113. LMU Response Codes 0901 thru 0977

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0901	Wrong LSM on GET response	M	L	H	H	H	H	H	H
0902	Packet type of response not received	M	L	H	H	H	H	H	H
0903	Wrong task ID on response	M	L	H	H	H	H	H	H
0904	Wrong function ID on response	M	L	H	H	H	H	H	H
0905	Wrong cell address on response	M	L	H	H	H	H	H	H
0906	LSM is offline (from LSM)	M	L	H	H	H	H	H	H
0907	Bad cell location (from LSM)	M	L	H	H	H	H	H	H
0908	Unknown ending status from LSM	M	L	H	H	H	H	H	H
0909	LSM returned invalid response	M	L	H	H	H	H	H	H
0910	Unexpected or out-of-sequence CAP message	M	L	H	H	H	H	H	H
0916	Failure ending status	M	L	H	H	H	H	H	H
0917	Busy ending status	M	L	H	H	H	H	H	H
0918	Bad command	M	L	H	H	H	H	H	H
0919	Bad parameters on command	M	L	H	H	H	H	H	H
0920	Bad address type	M	L	H	H	H	H	H	H

Table 113. LMU Response Codes 0901 thru 0977 (Continued)

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0921	Bad panel, row, or column	M	L	H	H	H	H	H	H
0922	Arm currently reserved	M	L	H	H	H	H		
0923	CAP currently reserved	M	L	H	H	H	H	H	H
0924	First Master Pass-Thru-Port reserved	M	L	H	H	H	H	H	H
0925	Second Master Pass-Thru-Port reserved	M	L	H	H	H	H	H	H
0926	Playground currently reserved	M	L	H	H	H	H	H	H
0943	LSM is online	M	L	H	H	H	H	H	H
0944	LSM is in maintenance mode	M	L	H	H	H	H	H	H
0945	LSM is offline	M	L	H	H	H	H	H	H
0946	LSM access door is open	M	-	r	r	r	r	r	r
0947	LSM is not initialized	M	L	H	H	H	H	H	H
0950	Cell location nonexistent	M	L	H	H	H	H	H	H
0951	Hand full	M	L	H	H	H	H	H	H
0952	Hand empty	M	L	H	H	H	H	H	H
0953	Drive full	M	L+	-	H	-	H	H	H
0955	CAP is currently unlocked	M	L	H	H	H	H	H	H
0956	Can’t unlock CAP in idle	M	L	H	H	H	H	H	H
0957	CAP is open	M	L	H	H	H	H	H	H
0958	CAP is currently locked	M	L	H	H	H	H	H	H
0960	CAP already in Idle mode	M	L	H	H	H	H	H	H
0961	CAP already in Eject mode	M	L	H	H	H	H	H	H
0962	CAP already in Enter mode	M	L	H	H	H	H	H	H
0963	CAP in Enter mode, can’t eject	M	L	H	H	H	H	H	H
0964	CAP in Eject mode, can’t enter	M	L	H	H	H	H	H	H
0965	CAP not locked for Idle mode	M	L	H	H	H	H	H	H
0970	Not a drive panel	M	L	H	H	H	H	H	H
0971	No drive installed at address	M	L	H	H	H	H	H	H
0972	Invalid drive command specifier	M	L	H	H	H	H	H	H
0975	Actively passing data	M	L	H	-	-	H	H	H

Table 113. LMU Response Codes 0901 thru 0977 (Continued)

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
0976	Can't rewind	M	L	H	-	-	H	H	H
0977	Can't unload	M	L	-	-	-	H	H	H
0978	Drive cannot honor write protected	M	L	H	H	H	H	H	H
0979	Drive currently reserved	M	L	H	H	H	H	H	H

Drive Error Codes: 1001 - 1011

Table 114. LMU Response Codes 1001 thru 1011

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
1001	Drive not communicating	M	L	-	-	-	H	H	H
1002	Drive is not operational	M	L	-	-	-	H	H	H
1003	Outstanding request for drive	M	L	-	H	-	H	H	H
1004	Drive is allocated	M	L+	-	H	-	H	H	H
1005	Drive already has cartridge in it - unload timeout	M	L	-	H	-	H	H	H
1006	Drive found online for diagnostic request	M	L	H	H	H	H	H	H
1010	Drive can't load cartridge	M	L	-	H	-	H	H	H
1011	Load or Unload already in progress	M	L	H	H	H	H	H	H
1012	Load Failure on Special Use Cartridge	M	L	H	-	H	-	-	-

Undefined Response Code

Table 115. LMU Response Code xxxx

LMU Resp	Response Description	Con Msg	LOG rec	Mnt B	Dmt C	Swp D	Mov E	Cat J/K	Vw X
xxxx	Undefined Ending Status	M	L	H	H	H	H	H	H

Appendix D. Programmatic Interface (PGMI)

Overview

The Host Software Component (HSC) provides a programmatic interface for users and software developers to request services from the HSC. This interface is functional at the HSC FULL service level.

Those services are:

- query information
- volume movement
- scratch volume control.

The interfaces defined in this document are provided to allow programs that do not use certain MVS services (e.g., unique tape management systems) to request certain services from the HSC.

Query Information

A user can query the HSC for information about configuration, data sets, drive selection, scratch pools, volume location and status. This includes some information available from the HSC Display command. The information is returned in structured control blocks.

A program can query the HSC to determine if a volume is resident in the ACS, and if it is, what drives are the closest. This permits programs doing their own dynamic allocation to make an appropriate choice.

Volume Movement

Interfaces are provided for issuing requests to the HSC to mount, dismount, and eject volumes. If the interface is not used, a program must go through allocation, OPEN/CLOSE/EOV, and the appropriate mount and dismount messages must be issued. The HSC intercepts the messages and instructs the ACS to perform the necessary operations. For further information on intercepted messages, refer to “Intercepted Messages List” in the *SMC Configuration and Administration Guide*.

Scratch Volume Control

The HSC supports the following scratch processing options:

- request a scratch volume to use; request the HSC to select a VOLSER the HSC thinks is scratch
- return a volume to scratch status
- mark a volume as nonscratch
- provide scratch subpool support.

This permits an installation more control over scratch processing.

Virtual Storage Manager (VSM) Support

VSM support has been added for certain HSC programmatic interface requests. See the VTCS documentation for more information.

Using the Interface

Requests for HSC services are made via the SLSXREQ macro. The request parameter list and response areas are mapped by the SLSXREQM macro. An assembler program that uses SLSXREQ is also required to have SLSXREQM generate the DSECTs used by the SLSXREQ macro.

SLSXREQ calls module SLSXCAL to actually get the request over to the HSC. The primary purpose of this routine is to locate the HSC program call (PC) number for cross address space communication. The user is required to have previously loaded SLSXCAL. The address of the routine is passed to the SLSXREQ macro. SLSXCAL is reentrant, so the LOAD need only be done once.

The normal return code (in R15) from the SLSXREQ macro is zero. This indicates the function was successfully initiated. When the HSC is unavailable, a SLSXREQ request receives a return code of SLXRNHSC (X'20') in register 15. The QHSC request can be used to periodically poll the HSC status to determine when it becomes available.

When request processing completes, the HSC returns the address of the response area and its length. R1 contains the address of the response area and R0 contains the length of the response. The response area is in non-fetch protected, HSC key storage. The user should not attempt to freemain or alter the response area. This response area is valid until the next SLSXREQ call, after which it no longer contains the response.

Both synchronous and asynchronous interfaces are provided. Synchronous requests cause the requestor to wait until the request is complete. Asynchronous mode allows the user to have multiple requests active at once, and returns control to the requestor immediately.

> **Note:** Asynchronous requests are not supported for the QHSC and READ functions.

Upon returning from an asynchronous request, R0 will contain a token and R1 will contain the address of an ECB. When the request is complete, the ECB will be posted. After the post, the user must issue a SLSXREQ READ function specifying the returned token. This causes a single response to be made available to the requestor. The ECB and token are no longer valid after the response has been read.

If the PGMI application terminates before all asynchronous requests have completed, any pending requests are canceled. To ensure all requests have completed, the PGMI application must wait for all ECBs to be posted.

> **Note:** If an asynchronous request specifies selected CAPs or volumes, and the PGMI does not wait until all ECBs are posted before terminating, CAPs may need to be released by entering the RELease CAP command (refer to ''RELease CAP Command'' in the *HSC Operator's Guide*) and VOLSERs may need to be ''unselected'' using the UNSElect utility (refer to "UNSElect Utility" on page 339).

The responses are mapped by the SLSXREQM macro. The response block always contains a Reply Header, mapped by the SLX DSECT. The contents of the elements that follow the SLX header depend on the type of request made. Elements of a similar type are always contiguous (e.g., all drive elements are together). The Reply Header contains the number of each type of element, the offset from the start of Reply Header to the start of the

elements of a specified type, and the length of each element type. In order to ensure compatibility with future enhancements, the length in the Reply Header should be used at run time; not an assembled constant.

In the event that the HSC is made unavailable in the middle of a request, the ECB will be posted and the response area will indicate that the HSC is unavailable.

A request can only be issued in task mode with no locks held. A task can have multiple requests active at once. If the requesting task terminates, no responses will be sent and any returned response areas will no longer be valid.

SLSXREQ Functions

The sections below describe the SLSXREQ functions.

Query Requests

Query requests can be issued to obtain information from the HSC. These requests include

- QCAP – Requests a CAP query to determine the number of CAPs available and the capacity and status of each CAP.
- QCONFIG – Requests certain configuration data from the HSC. It returns the number of ACSs and LSMs in the library.
- QDRIVES – Requests drive configuration data from the HSC.
- QDRLIST – Requests a list of drives sorted by proximity to a specified volume. An empty list is returned if the volume is not in the library. For scratch requests, drives are sorted by LSM. Drives attached to the LSM containing the most scratch volumes for a specified subpool are listed first.
- QDSN – Requests information about the current data sets in use by the HSC.
- QHSC – Requests the status (up or down) of the HSC.
- QEJECT – Determine the status of all vol-ids within a given eject request.
- QSCRATCH – Requests the scratch counts for each LSM in the library.
- QVOLUME – Requests information about a specified volume.

Motion Requests

Motion requests can be issued to have the HSC move a cartridge. The motions that can be requested are

- DISMOUNT – Dismount a cartridge and place it in a cell.
- EJECT – Move a cartridge from a cell, place the cartridge in a CAP, and have the operator remove the cartridge.
- MOUNT – Move a cartridge to a drive and mount it.
- MOVE – Move a volume(s) within an LSM or to another LSM.
- RESET – Attempt to dismount all cartridges mounted on behalf of a specified host.

Scratch Requests

The following requests can be issued to alter the scratch status of a volume:

- SCRATCH – Mark a volume as being in scratch status.
- SELSCR – Pick a volume in a specified scratch subpool and mark it as nonscratch.
- UNSCRATCH – Mark a volume as not being in scratch status.

Control Requests

The following requests can be issued to control processing of requests:

- READQ – Read a response associated with a specific token.
- STOP – Terminate a specific PGMI request.

Authorization

The HSC provides a user exit (SLSUX05) to perform authorization checking. If the user exit disables itself (setting return code UX05NOPR) or ABENDs, the HSC allows all users to issue the query and READ requests. The remaining requests can only be issued by APF-authorized, key 0-7, or supervisor state requestors.

If desired, an installation can use the user exit (SLSUX05) to perform different authorization (e.g., use RACF or similar product).

Functional Description

The user exit is invoked for all requests received from the user interface. This does not include HSC internal requests (e.g., job processing, utilities). The user exit should evaluate the request, and set a return code to indicate if the HSC should permit the request to be executed.

The installation written exit routine, which replaces the StorageTek default routine, must be named SLSUX05, and is link-edited into an HSC library. Standard IBM OS linkage conventions must be observed.

For more information on User Exit SLSUX05, see Chapter 9, “User Exits” on page 397.

Macros

The HSC programmatic interface uses the SLSXREQ invocation macro to format a parameter list and call SLSXCAL to continue processing. It is assumed that the caller has previously loaded SLSXCAL.

The SLSXREQM macro must be specified to generate a mapping of the parameter list and reply areas

R13 must point to a 72-byte register save area.

Addresses and Registers

- RS-type address: specifies an address that would be valid in an RS-type instruction
- RX-type address: specifies an address that would be valid in an RX-type instruction.
- Register (2) - (12): indicates that one of the general registers, 2 through 12, should be specified, enclosed in parentheses. The register must have been previously loaded with the value required by the parameter. Unused bits must be zeroed.
- Register (0): specifies general register 0, previously loaded as indicated above for register (2) - (12).

Macro SLSXREQ Syntax

Only list and execute forms of the SLSXREQ macro are available.

List Form

The list form defines a remote parameter list that is referenced by the execute form of the macro

The syntax for the list form is:

```
►─label─SLSXREQ──MF=L──────────────────────────────────────────►◄
```

Parameters

MF=L specifies that a remote parameter list is generated. All other options are ignored.

Execute Form

The execute form stores parameters in the area defined by the list form and calls SLSXCAL.

The syntax for the execute form is:

```
►─label─SLSXREQ─function─parameter──────────────────────────────►◄
```

where *function* is:

DISMOUNT	Dismount volume
EJECT	Eject volume(s) from an ACS
MOUNT	Mount volume
MOVE	Move volume(s) within library
QCAP	Get the number, capacity, and status of each CAP in an ACS
QCONFIG	Get configuration data
QDRIVES	Get drive information
QDRLIST	Get list of drives for mount
QDSN	Get data set information

QEJECT	Determine the status of individual vol-ids within a specific eject request
QHSC	Determine HSC status
QSCRATCH	Get LSM scratch counts
QVOLUME	Get volume status
READ	Read a response
RESET	Dismount all volumes mounted for a specified host
SCRATCH	Return a volume to scratch status
SELSCR	Select a scratch volume
STOP	Terminate a specific PGMI unit-of-work (or list of units-of-work)
UNSCRATCH	Remove a volume from scratch status

and *parameter* is:

,ACSID=*acsidaddr*

,CAP=*capidaddr*

,COL=*columnaddr*

,COUNT=*countaddr*

,DRIVE=*driveaddr*

,DSN=*datasetname*

,EXPDT=*expirationdate*

,HOSTID=*hostaddr* or *hostidaddr*

,JOB=*jobname* ,

,LIST=*itemlistaddr*

,LSM=*lsmidaddr* or *lsmaddr*

,LTYPE={LDT|SL|NL|AL|NSL|(*r*)}

,MEDIA=*medaddr*

,MF=(E,*parmaddr*)

,OPTION={SYNCH|ASYNCH}

,PAN=*paneladdr*

,PGM=*pgmname*

,PROTECT={YES|(*r*)}

,RECTECH=*recaddr*

,RETPD=*retentionperiod*

,ROW=*rowaddr*

,SCRATCH={YES|(*r*)}

,SCRPOOL=*value*

,STEP=*stepname*

,SUBPOOL=*subpoolname* or *value*

,TEXT=*textaddr*

,TOKEN=*tokenaddr*

,TOLSM=*lsmaddr*

,TOPAN=*paneladdr*

,VOLSER=*voladdr* or *volumeaddr*

,VOLTYPE={Specfic|Nonspecfic}

,XCALADR=*rtnaddr* or *subrtnaddr*

The following parameters from the list above are selection criteria (input) parameters taken from the TAPEREQ control statement:

- DSN
- EXPDT
- JOB
- PGM
- RETPD
- STEP
- VOLTYPE.

Note: EXPDT and RETPD are mutually exclusive.

MEDIA and RECTECH are media and format requirements (output) parameters also associated with TAPEREQ.

The PGMI determines media and recording technique values for a request either by using MEDia and RECtech parameters directly or by searching the TAPEREQ selection criteria (input) parameters in the following order:

1. If both MEDia and RECtech are specified, all TAPEREQ parameters are ignored.

   Note: PGMI TAPEREQ values (i.e., DSN, EXPDT, JOB, PGM, RETPD, STEP, and VOLTYPE) are ignored as well.

2. If either MEDia or RECtech is specified, the implied default is used for the parameter not entered (e.g., if MEDia is supplied, the RECtech default is taken).

3. If neither MEDia nor RECtech is specified, the PGMI TAPEREQ values (i.e., DSN, EXPDT, JOB, PGM, RETPD, STEP, or VOLTYPE) are searched to determine a media type and recording technique from the TAPEREQ statement(s).

4. If none of the PGMI TAPEREQ values is specified, the HSC tries to find a TAPEREQ that matches all the TAPEREQ default values. If that fails, the default values for MEDia and RECtech are used.

Return Specifications

Return Codes

Upon return, R15 contains a decimal return code as follows:

Return Field Name	Decimal Value and Description
SLXROK	0 - Wait can be issued (OPTION=ASYNCH) or check response area for status (OPTION=SYNCH).
SLXRNHSC	20 - HSC not available. No SLX response is returned.

After the ECB associated with the request (for OPTION=ASYNCH) has been posted, or upon return for OPTION=SYNCH, the field SLXCMDRC (Return Code) will indicate the status (decimal) of the request.

Return Field Name	Decimal Value and Description
SLXROK	0 - Request completed successfully.
SLXRWARN	4 - The request completed successfully. However, an anomalous condition occurred (e.g., a QVOLUME request specified a volume not in the library).
SLXRBADP	8 - Bad parameter list (e.g., incompatible options). SLXPEOFF will provide an offset to the bad parameter.
SLXRIERR	12 - Unrecoverable error occurred while processing request.
SLXRFAIL	16 - Request unsuccessful. SLXSRC contains the function specific reason code or a message. HSC messages and non-PGMI reason codes are described in the HSC Messages and Codes Guide. PGMI reason codes are described in "Reason Codes" on page 697.
SLXRNHSC	20 - HSC not available.
SLXRNAUT	24 - User not authorized. The request was failed by SLSUX05, or the HSC default authorization.
SLXNTCB	28 - Request unsuccessful. The caller was not in task mode.
SLXLOCKD	32 - Request unsuccessful. The caller held at least one lock.
SLXTPROT	36 - Request unsuccessful. The caller did not have fetch/store authority to the SLSXREQM parameter list.
SLXNORSP	40 - Request unsuccessful. No response element with the specified token existed.

Reason Codes

Reason Code Field Name	Decimal Value and Description
SLXANOALS	32772 - HSC is not active.
SLXQNOA	32788 - ASCOMM is not active.
SLXINVOP	32792 - Invalid QUAB option. Internal error; contact StorageTek.
SLXINVFC	32780 - Invalid function code. Internal error; contact StorageTek.
SLXNOLVT	32784 - No LVT. Internal error; contact StorageTek.
SLXTABND	32804 - ASCOMM server task abended.
SLXTINTR	32818 - Current task interrupted.
SLXSANF	32822 - Search argument not found.
SLXMSTT	32826 - Mismatch token types.
SLXTRNF	32832 - Token request area not found.
SLXSFUL	32848 - Reply area space is full.

DISMOUNT

The DISMOUNT request directs the HSC to dismount a volume from a specified transport.

DISMOUNT Considerations

If the operation fails, normal messages to the operator are still sent.

If the volume was temp-entered (see the MOUNT request), it will be ejected to the highest preference available CAP. Otherwise, it is moved to a cell chosen by the HSC.

The requestor is responsible for ensuring that the cartridge on the drive has been rewound. If it has not, the operator is asked for permission to rewind the drive. If the operator grants permission, the drive is unloaded, regardless of whether the drive is in use.

A DISMOUNT request may cancel a MOUNT request provided it is issued before the cartridge is removed from its cell. This is called suppression. If this happens, both requests fail, and the response reason codes indicate ‘‘suppression’’ has occurred.

Syntax

```
►►─label──SLSXREQ DISMOUNT──,DRIVE=driveaddr──,MF=(E,parmaddr)──────────►

►─,OPTION=─┬─SYNCH──┬─,XCALADR=rtnaddr──┬──────────────────────────────►◄
           └─ASYNCH─┘                   └──,HOSTID=hostaddr,VOLSER=voladdr─┘
```

Parameters

DRIVE

driveaddr specifies the address of the 2-byte drive specification (0cua) from which a volume needs dismounting. Specify either an RX-type address of the data or the register (2) - (12) containing the address of the data.

This parameter is required.

MF=(E,*parmaddr*)

specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH

specifies that the requestor wait until the request is complete.

ASYNCH

specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

HOSTID

specifies the address of an eight character host ID, left justified and padded with blanks.

hostaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional. If the parameter is not specified, the host ID executing the request is used.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required if HOSTID is specified.

Response to DISMOUNT Request

A return code (SLXCMDRC in the SLSXREQM macro) indicates the success of the operation. If the drive is now empty, a return code of SLXROK is placed in SLXCMDRC. If the dismount failed, a return code of SLXRFAIL is placed there.

If the return code is SLXROK or SLXRFAIL, a reason code or message is placed in SLXSRC, and a message text element (mapped by SLXSMSG) is returned. The reason code is the binary message number of the message that the HSC issued when the request completed. HSC messages and non-PGMI reason codes are described in

the *HSC Messages and Codes Guide*. PGMI reason codes are described in “Reason Codes” on page 697.

The response is returned at the completion of the request.

EJECT

The EJECT request causes the HSC to eject a specific volume from the library using the parameter VOLSER, or a list of volumes using the parameters LIST and COUNT. The volume is ejected to the available CAP with the highest preference. The volume may also be ejected at a designated LSM by issuing the LSM parameter.

EJECT Considerations

This request duplicates the operator EJect command with the exception that there is no limit of 100 VOLSERs specified with the COUNT parameter.

Syntax

```
►►─label─SLSXREQ EJECT──,MF=(E,parmaddr)──,OPTION=─┬─SYNCH──────────────────►
                                                   └─ASYNCH─┘

►─┬─,VOLSER=voladdr──────────────────────────────────────────────────────►
  └─,LIST=listitemaddr──,COUNT=countaddr─┘  └─,LSM=lsmaddr─┘  └─,CAP=capidaddr─┘

►─,XCALADR=rtnaddr──────────────────────────────────────────────────────►◄
                   └─,TEXT=textaddr─┘
```

Parameters

MF=(E,*parmaddr*)

specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH

specifies that the requestor wait until the request is complete.

ASYNCH

specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required if LIST and COUNT are not specified. Either VOLSER or LIST and COUNT must be specified.

LIST

listitemaddr specifies the address of a list of elements.

For EJECT, LIST designates a list of 6-byte VOLSERs.

This parameter is required if VOLSER is not specified.

COUNT

countaddr specifies the address of a two-byte count value.

This parameter is required when LIST is specified.

For EJECT, COUNT specifies the number of VOLSERs in the list designated by the co-requisite LIST parameter. Either COUNT and LIST or VOLSER must be specified.

LSM

specifies the address of an LSMid. The format of *lsmaddr* is *AA*0*L*, where *AA* is the ACS number and 0*L* is the LSM number. The 0 (zero) preceding the value for *L* is a required value. For example, 0102 is ACS 01, LSM 2. All values are in hexadecimal format.

Specify either an RX-type address of the LSMid or the register (2) - (12) containing the address of the LSMid.

This parameter is optional.

CAP

specifies the address of the CAP used to satisfy the request. *capidaddr* specifies either the RX-type address of the data or the number of the register containing the address of the data.

The format of *capidaddr* is *AALLCC*00, where *AA* is the ACS number, *LL* is the LSM number, and *CC* is the CAP number. These identifiers are always followed by 00. The values specified are hexadecimal values.

This parameter is optional.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

TEXT

specifies the address of a 32-byte text string issued whenever the operator is requested to open the CAP for an EJECT request.

This parameter is optional.

Response to EJECT Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the volume was ejected, a return code of SLXROK is placed in SLXCMDRC. If the eject failed, a return code of SLXRFAIL is placed there. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

The response is returned at the completion of the request.

MOUNT

The MOUNT request directs the HSC to mount a volume.

MOUNT Considerations

When a cartridge is removed from its home cell, it becomes ‘‘selected’’ and remains in that state until it is returned. A cartridge in the selected state cannot be used by the following requests:

- EJECT
- MOUNT
- MOVE
- SCRATCH
- UNSCRATCH.

If the target transport for the mount has a volume mounted but unloaded, that volume will be dismounted automatically when the next mount for that transport is requested.

If the volume to be mounted is not in the library, the operator will be given a chance to enter the volume in the library, either permanently or temporarily (temp-enter). If the volume is temp-entered, it will be automatically ejected when dismounted.

Note: To enter a volume in the library, there must be an empty cell in the ACS for the volume, even if it is being temp-entered.

Syntax

```
►►─label─SLSXREQ MOUNT──,DRIVE=driveaddr─,MF=(E,parmaddr)──,OPTION=┬─SYNCH──┬►
                                                                   └─ASYNCH─┘

►─,XCALADR=rtnaddr──┬──────────────────┬──┬─Volume Selection Method 1─┬──►◄
                    └─,HOSTID=hostaddr─┘  └─Volume Selection Method 2─┘
```

Volume Selection Method 1:

```
├─,SCRATCH=YES──┬──────────────────────────────────────────┬──┬──────────────────┬►
                │                                          │  └─,MEDIA=medaddr───┘
                │                          ┌─LDT─┐         │
                ├─,SCRPOOL=value,LTYPE=────┤─SL──├─────────┤
                │                          ├─NL──┤         │
                │                          ├─AL──┤         │
                │                          ├─NSL─┤         │
                │                          └─(r)─┘         │
                └─,SUBPOOL=subpoolname────────────────────┘

►┬──────────────┬──┬──────────────┬──┬──────────────────────┬──┬──────────────┬►
 └─,RECTECH=recaddr─┘  └─,DSN=datasetname─┘  ├─,EXPDT=expirationdate─┤
                                             └─,RETPD=retentionperiod─┘

►┬──────────────┬──┬──────────────┬──┬──────────────┬►
 └─,JOB=jobname─┘  └─,STEP=stepname─┘  └─,PGM=pgmname─┘

►─,VOLTYPE=──┬─Specific──┬──────────────────────────────────────────────┤
             └─Nonspecific─┘
```

Volume Selection Method 2:

```
├─,VOLSER=voladdr──┬──────────────────────────────────────────────────────┤
                   └─,PROTECT=──┬─YES─┬──┘
                                └─(r)─┘
```

Parameters

DRIVE

*driveadd*r specifies the address of the 2-byte drive specification (0cua) on which a volume needs to be mounted.

Specify either an RX-type address of the data or the register (2) - (12) containing the address of the data.

This parameter is required.

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

HOSTID
specifies the address of an eight character host ID, left justified and padded with blanks.

hostaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional. If the parameter is not specified, the host ID executing the request is used.

SCRATCH
specifies that the request is for a nonspecific (scratch) volume.

A VOLSER is selected at this time and mounted on the specified transport.

This parameter is required if VOLSER is not specified. Either SCRATCH **or** VOLSER must be specified.

SCRPOOL

specifies the scratch subpool index for each request. The index ranges from 0 to 255. A value of zero indicates no special subpool request and any available scratch volume is usable. These subpools are defined by the user in the PARMLIB data set.

value specifies either an RX-type address of the one-byte subpool or the register (2) - (12) containing the subpool in byte 3 (rightmost).

This parameter is optional and defaults to 0 (any scratch volume).

When SCRPOOL is specified, an LTYPE value is also required. SCRPOOL only has meaning for a scratch request and is disregarded when a SUBPOOL value is issued.

LTYPE

specifies the label type for scratch processing. This parameter causes scratch processing to be restricted to the set of scratch volumes associated with the label type specified. These label types are defined in a user defined PARMLIB data set.

LDT

specifies the library default label type.

SL

specifies the standard-labeled pool.

NL

specifies the nonlabeled pool.

AL

specifies the ANSI-labeled pool.

NSL

specifies the nonstandard-labeled pool.

(*r*)

specifies a register (2) - (12) containing the label type in byte 0 of the register. That value is either SLSXLLDT (library default), SLSXLSL (standard label), SLSXLAL (ANSI label), SLSXLNL (nonlabeled) or SLSXLNS (nonstandard label).

This parameter defaults to library default type (LDT). If the default value is accepted for LTYPE, then SCRPOOL defaults to zero (0). If the label type is not the library default type, a nonzero subpool (SCRPOOL) must be specified.

When SCRPOOL is specified, an LTYPE parameter must also be specified. LTYPE has meaning for a SCRATCH=YES request only. When SUBPOOL is specified, SCRPOOL and LTYPE have no meaning.

SUBPOOL

specifies the address of a 13-character field containing the scratch subpool name for the scratch subpool.

If *subpoolname* is not provided, the subpool index is converted into three EBCDIC decimal digits and placed in the leftmost three positions of the subpool name.

Specify either an RX-type address of the data or the number of the register containing the address of the data. When SUBPOOL is specified, SCRPOOL and LTYPE have no meaning.

This parameter is optional.

MEDia

specifies the address of an 8-byte character field containing the media type of the cartridge to be mounted.

medaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If **MEDia** is not specified, the next scratch cartridge is mounted without regard to media type.

This parameter is optional.

Valid media types are:

LONGItud

indicates any Standard, ECART, or ZCART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R

indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2

indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
specifies the address of an 8-byte field containing the recording technique used to record data tracks on the tape surface.

recaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If RECtech is not specified, the next scratch cartridge is mounted depending on the MEDia type that has been specified.

This parameter is optional.

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The following parameters are ignored if Media, RECtech, or both are specified.

DSN

datasetname specifies the data set name.

This parameter is optional.

EXPDT

expirationdate specifies the expiration date of the data set in *yyddd* or *yyy*/*ddd* format.

This parameter is optional.

RETPD

retentionperiod specifies the retention period for the data set in days. Specify the number of days as a one- to four-digit decimal number.

This parameter is optional.

JOB

jobname specifies the job name.

This parameter is optional.

STEP

stepname specifies the step name.

This parameter is optional.

PGM

pgmname specifies the step name.

This parameter is optional.

VOLTYPE

indicates whether or not a nonspecific volume was requested.

Specific

requests a specific volume to be mounted.

Nonspecific

requests a nonspecific volume to be mounted

This parameter is optional.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required if SCRATCH is not specified. Either VOLSER **or** SCRATCH must be specified.

PROTECT

PROTECT=YES - Specifies the volume is disabled for writing. It causes a volume enabled by the physical thumbwheel to be write disabled for this mount. There is no way to write-enable a cartridge whose thumbwheel indicates the volume is write disabled.

PROTECT=(*r*) - Specifies a register (2) - (12) that contains the write disablement in byte 2 of the register. If bit SLSXPROT is on, writing is disabled. If not on, the thumbwheel determines the write enablement.

This parameter is optional. If omitted, the write enablement is determined by the thumbwheel on the cartridge.

Response to MOUNT Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXROK or SLXRFAIL, a reason code or message is placed in SLXSRC, and a message text element (mapped by SLXSMSG) is returned. The reason code corresponds to the message in the message text. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in “Reason Codes” on page 697.

If the volume was mounted, a return code of SLXROK is placed in SLXCMDRC. A volume information element (mapped by SLXSVOL) is returned for the mounted volume.

The response is returned at the completion of the request.

MOVE

The MOVE request permits you to request the HSC to move a single volume to another location within a library complex.

MOVE Considerations

The following apply before using the MOVE request:

- Movement of volumes to the same panel in the same LSM, or to a frozen panel, is not allowed. The following volume move functions are permitted:
  - Move a single volume from a panel within an LSM to another panel of the same LSM.
  - Move a single volume from a panel within an LSM to any panel of a different LSM within the library complex.
- Movement of volumes to LSMs is done on a first-come first-serve basis. As volumes are moved, if an LSM is filled before the move request is finished for that LSM, the move request continues with the movement of volumes designated for the next LSM specified in the request. An LSM is full if all available cells contain tape cartridges. This process continues until the entire move request is completed.

Syntax

```
►►─label─SLSXREQ MOVE──────,MF=(E,parmaddr)──────,OPTION=┬─SYNCH──┬──────────────────►
                                                          └─ASYNCH─┘

►┬─,VOLSER=volumeaddr──────────────────────────────────────────────┬─,TOLSM=lsmaddr─►
 └─,LSM=lsmaddr──────,PAN=paneladdr──────,ROW=rowaddr──────,COL=columnaddr─┘

►┬──────────────────────┬──────,XCALADR=rtnaddr──────────────────────────────────────►◄
 └─,TOPAN=paneladdr─────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

VOLSER
specifies the address of a volume.

volumeaddr specifies either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the volume. The format of VOLSER is six characters (*vvvvvv*). Valid characters are A-Z, 0-9, #, $, ¥, and trailing blanks.

This parameter is required if LSM is not specified.

LSM
specifies the address of an LSMid. The format of the *LSMid* is *AA*0*L* in hexadecimal, where *AA* is the ACS number and 0*L* is the LSM number. The 0 (zero) preceding the value for *L* is a required value. For example, 010A is ACS 01, LSM 10.

Specify either an RX-type address of the LSMid or the register (2) - (12) containing the address of the LSMid.

The COL, PAN, and ROW parameters must accompany the LSM parameter. **This parameter is required if VOL is not specified.**

PAN
specifies the address of a panel number. The format of the panel number is *nn*, where '*nn*' is a one-byte hexadecimal number.

Specify either an RX-type address of the panel or the register (2) - (12) containing the address of the panel.

The COL, ROW, and LSM parameters must accompany the PAN parameter. **These four parameters or the VOL parameter must be issued.**

ROW
specifies the address of a row number. The format of the row number is *nn*, where '*nn*' is a one-byte hexadecimal number.

Specify either an RX-type address of the Row or the register (2) - (12) containing the address of the Row.

The COL, PAN, and LSM parameters must accompany the ROW parameter. **These four parameters or the VOL parameter must be issued**.

COL

specifies the address of a column number. The format of the column number is *nn*, where '*nn*' is a one-byte hexadecimal number.

Specify either an RX-type address of the COL or the register (2) - (12) containing the address of the COL.

The LSM, PAN, and ROW parameters must accompany the COL parameter. **These four parameters or the VOL parameter must be issued**.

TOLSM

specifies the address of the LSMid where the volume is moved. The LSMid is two hexadecimal bytes in the format *AA*0*L*, where *AA* is the ACS number and 0*L* is the LSM number.

lsmaddr specifies either an RX-type address of the LSMid or the register (2) - (12) containing the address of the LSMid.

This parameter is required.

TOPAN

specifies the address of a panel number. The format of the panel number is *nn*, where '*nn*' is a one-byte hexadecimal number.

Specify either an RX-type address of the panel or the register (2) - (12) containing the address of the panel.

This parameter is optional.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to Move Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXROK or SLXRFAIL, a reason code is placed in SLXSRC, and a message text element (mapped by SLXSMSG) is returned. The reason code corresponds to the message in the message text.

If the volume was moved, a return code of SLXROK is placed in SLXCMDRC. A volume information element (mapped by SLXSVOL) is returned for the moved volume and the new location is returned in SLXVLOC field.

The response is returned at the completion of the request.

QCAP

This request is used to query the capacity and status of a CAP.

QCAP Considerations

There are no considerations for this PGMI function.

Syntax

```
►►─label─SLSXREQ QCAP──,MF=(E,parmaddr)──┬──────────────────────────────────────┬──►
                                         ├──,ACSID=acsidaddr────────────────────┤
                                         ├──,LSM=lsmidaddr──────────────────────┤
                                         ├──,CAP=capidaddr──────────────────────┤
                                         └──,LIST=listitemaddr─,COUNT=countaddr─┘

►──┬──────────────────────┬──,OPTION=──┬─SYNCH──┬──,XCALADR=subrtnaddr──────────►◄
   └──,HOSTID=hostidaddr──┘            └─ASYNCH─┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

ACSID
acsidaddr specifies the address of the ACS used to satisfy the request. The format of *acsidaddr* is *AA*, where *AA* is the ACS number. *AA* is in hexadecimal format. For example, 01, designates ACS 01. Specify either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional. If specified, the returned data is for the specific ACS.

If ACSID, LSM, CAP, or LIST and COUNT, are not specified, the data returned is for all CAPs.

LSM
specifies the address of an LSMid. The format of *lsmaddr* is *AA*0*L*, where *AA* is the ACS number and 0*L* is the LSM number. The 0 (zero) preceding the value for *L* is a

required value. For example, 0102 is ACS 01, LSM 2. All values are in hexadecimal format.

Specify either an RX-type address of the LSMid or the register (2) - (12) containing the address of the LSMid. **This parameter is optional.**

If specified, the returned data is for the specific LSM.

If ACSID, LSM, CAP, or LIST and COUNT, are not specified, the data returned is for all CAPs.

CAP

specifies the address of the CAP used to satisfy the request. *capidaddr* specifies either the RX-type address of the data or the number of the register containing the address of the data.

The format of *capidaddr* is *AALLCC*00, where *AA* is the ACS number, *LL* is the LSM number, and *CC* is the CAP number. These identifiers are always followed by 00. The values specified are hexadecimal values. **This parameter is optional**.

If specified, the returned data is for the specific CAP.

If ACSID, LSM, CAP, or LIST and COUNT, are not specified, the data returned is for all CAPs.

LIST

listitemaddr specifies the address of the CAPIDs used to satisfy the request. Specify either an RX-type address of the data or the number of the register containing the address of the data. **This parameter is optional.**

If specified, the returned data is for the specific CAPIDs.

If ACSID, LSM, CAP, or LIST and COUNT, are not specified, the data returned is for all CAPs.

COUNT

countaddr specifies the address of a two-byte count value.

This parameter is required when LIST is specified.

For QCAP, COUNT specifies the number of CAPIDs in the list designated by the co-requisite LIST parameter.

If ACSID, LSM, CAP, or LIST and COUNT, are not specified, the data returned is for all CAPs.

HOSTID

specifies the address of an eight character host ID, left justified and padded with blanks.

hostidaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional. If the parameter is not specified, the host ID executing the request is used.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH

specifies that the requestor wait until the request is complete.

ASYNCH

specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR

subrtnaddr specifies a location containing the address of the SLSXCAL routine.

Specify either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QCAP Request

A return code (SLSXQCAP in SLSXREQM macro) indicates the success of the operation. A value of 1A in R15 indicates that a QCAP has been requested. A value of zero indicates that the request has processed.

QCONFIG

This request is provided to enable the requestor to get information about the library configuration.

QCONFIG Considerations

There are no special considerations associated with the QCONFIG request.

Syntax

```
►►─label─SLSXREQ QCONFIG─,MF=(E,parmaddr)─,OPTION=┬─SYNCH──────┬─,XCALADR=rtnaddr─►◄
                                                  └─ASYNCH────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QCONFIG Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

In addition to the Reply Header, the Configuration Summary Section, mapped by SLXSCFG is returned.

QDRIVES

This request retrieves drive related configuration data. The response includes the ACS and LSM address of the transports, whether or not an enhanced CAP is present, and LSM pass-thru connections.

QDRIVES Considerations

There are no special considerations associated with the QDRIVES request.

Syntax

```
►►─label──SLSXREQ QDRIVES──────,MF=(E,parmaddr)──────,OPTION=──┬─SYNCH──┬──────►
                                                               └─ASYNCH─┘

►─,XCALADR=rtnaddr──┬──────────────────────┬──┬──────────────────────┬──────────►◄
                    └─,ACSID=acsidaddr─────┘  └─,HOSTID=hostaddr─────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

ACSID

acsidaddr specifies the address of the ACS used to satisfy the request. The format of *acsidaddr* is *AA*, where *AA* is the ACS number. AA is in hexadecimal format. For example, 01, designates ACS 01. Specify either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional.

HOSTID

specifies the address of an eight character host ID, left justified and padded with blanks.

hostaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional. If the parameter is not specified, the host ID executing the request is used.

Response to QDRIVES Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

In addition to the Reply Header, the Drive Information Section (mapped by SLXSDRV) and LSM Information Section (mapped by SLXSLSM) are returned.

QDRLIST

The QDRLIST request is used to obtain the HSC recommendation for a library transport for use on a subsequent MOUNT request.

QDRLIST Considerations

The HSC makes its recommendation by returning a list of drive information elements ordered so that the first element describes the best drive to use, the second element describes the second best drive to use, etc..

If the request is for a specific volume (i.e. SCRATCH=NO), the drive information elements are arranged so that the first drive is in the LSM that is closest to (or in the same LSM as) the LSM that the cartridge is in, and the last drive is in the LSM that is farthest from the cartridge. Only the drives in the same ACS as the volume are returned. In addition, volume information for the specified volume is returned.

If the request is for a nonspecific volume (i.e. SCRATCH=YES), the drive information elements are arranged so that the first drive is in the LSM with the most scratch volumes of the specified subpool and label type, and the last drive is in the LSM that has the least scratch volumes. Drives from all ACSs are returned. A list of drives is still returned even if there are no scratch volumes, in which case, the scratch counts in the LSM elements are zeros.

The HSC ignores whether a transport already has a volume mounted, is in an offline LSM, or a disconnected ACS.

Syntax

```
►►─label─SLSXREQ QDRLIST─,MF=(E,parmaddr)─,OPTION=┬─SYNCH──┬─,XCALADR=rtnaddr──►
                                                  └─ASYNCH─┘

►─,HOSTID=hostaddr──────────┬──────────────┬──────────────────────────────────►
                            └─,MEDIA=medaddr─┘   └─,RECTECH=recaddr─┘

►──┬──────────────┬──┬──────────────────────┬──┬──────────────┬──────────────►
   └─,DSN=datasetname─┘  ├─,EXPDT=expirationdate─┤  └─,JOB=jobname─┘
                         └─,RETPD=retentionperiod─┘

►──┬──────────────┬──┬──────────────┬──┬──────────────────────────────────┬──►
   └─,STEP=stepname─┘  └─,PGM=pgmname─┘  └─,VOLTYPE=┬─Specific──┬──────────┘
                                                    └─Nonspecific─┘

►──┤   Transport Selection Method   ├──────────────────────────────────────►◄
```

Transport Selection Method:

```
├──┬─,SCRATCH=┬─YES─┬──┬──────────────────────────────────────────────────┬──┤
   │          ├─NO──┤  │                                                  │  │
   │          └─(r)─┘  ├─,SCRPOOL=value,LTYPE=┬─LDT─┬──┤                   │  │
   │                   │                      ├─SL──┤  │                   │  │
   │                   │                      ├─NL──┤  │                   │  │
   │                   │                      ├─AL──┤  │                   │  │
   │                   │                      ├─NSL─┤  │                   │  │
   │                   │                      └─(r)─┘  │                   │  │
   │                   └─,SUBPOOL=subpoolname──────────┘                   │  │
   │                                                                       │  │
   └─,VOLSER=voladdr──┬──────────────┬──────────────────────────────────────┘  │
                      └─,PROTECT=YES─┘                                         │
```

Parameters

MF=(E,*parmaddr*)

specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

HOSTID
specifies the address of an eight character host ID, left justified and padded with blanks.

hostaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional.

If the parameter is not specified, the host ID executing the request is used.

MEDia
specifies the address of an 8-byte character field containing the media type of the selected transport.

*medadd*r specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If MEDia is not specified, transports are selected without regard to media type.

This parameter is optional.

Valid media types are:

LONGItud
indicates any Standard, ECART, or ZCART cartridge.

Standard
indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART
indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART
indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

DD3
indicates any DD3A, DD3B, or DD3C cartridge. HELical is a synonym for DD3.

Note: DD3 is not valid when SCRATCH=YES is specified.

DD3A, DD3B, DD3C
indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1
indicates any T9840 cartridge.

STK1R
indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
specifies the address of an 8-byte field containing the recording technique used to record data tracks on the tape surface.

recaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If **RECtech** is not specified, transports are selected depending on the MEDia type that has been specified.

This parameter is optional.

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport. 36Btrack indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The following parameters are ignored if Media, RECtech, or both are specified.

DSN
datasetname specifies the data set name.

This parameter is optional.

EXPDT
expirationdate specifies the expiration date of the data set in *yyddd* or *yyy/ddd* format.

This parameter is optional.

RETPD
retentionperiod specifies the retention period for the data set in days. Specify the number of days as a one- to four-digit decimal number.

This parameter is optional.

JOB
jobname specifies the job name.

This parameter is optional.

STEP
stepname specifies the step name. This parameter is optional. PGM pgmname specifies the step name.

This parameter is optional.

VOLTYPE
indicates whether or not a nonspecific volume was requested.

Specific
requests a specific volume to be mounted.

Nonspecific
requests a nonspecific volume to be mounted.

This parameter is optional.

SCRATCH

specifies that the request is for a nonspecific (scratch) volume. If SCRATCH=YES is specified, VOLSER is optional and is used only in messages to the operator.

SCRATCH=(*r*) - Specifies a register (2) - (12) containing the scratch request flag in byte 1 of the register. If bit SLSXSCR is on, the request is a scratch request.

If SCRATCH=NO is specified or the SCRATCH parameter is omitted, the VOLSER parameter is required.

A VOLSER is selected at this time.

This parameter is required if VOLSER is not specified. Either SCRATCH **or** VOLSER must be specified.

SCRPOOL

specifies the scratch subpool index for each request. The index ranges from 0 to 255. A value of zero indicates no special subpool request and any available scratch volume is usable. These subpools are defined by the user in the PARMLIB data set.

value specifies either an RX-type address of the one-byte subpool or the register (2) - (12) containing the subpool in byte 3 (rightmost).

This parameter is optional and defaults to 0 (any scratch volume).

When SCRPOOL is specified, an LTYPE value is also required.

SCRPOOL only has meaning for a scratch request and is disregarded when a SUBPOOL value is issued.

LTYPE

specifies the label type for scratch processing. This parameter causes scratch processing to be restricted to the set of scratch volumes associated with the label type specified. These label types are defined in a user defined PARMLIB data set.

LDT

specifies the library default label type.

SL

specifies the standard-labeled pool.

NL

specifies the nonlabeled pool.

AL

specifies the ANSI-labeled pool.

NSL

specifies the nonstandard-labeled pool.

(*r*)

specifies a register (2) - (12) containing the label type in byte 0 of the register. That value is either SLSXLLDT (library default), SLSXLSL (standard label), SLSXLAL (ANSI label), SLSXLNL (nonlabeled) or SLSXLNS (nonstandard label).

This parameter defaults to library default type (LDT). If the default value is accepted for LTYPE, then SCRPOOL defaults to zero (0). If the label type is not the library default type, a nonzero subpool (SCRPOOL) must be specified.

When SCRPOOL is specified, an LTYPE parameter must also be specified. LTYPE has meaning for a SCRATCH=YES request only. When SUBPOOL is specified, SCRPOOL and LTYPE have no meaning.

SUBPOOL

specifies the address of a 13-character field containing the scratch subpool name for the scratch subpool.

If *subpoolname* is not provided, the subpool index is converted into three EBCDIC decimal digits and placed in the leftmost three positions of the subpool name.

Specify either an RX-type address of the data or the number of the register containing the address of the data. When SUBPOOL is specified, SCRPOOL and LTYPE have no meaning.

This parameter is optional.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required if SCRATCH is not specified. Either VOLSER **or.** SCRATCH must be specified.

PROTECT

PROTECT=YES - Specifies the volume is disabled for writing. It causes a volume write enabled by the physical thumbwheel to be write disabled for this mount. There is no way to write-enable a cartridge whose thumbwheel indicates the volume is write disabled.

This parameter is optional. If omitted, the write enablement is determined by the thumbwheel on the cartridge.

Response to QDRLIST Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in “Reason Codes” on page 697.

If the request specifies SCRATCH=NO and the volume is not in the library, a code of SLXRWARN is placed in SLXCMDRC, a reason code of 700C is set, and only a Volume Information Section is returned.

The QDRLIST response consists of a Reply Header (mapped by SLX), and a Drive Information Section (mapped by SLXSDRV). If the request specifies SCRATCH=YES, an LSM Information Section (mapped by SLXSLSM) is included, sorted by scratch counts. The Drive Information Section is also sorted by scratch counts (most scratch volumes first). If the request specifies SCRATCH=NO, a Volume Information Section (mapped by SLXSVOL) is returned for the specified volume. The Drive Information Section is sorted by proximity to that volume.

QDSN

This request is provided to enable the requestor to get information about the current data sets in use by HSC.

QDSN Considerations

There are no special considerations associated with the QDSN request.

Syntax

```
►►─label──SLSXREQ QDSN──,MF=(E,parmaddr)──,OPTION=─┬─SYNCH──┬──,XCALADR=rtnaddr──►◄
                                                   └─ASYNCH─┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QDSN Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC

When querying data set information use the new QDSN Information Element Block (QDS) that is mapped by the SLXDSNIM. The response created is in contiguous storage and is composed of the SLX header and the QDSN information elements for a single QDSN request which are pointed to by the QDSN/QCONFIG directory.

QEJECT

This request is used to determine the status of individual volser within an eject task.

QEJECT Considerations

There are no special considerations associated with the QEJECT request.

Syntax

```
►►─label─SLSXREQ QEJECT──────,MF=(E,parmaddr)──────,OPTION=┬─SYNCH──┬──────────►
                                                            └─ASYNCH─┘

►┬─,TOKEN=tokenaddr──────────────────────────┬──,XCALADR=subrtnaddr──────────►◄
 └─,LIST=listitemaddr──,COUNT=countaddr──────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

TOKEN
specifies the address of the token originally returned in R0 when the request was initiated.

tokenaddr specifies either an RX-type address of the token or the register (2) - (12) containing the address of the token.

This parameter is required if LIST is not specified.

LIST

tokenlist specifies the address of a list of tokens for STOP processing. The parameter list address may be specified as an RX-type address or in register form. Valid register values are (2) - (12).

A special form of this parameter, **LIST**=*, indicates that the list immediately follows the parameter list control block.

This parameter is required if TOKEN is not specified.

COUNT

countaddr specifies the address of a two-byte count value. For QEJECT, COUNT specifies the number of VOLSERS in the list designated by the co-requisite LIST parameter.

This parameter is required when LIST is specified.

XCALADR

subrtnaddr specifies a location containing the address of the SLSXCAL routine. Specify either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QEJECT Request

A return code indicates the success of the QEJECT operation. When successful, QEJECT returns the status of each VOLSER in an EJECT request.

QHSC

This request may be used to determine if the HSC is active or not. This permits programs to poll periodically to determine when the HSC becomes active.

QHSC Considerations

The QHSC request is synchronous only.

Syntax

```
►►─label──SLSXREQ QHSC──────,MF=(E,parmaddr)──────,XCALADR=rtnaddr──────────────────►◄
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QHSC Request

A return code in R15 indicates if the HSC is active (SLXROK) or not (SLXRNHSC). The response length (R0) and response address (R1) are zero.

QSCRATCH

The QSCRATCH request is used to obtain detailed information about the number of scratch volumes in each LSM and ACS.

QSCRATCH Considerations

When the library and its associated control data sets are shared by more than one HSC, then the reported totals may differ from the true totals because they may not account for recent scratch volume activity on other processors. However, each HSC refreshes its scratch volume totals every 4 minutes (or the time interval specified in the OPTion command), so the variance should be slight. The LSM Information Elements are returned in highest scratch-count to lowest scratch-count order.

Syntax

```
►►─label─SLSXREQ QSCRATCH──,MF=(E,parmaddr)──,OPTION=─┬─SYNCH──┬─,XCALADR=rtnaddr─►
                                                      └─ASYNCH─┘

►──┬──────────────────┬──┬──────────────────┬──┬──────────────────────────┬──►
   └─,ACSID=acsidaddr─┘  ├─,SCRPOOL=value───┤  │                          │
                         └─,SUBPOOL=value───┘  └─,LTYPE=─┬─LDT─┬──────────┘
                                                         ├─SL──┤
                                                         ├─NL──┤
                                                         ├─AL──┤
                                                         ├─NSL─┤
                                                         └─(r)─┘

►──┬──────────────────┬──┬──────────────────┬──┬──────────────────────────┬──►
   └─,MEDIA=medaddr───┘  └─,RECTECH=recaddr─┘  └─,DSN=datasetname─────────┘

►──┬──────────────────────────┬──┬──────────────────┬──┬──────────────────┬──►
   ├─,EXPDT=expirationdate────┤  └─,JOB=jobname─────┘  └─,STEP=stepname───┘
   └─,RETPD=retentionperiod───┘

►──┬──────────────────┬──┬──────────────────────────────────────────────┬──►◄
   └─,PGM=pgmname─────┘  └─,VOLTYPE=─┬─Specific────┬──────────────────┘
                                     └─Nonspecific─┘
```

Parameters

MF=(E,*parmaddr*)

specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH

specifies that the requestor wait until the request is complete.

ASYNCH

specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

ACSID

acsidaddr specifies the address of the ACS used to satisfy the request. The format of acsidaddr is *AA*, where *AA* is the ACS number. *AA* is in hexadecimal format. For example, 01, designates ACS 01. Specify either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional.

SCRPOOL

specifies the scratch subpool index for each request. The index ranges from 0 to 255. A value of zero indicates no special subpool request and any available scratch volume is usable. These subpools are defined by the user in the PARMLIB data set.

value specifies either an RX-type address of the one-byte subpool or the register (2) - (12) containing the subpool in byte 3.

This parameter is optional and defaults to 0 (any scratch volume).

SUBPOOL

specifies the address of a 13-character field containing the scratch subpool name for the scratch subpool.

subpoolname specifies either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional.

LTYPE
specifies the label type for scratch processing. This parameter causes scratch processing to be restricted to the set of scratch volumes associated with the label type specified. These label types are defined in a user defined PARMLIB data set.

LDT
specifies the library default label type.

SL
specifies the standard-labeled pool.

NL
specifies the nonlabeled pool.

AL
specifies the ANSI-labeled pool.

NSL
specifies the nonstandard-labeled pool.

(*r*)
specifies a register (2) - (12) containing the label type in byte 0 of the register. That value is either SLSXLLDT (library default), SLSXLSL (standard label), SLSXLAL (ANSI label), SLSXLNL (nonlabeled) or SLSXLNS (nonstandard label).

This parameter defaults to library default type (LDT). If the default value is accepted for LTYPE, then SCRPOOL defaults to zero (0). If the label type is not the library default type, a nonzero subpool (SCRPOOL) must be specified.

This parameter is optional.

MEDia
specifies the address of an 8-byte character field containing the media type of of the requested scratch cartridge.

medaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If MEDia is not specified, scratch cartridges are selected without regard to media type.

This parameter is optional.

Valid media types are:

LONGItud
indicates any Standard, ECART, or ZCART cartridge.

Standard

indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART

indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART

indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3

indicates any DD3A, DD3B, or DD3C cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C

indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1

indicates any T9840 cartridge.

STK1R
indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
specifies the address of an 8-byte field containing the recording technique used to record data tracks on the tape surface.

recaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If **RECtech** is not specified, scratch cartridges are selected depending on the MEDia type that has been specified.

This parameter is optional.

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode).

36Atrack
indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The following parameters are ignored if Media, RECtech, or both are specified.

DSN
datasetname specifies the data set name.

This parameter is optional.

EXPDT
expirationdate specifies the expiration date of the data set in *yyddd* or *yyy*/*ddd* format.

RETPD
retentionperiod specifies the retention period for the data set in days. Specify the number of days as a one- to four-digit decimal number.

This parameter is optional.

JOB
jobname specifies the job name. This parameter is optional. STEP stepname specifies the step name. This parameter is optional. PGM pgmname specifies the step name.

This parameter is optional.

VOLTYPE
indicates whether or not a nonspecific volume was requested.

Specific
requests a specific volume to be mounted.

Nonspecific
requests a nonspecific volume to be mounted.

This parameter is optional.

Response to QSCRATCH Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in “Reason Codes” on page 697.

In addition to the Reply Header, an LSM information element for each LSM (mapped by SLXSLSM) is returned.

QVOLUME

The QVOLUME request is used to obtain the library status of a cartridge.

QVOLUME Considerations

There are no considerations for this PGMI function.

Syntax

```
►►─label─SLSXREQ QVOLUME──────,MF=(E,parmaddr)──────────,OPTION=┬─SYNCH──┬──────────►
                                                               └─ASYNCH─┘

►┬─,VOLSER=voladdr──────────────────────────┬──,XCALADR=rtnaddr──────────────────►◄
 └─,LIST=listitemaddr──,COUNT=countaddr──────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required.

LIST

specifies the address of a list of elements. *listitemaddr* specifies either an RX-type address of the data or the number of a register containing the address of the data. LIST designates a list of 6-byte VOLSERs.

This parameter is required if VOLSER is not specified.

COUNT

specifies the address of a two-byte count value.

countaddr specifies either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is required when LIST is specified.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to QVOLUME Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

In addition to the Reply Header, the Volume Information Section (mapped by SLXSVOL) is returned.

If the volume is not in the library, a code of SLXRWARN is placed in SLXCMDRC, a reason code of 700C is set.

READ

The READ request directs the HSC to return the response(s) associated with a previously initiated request, which has completed as indicated by a posted ECB.

READ Considerations

This request is used to read a response associated with a particular token. The requestor specifies the token returned on the original request.

The READ request is synchronous only.

Syntax

```
►►─label──SLSXREQ READ──,MF=(E,parmaddr)──,TOKEN=tokenaddr──,XCALADR=rtnaddr──►◄
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

TOKEN
specifies the address of the token originally returned in R0 when the request was initiated.

tokenaddr specifies either an RX-type address of the token or the register (2) - (12) containing the address of the token.

This parameter is required.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to READ Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If zero, R1 contains the address of the response, and R0 contains the length. The area and length are valid until the next SLSXREQ macro. The response area is in HSC key, non-fetch protected, so the user should not attempt to modify the response area.

If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide.* PGMI reason codes are described in "Reason Codes" on page 697. Valid reason codes depend on the original request.

RESET

The RESET request causes the HSC to attempt to dismount all volumes that were mounted on behalf of a specified host.

RESET Considerations

While volumes are mounted on a drive, they can only be dismounted by the host that mounted them. In the event that the HSC is being used to mount volumes those volumes are inaccessible until they are dismounted. This interface provides a way to get those volumes dismounted.

This request is used to dismount all volumes that were mounted with a specific HOSTID parameter. It must be issued on the same host that issued the MOUNT with the HOSTID parameter.

To prevent the appearance a message (requesting permission to unload the drive), the requestor should ensure that the drives have been unloaded.

Syntax

```
►►─label──SLSXREQ RESET──────,HOSTID=hostaddr──────,MF=(E,parmaddr)──────────────►

►─,OPTION=─┬─SYNCH──────────,XCALADR=rtnaddr──────────────────────────────────►◄
           └─ASYNCH──────┘
```

Parameters

HOSTID
specifies the address of an eight character host ID, left justified and padded with blanks.

hostaddr specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is required.

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address parmaddr may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION

specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH

specifies that the requestor wait until the request is complete.

ASYNCH

specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to RESET Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the reset was successful, a return code of SLXROK is placed in SLXCMDRC. A ''success'' code indicates that a dismount has been attempted for all drives, and not the status of each dismount. If the reset failed, a return code of SLXRFAIL is placed there. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

The response is returned at the completion of the request.

SCRATCH

The SCRATCH request causes a volume to be placed in scratch status in the library control data set.

SCRATCH Considerations

The volume must be in the library. No volume movement takes place. However, SCRATCH processing must select the cartridge in order to change its status. This means that the scratch request fails if the cartridge is in use.

Syntax

```
►►label—SLSXREQ SCRATCH—,MF=(E,parmaddr)—,OPTION=┬─SYNCH──┬──,VOLSER=voladdr──►
                                                 └─ASYNCH─┘

►─,XCALADR=rtnaddr──────────────────────────────────────────────────────────►◄
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to SCRATCH Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the scratch was successful, a return code of SLXROK is placed in SLXCMDRC. If the scratch failed, a return code of SLXRFAIL is placed there. If the code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

The response is returned at the completion of the request.

SELSCR

The SELSCR causes the HSC to choose a library scratch volume and remove it from scratch status in the library control data sets.

SELSCR Considerations

No volume movement occurs.

When neither ACSID nor DRIVE is specified, the HSC searches through all library LSMs and chooses a scratch volume from the LSM containing the most scratch volumes. When ACSID is specified, the HSC chooses a scratch volume from the LSM in the specified ACS that holds the most cartridges. When DRIVE is specified the HSC chooses a scratch volume from the closest LSM, if the drive is in an automatic mode LSM. If the drive is in a manual mode LSM, a scratch volume is picked from a manual mode LSM before it is picked from an automatic mode LSM.

Syntax

```
►►─label─SLSXREQ SELSCR──,MF=(E,parmaddr)─,OPTION=─┬─SYNCH──┬─,XCALADR=rtnaddr─►
                                                   └─ASYNCH─┘

►─┬─────────────────────┬─┬─────────────────────┬─┬─────────────────────┬──────────►
  └─,ACSID=acsidaddr────┘ └─,DRIVE=driveaddr────┘ └─,HOSTID=hostaddr────┘

►─┬─────────────────────┬─┬──────────────────────┬─┬─────────────────────┬──────────►
  ├─,SCRPOOL=value──────┤ │                      │ └─,MEDIA=medaddr──────┘
  └─,SUBPOOL=subpoolname┘ └─,LTYPE=─┬─LDT──┬──────┘
                                    ├─SL───┤
                                    ├─NL───┤
                                    ├─AL───┤
                                    ├─NSL──┤
                                    └─(r)──┘

►─┬─────────────────────┬─┬─────────────────────┬─┬──────────────────────┬──────────►
  └─,RECTECH=recaddr────┘ └─,DSN=datasetname────┘ ├─,EXPDT=expirationdate─┤
                                                  └─,RETPD=retentionperiod┘

►─┬─────────────────────┬─┬─────────────────────┬─┬─────────────────────┬──────────►
  └─,JOB=jobname────────┘ └─,STEP=stepname──────┘ └─,PGM=pgmname────────┘

►─┬─────────────────────────────────────────────┬──────────────────────────────►◄
  └─,VOLTYPE=─┬─Specific────┬──────────────────┘
              └─Nonspecific─┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

XCALADR
specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

ACSID
acsidaddr specifies the address of the ACS used to satisfy the request. The format of *acsidaddr* is *AA*, where *AA* is the ACS number. *AA* is in hexadecimal format. For example, 01, designates ACS 01. Specify either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional.

DRIVE
driveaddr specifies the address of the 2-byte drive specification (0cua) from which a volume needs dismounting.

Specify either an RX-type address of the data or the register (2) - (12) containing the address of the data.

This parameter is optional.

HOSTID

specifies the address of an eight character host ID, left justified and padded with blanks. *hostaddr* specifies either an RX-type address of the host ID or the register (2) - (12) containing the address of the host ID.

This parameter is optional. If the parameter is not specified, the host ID executing the request is used.

SCRPOOL

specifies the scratch subpool index for each request. The index ranges from 0 to 255. A value of zero indicates no special subpool request and any available scratch volume is usable. These subpools are defined by the user in the PARMLIB data set.

value specifies either an RX-type address of the one-byte subpool or the register (2) - (12) containing the subpool in byte 3.

This parameter is optional and defaults to 0 (any scratch volume).

SUBPOOL

specifies the address of a 13-character field containing the scratch subpool name for the scratch subpool.

subpoolname specifies either an RX-type address of the data or the number of the register containing the address of the data.

This parameter is optional.

LTYPE

specifies the label type for scratch processing. This parameter causes scratch processing to be restricted to the set of scratch volumes associated with the label type specified. These label types are defined in a user defined PARMLIB data set.

LDT

specifies the library default label type.

SL

specifies the standard-labeled pool.

NL

specifies the nonlabeled pool.

AL

specifies the ANSI-labeled pool.

NSL

specifies the nonstandard-labeled pool.

(*r*)
specifies a register (2) - (12) containing the label type in byte 0 of the register. That value is either SLSXLLDT (library default), SLSXLSL (standard label),

SLSXLAL (ANSI label), SLSXLNL (nonlabeled) or SLSXLNS (nonstandard label).

This parameter defaults to library default type (LDT). If the default value is accepted for LTYPE, then SCRPOOL defaults to zero (0). If the label type is not the library default type, a nonzero subpool (SCRPOOL) must be specified

This parameter is optional.

MEDia
specifies the address of an 8-byte character field containing the media type of the selected scratch cartridge.

medaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If **MEDia** is not specified, scratch cartridges are selected without regard to media type.

This parameter is optional.

Valid media types are:

LONGItud
indicates any Standard, ECART, or ZCART cartridge.

Standard
indicates a standard length, 3480 cartridge. It can be read on any longitudinal drives (4480, 4490, 9490, or 9490EE). Data can be written in 36-track mode on 4490, 9490, or 9490EE transports but cannot be read on an 18-track (4480) drive. Synonyms for this type of cartridge include:

- CST
- MEDIA1
- STD
- 1
- 3480

ECART
indicates a 3490E, extended capacity cartridge. It can be used only on a 36-track drive (4490, 9490, or 9490EE). Synonyms include:

- E
- ECCST
- ETAPE
- Long
- MEDIA2
- 3490E

ZCART
indicates a 3490E, extended capacity cartridge that provides greater storage capacity than an ECART. It can be used only on a 9490EE drive.

ZCART can be abbreviated as Z.

DD3
indicates any DD3A, DD3B, or DD3C cartridge. HELical is a synonym for DD3.

DD3A, DD3B, DD3C
indicates a helical cartridge. The media indicator in the external label is encoded with the cartridge type (A, B, or C).

Note: DD3A, DD3B, or DD3C can be abbreviated to A, B, or C, respectively.

Types of helical cartridges, along with their associated media capacities, are:

- A – 10GB
- B – 25GB
- C – 50GB.

Data capacity differences between DD3A, DD3B, and DD3C cartridges are related to the length of the tape in the cartridge, not to the recording density of the data.

STK1
indicates any T9840 cartridge.

STK1R
indicates a T9840 20GB data cartridge. The media indicator in the external label is encoded with the cartridge type (R). STK1R can be abbreviated to R.

STK2
indicates any T9940 cartridge. This parameter is the default for all T9940A and T9940B data cartridge types.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2P
indicates a T9940 data cartridge. The media indicator in the external label is encoded with the cartridge type (P).

Note: STK2P can be abbreviated to P.

T9940 cartridge media capacities are 60GB (T9940A) or 200GB (T9940B).

RECtech
specifies the address of an 8-byte field containing the recording technique used to record data tracks on the tape surface.

recaddr specifies either an RX-type address of the data or the register (2) - (12) containing the address of the data.

Note: If **RECtech** is not specified, scratch cartridges are selected depending on the MEDia type that has been specified.

This parameter is optional.

Valid recording techniques are:

LONGItud
indicates any device that uses longitudinal recording.

18track
indicates a 4480 transport.

36track
indicates a 4490, 9490, or 9490EE transport (any device that records in 36-track mode). 36Atrack indicates a 4490 (Silverton) transport.

36Btrack
indicates a 9490 (Timberline) transport.

36Ctrack
indicates a 9490EE transport.

HELical
indicates a device using helical recording.

DD3
indicates a device using helical recording.

STK1R
indicates any 9840 or T9840B transport.

STK1R34
indicates any 3490E-image 9840 or T9840B transport.

STK1R35
indicates any 3590-image 9840 or T9840B transport.

STK1RA
indicates a 3490E or 3590-image 9840 transport.

STK1RA34
indicates a 3490E-image 9840 transport.

STK1RA35
indicates a 3590-image 9840 transport.

STK1RB
indicates a 3490E or 3590-image T9840B transport.

STK1RB34
indicates a 3490E-image T9840B transport.

STK1RB35
indicates a 3590-image T9840B transport.

STK2P
indicates any T9940 transport.

STK2P34
indicates a 3490E-image T9940A transport.

STK2P35
indicates a 3590-image T9940A transport.

STK2PB
indicates any T9940B transport.

Note: Support of the T9940B transport is for open systems clients with fiber connectivity. ESCON and FICON are currently NOT supported for this drive type.

STK2PB34
indicates a 3490E-image T9940B transport.

STK2PB35
indicates a 3590-image T9940B transport.

Note: The following parameters are ignored if Media, RECtech, or both are specified.

DSN
datasetname specifies the data set name.

This parameter is optional.

EXPDT

expirationdate specifies the expiration date of the data set in *yyddd* or *yyy*/*ddd* format.

This parameter is optional.

RETPD

retentionperiod specifies the retention period for the data set in days. Specify the number of days as a one- to four-digit decimal number.

This parameter is optional.

JOB

jobname specifies the job name.

This parameter is optional.

STEP

stepname specifies the step name.

This parameter is optional.

PGM

pgmname specifies the step name.

This parameter is optional.

VOLTYPE

indicates whether or not a nonspecific volume was requested.

Specific

requests a specific volume to be mounted.

Nonspecific

requests a nonspecific volume to be mounted.

This parameter is optional.

Response to SELSCR Request

A return code (SLXCMDRC in the SLSXREQM macro) indicates the success of the operation. If the return code is SLXROK, a volume information element will be returned describing the volume picked.

If the return code is SLXRWARN, there is no scratch volume that met the specifications. A reason code of X'4011' will be set in SLXSRC.

If the return code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide*. PGMI reason codes are described in "Reason Codes" on page 697.

STOP

The STOP request causes a specific PGMI request to be terminated.

STOP Considerations

Each PGMI request is assigned a token number. This token number is available to the operator when submitting a request for tracking or conversational purposes. The HSC's allow for a variable number of EJECT requests. The STOP request provides the ability to interrupt those requests. Through the use of tokens, a STOP request can be issued to terminate any specific request.

The STOP request allows a forced, orderly termination of a given unit or units of work.

Syntax

```
►►─label─SLSXREQ STOP──────,MF=(E,parmaddr)──────,OPTION=┬─SYNCH──┬──────────►
                                                          └─ASYNCH─┘

►─┬─,TOKEN=tokenaddr──────────────────────────┬──────,XCALADR=subrtnaddr──────►◄
  └─,LIST=listitemaddr──,COUNT=countaddr──────┘
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

TOKEN

Specifies the address of the token originally returned in R0 when the request was initiated.

tokenaddr specifies either an RX-type address of the token or the register (2) - (12) containing the address of the token.

This parameter is required if LIST is not specified.

LIST

tokenlist specifies the address of a list of tokens for STOP processing. The parameter list address may be specified as an RX-type address or in register form. Valid register values are (2) - (12).

A special form of this parameter, LIST=*, indicates that the list immediately follows the parameter list control block.

This parameter is required if TOKEN is not specified.

COUNT

countaddr specifies the RX or register form address of a two-byte binary field containing the number of entries specified in **LIST**. Valid register values for RX addressing are (2) - (12). The maximum number of tokens specified is 500. If COUNT is specified without LIST, an error results.

This parameter is required when LIST is specified.

XCALADR

subrtnaddr specifies a location containing the address of the SLSXCAL routine. Specify either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to STOP Request

A return code indicates the success of the STOP operation.

UNSCRATCH

The UNSCRATCH request causes a volume to be removed from scratch status in the HSC control data set.

UNSCRATCH Considerations

This request removes a volume from scratch status within the library.

No volume movement occurs. However, UNSCRATCH processing must select the cartridge in order to change its status. This means that the UNSCRATCH request will fail if the cartridge is mounted on a drive.

Syntax

```
►►label—SLSXREQ UNSCRATCH——,MF=(E,parmaddr)——,OPTION=┬─SYNCH──┬──────────►
                                                      └─ASYNCH─┘

►—,VOLSER=voladdr——,XCALADR=rtnaddr──────────────────────────────────────►◄
```

Parameters

MF=(E,*parmaddr*)
specifies the execute form of the SLSXREQ macro using a remote parameter list. The parameter list address *parmaddr* may be specified as an RX-type address or in the register form. Valid register values are (1) - (12).

This parameter is required.

OPTION
specifies whether the requestor is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

SYNCH
specifies that the requestor wait until the request is complete.

ASYNCH
specifies that the requestor continue processing while the request is active. After return from the original request, R1 contains the address of an ECB POSTed when the response completed. R0 contains the token used by SLSXREQ READ to read the response.

VOLSER

voladdr specifies the address of a six-character volume label. Acceptable characters for a VOLSER are A-Z, 0-9, #, $, ¥, and trailing blanks.

Specify either an RX-type address of the VOLSER or the register (2) - (12) containing the address of the VOLSER.

This parameter is required.

XCALADR

specifies a location containing the address of the SLSXCAL routine.

rtnaddr specifies either an RX-type address of the routine, register (15), or register (2) - (12) containing the routine's address.

This parameter is required.

Response to UNSCRATCH Request

A return code (SLXCMDRC in SLSXREQM macro) indicates the success of the operation. If the unscratch was successful, a return code of SLXROK is placed in SLXCMDRC. If the unscratch failed, a return code of SLXRFAIL is placed there. If the return code is SLXRFAIL, a reason code or message is placed in SLXSRC. HSC messages and non-PGMI reason codes are described in the *HSC Messages and Codes Guide.* PGMI reason codes are described in "Reason Codes" on page 697.

The response is returned at the completion of the request.

Sample Requests

Sample Set Up

The following code fragment sets up for the SLSXREQ environment, and then issues QHSC to see if the HSC is available.

```
*
* Get HSC call routine
*
       LOAD EP=SLSXCAL,         LOAD SLSXCAL.                    +
               ERRET=NOHSC      ASSUME NOT UP IF LOAD FAILS
       ST      Ø,WXCALADR       SAVE ADDR FOR LATER.
*
* See if the HSC is up
*
       SLSXREQ QHSC,            QUERY HSC STATUS.                +
             XCALADR=WXCALADR,                                  +
             MF=(E,WSLSXREQ)
       LTR   15,15              RETURN CODE ZERO
       BNZ   NOHSC              NO - HSC NOT UP.
```

Figure 31. Sample 1 - SLSXREQ Environment Set Up

Sample QVOLUME Request

The following code fragment issues a QVOLUME request to determine if a volume is in the library. If it is, that information could be used in a Display command.

Note: The response is copied so that further SLSXREQ requests can be issued without losing the volume data.

```
QVOLUME TITLE '- PROGRAMMATIC INTERFACE - QVOLUME'
*
* QVOLUME - PROGRAMMATIC INTERFACE - QUERY THE STATUS OF A VOLUME
* FUNCTION: USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*           QVOLUME.
*
* ATTRIBUTES:
* ATTRIBUTES –
*      1. PROBLEM STATE, USER KEY
*      2. NON-APF AUTHORIZED
* EXITS
*     RETURN CODE:
*          R15 = 8 = HSC NOT AVAILABLE
*                4 = QUERY VOLUME FUNCTION FAILED
*                Ø = QUERY VOLUME FUNCTION SUCCESSFUL
*
* CHANGE HISTORY:
*     Ø1/Ø5/95-GRC      - CORRECT CODING ERRORS
*                        - AND MISLEADING OMISSIONS.
*     11/3Ø/9Ø-CRTD-VB      - MODULE CREATED.
**ENDPROLOGUE*****************************************************
          TITLE '- ESTABLISH ENTRY, BASE REGISTERS AND WORK AREAS'
          PRINT GEN
          ENTRY QVOLUME
QVOLUME CSECT
QVOLUME AMODE 31
QVOLUME RMODE ANY
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
          STM R14,R12,12(R13)        SAVE REGISTERS
          LR  R12,R15                BASE REG 12
          USING QVOLUME,R12          SETUP BASE REG 12
          B     AØØØ
MODNAME   DC    CL8'QVOLUME '
          DC    CL8'&SYSDATE'
          DC    CL5'&SYSTIME'
*
AØØØ DS    ØH
          LA    RIØ,QVOLWORK         RIØ IS WORKAREA BASE
          ST    R13,4(,RIØ)          PTR TO PREV S.A. FROM NEW
          ST    RIØ,8(,R13)          PTR TO NEW S.A. FROM OLD
          LR    R13,RIØ              ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLX RESPONSE AREA.
          USING SLX,R5
          TITLE '- LOAD SLSXCAL'
```

Figure 32. Sample 2 - QVOLUME Request

(1 of 4)

```
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
         LOAD EP=SLSXCAL          LOAD SLSXCAL
         ST RØ,WSCALADR           SAVE SLSXCAL ROUTINE ADR
         TITLE '- QUERY VOLUME DATA'
*
* QUERY A VOLUME
*
         SLSXREQ QVOLUME,         QUERY VOLUME.                    +
               VOLSER=VOLSER,                                     +
               OPTION=SYNCH,                                      +
               XCALADR=WSCALADR,                                  +
               MF=(E,WSLSXREQ)
         LTR   15,15              RETURN CODE ZERO?
         BNZ   HSCNOTAV           NO - HSC NOT UP.
         LR    R5,R1              SAVE STORAGE ADDRESS.
         CLI   SLXCMDRC,SLXROK    DID IT WORK?
         BN    FUNCFAIL           NO, TELL OPERATOR
         LR    4,1                SAVE REPLY BUFFER ADDRESS.
         LR    3,Ø                SAVE REPLY LENGTH.
         GETMAIN RU,LV=(3),SP=Ø   GET PERMANENT STORAGE.
         LR    R5,R1              SAVE THE REPLY COPY AREA ADDRESS
         LR    14,1               "TO" ADDRESS.
         LR    15,3               "TO" LENGTH.
         LR    Ø,4                "FROM" ADDRESS.
         LR    1,3                "FROM" LENGTH.
         MVCL  14,Ø               MOVE THE REPLY TO PERMANENT STORAGE.
         L     4,SLXXVOLL         LENGTH OF VOLUME SECTION.
         L     2,SLXXVOLO         GET VOLUME OFFSET.
         LA    2,SLX(2)           GET ADDR PF VOLUME SECTION.
         USING SLXSVOL,2          TELL ASSEMBLER.
*********************************************************************
*----->     CUSTOMER CODE TO PROCESS QVOLUME DATA GOES HERE          *
*********************************************************************
         WTO   'QVOLUME - SUCCESSFUL'
         FREEMAIN RU,A=(R5),LV=(R3),SP=Ø FREE QVOLUME REPLY COPY AREA
         XR    R15,R15            NORMAL RETURN
         B     FUNCEXIT           EXIT
         TITLE '- ERROR ROUTINES'
*
* HSC IS NOT AVAILABLE.
*
HSCNOTAV DS    ØH
         WTO   'QVOLUME - HSC NOT AVAILABLE'
         LA    R15,8              HSC NOT AVAILABLE RETURN CODE
         B     FUNCEXIT           EXIT
*
* QVOLUME REQUEST FAILED.
*
```

Figure 89. Sample 2 - QVOLUME Request (2 of 4)

```
*
FUNCFAIL DS     ØH
         LA     R4,SLXCMDRC          POINT TO FAILING RETURN CODE
         LA     R5,WFCMDRC           RECEIVING AREA
         LA     R15,1                NUMBER OF BYTES TO CONVERT
         BAL  R2,CONVHTC             CONVERT
         WTO MF=(E,WTOQFAIL)         TELL OPERATOR
         LA     R15,4 QVOLUME        FUNCTION FAILED RETURN CODE
         B      FUNCEXIT             EXIT
         TITLE  '- COMMON EXIT'
*
* RETURN TO CALLER.
FUNCEXIT DS     ØH
         LR     R2,R15               SAVE RETURN CODE
         DELETE EP=SLSXCAL           DELETE SLSXCAL
         L      R13,4(,R13)          POINT TO PREV REG SAVE AREA
         LR     R15,R2               BRING BACK RETURN CODE
         L      R14,12(R13)          RESTORE REG 14
         LM     RØ,R12,2Ø(R13)       RESTORE REGS Ø - 12
         BR     R14                  RETURN TO CALLER
         TITLE  '- SERVICE ROUTINES (DATA CONVERSION)'
*         CONVERT HEXADECIMAL DATA TO CHARACTER DATA.
*
CONVHTC  DS     ØH
         ICM    R7,B'1ØØØ',Ø(R4)     GET ONE HEX BYTE
         LA     R8,2                 TWO HEX CHAR IN EACH BYTE
CHTCLOOP DS  ØH
         XR     R6,R6                CLEAR
         SLDL   R6,4                 SHIFT HALF BYTE TO NEXT REGISTER
         STC    R6,Ø(R5)             SET IN RECEIVING AREA
         TR     Ø(1,R5),TRTAB        TRANSLATE TO CHARACTER
         LA     R5,1(,R5)            BUMP TO NEXT RECEIVING BYTE
         BCT    R8,CHTCLOOP          DO FOR BOTH HEX CHAR IN BYTE
         LA     R4,1(,R4)            BUMP TO NEXT HEX BYTE
         BCT    R15,CONVHTC          DO FOR NUMBER OF HEX BYTES
         BR     R2                   RETURN TO CALLER
*
         TITLE  '- MISCELLANEOUS CONSTANTS AND WORK AREAS'
         TRTAB  DC                   CL16'Ø123456789ABCDEF'
*
VOLSER   DC     C'EDU228'            VOLUME SERIAL TO QVOLUME
*
WTOQFAIL WTO    'QVOLUME - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
WFCMDRC  EQU    WTOQFAIL+41
QVOLWORK DS     ØD                   LINKAGE SAVE AREA
         DS     18F                  LINKAGE SAVE AREA
*
WSCALADR DS     F                    SLSXCAL ROUTINE ADR
*
WSLSXREQ SLSXREQ MF=L                REMOTE SLSXREQ.
```

Figure 89. Sample 2 - QVOLUME Request (3 of 4)

```
QVOLWKL  EQU      *-QVOLWORK
*
         LTORG
         TITLE '- ESTABLISH REGISTER EQUATES'
         SLSREGS
         TITLE '- DSECT MACROS'
         SLSXREQM ,
*
         END QVOLUME
```

Figure 89. Sample 2 - QVOLUME Request (4 of 4)

Sample SCRATCH Request

The following code fragment issues a SCRATCH request to direct the HSC to scratch a volume.

```
SCRATCH TITLE 'SCRATCH - PROGRAMMATIC INTERFACE - SCRATCH'
*
* SCRATCH - PROGRAMMATIC INTERFACE - DIRECT HSC TO SCRATCH A VOLUME
*
* FUNCTION:  USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*                          SCRATCH.
*
* ATTRIBUTES:
* ATTRIBUTES  --
*     1.  PROBLEM STATE, USER KEY
*     2.  NON-APF AUTHORIZED
*
* EXITS
*     RETURN CODE:
*          R15 =
*
* CHANGE HISTORY:
*     11/30/90-CRTD-VB - MODULE CREATED.
**ENDPROLOGUE*********************************************************
         TITLE 'SCRATCH - ESTABLISH BASE REGISTER'
         PRINT GEN
         ENTRY SCRATCH
SCRATCH CSECT
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
         LR     R12,R15               LOAD EPA AND ESTABLISH
         USING  SCRATCH,R12           ADDRESSABILITY TO THE CSECT
         STM    R14,R12,12(R13)       SAVE REGS
         LA     R10,MAINSAVE          POINT TO OUR SAVE AREA
         ST     R13,4(,R10)           PTR TO PREV S.A. FROM NEW
         ST     R10,8(,R13)           PTR TO NEW S.A. FROM OLD
         LR     R13,R10               ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLSX RESPONSE AREA.
*
         USING  SLX,R3
*
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
         LOAD   EP=SLSXCAL            LOAD SLSXCAL
         ST     R0,WSCALADR           SAVE SLSXCAL ROUTINE ADR
```

Figure 33. Sample 3 - PGMI SCRATCH Request

(1 of 3)

```
* USE SLSXREQ MACRO TO INVOKE SCRATCH OPTION.
*
        SLSXREQ SCRATCH,                                          +
             OPTION=SYNCH,                                        +
             XCALADR=WSCALADR,                                    +
             VOLSER=VOLSER,                                       +
             MF=(E,WSLSXREQ)
         LTR R15,R15                  HSC AVAILABLE?
         BNZ HSCNOTAV                 NO, TELL OPERATOR
         LR  R3,R1                    POINT TO START OF REPLY HEADER
         CLI SLXCMDRC,SLXROK          SCRATCH SUCCESSFUL?
         BNE FUNCFAIL                 NO, TELL OPERATOR WHY
         B   FUNCEXIT                 EXIT
*
* HSC IS NOT AVAILABLE.
*
  HSCNOTAV DS  ØH
           WTO 'SCRATCH - HSC NOT AVAILABLE'
           B   FUNCEXIT               EXIT
*
* SCRATCH REQUEST FAILED.
*
  FUNCFAIL DS  ØH
           LA  R4,SLXCMDRC            POINT TO FAILING RETURN CODE
           LA  R5,WFCMDRC             RECEIVING AREA
           LA  R15,1                  NUMBER OF BYTES TO CONVERT
           BAL R2,CONVHTC             CONVERT
           WTO MF=(E,WTOQFAIL)        TELL OPERATOR
           B   FUNCEXIT               EXIT
*
* RETURN TO CALLER.
*
  FUNCEXIT DS  ØH
           DELETE EP=SLSXCAL          DELETE SLSXCAL
           L   R13,4(,R13)            POINT TO PREV REG SAVE AREA
           L   R14,12(R13)            RESTORE REG 14
           LM  RØ,R12,2Ø(R13)         RESTORE REGS Ø - 12
           BR  R14                    RETURN TO CALLER
*          TITLE 'SCRATCH - SERVICE ROUTINES (DATA CONVERSION)'
*          CONVERT HEXADECIMAL DATA TO CHARACTER DATA.
*
 CONVHTC   DS  ØH
           ICM R7,B'1ØØØ',Ø(R4)       GET ONE HEX BYTE
           LA  R8,2                   TWO HEX CHAR IN EACH BYTE
```

Figure 90. Sample 3 - PGMI SCRATCH Request (2 of 3)

```
CHTCLOOP   DS   ØH
           XR   R6,R6                CLEAR
           SLDL R6,4                 SHIFT HALF BYTE TO NEXT REGISTER
           STC  R6,Ø(R5)             SET IN RECEIVING AREA
           TR   Ø(1,R5),TRTAB        TRANSLATE TO CHARACTER
           LA   R5,1(,R5)            BUMP TO NEXT RECEIVING BYTE
           BCT  R8,CHTCLOOP          DO FOR BOTH HEX CHAR IN BYTE
           LA   R4,1(,R4)            BUMP TO NEXT HEX BYTE
           BCT  R15,CONVHTC          DO FOR NUMBER OF HEX BYTES
           BR   R2                   RETURN TO CALLER
 TRTAB     DC   CL16'Ø123456789ABCDEF'
*
           TITLE 'SCRATCH - MISCELLANEOUS CONSTANTS AND EQUATES'
           LTORG
*
 MAINSAVE  DS   9D                   LINKAGE SAVE AREA
 DWORD     DS   D                    DOUBLEWORD WORK AREA
*
 WSCALADR  DS   F                    SLSXCAL ROUTINE ADR
*
 VOLSER    DC   C'EDU228'            VOLUME SERIAL TO SCRATCH
*
 WTOQFAIL  WTO  'SCRATCH - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
 WFCMDRC   EQU  WTOQFAIL+41
*
          TITLE 'SCRATCH - SLSXREQ DSECT MACRO'
          SLSXREQM ,
*
           END  SCRATCH
```

Figure 90. Sample 3 - PGMI SCRATCH Request (3 of 3)

Sample UNSCRATCH Request

The following code fragment issues a UNSCRATCH request to direct the HSC to remove a volume from scratch status.

```
UNSCRTCH TITLE 'UNSCRATCH - PROGRAMMATIC INTERFACE - UNSCRATCH'
*
* UNSCRATCH - PROGRAMMATIC INTERFACE-DIRECT HSC TO UNSCRATCH A VOLUME
*
* FUNCTION:  USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*                          UNSCRATCH.
*
* ATTRIBUTES:
* ATTRIBUTES  --
*     1.  PROBLEM STATE, USER KEY
*     2.  NON-APF AUTHORIZED
*
* EXITS
*     RETURN CODE:
*          R15 =
*
* CHANGE HISTORY:
*     11/30/90-CRTD-VB - MODULE CREATED.
**ENDPROLOGUE*******************************************************
            TITLE 'UNSCRTCH - ESTABLISH BASE REGISTER'
            PRINT GEN
            ENTRY UNSCRTCH
UNSCRTCH CSECT
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
            LR    R12,R15          LOAD EPA AND ESTABLISH
            USING UNSCRTCH,R12     ADDRESSABILITY TO THE CSECT
            STM   R14,R12,12(R13)  SAVE REGS
            LA    R10,MAINSAVE     POINT TO OUR SAVE AREA
            ST    R13,4(,R10)      PTR TO PREV S.A. FROM NEW
            ST    R10,8(,R13)      PTR TO NEW S.A. FROM OLD
            LR    R13,R10          ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLSX RESPONSE AREA.
*
            USING SLX,R3
*
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
            LOAD  EP=SLSXCAL       LOAD SLSXCAL
            ST    R0,WSCALADR      SAVE SLSXCAL ROUTINE ADR
```

Figure 34. PGMI UNSCRATCH Request

(1 of 3)

```
*
* USE SLSXREQ MACRO TO INVOKE UNSCRATCH OPTION.
*
         SLSXREQ UNSCRATCH,                                          +
               OPTION=SYNCH,                                         +
               XCALADR=WSCALADR,                                     +
               VOLSER=VOLSER,                                        +
               MF=(E,WSLSXREQ)
         LTR   R15,R15                HSC AVAILABLE?
         BNZ   HSCNOTAV               NO, TELL OPERATOR
         LR    R3,R1                  POINT TO START OF REPLY HEADER
         CLI   SLXCMDRC,SLXROK        UNSCRATCH SUCCESSFUL?
         BNE   FUNCFAIL               NO, TELL OPERATOR WHY
         B     FUNCEXIT               EXIT
*
* HSC IS NOT AVAILABLE.
*
HSCNOTAV DS    ØH
         WTO   'UNSCRATCH - HSC NOT AVAILABLE'
         B     FUNCEXIT               EXIT
*
* UNSCRATCH REQUEST FAILED.
*
FUNCFAIL DS    ØH
         LA    R4,SLXCMDRC            POINT TO FAILING RETURN CODE
         LA    R5,WFCMDRC             RECEIVING AREA
         LA    R15,1                  NUMBER OF BYTES TO CONVERT
         BAL   R2,CONVHTC             CONVERT
         WTO   MF=(E,WTOQFAIL)        TELL OPERATOR
         B     FUNCEXIT               EXIT
*
* RETURN TO CALLER.
*
FUNCEXIT DS    ØH
         DELETE EP=SLSXCAL            DELETE SLSXCAL
         L     R13,4(,R13)            POINT TO PREV REG SAVE AREA
         L     R14,12(R13)            RESTORE REG 14
         LM    RØ,R12,2Ø(R13)         RESTORE REGS Ø - 12
         BR    R14                    RETURN TO CALLER
*
TITLE 'UNSCRATCH - SERVICE ROUTINES (DATA CONVERSION)'
```

Figure 91. Sample 4 - PGMI UNSCRATCH Request (2 of 3)

```
*
* CONVERT HEXADECIMAL DATA TO CHARACTER DATA.
*
CONVHTC   DS     ØH
          ICM    R7,B'1ØØØ',Ø(R4)   GET ONE HEX BYTE
          LA     R8,2               TWO HEX CHAR IN EACH BYTE
CHTCLOOP  DS     ØH
          XR     R6,R6              CLEAR
          SLDL   R6,4               SHIFT HALF BYTE TO NEXT REGISTER
          STC    R6,Ø(R5)           SET IN RECEIVING AREA
          TR     Ø(1,R5),TRTAB      TRANSLATE TO CHARACTER
          LA     R5,1(,R5)          BUMP TO NEXT RECEIVING BYTE
          BCT    R8,CHTCLOOP        DO FOR BOTH HEX CHAR IN BYTE
          LA     R4,1(,R4)          BUMP TO NEXT HEX BYTE
          BCT    R15,CONVHTC        DO FOR NUMBER OF HEX BYTES
          BR     R2                 RETURN TO CALLER
TRTAB     DC     CL16'Ø123456789ABCDEF'
*
          TITLE 'UNSCRATCH - MISCELLANEOUS CONSTANTS AND EQUATES'
          LTORG
*
MAINSAVE  DS     9D                 LINKAGE SAVE AREA
DWORD     DS     D                  DOUBLEWORD WORK AREA
*
WSCALADR  DS     F                  SLSXCAL ROUTINE ADR
*
VOLSER    DC     C'EDU228'          VOLUME SERIAL TO UNSCRATCH
*
WTOQFAIL  WTO    'UNSCRATCH - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
WFCMDRC   EQU    WTOQFAIL+41
*
          TITLE 'UNSCRATCH - SLSXREQ DSECT MACRO'
          SLSXREQM ,
*
            END    UNSCRTCH
```

Figure 91. Sample 4 - PGMI UNSCRATCH Request (3 of 3)

Sample DISMOUNT Request

The following code fragment issues a DISMOUNT request to direct the HSC to dismount a volume.

```
DISMOUNT TITLE 'DISMOUNT - PROGRAMMATIC INTERFACE - DISMOUNT'
*
* DISMOUNT - PROGRAMMATIC INTERFACE - DIRECT HSC TO DISMOUNT A VOLUME
*
* FUNCTION:  USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*                          DISMOUNT.
*
* ATTRIBUTES:
* ATTRIBUTES  --
*     1.  PROBLEM STATE, USER KEY
*     2.  NON-APF AUTHORIZED
*
* EXITS
*     RETURN CODE:
*          R15 =
*
* CHANGE HISTORY:
*     12/04/90-CRTD-VB - MODULE CREATED.
**ENDPROLOGUE*******************************************************
         TITLE 'DISMOUNT - ESTABLISH BASE REGISTER'
         PRINT GEN
         ENTRY DISMOUNT
DISMOUNT CSECT
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
         LR     R12,R15           LOAD EPA AND ESTABLISH
         USING  DISMOUNT,R12      ADDRESSABILITY TO THE CSECT
         STM    R14,R12,12(R13)   SAVE REGS
         LA     R10,MAINSAVE      POINT TO OUR SAVE AREA
         ST     R13,4(,R10)       PTR TO PREV S.A. FROM NEW
         ST     R10,8(,R13)       PTR TO NEW S.A. FROM OLD
         LR     R13,R10           ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLSX RESPONSE AREA.
*
         USING  SLX,R3
*
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
         LOAD   EP=SLSXCAL        LOAD SLSXCAL
         ST     R0,WSCALADR       SAVE SLSXCAL ROUTINE ADR
```

Figure 35. Sample 5 - PGMI DISMOUNT Request

(1 of 3)

```
*
* USE SLSXREQ MACRO TO INVOKE DISMOUNT OPTION.
*
         SLSXREQ DISMOUNT,                                          +
               OPTION=SYNCH,                                        +
               XCALADR=WSCALADR,                                    +
               DRIVE=DRIVEADR,                                      +
               VOLSER=VOLSER,                                       +
               MF=(E,WSLSXREQ)
         LTR   R15,R15           HSC AVAILABLE?
         BNZ   HSCNOTAV          NO, TELL OPERATOR
         LR    R3,R1             POINT TO START OF REPLY HEADER
         CLI   SLXCMDRC,SLXROK   DISMOUNT SUCCESSFUL?
         BNE   FUNCFAIL          NO, TELL OPERATOR WHY
         B     FUNCEXIT          EXIT
*
* HSC IS NOT AVAILABLE.
*
HSCNOTAV DS    ØH
         WTO   'DISMOUNT - HSC NOT AVAILABLE'
         B     FUNCEXIT          EXIT
*
* DISMOUNT REQUEST FAILED.
*
FUNCFAIL DS    ØH
         LA    R4,SLXCMDRC       POINT TO FAILING RETURN CODE
         LA    R5,WFCMDRC        RECEIVING AREA
         LA    R15,1             NUMBER OF BYTES TO CONVERT
         BAL   R2,CONVHTC        CONVERT
         WTO   MF=(E,WTOQFAIL)   TELL OPERATOR
         B     FUNCEXIT          EXIT
*
* RETURN TO CALLER.
*
FUNCEXIT DS    ØH
         DELETE EP=SLSXCAL       DELETE SLSXCAL
         L     R13,4(,R13)       POINT TO PREV REG SAVE AREA
         L     R14,12(R13)       RESTORE REG 14
         LM    RØ,R12,2Ø(R13)    RESTORE REGS Ø - 12
         BR    R14               RETURN TO CALLER
*
         TITLE 'DISMOUNT - SERVICE ROUTINES (DATA CONVERSION)'
```

Figure 92. Sample 5 - PGMI DISMOUNT Request (2 of 3)

```
*
*CONVERT HEXADECIMAL DATA TO CHARACTER DATA
*
CONVHTC  DS      ØH
         ICM     R7,B'1ØØØ',Ø(R4)  GET ONE HEX BYTE
         LA      R8,2              TWO HEX CHAR IN EACH BYTE
CHTCLOOP DS      ØH
         XR      R6,R6             CLEAR
         SLDL    R6,4              SHIFT HALF BYTE TO NEXT REGISTER
         STC     R6,Ø(R5)          SET IN RECEIVING AREA
         TR      Ø(1,R5),TRTAB     TRANSLATE TO CHARACTER
         LA      R5,1(,R5)         BUMP TO NEXT RECEIVING BYTE
         BCT     R8,CHTCLOOP       DO FOR BOTH HEX CHAR IN BYTE
         LA      R4,1(,R4)         BUMP TO NEXT HEX BYTE
         BCT     R15,CONVHTC       DO FOR NUMBER OF HEX BYTES
         BR      R2                RETURN TO CALLER
TRTAB    DC      CL16'Ø123456789ABCDEF'
*
         TITLE 'DISMOUNT - MISCELLANEOUS CONSTANTS AND EQUATES'
         LTORG
*
MAINSAVE DS      9D                LINKAGE SAVE AREA
DWORD    DS      D                 DOUBLEWORD WORK AREA
*
WSCALADR DS      F                 SLSXCAL ROUTINE ADR
*
DRIVEADR DC      X'Ø38Ø'           DRIVE ADDRESS
*
VOLSER   DC      CL6'EDU228'       VOLUME SERIAL NUMBER
*
WTOQFAIL WTO     'DISMOUNT - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
WFCMDRC  EQU     WTOQFAIL+42
*
         TITLE 'DISMOUNT - SLSXREQ DSECT MACRO'
         SLSXREQM ,
*
         END   DISMOUNT
```

Figure 92. Sample 5 - PGMI DISMOUNT Request (3 of 3)

Sample MOUNT Request

The following code fragment issues a MOUNT request to direct the HSC to mount a volume.

```
MOUNT TITLE 'MOUNT - PROGRAMMATIC INTERFACE - MOUNT'
*
* MOUNT - PROGRAMMATIC INTERFACE - DIRECT HSC TO MOUNT A VOLUME
*
* FUNCTION:  USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*            MOUNT.
*
* ATTRIBUTES:
* ATTRIBUTES  --
*     1.  PROBLEM STATE, USER KEY
*     2.  NON-APF AUTHORIZED
*
* EXITS
*     RETURN CODE:
*          R15 =
*
* CHANGE HISTORY:
*     11/3Ø/9Ø-CRTD-VB - MODULE CREATED.
**ENDPROLOGUE*******************************************************
        TITLE  'MOUNT - ESTABLISH BASE REGISTER'
        PRINT  GEN
        ENTRY  MOUNT
MOUNT CSECT
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
        LR     R12,R15            LOAD EPA AND ESTABLISH
        USING  MOUNT,R12          ADDRESSABILITY TO THE CSECT
        STM    R14,R12,12(R13)    SAVE REGS
        LA     R1Ø,MAINSAVE       POINT TO OUR SAVE AREA
        ST     R13,4(,R1Ø)        PTR TO PREV S.A. FROM NEW
        ST     R1Ø,8(,R13)        PTR TO NEW S.A. FROM OLD
        LR     R13,R1Ø            ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLSX RESPONSE AREA.
*
        USING  SLX,R3
*
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
        LOAD   EP=SLSXCAL         LOAD SLSXCAL
        ST     RØ,WSCALADR        SAVE SLSXCAL ROUTINE ADR
```

Figure 36. Sample 6 - PGMI MOUNT Request

(1 of 3)

```
*
* USE SLSXREQ MACRO TO INVOKE MOUNT OPTION.
*
       SLSXREQ MOUNT,                                              +
              OPTION=SYNCH,                                        +
              XCALADR=WSCALADR,                                    +
              DRIVE=DRIVEADR,                                      +
              SCRATCH=YES,                                         +
              SCRPOOL=SCRPOOL,                                     +
              MF=(E,WSLSXREQ)
         LTR  R15,R15              HSC AVAILABLE?
         BNZ  HSCNOTAV             NO, TELL OPERATOR
         LR   R3,R1                POINT TO START OF REPLY HEADER
         CLI  SLXCMDRC,SLXROK      MOUNT SUCCESSFUL?
         BNE  FUNCFAIL             NO, TELL OPERATOR WHY
         B    FUNCEXIT             EXIT
*
* HSC IS NOT AVAILABLE.
*
HSCNOTAV DS   ØH
         WTO  'MOUNT - HSC NOT AVAILABLE'
         B    FUNCEXIT             EXIT
*
* MOUNT REQUEST FAILED.
*
FUNCFAIL DS   ØH
         LA   R4,SLXCMDRC          POINT TO FAILING RETURN CODE
         LA   R5,WFCMDRC           RECEIVING AREA
         LA   R15,1                NUMBER OF BYTES TO CONVERT
         BAL  R2,CONVHTC           CONVERT
         WTO  MF=(E,WTOQFAIL)      TELL OPERATOR
         B    FUNCEXIT             EXIT
*
* RETURN TO CALLER.
*
FUNCEXIT DS   ØH
         DELETE EP=SLSXCAL         DELETE SLSXCAL
         L    R13,4(,R13)          POINT TO PREV REG SAVE AREA
         L    R14,12(R13)          RESTORE REG 14
         LM   RØ,R12,2Ø(R13)       RESTORE REGS Ø - 12
         BR   R14                  RETURN TO CALLER
*
         TITLE 'MOUNT - SERVICE ROUTINES (DATA CONVERSION)'
```

Figure 93. Sample 6 - PGMI MOUNT Request (2 of 3)

```
*
* CONVERT HEXADECIMAL DATA TO CHARACTER DATA.
*
CONVHTC  DS     ØH
         ICM    R7,B'1ØØØ',Ø(R4)     GET ONE HEX BYTE
         LA     R8,2                 TWO HEX CHAR IN EACH BYTE
CHTCLOOP DS     ØH
         XR     R6,R6                CLEAR
         SLDL   R6,4                 SHIFT HALF BYTE TO NEXT REGISTER
         STC    R6,Ø(R5)             SET IN RECEIVING AREA
         TR     Ø(1,R5),TRTAB        TRANSLATE TO CHARACTER
         LA     R5,1(,R5)            BUMP TO NEXT RECEIVING BYTE
         BCT    R8,CHTCLOOP          DO FOR BOTH HEX CHAR IN BYTE
         LA     R4,1(,R4)            BUMP TO NEXT HEX BYTE
         BCT    R15,CONVHTC          DO FOR NUMBER OF HEX BYTES
         BR     R2                   RETURN TO CALLER
TRTAB    DC     CL16'Ø123456789ABCDEF'
*
         TITLE  'MOUNT - MISCELLANEOUS CONSTANTS AND EQUATES'
         LTORG
*
MAINSAVE DS     9D                   LINKAGE SAVE AREA
DWORD    DS     D                    DOUBLEWORD WORK AREA
*
WSCALADR DS     F                    SLSXCAL ROUTINE ADR
*
DRIVEADR DC     X'Ø38Ø'              DRIVE ADDRESS
*
SCRPOOL  DC     X'Ø1'                SCRATCH SUBPOOL ID
*
WTOQFAIL WTO    'MOUNT - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
WFCMDRC  EQU    WTOQFAIL+39
*
                TITLE 'MOUNT - SLSXREQ DSECT MACRO'
                SLSXREQM ,
*
                END   MOUNT
```

Figure 93. Sample 6 - PGMI MOUNT Request (3 of 3)

Sample EJECT Request

The following code fragment issues a EJECT request to direct the HSC to eject a volume.

```
EJECT TITLE 'EJECT - PROGRAMMATIC INTERFACE - EJECT'
*
* EJECT - PROGRAMMATIC INTERFACE - DIRECT HSC TO EJECT A VOLUME
*
* FUNCTION:  USE PROGRAMMATIC INTERFACE SLSXREQ MACRO FUNCTION
*            EJECT.
*
* ATTRIBUTES:
* ATTRIBUTES  --
*     1.  PROBLEM STATE, USER KEY
*     2.  NON-APF AUTHORIZED
*
* EXITS
*     RETURN CODE:
*          R15 =
*
* CHANGE HISTORY:
*     11/30/90-CRTD-VB - MODULE CREATED.
**ENDPROLOGUE*********************************************************
          TITLE 'EJECT - ESTABLISH BASE REGISTER'
          PRINT GEN
          ENTRY EJECT
EJECT CSECT
*
* ESTABLISH CSECT ADDRESSABILITY.
* IF NEEDED, R11 HAS BEEN RESERVED FOR A SECOND BASE REGISTER.
*
          LR    R12,R15             LOAD EPA AND ESTABLISH
          USING EJECT,R12           ADDRESSABILITY TO THE CSECT
          STM   R14,R12,12(R13)     SAVE REGS
          LA    R10,MAINSAVE        POINT TO OUR SAVE AREA
          ST    R13,4(,R10)         PTR TO PREV S.A. FROM NEW
          ST    R10,8(,R13)         PTR TO NEW S.A. FROM OLD
          LR    R13,R10             ESTABLISH NEW SAVE AREA
*
* ESTABLISH MAP TO SLSX RESPONSE AREA.
*
          USING SLX,R3
*
* LOAD HSC INTERFACE MODULE SLSXCAL.
*
          LOAD  EP=SLSXCAL          LOAD SLSXCAL
          ST    R0,WSCALADR         SAVE SLSXCAL ROUTINE ADR
```

Figure 37. Sample 7 - PGMI EJECT Request

(1 of 3)

```
*
* USE SLSXREQ MACRO TO INVOKE EJECT OPTION.
*
          SLSXREQ EJECT,                                          +
                OPTION=SYNCH,                                     +
                XCALADR=WSCALADR,                                 +
                VOLSER=VOLSER,                                    +
                MF=(E,WSLSXREQ)
          LTR   R15,R15              HSC AVAILABLE?
          BNZ   HSCNOTAV             NO, TELL OPERATOR
          LR    R3,R1                POINT TO START OF REPLY HEADER
          CLI   SLXCMDRC,SLXROK      EJECT SUCCESSFUL?
          BNE   FUNCFAIL             NO, TELL OPERATOR WHY
          B     FUNCEXIT             EXIT
*
* HSC IS NOT AVAILABLE.
*
HSCNOTAV  DS    ØH
          WTO   'EJECT - HSC NOT AVAILABLE'
          B     FUNCEXIT             EXIT
*
* EJECT REQUEST FAILED.
*
FUNCFAIL  DS    ØH
          LA    R4,SLXCMDRC          POINT TO FAILING RETURN CODE
          LA    R5,WFCMDRC           RECEIVING AREA
          LA    R15,1                NUMBER OF BYTES TO CONVERT
          BAL   R2,CONVHTC           CONVERT
          WTO   MF=(E,WTOQFAIL)      TELL OPERATOR
          B     FUNCEXIT             EXIT
*
* RETURN TO CALLER.
*
FUNCEXIT  DS    ØH
          DELETE EP=SLSXCAL          DELETE SLSXCAL
          L     R13,4(,R13)          POINT TO PREV REG SAVE AREA
          L     R14,12(R13)          RESTORE REG 14
          LM    RØ,R12,2Ø(R13)       RESTORE REGS Ø - 12
          BR    R14                  RETURN TO CALLER
*
          TITLE 'EJECT - SERVICE ROUTINES (DATA CONVERSION)'
*
* CONVERT HEXADECIMAL DATA TO CHARACTER DATA.
*
CONVHTC   DS    ØH
          ICM   R7,B'1ØØØ',Ø(R4)     GET ONE HEX BYTE
          LA    R8,2                 TWO HEX CHAR IN EACH BYTE
```

Figure 94. Sample 7 - PGMI EJECT Request (2 of 3)

```
CHTCLOOP    DS    ØH
            XR    R6,R6             CLEAR
            SLDL  R6,4              SHIFT HALF BYTE TO NEXT REGISTER
            STC   R6,Ø(R5)          SET IN RECEIVING AREA
            TR    Ø(1,R5),TRTAB     TRANSLATE TO CHARACTER
            LA    R5,1(,R5)         BUMP TO NEXT RECEIVING BYTE
            BCT   R8,CHTCLOOP       DO FOR BOTH HEX CHAR IN BYTE
            LA    R4,1(,R4)         BUMP TO NEXT HEX BYTE
            BCT   R15,CONVHTC       DO FOR NUMBER OF HEX BYTES
            BR    R2                RETURN TO CALLER
TRTAB       DC    CL16'Ø123456789ABCDEF'
*
            TITLE 'EJECT - MISCELLANEOUS CONSTANTS AND EQUATES'
            LTORG
*
MAINSAVE    DS    9D                LINKAGE SAVE AREA
DWORD       DS    D                 DOUBLEWORD WORK AREA
*
WSCALADR    DS    F                 SLSXCAL ROUTINE ADR
*
VOLSER      DC    C'EDU228'         VOLUME SERIAL TO EJECT
*
WTOQFAIL    WTO   'EJECT - SLSXREQ FAILED, SLXCMDRC = XX',MF=L
WFCMDRC     EQU   WTOQFAIL+39
*
            TITLE 'EJECT - SLSXREQ DSECT MACRO'
            SLSXREQM ,
*
            END   EJECT
```

Figure 94. Sample 7 - PGMI EJECT Request (3 of 3)

SLSXREQM Macro

The macro SLSXREQM must be specified in any assembly that uses the SLSXREQ macro. It generates symbols used by the SLSXREQ macro as well as providing mapping DSECTs of the response areas

Syntax

```
►►─label──SLSXREQM──┬──────────────────────────┬──────────────────────────►◄
                    │              ┌─NO─┐      │
                    └─PRO=─────────┴─YES──┘──────┘
```

Parameters

PRO={NO|YES}
Specifies whether the prologue should be generated (YES) or not (NO). **The default is NO.**

Programmatic Interface Mapping (SLSXREQM) Macro

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
0	(0)	STRUCTURE		SLSXREQM	USER INTERFACE
0	(0)	CHARACTER	4	SLSXHDR	EYECATCHER
‘SLSX’	(E2D3E2E7)	CHAR CONST		SLSXID	IS AN SLSXREQ
4	(4)	SIGNED-FWORD	4	SLSXLEN	LENGTH OF CONTROL BLOCK
8	(8)	A-ADDR	1	SLSXVER	VERSION OF SLSXREQ
9	(09)	CONST		SLSXVN	CURRENT VERSION
‘W’	(E6)	CHAR CONST		SLSXSP	SUB-POOL NUMBER
THE FOLLOWING FLAGS DEFINE THE TYPE OF PROCESSING REQUESTED					
9	(9)	A-ADDR	1	SLSXRT	REQUEST TYPE
0	(00)	CONST		SLSXNOOP	NOOP - NO OPERATION
1	(01)	CONST		SLSXQHSC	QHSC - IS HSC UP?
2	(02)	CONST		SLSXREST	RESET - DISMOUNT ALL VOL
3	(03)	CONST		SLSXREAD	READ - READ A RESPONSE
4	(04)	CONST		SLSXSTOP	STOP - STOP A PROCESS
5	(05)	CONST		SLSXRS05	RESERVED - VM ONLY
20	(14)	CONST		SLSXQCNF	QCONFIG - QUERY CONFIG
21	(15)	CONST		SLSXQDRV	QDRIVES - QUERY DRIVES
22	(16)	CONST		SLSXQDRL	QDRLIST - QUERY DRIVES
23	(17)	CONST		SLSXQSCR	QSCRATCH - QUERY SCRATCH
24	(18)	CONST		SLSXQVOL	QVOLUME - QUERY VOLUME
25	(19)	CONST		SLSXQEJT	QEJECT - QUERY EJECT TASK
26	(1A)	CONST		SLSXQCAP	QCAP - QUERY CAP CONFIG
27	(1B)	CONST		SLSXRS17	RESERVED - VM ONLY
28	(1C)	CONST		SLSXQRQS	QREQUEST QUERY REQUEST
29	(1D)	CONST		SLSXQDSN	QDSN - QUERY DATASET
40	(28)	CONST		SLSXMNT	MOUNT - MOUNT A VOLUME
41	(29)	CONST		SLSXMOVE	MOVE - MOVE A CARTRIDGE
42	(2A)	CONST		SLSXDSM	DISMOUNT - DISMOUNT A VOLUME
43	(2B)	CONST		SLSXEJCT	EJECT - EJECT A VOLUME
60	(3C)	CONST		SLSXSSCR	SELSCR - SELECT SCRATCH

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
61	(3D)	CONST		SLSXSCRA	SCRATCH - SCRATCH A VOLUME
62	(3E)	CONST		SLSXUNSC	UNSCRATCH - UNSCRATCH A VOL
63	(3F)	CONST		SLSXRS63	RESERVED - VM ONLY
64	(40)	CONST		SLSXRS64	RESERVED - VM ONLY
70	(46)	CONST		SLSXVCI	VCI REQUEST
71	(47)	CONST		SLSXVCIR	READ VCI REQUEST
10	(A)	BITSTRING	1	SLSXFLG1	FLAG BYTE 1 (PGMI CONTROL1)
		1... .... X’80’		SLSXSYNC	OPTION=SYNC SPECIFIED
		.1.. .... X’40’		SLSXF140	RESERVED VM USER=OPTION
		..1. .... X’20’		SLSXF120	RESERVEDVM DIALOG OFF
		...1 .... X’10’		SLSXF110	RESERVED VM DIALOG ON
		.... 1... X’08’		SLSXF108	RESERVED VM NOTIFY=INSEDL
		.... .1.. X’04’		SLSXF104	RESERVED VM NOTIFY=NOINSDEL
		.... ..1. X’02’		SLSXF102	RESERVED VM ACCT2
		....1 X’01’		SLSXF101	RESERVEDVM ACCT1
11	(B)	HEXSTRING	1	SLSXFLG2	FLAG BYTE 2 (PGMI CONTROL 2)
12	(C)	BITSTRING	1	SLSXFLG3	FLAG BYTE3 (MOVEMENT CONTROL 1)
		1... .... X’80’		SLSXVHST	SLSXHOST CONTAINS A HOSTID
		.1.. .... X’40’		SLSXVACS	SLSXACS CONTAINS AN ACSID
		..1. .... X’20’		SLSXVLSM	SLSXLSMI CONTAINS THE LSMID
		...1 .... X’10’		SLSXVCAP	SLSXCAP CONTAINS CAP
		.... 1... X’08’		SLSXF308	RESERVED FUTURE USE
		.... .1.. X’04’		SLSXVVOL	SLSXVOLS CONTAINS A VOLSER
		.... ..1. X’02’		SLSXVLST	SLSXLSTA CONTAINS A LIST ADR
		....1 X’01’		SLSXVCNT	SLSXCNT CONTAINS LIST COUNT
13	(D)	BITSTRING	1	SLSXFLG4	FLAG BYTE 4 (MOVEMENT CONTROL 2)

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
		1... .... X’80’		SLSXVTLM	SLSXTLSM CONTAINS TOLSM
		.1.. .... X’40’		SLSXVTPN	SLSXTPAN CONTAINS TOPANEL
		..1. .... X’20’		SLSXF420	RESERVED FUTURE USE
		...1 .... X’10’		SLSXF410	RESERVED FUTURE USE
		.... 1... X’08’		SLSXVPAN	SLSXPAN CONTAINS PANEL #
		.... .1.. X’04’		SLSXVROW	SLSXROW CONTAINS ROW #
		.... ..1. X’02’		SLSXVCOL	SLSXCOL CONTAINS COLUMN #
		....1 X’01’		SLSXVDRV	SLSXDRIV CONTAINS DEVICE NUMBER
14	(E)	HEXSTRING	1	SLSXFLG5	FLAG BYTE 5 (MOVEMENT CONTROL 3)
15	(F)	BITSTRING	1	SLSXFLG6	FLAG BYTE 6 (MISCELLANEOUS CONTROL 1)
		1... .... X’80’		SLSXPROT	PROTECT=YES SPECIFIED
		.1.. .... X’40’		SLSXSCR	SCRATCH=YES SPECIFIED
		..1. .... X’20’		SLSXVSCP	SLSXPOOL HAS A SCRATCH POOL NUM
		...1 .... X’10’		SLSXSUBN	SLSXSUBP CONTAINS TEXT
		.... 1... X’08’		SLSXVTKN	SLSXTKNO CONTAINS TOKEN NUM
		.... .1.. X’04’		SLSXVTXT	SLSXTEXT CONTAINS TEXT
		.... ..1. X’02’		SLSXF602	RESERVED FUTURE USE
		....1 X’01’		SLSXF601	RESERVED FUTURE USE
16	(10)	HEXSTRING	1	SLSXFLG7	FLAG BYTE 7 (MISCELLANEOUS CONTROL 2)
17	(11)	BITSTRING	1	SLSXLABT	LABEL TYPE
0	(00)	CONST		SLSXLLDT	LDT (LIBRARY DEFAULT TYPE)
1	(01)	CONST		SLSXLSL	SL (STANDARD LABEL)
2	(02)	CONST		SLSXLAL	AL (ANSI LABEL)
3	(03)	CONST		SLSXLNL	NL (NON-LABELED)
4	(04)	CONST		SLSXLNS	NSL (NON-STANDARD LABEL)
18	(12)	CHARACTER	8	-RESERVED-	RESERVED VM USER
26	(1A)	CHARACTER	8	-RESERVED-	RESERVED VM ACCT1
34	(22)	CHARACTER	8	-RESERVED-	RESERVED VM ACCT2
42	(2A)	HEXSTRING	2	-RESERVED-	

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
44	(2C)	SIGNED-FWORD	4	SLSXRLEN	RESPONSE LENGTH
48	(30)	SIGNED-FWORD	4	SLSXTKNO	PGMI PASS THRU TOKEN NUMBER
52	(34)	A-ADDR	4	SLSXLSTA	ADDRESS OF LIST
56	(38)	SIGNED-HWORD	2	SLSXCNT	COUNT OF ELEMENTS IN LIST
58	(3A)	SIGNED-HWORD	2	SLSXLOFF	OFFSET, FROM START OF PARAMETER LIST TO START OF THE ELEMENT LIST AREA
60	(3C)	CHARACTER	6	SLSXVOLS	VOLSER FROM VOLSER= PARAMETER
66	(42)	CHARACTER	8	SLSXHOST	ASSOCIATED HOSTID
74	(4A)	AREA	4	SLSXALC	ACS / LSM / CAP IDENTIFICATION
74	(4A)	HEXSTRING	1	SLSXACS	ACS ID NUMBER
74	(4A)	HEXSTRING	2	SLSXLSMI	LSM ID NUMBER
74	(4A)	HEXSTRING	4	SLSXCAP	CAP-ID
74	(4A)	HEXSTRING	3	-RESERVED-	
77	(4D)	HEXSTRING	1	-RESERVED-	NOT IMPLEMENTED (ALWAYS X’00’)
78	(4E)	HEXSTRING	1	SLSXPAN	CELL- PANEL
79	(4F)	HEXSTRING	1	SLSXROW	CELL- ROW
80	(50)	HEXSTRING	1	SLSXCOL	CELL- COLUMN
81	(51)	HEXSTRING	2	SLSXTLSM	TOLSM ID FOR MOVE FUNCTION
83	(53)	HEXSTRING	1	SLSXTPAN	“TO” PANEL FOR MOVE FUNCTION
84	(54)	A-ADDR	2	SLSXDRIV	DRIVE DEVICE NUMBER
86	(56)	A-ADDR	1	SLSXPOOL	SCRATCH POOL NUMBER
87	(57)	CHARACTER	32	SLSXTEXT	TEXT ASSOCIATED WITH REQUEST
119	(77)	CHARACTER	13	SLSXSUBP	SCRATCH SUBPOOL NAME
TAPEREQ INPUT KEY VALUES. THE FOLLOWING VALUES ARE USED AS THE KEY IN SEARCHING THE CURRENT TAPEREQ PARAMETER FILE.					
132	(84)	BITSTRING	1	SLSXFLG8	FLAG BYTE 8: (TAPEREQ CONTROL 1)
		1... .... X’80’		SLSXFJOB	SLSXJOBN PRESENT
		.1.. .... X’40’		SLSXFSTP	SLSXSTEP PRESENT

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
		..1. .... X’20’		SLSXFPGM	SLSXPGMN PRESENT
		...1 .... X’10’		SLSXFDSN	SLSXDSN PRESENT
		.... 1... X’08’		SLSXFEXP	SLSXEXPD PRESENT
		.... .1.. X’04’		SLSXFRET	SLSXRETP PRESENT
		.... ..1. X’02’		SLSXFVOL	SLSXVOLT PRESENT
133	(85)	OFFSET		SLSXTRI	TAPEREQ INPUT VALUES
133	(85)	CHARACTER	8	SLSXJOBN	STRING TO MATCH TAPEREQ JOBNAME VALUE
141	(8D)	CHARACTER	8	SLSXSTEP	STRING TO MATCH TAPEREQ STEPNAME VALUE
149	(95)	CHARACTER	8	SLSXPGMN	STRING TO MATCH TAPEREQ PROGNAME VALUE
157	(9D)	CHARACTER	44	SLSXDSN	STRING TO MATCH TAPEREQ DSN VALUE
201	(C9)	HEXSTRING	3	SLSXEXPD	VALUE TO MATCH TAPEREQ EXPDT VALUE
204	(CC)	HEXSTRING	2	SLSXRETP	VALUE TO MATCH TAPEREQ RETPD VALUE
206	(CE)	CHARACTER	1	SLSXVOLT	STRING TO MATCH TAPEREQ VOLTYPE VALUE
74	(4A)	LENGTH		SLSXTRIL	
TAPEREQ OUTPUT VALUES. THE FOLLOWING VALUES ARE USED AS OVERRIDE (OR SPECIFIC) VALUES TO THE VALUES FOUND IN THE CURRENT TAPEREQ PARAMETER FILE.					
207	(CF)	BITSTRING	1	SLSXFLG9	FLAG BYTE 9: (TAPEREQ CONTROL 2)
		1... .... X’80’		SLSXFREC	SLSXRECT PRESENT
		.1.. .... X’40’		SLSXFMED	SLSXMED PRESENT
		..1. .... X’20’		SLSXFMGT	SLSXMGMT PRESENT
208	(D0)	CHARACTER	8	SLSXRECT	RECORDING TECHNIQUE
216	(D8)	CHARACTER	8	SLSXMED	MEDIA
224	(E0)	SIGNED-FWORD	4	SLSXVCIP	POINTER TO VCI TEXT
228	(E4)	SIGNED-FWORD	2	SLSXVCIL	LENGTH OF VCI TEST
224	(E0)	SIGNED-FWORD	4	SLSXVCIT	VCI RESPONSE TOKEN
230	(E6)	CHARACTER	8	SLSXMGMT	MANAGEMENT CLASS
238	(EE)	HEXSTRING	242	-RESERVED-	RESERVED FOR FUTURE PARM EXPANSION
480	(1E0)	AREA	8	-RESERVED-	ALIGNMENT

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
480	(1E0)	LENGTH		SLSXLN	LENGTH OF FIXED AREA OF SLSXREQ
480	(1E0)	AREA	1	SLSXLIST	ELEMENT LIST DESIGNATED BY LIST= PARAMETER BEGINS HERE (FIELD SLSXCNT CONTAINS NUMBER OF ELEMENTS IN THIS LIST).
6	(06)	CONST		SLSXLVSL	LENGTH OF EACH ELEMENT (VOLSER) IN THE LIST USED BY THE EJECT FUNCTION.
500	(1F4)	CONST		SLSXMVSL	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE EJECT, QCAP AND QEJECT FUNCTIONS.
4	(04)	CONST		SLSXLCAP	LENGTH OF EACH ELEMENT (CAP IDENTIFIER) IN THE LIST USED BY THE QCAP FUNCTION.
500	(1F4)	CONST		SLSXMCAP	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE QCAP FUNCTION.
4	(04)	CONST		SLSXLTOK	LENGTH OF EACH ELEMENT (UNIQUE TOKEN) IN THE LIST USED BY THE QCAP FUNCTION.
500	(1F4)	CONST		SLSXMTOK	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE QEJECT/STOP FUNCTIONS.
REPLY HEADER					
0	(0)	STRUCTURE		SLX	
0	(0)	AREA	1	SLXRPLY	
0	(0)	CHARACTER	3	SLXHID	HEADER IDENTIFIER
‘W’	(E6)	CHAR CONST		SLXSP	SUB-POOL NUMBER
3	(3)	A-ADDR	1	SLXCMDRC	RETURN CODE
0	(00)	CONST		SLXROK	REQUEST SUCCESSFUL
4	(04)	CONST		SLXRWARN	WITH WARNING SLXSRC WILL PROVIDE THE SPECIFIC REASON FOR THE WARNING
8	(08)	CONST		SLXRBADP	REQUEST FAILED - THE PARAMETER LIST (SLSXREQM) CONTAINED INVALID DATA (E.G. INCOMPATIBLE OPTIONS) SLXPEOFF (PARM ERROR OFFSET) WILL PROVIDE AN OFFSET OF THE SLSXREQM FIELD FOUND IN ERROR

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
12	(C)	CONST		SLXRIERR	REQUEST FAILED - AN UNRECOVERABLE INTERNAL ERROR INTERNAL EROR OCCURRED WHILE PROCESSING THE REQUEST
16	(10)	CONST		SLXRFAIL	REQUEST FAILED - SLXSRC WILL PROVIDE THE SPECIFIC REASON FOR THE FAILURE
20	(14)	CONST		SLXRNHSC	REQUEST FAILED - HSC NOT AVAILABLE (MVS ONLY)
24	(18)	CONST		SLXRNAUT	REQUEST FAILED - USER NOT AUTHORIZED. THE REQUEST WAS FAILED BY SLSUX05 OR THE HSC DEFAULT AUTHORIZATION (MVS ONLY)
28	(1C)	CONST		SLXNTCB	REQUEST FAILED - THE CALLER WAS NOT IN TASK MODE (MVS ONLY)
32	(20)	CONST		SLXLOCKD	REQUEST FAILED - THE CALLER HELD AT LEAST ONE LOCK (MVS ONLY)
36	(24)	CONST		SLXTPROT	REQUEST FAILED - THE CALLER DID NOT HAVE FETCH/STORE AUTHORITY TO THE SLSXREQM PARAMETER LIST (MVS ONLY)
40	(28)	CONST		SLXNORSP	REQUEST FAILED - NO RESPONSE ELEMENT WITH THE SPECIFIED TOKEN EXISTED. (MVS ONLY)
44	(2C)	CONST		SLXRBADL	REQUEST FAILED; REPLY AREA PROVIDED BY REQUESTOR WAS TOO SMALL TO CONTAIN ALL REPLY DATA ASSOCIATED WITH THE REQUEST. IF FIELD SLXCRLN IS NON-ZERO, IT CONTAINS THE LENGTH VALUE THAT SHOULD BE SPECIFIED FOR THE REPLY AREA FOR THIS REQUEST. (VM ONLY)
48	(30)	CONST		SLXRNVCI	VCIRQST AND VCIRESP NOT SUPPORTED. EITHER VTCS IS NOT INSTALLED - OR - IS NOT AT THE REQUIRED LEVEL TO SUPPORT THE PGMI VCI REQUEST.
52	(34)	CONST		SLXREOV	END OF VCI RESPONSES.
56	(38)	CONST		SLXRVNV	VCI REQUEST NOT VALID. THE VCI COMMAND SUPPLIED ON THE VCIRQST STATEMENT IS NOT VALID.
60	(3C)	CONST		SLXRBTOK	THE VCI TOKEN BEING USED TO OBTAIN VCI RESPONSES IS INVALID

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
4	(4)	A-ADDR	1	SLXVERS	REPLY VERSION CODE
9	(09)	CONST		SLXVCODE	VERSION 9 OF THE REPLY AREA
5	(5)	BITSTRING	1	SLXRFLG1	‘RESPONSE FLAGS
		1... .... X’80’		SLXROKM	MORE RESPONSES CAN BE READ
6	(6)	HEXSTRING	2	-RESERVED-	RESERVED
8	(8)	SIGNED-FWORD	4	SLXSRC	FAILURE REASON CODE THESE REASON CODES ARE THE ACTUAL RETURN CODES FOR A GIVEN FUNCTION. THEY ARE DOCUMENTED IN THE HSC MESSAGES AND CODES GUIDE, CHAPTER 4 - HSC RETURN CODES.
32772	(8004)	CONST		SLXNOALS	HSC IS NOT ACTIVE
32788	(8014)	CONST		SLXQNOA	ASCOMM IS NOT ACTIVE
32792	(8018)	CONST		SLXINVOP	INVALID QUAB OPTION INTERNAL ERROR - CONTACT STK
32780	(800C)	CONST		SLXINVFC	INVALID FUNCTION CODE INTERNAL ERROR - CONTACT STK.
32784	(8010)	CONST		SLXNOLVT	NO LVT INTERNAL ERROR - CONTACT STK.
32804	(8024)	CONST		SLXTABND	ASCOMM SERVER TASK ABENDED
32818	(8032)	CONST		SLXTINTR	CURRENT TASK INTERRUPTED
32822	(8036)	CONST		SLXSANF	SEARCH ARGUMENT NOT FOUND
32826	(803A)	CONST		SLXMSTT	MIS-MATCHED TOKEN TYPES
32832	(8040)	CONST		SLXTRNF	TOKEN REQUEST AREA NOT FOUND
32848	(8050)	CONST		SLXSFUL	REPLY AREA SPACE FULL
32849	(8051)	CONST		SLXDVMM	DRIVE/MEDIA MISMATCH THE REQUESTED MEDIA (EITHER DIRECTLY VIA PGMI MEDIA/RECTECH OR INDIRECTLY VIA TAPEREQ) IS NOT COMPATIBLE WITH THE DRIVE SPECIFIED IN THE PGMI CALL
12	(C)	A-ADDR	4	SLXLEN	TOTAL RESPONSE LENGTH.
16	(10)	SIGNED-FWORD	4	SLXPEOFF	PARAMETER ERROR OFFSET
20	(14)	LENGTH		SLXHL	SLX HEADER LENGTH

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
CONFIGURATION SUMMARY SECTION DIRECTORY					
20	(14)	SIGNED-FWORD	4	SLXXCFGN	NUMBER OF CONFIGURATION ELEMENTS PRESENT IN THIS REPLY
24	(18)	SIGNED-FWORD	4	SLXXCFGO	OFFSET TO CONFIGURATION SECTION FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN ANY CONFIGURATION ELEMENTS
28	(1C)	SIGNED-FWORD	4	SLXXCFGL	LENGTH OF A CONFIGURATION ELEMENT, OR 0 IF REPLY DOESN'T CONTAIN ANY CONFIGURATION ELEMENTS
VOLUME INFORMATION SECTION DIRECTORY					
32	(20)	SIGNED-FWORD	4	SLXXVOLN	NUMBER OF VOLUME ELEMENTS PRESENT THIS REPLY
36	(24)	SIGNED-FWORD	4	SLXXVOLO	OFFSET TO VOLUME SECTION FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN ANY VOLUME ELEMENTS
40	(28)	SIGNED-FWORD	4	SLXXVOLL	LENGTH OF A VOLUME ELEMENT, OR 0 IF REPLY DOESN'T CONTAIN ANY VOLUME ELEMENTS
DRIVE INFORMATION SECTION DIRECTORY					
44	(2C)	SIGNED-FWORD	4	SLXXDRVN	NUMBER OF DRIVE ELEMENTS PRESENT IN THIS REPLY
48	(30)	SIGNED-FWORD	4	SLXXDRVO	OFFSET TO DRIVE SECTION FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN A DRIVE SECTION
52	(34)	SIGNED-FWORD	4	SLXXDRVL	LENGTH OF A DRIVE ELEMENTS OR 0 IF REPLY DOESN'T CONTAIN A DRIVE SECTION
LSM INFORMATION SECTION DIRECTORY					
56	(38)	SIGNED-FWORD	4	SLXXLSMN	NUMBER OF LSM ELEMENTS PRESENT IN THIS REPLY
60	(3C)	SIGNED-FWORD	4	SLXXLSMO	OFFSET TO LSM SECTION FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN A LSM SECTION
64	(40)	SIGNED-FWORD	4	SLXXLSML	LENGTH OF AN LSM ELEMENT, OR 0 IF REPL DOESN'T CONTAIN AN LSM SECTION
MESSAGE TEXT SECTION DIRECTORY					

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
68	(44)	SIGNED-FWORD	4	SLXXMSGN	NUMBER OF MESSAGE ELEMENTS PRESENT IN THIS REPLY
72	(48)	SIGNED-FWORD	4	SLXXMSGO	OFFSET TO MESSAGE SECTION, FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN ANY MESSAGE ELEMENTS
76	(4C)	SIGNED-FWORD	4	SLXXMSGL	LENGTH OF A MESSAGE ELEMENT
QCAP INFORMATION SECTION DIRECTORY					
80	(50)	SIGNED-FWORD	4	SLXXCAPN	NUMBER OF CAP ELEMENTS PRESENT IN THIS REPLY
84	(54)	SIGNED-FWORD	4	SLXXCAPO	OFFSET TO CAP SECTION FROM START OF REPLY
88	(58)	SIGNED-FWORD	4	SLXXCAPL	LENGTH OF A CAP ELEMENT
QEJECT INFORMATION SECTION DIRECTORY					
92	(5C)	SIGNED-FWORD	4	SLXXQJTN	NUMBER OF QEJECT ELEMENTS PRESENT THIS REPLY
96	(60)	SIGNED-FWORD	4	SLXXQJTO	OFFSET TO QEJECT SECTION FROM START OF REPLY
100	(64)	SIGNED-FWORD	4	SLXXQJTL	LENGTH OF A QEJECT ELEMENT
STOP INFORMATION SECTION DIRECTORY					
104	(68)	SIGNED-FWORD	4	SLXXSTPN	NUMBER OF STOP ELEMENTS PRESENT IN THIS REPLY
108	(6C)	SIGNED-FWORD	4	SLXXSTPO	OFFSET TO STOP SECTION FROM START OF REPLY
112	(70)	SIGNED-FWORD	4	SLXXSTPL	LENGTH OF A STOP ELEMENT
QDSN INFORMATION SECTION DIRECTORY					
116	(74)	SIGNED-FWORD	4	SLXXQDSN	NUMBER OF QDSN ELEMENTS PRESENT IN THIS REPLY
120	(78)	SIGNED-FWORD	4	SLXXQDSO	OFFSET TO QDSN SECTION FROM START OF REPLY
124	(7C)	SIGNED-FWORD	4	SLXXQDSL	LENGTH OF A QDSN ELEMENT
VCI INFORMATION SECTION DIRECTORY					
128	(80)	SIGNED-FWORD	4	SLXXVCIN	NUMBER OF VCI ELEMENTS PRESENT IN THIS REPLY
132	(84)	SIGNED-FWORD	4	SLXXVCIO	OFFSET TO VCI SECTION FROM START OF REPLY
136	(88)	SIGNED-FWORD	4	SLXXVCIL	LENGTH OF A VCI ELEMENT

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
140	(8C)	A-ADDR	4	-RESERVED-(9)	RESERVED FOR FUTURE ENTRIES
176	(B0)	AREA	8	SLXEND	LABEL FOR ADDRESSING NEXT AREA.
176	(B0)	LENGTH		SLXL	SLXLENGTH
CONFIGURATION SUMMARY ELEMENT THIS ELEMENT APPEARS IN THE REPLY TO A QCONFIG REQUEST AND SUPPLIES SUMMARY INFORMATION ABOUT THE LIBRARY AND ABOUT REPLY LENGTHS NECESSARY FOR OTHER TYPES OF REQUESTS.					
0	(0)	STRUCTURE		SLXSCFG	STANDARD
0	(0)	CHARACTER	3	SLXLID	ELEMENT IDENTIFIER
3	(3)	HEXSTRING	1	-RESERVED-	RESERVED
4	(4)	CHARACTER	8	SLXLHNAM	HOST ID
12	(C)	SIGNED-FWORD	4	SLXLHHBT	HOST PULSE VALUE
16	(10)	SIGNED-FWORD	4	SLXLRSTM	RESERVE TIMEOUT LIMIT
20	(14)	CHARACTER	8	SLXLQNAM	ENQ MAJOR NAME
28	(1C)	CHARACTER	8	-RESERVED-	RESERVED
36	(24)	CHARACTER	1	SLXLCMPF	COMMAND PREFIX CHARACTER
37	(25)	BITSTRING	1	SLXLSCLB	SCRATCH LABEL TYPE:
0	(00)	CONST		SLXLLBSL	
1	(01)	CONST		SLXLLBAL	ASCII
2	(02)	CONST		SLXLLBNL	NON-LABELED
3	(03)	CONST		SLXLLBNS	NON-STANDARD LABEL
		11.. ..1. X’C2’		SLXLLBBL	BYPASS LABEL (CHARACTER = B)
		11.1 .1.1 X’D5’		SLXLLBNA	LABEL INFO NA (CHARACTER = N)
38	(26)	A-ADDR	1	SLXLSMF	SMF RECORD TYPE
39	(27)	HEXSTRING	1	-RESERVED-	RESERVED
40	(28)	SIGNED-FWORD	4	SLXQMDR	LARGEST NUMBER OF DRIVES IN ANY ACS
44	(2C)	SIGNED-FWORD	4	SLXQDRCT	NUMBER OF DRIVES IN THE LIBRARY
48	(30)	SIGNED-FWORD	4	SLXQACNT	NUMBER OF ACSS IN THE LIBRARY
52	(34)	SIGNED-FWORD	4	SLXQLCNT	NUMBER OF LSMS IN THE LIBRARY

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
56	(38)	SIGNED-FWORD	4	-RESERVED-(15)	RESERVED - VM LENGTHS
WARNING. THE FOLLOWING FIELD DOES NOT EXIST UNLESS THE VERSION IN SLXVERS IS GREATER THAN 2.					
116	(74)	A-ADDR	4	SLXQUCSA	ADDRESS OF SLSUXCSA.
120	(78)	A-ADDR	4	-RESERVED-	RESERVED VM
124	(7C)	SIGNED-FWORD	4	SLXQLCAP	NUMBER OF CAPS IN THE LIBRARY
128	(80)	SIGNED-FWORD	4	SLXEXLM0	ExLM R15
132	(84)	SIGNED-FWORD	4	SLXEXML1	ExLM R1
136	(88)	SIGNED-FWORD	4	SLXEXLM2	ExLM R2
140	(8C)	SIGNED-FWORD	4	-RESERVED-(5)	RESERVED - VM Z-FIELDS
160	(A0)	SIGNED-HWORD	2	SLXHSCV	HSC VERSION NUMBER
162	(A2)	HEXSTRING	6	-RESERVED-	ALIGN TO DOUBLE WORD
168	(A8)	LENGTH		SLXSCFGL	LENGTH
QDSN INFORMATION ELEMENT THIS ELEMENT APPEARS IN THE REPLY TO A QDSN REQUEST AND SUPPLIES SUMMARY INFORMATION ABOUT THE CURRENT REFERENCED DATASETS USED BY THE HSC.					
0	(0)	STRUCTURE		SLXDSNIM	DATASET INFORMATION MAP
0	(0)	CHARACTER	3	SLXQDID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SLXDSFLG	DATASET TYPE
1	(01)	CONST		SLXDSPRM	CDS PRIMARY
2	(02)	CONST		SLXDSSEC	CDS SECONDARY
3	(03)	CONST		SLXDSSBY	CDS STANDBY
4	(04)	CONST		SLXDSVAT	VOLUME ATTRIBUTES
5	(05)	CONST		SLXDSUAT	UNIT ATTRIBUTES
6	(06)	CONST		SLXDSTRQ	TAPEREQS
7	(07)	CONST		SLXDSPLB	PARMLIB
8	(08)	CONST		SLXDSJNP	PRIMARY JOURNAL
9	(09)	CONST		SLXDSJNA	ALTERNATE JOURNAL
9	(09)	CONST		SLXDSMAX	MAX NUMBER OF QDS RETURNED
4	(4)	CHARACTER	44	SLXDSNAM	DATASET NAME
48	(30)	CHARACTER	8	SLXDSMBR	MEMBER NAME
56	(38)	CHARACTER	6	SLXDSVOL	VOLUME NAME
62	(3E)	CHARACTER	8	SLXDSUNT	UNIT NAME

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
70	(46)	CHARACTER	2	-RESERVED-	RESERVED
72	(48)	CHARACTER	96	-RESERVED-	RESERVED
168	(A8)	AREA	8	-RESERVED-	ALIGN
168	(A8)	LENGTH		SLXDSNEL	LENGTH OF ONE DATASET ENTRY
CAP INFORMATION ELEMENT THIS ELEMENT SUPPLIES INFORMATION ABOUT A SINGLE LIBRARY CAP					
0	(0)	STRUCTURE		SLXSCAP	
0	(0)	CHARACTER	4	SLXCID	SECTION IDENTIFIER
4	(4)	HEXSTRING	1	SLXCACS	ACS ADDRESS
5	(5)	HEXSTRING	1	SLXCLSM	LSM ADDRESS
6	(6)	HEXSTRING	1	SLXCCAP	CAP NUMBER
7	(7)	HEXSTRING	1	-RESERVED-	RESERVED
8	(8)	AREA	2	SLXCSTAT	CAP STATUS
8	8	BITSTRING	1	SLXCSTB1	CAP STATUS
		1... .... X’80’		SLXCSTCA	CAP IS ACTIVE
		.1.. .... X’40’		SLXCSTNR	CAP NEEDS RECOVERY
		..1. .... X’20’		SLXCSTAM	CAP IS IN AUTOMATIC MODE
		...1 .... X’10’		SLXCSTCL	CAP IS LINKED
		.... 1... X’08’		SLXCSTCO	CAP IS ONLINE
9	(9)	BITSTRING	1	SLXCSTB2	CAP MODE
		1... .... X’80’		SLXCSTIE	CAP IS ENTERING
		.1.. .... X’40’		SLXCSTID	CAP IS DRAINING
		..1. .... X’20’		SLXCSTIJ	CAP IS EJECTING
		...1 .... X’10’		SLXCSTIC	CAP IS CLEANING
		.... 1... X’08’		SLXCSTII	CAP IS IDLE
10	(A)	BITSTRING	1	SLXCTYPE	TYPE OF CAP
		1... .... X’80’		SLXCTPC	PRIORITY CAP
		....1 X’01’		SLXCTCIM	CIMARRON
		.... ..1. X’02’		SLXCTCLP	CLIPPER
		.... ..11 X’03’		SLXCTTWS	STANDARD CLIPPER
		.... .1.. X’04’		SLXCTTWO	OPTIONAL CLIPPER
		.... .1.1 X’05’		SLXCTTIM	(9740/TIMBERWOLF)

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
12	(C)	SIGNED-HWORD	2	SLXCCELL	CELLS IN CAP
14	(E)	HEXSTRING	1	SLXCNROW	ROWS
15	(F)	HEXSTRING	1	SLXCNCOL	COLUMNS
16	(10)	HEXSTRING	1	SLXCCMAG	MAGAZINES
17	11	HEXSTRING	1	SLXCCMGC	CELLS IN MAGAZINE
18	(12)	CHARACTER	8	SLXCJOB	JOBNAME OF OWNER
26	(1A)	HEXSTRING	6	-RESERVED-	ALIGN TO DOUBLE WORD
32	(20)	LENGTH		SLXSCAPL	LENGTH
QEJECT INFORMATION ELEMENT THIS ELEMENT SUPPLIES INFORMATION ABOUT A SINGLE EJECT VOLUME AND IS REPEATED FOR EACH VOLUME WITHIN AN EJECT LIST					
0	(0)	STRUCTURE		SLXQJT	
0	(0)	CHARACTER	4	SLXQID	SECTION IDENTIFIER
4	(4)	HEXSTRING	4	SLXQJTT	TOKEN OF EJECT TASK
8	(8)	HEXSTRING	4	SLXQJTC	EJECT (ACS / LSM / CAP 00)
12	(C)	HEXSTRING	2	SLXQJTS	TARGETED VOLUME EJECT STATUS
65535	(FFFF)	CONST		SLXQJTN	VOLUME NOT PROCESSED YET
0	(00)	CONST		SLXQJTD	VOLUME HAS BEEN EJECTED
14	(E)	HEXSTRING	6	SLXQJTV	VOLUME NUMBER
20	(14)	HEXSTRING	4	-RESERVED-	ALIGN TO DOUBLE WORD
24	(18)	LENGTH		SLXQJTL	LENGTH
STOP INFORMATION ELEMENT THIS ELEMENT SUPPLIES STATUS FOR A TOKEN OF A PGMI TASK REQUESTED TO BE STOPPED. THIS DEFINITION WILL BE REPEATED FOR EACH ELEMENT WITHIN A TASK STOP LIST					
0	(0)	STRUCTURE		SLXSTP	
0	(0)	CHARACTER	4	SLXSID	SECTION IDENTIFIER
4	(4)	HEXSTRING	4	SLXSTPT	TOKEN NUMBER
8	(8)	HEXSTRING	1	SLXSTPY	TARGET PROCESS TYPE X’FF’ PROCESS TYPE UNKNOWN
9	(9)	BITSTRING	1	SLXSTPS	TARGET PROCESS STOP STATUS
		.... X’00’		SLXSTPK	PROCESS MARKED TO STOP
		111. 111. X’EE’		SLXSTPE	PROCESS DOES NOT SUPPORT STOP
		1111 1111 X’FF’		SLXSTPN	SLXSTPN PROCESS TOKEN NOT FOUND

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
10	(A)	HEXSTRING	6	-RESERVED-	ALIGN TO DOUBLE WORD
16	(10)	LENGTH		SLXSTPL	LENGTH
VOLUME INFORMATION ELEMENT THIS ELEMENT SUPPLIES INFORMATION ABOUT A SINGLE VOLUME AND IS REPEATED FOR EACH VOLUME ASSOCIATED WITH A REQUEST. THIS ELEMENT MAY APPEAR IN REPLIES TO THE FOLLOWING REQUESTS: QDRLIST - RETURN DRIVE INFORMATION, ORDERED BY PREFERENCE QVOLUME - RETURN VOLUME INFORMATION SELSCR - SELECT A SCRATCH VOLUME EJECT - EJECT VOLUMES					
0	(0)	STRUCTURE		SLXSVOL	
0	(0)	CHARACTER	3	SLXVID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SLXVSTA	VOLUME STATUS:
		1... .... X’80’		SLXVILB	VOLUME IS IN LIBRARY
		.1.. .... X’40’		SLXVOHST	VOLUME IS IN USE BY ANOTHER HOST
		..1. .... X’20’		SLXVSCR	VOLUME IS CONSIDERED SCRATCH
		...1 .... X’10’		SLXVMAL	VOLUME IS IN MANUAL-MODE LSM
		.... 1... X’08’		SLXVDSC	VOLUME IS IN DISCONNECTED ACS
		.... .1.. X’04’		SLXVMNT	VOLUME IS MOUNTED ON A DRIVE
		.... ..1. X’02’		SLXVERR	VOLUME IS ‘ERRANT’ (I.E. ITS LOCATION WITHIN THE LIBRARY IS UNCERTAIN) EQU X’01’ RESERVED
		....1 X’01’		SLXVTV	VOLUME IS A VTCS VIRTUAL VOLUME
4	(4)	CHARACTER	6	SLXVSER	VOLUME SERIAL
10	(A)	A-ADDR	1	SLXVLC	VOLUME LOCATION CODE:
0	(00)	CONST		SLXVUNK	LOCATION DATA UNAVAILABLE (SLXVLOC IS
1	(01)	CONST		SLXVCEL	LOCATION DATA IS A CELL ADDRESS
2	(02)	CONST		SLXVDRV	LOCATION DATA IS A DRIVE ADDRESS
11	(B)	AREA	5	SLXVLOC	VOLUME LOCATION DATA:
11	(B)	HEXSTRING	1	SLXVACS	ACS ADDRESS
12	(C)	HEXSTRING	1	SLXVLSM	LSM ADDRESS
13	(D)	HEXSTRING	3	SLXVPNL	PANEL, ROW, COL

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
13	(D)	HEXSTRING	2	SLXVDRIV	DRIVE ADDRESS (0CUU)
15	(F)	BITSTRING	1	SLXVSTA2	MORE VOLUME STATUS: EQU X'E0' RESERVED
		....1 .... X'10'		SLXVMLMU	VOLUME MEDIA TYPE CAME FROM LMU. EQU X'08' RESERVED.
		.... .1.. X'04'		SLXVMUNR	VOLUME MEDIA TYPE UNREADABLE.
		.... ..1. X'02'		SLXVMVLA	VOLUME MEDIA TYPE CAME FROM VOLATTR
		....1 X'01'		SLXVMDFL	VOLUME MEDIA TYPE DEFAULT ASSIGNED.
16	(10)	AREA	8	SLXVTSSN	VTSS NAME
16	(10)	SIGNED-FWORD	4	SLXVDATI	HI-WORD OF TOD AT INSERTION
20	(14)	SIGNED-FWORD	4	SLXVDATL	HI-WORD OF TOD LAST SELECTION
24	(18)	SIGNED-FWORD	4	SLXVSCNT	SELECTION COUNT
28	(1C)	SIGNED-FWORD	4	SLXVDATD	HI-WORD OF TOD LAST MOUNT/DISMOUNT
32	(20)	CHARACTER	8	SLXVMED	TYPE OF MEDIA
40	(28)	AREA	8	-RESERVED-	ALIGN
40	(28)	LENGTH		SLXSVOLL	LENGTH OF SLXSVOL
DRIVE INFORMATION ELEMENT THIS ELEMENT SUPPLIES INFORMATION ABOUT A SINGLE LIBRARY TAPE DRIVE AND IS REPEATED FOR EACH DRIVE ASSOCIATED WITH A REQUEST. THIS ELEMENT MAY APPEAR IN REPLIES TO THE FOLLOWING REQUESTS: QDRIVES - RETURN DRIVE AND LSM INFORMATION QDRLIST - RETURN DRIVE INFORMATION, ORDERED BY PREFERENCE					
0	(0)	STRUCTURE		SLXSDRV	
0	(0)	CHARACTER	3	SLXDID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SLXDSTA	LIBRARY STATUS
		...1 .... X'10'		SLXDMANU	LSM IS IN MANUAL MODE
		.... 1... X'08'		SLXDDISC	ACS IS DISCONNECTED
		....1 X'01'		SLXDVIRT	DRIVE IS VIRTUAL
4	(4)	HEXSTRING	1	SLXQDEAC	ACS ADDRESS
5	(5)	HEXSTRING	1	SLXQDELS	LSM ADDRESS
6	(6)	HEXSTRING	2	SLXQDECU	DRIVE ADDRESS (0CUA)
8	(8)	CHARACTER	8	SLXQDRT	RECORDING TECHNIQUE OF DRIVE

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
16	(10)	AREA	8	-RESERVED-	ALIGN
16	(10)	LENGTH		SLXSDRVL	LENGTH OF SLSXDRV
LSM INFORMATION ELEMENT THIS ELEMENT SUPPLIES INFORMATION ABOUT A SINGLE LSM (LIBRARY STORAGE MODULE) AND IS REPEATED FOR EACH LSM ASSOCIATED WITH A REQUEST. THIS ELEMENT MAY APPEAR IN REPLIES TO THE FOLLOWING REQUESTS: QDRIVES - RETURN DRIVE AND LSM INFORMATION QDRLIST - RETURN LSM INFORMATION FOR SCRATCH=YES QSCRATCH - RETURN LSM INFORMATION, ORDERED BY PREFERENCE					
0	(0)	STRUCTURE		SLXSLSM	
0	(0)	CHARACTER	3	SLXMID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SLXMSTAT	LSM STATUS FLAGS:
		...1 .... X’10’		SLXMANUL	LSM IS IN MANUAL MODE
		.... 1... X’08’		SLXMDISC	LSM’S ACS IS DISCONNECTED
4	(4)	HEXSTRING	1	SLXMACS	ACS ADDRESS
5	(5)	HEXSTRING	1	SLXMLSM	LSM ADDRESS
6	(6)	A-ADDR	1	SLXMADJN	NUMBER OF ADJACENT LSMS
7	(7)	A-ADDR	1	SLXMADJI(4)	ADJACENT LSM INDICES (ONLY THE FIRST N IDS ARE VALID, WHERE N IS THE VALUE IN SLXMADJN)
11	(B)	HEXSTRING	1	-RESERVED-	RESERVED
12	(C)	SIGNED-FWORD	4	SLXMNSCR	SCRATCH COUNT FOR LSM
16	(10)	SIGNED-FWORD	4	SLXMTCEL	TOTAL CELLS IN LSM
20	(14)	SIGNED-FWORD	4	SLXMFCEL	LSM FREE CELL COUNT
24	(18)	LENGTH		SLXSLSML	LENGTH
MESSAGE TEXT ELEMENT THIS ELEMENT SUPPLIES THE COMPLETE TEXT OF THE MESSAGE WHOSE BINARY MESSAGE ID NUMBER IS REPORTED IN HEADER FIELD SLXSRC. THIS ELEMENT MAY APPEAR IN REPLIES TO THE FOLLOWING REQUESTS: DISMOUNT - DISMOUNT A VOLUME MOUNT - MOUNT A VOLUME EJECT - EJECT VOLUMES					
0	(0)	STRUCTURE		SLXSMSG	MESSAGE TEXT ELEMENT
0	(0)	CHARACTER	3	SLXGID	ELEMENT IDENTIFIER
3	(3)	CHARACTER	125	SLXGTEXT	TEXT OF A MESSAGE. FOR MOUNT AND DISMOUNT, THE MESSAGE NUMBER IS IN FIELD SLXSRC OF THE REPLY HEADER
128	(80)	AREA	8	-RESERVED-	ALIGN

Table 116. SLSXREQM Record Format

Dec	Hex	Type	Length	Label	Description
128	(80)	LENGTH		SLXSMSGL	LENGTH

Cross Reference

Name	Len	Offset Value
SLSXACS	000001	4A
SLSXALC	000004	4A
SLSXCAP	000004	4A
SLSXCNT	000002	38
SLSXCOL	000001	50
SLSXDRIV	000002	54
SLSXDSM	-	2A
SLSXDSN	000044	9D
SLSXEJCT	-	2B
SLSXEXPD	000003	C9
SLSXFDSN	-	10
SLSXFEXP	-	08
SLSXFJOB	-	80
SLSXFLG1	000001	0A
SLSXFLG2	000001	0B
SLSXFLG3	000001	0C
SLSXFLG4	000001	0D
SLSXFLG5	000001	0E
SLSXFLG6	000001	0F
SLSXFLG7	000001	10
SLSXFLG8	000001	84
SLSXFLG9	000001	CF
SLSXFMED	-	40
SLSXFMGT	-	20
SLSXFPGM	-	20
SLSXFREC	-	80
SLSXFRET	-	04
SLSXFSTP	-	40
SLSXFVOL	-	02
SLSXF101	-	01
SLSXF102	-	02

Name	Len	Offset Value
SLSXF104	-	04
SLSXF108	-	08
SLSXF110	-	10
SLSXF120	-	20
SLSXF140	-	40
SLSXF308	-	08
SLSXF410	-	10
SLSXF420	-	20
SLSXF601	-	01
SLSXF602	-	02
SLSXHDR	000004	00
SLSXHOST	000008	42
SLSXID	-	‘CVAL’
SLSXJOBN	000008	85
SLSXLABT	000001	11
SLSXLAL	-	02
SLSXLCAP	-	04
SLSXLEN	000004	04
SLSXLIST	000001	1E0
SLSXLLDT	-	00
SLSXLN	-	1E0
SLSXLNL	-	03
SLSXLNS	-	04
SLSXLOFF	000002	3A
SLSXLSL	-	01
SLSXLSMI	000002	4A
SLSXLSTA	000004	34
SLSXLTOK	-	04
SLSXLVSL	-	06
SLSXMCAP	-	1F4
SLSXMED	000008	D8
SLSXMGMT	000008	E6

Name	Len	Offset Value
SLSXMNT	-	28
SLSXMOVE	-	29
SLSXMTOK	-	1F4
SLSXMVSL	-	1F4
SLSXNOOP	-	00
SLSXPAN	000001	4E
SLSXPGMN	000008	95
SLSXPOOL	000001	56
SLSXPROT	-	80
SLSXQCAP	-	1A
SLSXQCNF	-	14
SLSXQDRL	-	16
SLSXQDRV	-	15
SLSXQDSN	-	1D
SLSXQEJT	-	19
SLSXQHSC	-	01
SLSXQRQS	-	1C
SLSXQSCR	-	17
SLSXQVOL	-	18
SLSXREAD	-	03
SLSXRECT	000008	D0
SLSXREST	-	02
SLSXRETP	000002	CC
SLSXRLEN	000004	2C
SLSXROW	000001	4F
SLSXRS05	-	05
SLSXRS17	-	1B
SLSXRS63	-	3F
SLSXRS64	-	40
SLSXRT	000001	09
SLSXSCR	-	40
SLSXSCRA	-	3D

Name	Len	Offset Value
SLSXSP	-	‘W’
SLSXSSCR	-	3C
SLSXSTEP	000008	8D
SLSXSTOP	-	04
SLSXSUBN	-	10
SLSXSUBP	000013	77
SLSXSYNC	-	80
SLSXTEXT	000032	57
SLSXTKNO	000004	30
SLSXTLSM	000002	51
SLSXTPAN	000001	53
SLSXTRI	-	85
SLSXTRIL	-	4A
SLSXUNSC	-	3E
SLSXVACS	-	40
SLSXVCAP	-	10
SLSXVCI	-	46
SLSXVCIL	000002	E4
SLSXVCIP	000004	E0
SLSXVCIR	-	47
SLSXVCIT	000004	E0
SLSXVCNT	-	01
SLSXVCOL	-	02
SLSXVDRV	-	01
SLSXVER	000001	08
SLSXVHST	-	80
SLSXVLSM	-	20
SLSXVLST	-	02
SLSXVN	-	09
SLSXVOLS	000006	3C
SLSXVOLT	000001	CE
SLSXVPAN	-	08

Name	Len	Offset Value
SLSXVROW	-	04
SLSXVSCP	-	20
SLSXVTKN	-	08
SLSXVTLM	-	80
SLSXVTPN	-	40
SLSXVTXT	-	04
SLSXVVOL	-	04
SLXCACS	000001	04
SLXCCAP	000001	06
SLXCCELL	000002	0C
SLXCCMAG	000001	10
SLXCCMGC	000001	11
SLXCID	000004	00
SLXCJOB	000008	12
SLXCLSM	000001	05
SLXCMDRC	000001	03
SLXCNCOL	000001	0F
SLXCNROW	000001	0E
SLXCSTAM	-	20
SLXCSTAT	000002	08
SLXCSTB1	000001	08
SLXCSTB2	000001	09
SLXCSTCA	-	80
SLXCSTCL	-	10
SLXCSTCO	-	08
SLXCSTIC	-	10
SLXCSTID	-	40
SLXCSTIE	-	80
SLXCSTII	-	08
SLXCSTIJ	-	20
SLXCSTNR	-	40
SLXCTCIM	-	01

Name	Len	Offset Value
SLXCTCLP	-	02
SLXCTPC	-	80
SLXCTTIM	-	05
SLXCTTWO	-	04
SLXCTTWS	-	03
SLXCTYPE	000001	0A
SLXDDISC	-	08
SLXDID	000003	00
SLXDMANU	-	10
SLXDSFLG	000001	03
SLXDSJNA	-	09
SLXDSJNP	-	08
SLXDSMAX	-	09
SLXDSMBR	000008	30
SLXDSNAM	000044	04
SLXDSNEL	-	A8
SLXDSPLB	-	07
SLXDSPRM	-	01
SLXDSSBY	-	03
SLXDSSEC	-	02
SLXDSTA	000001	03
SLXDSTRQ	-	06
SLXDSUAT	-	05
SLXDSUNT	000008	3E
SLXDSVAT	-	04
SLXDSVOL	000006	38
SLXDVIRT	-	01
SLXDVMM	-	8051
SLXEND	000008	B0
SLXEXLM0	000004	80
SLXEXLM1	000004	84
SLXEXLM2	000004	88

Name	Len	Offset Value
SLXGID	000003	00
SLXGTEXT	000125	03
SLXHID	000003	00
SLXHL	-	14
SLXHSCV	000002	A0
SLXINVFC	-	800C
SLXINVOP	-	8018
SLXL	-	B0
SLXLCMPF	000001	24
SLXLEN	000004	0C
SLXLHHBT	000004	0C
SLXLHNAM	000008	04
SLXLID	000003	00
SLXLLBAL	-	01
SLXLLBBL	-	C2
SLXLLBNA	-	D5
SLXLLBNL	-	02
SLXLLBNS	-	03
SLXLLBSL	-	00
SLXLOCKD	-	20
SLXLQNAM	000008	14
SLXLRSTM	000004	10
SLXLSCLB	000001	25
SLXLSMF	000001	26
SLXMACS	000001	04
SLXMADJI	000001	07
SLXMADJN	000001	06
SLXMANUL	-	10
SLXMDISC	-	08
SLXMFCEL	000004	14
SLXMID	000003	00
SLXMLSM	000001	05

Name	Len	Offset Value
SLXMNSCR	000004	0C
SLXMSTAT	000001	03
SLXMSTT	-	803A
SLXMTCEL	000004	10
SLXNOALS	-	8004
SLXNOLVT	-	8010
SLXNORSP	-	28
SLXNTCB	-	1C
SLXPEOFF	000004	10
SLXQACNT	000004	30
SLXQDEAC	000001	04
SLXQDECU	000002	06
SLXQDELS	000001	05
SLXQDID	000003	00
SLXQDRCT	000004	2C
SLXQDRT	000008	08
SLXQID	000004	00
SLXQJTC	000004	08
SLXQJTD	-	00
SLXQJTL	-	18
SLXQJTN	-	FFFF
SLXQJTS	000002	0C
SLXQJTT	000004	04
SLXQJTV	000006	0E
SLXQLCAP	000004	7C
SLXQLCNT	000004	34
SLXQMDR	000004	28
SLXQNOA	-	8014
SLXQUCSA	000004	74
SLXRBADL	-	2C
SLXRBADP	-	08
SLXRBTOK	-	3C

Name	Len	Offset Value
SLXREOV	-	34
SLXRFAIL	-	10
SLXRFLG1	000001	05
SLXRIERR	-	0C
SLXRNAUT	-	18
SLXRNHSC	-	14
SLXRNVCI	-	30
SLXROK	-	00
SLXROKM	-	80
SLXRPLY	000001	00
SLXRVNV	-	38
SLXRWARN	-	04
SLXSANF	-	8036
SLXSCAPL	-	20
SLXSCFGL	-	A8
SLXSDRVL	-	10
SLXSFUL	-	8050
SLXSID	000004	00
SLXSLSML	-	18
SLXSMSGL	-	80
SLXSP	-	‘W’
SLXSRC	000004	08
SLXSTPE	-	EE
SLXSTPK	-	00
SLXSTPL	-	10
SLXSTPN	-	FF
SLXSTPS	000001	09
SLXSTPT	000004	04
SLXSTPY	000001	08
SLXSVOLL	-	28
SLXTABND	-	8024
SLXTINTR	-	8032

Name	Len	Offset Value
SLXTPROT	-	24
SLXTRNF	-	8040
SLXVACS	000001	0B
SLXVCEL	-	01
SLXVCODE	-	09
SLXVDATD	000004	1C
SLXVDATI	000004	10
SLXVDATL	000004	14
SLXVDRIV	000002	0D
SLXVDRV	-	02
SLXVDSC	-	08
SLXVERR	-	02
SLXVERS	000001	04
SLXVID	000003	00
SLXVILB	-	80
SLXVLC	000001	0A
SLXVLOC	000005	0B
SLXVLSM	000001	0C
SLXVMAL	-	10
SLXVMDFL	-	01
SLXVMED	000008	20
SLXVMLMU	-	10
SLXVMNT	-	04
SLXVMUNR	-	04
SLXVMVLA	-	02
SLXVOHST	-	40
SLXVPNL	000003	0D
SLXVSCNT	000004	18
SLXVSCR	-	20
SLXVSER	000006	04
SLXVSTA	000001	03
SLXVSTA2	000001	0F

Name	Len	Offset Value
SLXVTSSN	000008	10
SLXVTV	-	01
SLXVUNK	-	00
SLXXCAPL	000004	58
SLXXCAPN	000004	50
SLXXCAPO	000004	54
SLXXCFGL	000004	1C
SLXXCFGN	000004	14
SLXXCFGO	000004	18
SLXXDRVL	000004	34
SLXXDRVN	000004	2C
SLXXDRVO	000004	30
SLXXLSML	000004	40
SLXXLSMN	000004	38
SLXXLSMO	000004	3C
SLXXMSGL	000004	4C
SLXXMSGN	000004	44
SLXXMSGO	000004	48
SLXXQDSL	000004	7C
SLXXQDSN	000004	74
SLXXQDSO	000004	78
SLXXQJTL	000004	64
SLXXQJTN	000004	5C
SLXXQJTO	000004	60
SLXXSTPL	000004	70
SLXXSTPN	000004	68
SLXXSTPO	000004	6C
SLXXVCIL	000004	88
SLXXVCIN	000004	80
SLXXVCIO	000004	84
SLXXVOLL	000004	28
SLXXVOLN	000004	20

Name	Len	Offset Value
SLXXVOLO	000004	24

Appendix E. Batch Application Program Interface (API)

Overview

The Batch API allows you to retrieve CDS information in batch mode. The CDS specified as input to the request does not have to be active nor does it have to be currently referenced by the HSC address space (the request can execute entirely in the user address space). In addition, the HSC does not have to be active to submit the request.

QCDS Request

The QCDS request reads records from the input CDS and provides information about various library elements (e.g., CAPs, drives, volumes, and so forth). QCDS requests are synchronous, meaning that multiple requests cannot be active at the same time.

QCDS does not interact with the HSC address space except when the request specifies automatic allocation of the CDS. In this case, the HSC executes a single query operation to obtain data set information for CDS dynamic allocation. All other request processing occurs in the user address space. QCDS requests are limited to a single task within the current job step.

How QCDS Functions

QCDS automatically creates a DCB and opens and closes an input CDS as required. The request opens the CDS only if no other library element record areas are currently open for that CDS. Conversely, QCDS closes the CDS only if all other record areas for that CDS are closed.

Note: Do not issue MVS I/O macros or instructions for an input CDS whenever any associated record area is open.

Invoking QCDS (SLSUREQ Macro)

QCDS requests are issued by the SLSUREQ macro. Results from the request are returned in a response area that contains a reply header describing the results and a set of library element records. The response area must be long enough to contain the reply header and at least one library element record of the requested type. A read request transfers as many whole records as possible without exceeding the response area capacity.

> **Note:** To retrieve individual records from the response area, deblock those records using the record length constant settings provided in the SLUV*x*DAT record formats.

Refer to “Volume Report and Batch API Mapping Macros” on page 626 to see these layouts.

The SLSUREQM macro maps the SLSUREQ reply header, parameter list, and return code values. Refer to “SLSUREQM Macro” on page 835 to see the record layout.

Reply header length is defined in SLSUREQM, and library element record lengths are defined in the SLUV*x*DAT macros. Return codes for each request (see “Return Codes” on page 823) are stored in register 15.

Addresses and Registers

- RX-type address: specifies an address that is valid in an RX-type instruction.
- Register (2) - (12): indicates that one of the general registers, 2 through 12, should be specified, enclosed in parentheses. The register must have been previously loaded with the value required by the parameter. Unused bits must be zeroed.
- Register (13) must point to a 72-byte MVS register save area when a QCDS request is issued.
- Register (15): stores QCDS request return codes.

Syntax

The syntax for the QCDS request is:

```
►►─label──SLSUREQ QCDS──,REQUEST=request──,TYPE=type──,BUFFER=buffer──────────►◄

►─,BUFLEN=buflen──,TOKEN=token──,DDNAME=ddname──,UCALADR=rtnaddr──────────────►

►─,MF=──┬─L──────────────────────────────────────────────────────────────────►◄
        └─(E,parmaddr)─┘
```

Parameters

label
label indicates a user-defined assembler label.

REQUEST
request indicates to access a library element record area.

OPEN
specifies to open a library element area and move to the first record of the area.

READ
specifies to retrieve the next group of library element records.

CLOSE
specifies to close a library element area.

This parameter is required.

TYPE
type indicates a library element record area type.

ACS
specifies the ACS/LSM record area

CAP
specifies the CAP record area

CDS
specifies the CDS information record area

CFG
specifies the configuration record area

DRV
specifies the drive record area

HST
specifies the host information record area

MVC
specifies the Multi-Volume Cartridge record area

STA
specifies the station record area

VOL
specifies the volume record area

VTV
specifies the Virtual Tape Volume record area

This parameter is required.

BUFFER
buffer indicates an RX-type fullword location or a register (2) - (12) containing the response area address for this READ request.

This parameter is required for the READ request but is ignored for OPEN and CLOSE requests.

BUFLEN

buflen indicates an RX-type fullword location or a register (2) - (12) containing the response area length for this READ request.

This parameter is required for the READ request but is ignored for OPEN and CLOSE requests.

TOKEN

token indicates an RX-type fullword location or a register (2) - (12) containing a fullword address that maintains QCDS state information for an input CDS.

The token value for an OPEN request must be zero when no associated CDS record areas are open. In this case, OPEN assigns a value to token that must be presented with all other QCDS requests for that CDS.

When all record areas of the CDS are closed, the token is no longer valid.

This parameter is required.

DDNAME

ddname indicates an RX-type address or a register (2) - (12) containing the address of the eight-character DDname of an input CDS. A DDname less than eight characters must be padded with trailing blanks.

Notes:

1. A CDS must be preallocated to *ddname* in the JCL or in a SVC 99 dynamic allocation request before issuing QCDS requests.
2. The input CDS does not need to be active or referenced by the HSC address space.
3. QCDS allows for multiple input CDSs, as long as each uses a unique *ddname* and specifies a different token for each open CDS. For example, an application can open two input CDSs and process them in an alternating, or interleaved, fashion.

This parameter is optional. If DDNAME is omitted, QCDS attempts to open the most recently updated CDS specified in the SLSCNTL, SLSCNTL2, or SLSSTBY DDnames for the current job step. If none of these DDnames is defined, QCDS tries to open an active CDS. In this case, the HSC address space must be active or the OPEN fails.

UCALADR

rtnaddr indicates an RX-type fullword location, register (15), or a register (2) - (12) containing the address of the SLSUCAL routine.

This parameter is required. You must load the SLSUCAL module into storage before issuing a QCDS request.

MF

indicates either the list or execute form of the macro.

L

specifies the list form of the macro. This parameter generates a remote parameter list that can be referenced by the execute form of the macro.

Note: When **L** is specified, all other parameters are ignored.

E,*parmaddr*

specifies the execute form of the macro. parmaddr is an RX-type address or a register (1) - (12) containing the address of the remote parameter list.

This parameter is required.

QCDS Programming Considerations

- Only one instance of each library element record area can be open for each invocation.
- QCDS does not account for CDS switches for any open input CDS.
- The job step or task should define DDname SYSMDUMP to capture diagnostic information if an internal QCDS error occurs.
- Record order within a library element record area is unpredictable.

Return Codes

Invalid SLSUREQ requests and QCDS access requests provide return codes in register 15. Table 117 shows the list of return codes.

Table 117. Batch API Return Codes

Return Field Name:	Decimal Value and Description:
Invalid SLSUREQ Requests:	
SLURRQPL	1000 - SLSUREQ request failed: Invalid SLSUREQ parameter list.
SLURRQRT	1001 - SLSUREQ request failed: Invalid SLSUREQ request type.
SLURQCRT	1002 - SLSUREQ request failed: Invalid QCDS access request type.
OPEN Return Codes:	
SLUROPOK	0 - Record area was opened successfully.
SLUROPAO	4 - Open failed: Attempt to open a record area that is already open.
SLUROPIT	8 - Open failed: Invalid token value.
SLUROPRA	12 - Open failed: Invalid record area type.

Table 117. Batch API Return Codes (Continued)

Return Field Name:	Decimal Value and Description:
SLUROPIO	16 - Open failed: I/O error while accessing the associated CDS.
SLUROPDD	20 - Open failed: An input CDS is not allocated to the designated DDname.
SLUROPNA	24 - Open failed: HSC address space not operational during automatic CDS allocation attempt.
SLUROPDA	28 - Open failed: Error during automatic CDS dynamic allocation operation.
READ Return Codes:	
SLURRDOK	0 - Successful read. One or more records were transferred to the response area and one or more additional records can be obtained by a subsequent READ request.
SLURRDEA	4 - Successful read. One or more records were transferred to the response area and no additional records can be read from the associated record area.
SLURRDIT	8 - Read failed: Invalid token value.
SLURRDRA	12 - Read failed: Invalid record area type.
SLURRDIO	16 - Read failed: I/O error while accessing the associated CDS.
SLURRDNO	20 - Read failed: Attempt to read a record area that is not currently open.
SLURRDBA	24 - Read failed: Attempt to read beyond the end of the record area.
SLURRDIB	28 - Read failed: Invalid response area buffer address.
SLURRDIL	32 - Read failed: Response area buffer length too short to contain both the reply header and at least one library element record.
CLOSE Return Codes:	
SLURCLOK	0 - Record area was closed successfully.
SLURCLAC	4 - Close failed: Attempt to close a record area that is already closed.
SLURCLIT	8 - Close failed: Invalid token value.
SLURCLRA	12 - Close failed: Invalid record area type.
SLURCLIO	16 - Close failed: I/O error while accessing the associated CDS.

Sample QCDS Requests

The following QCDS program samples detail two different scenarios:

- a request to open the current primary CDS
- a request to process two library element record area types.

Both of these examples can be found in the SAMPLIB data set distributed to customers. Error processing code has been omitted in the examples.

Sample 1 - Reading the Volume Record Area of the Current Primary CDS

This sample QCDS request uses automatic CDS allocation to open the current primary CDS. Automatic CDS allocation does not require JCL to identify the input CDS but does require an operational HSC address space.

After opening the CDS volume record area, the program reads groups of volume records into a 64 KB response area buffer.

```
QCDSVTV  TITLE 'QCDS Read current primary CDS VTV record area'
*
*
* Function: Use QCDS to automatically allocate and Open the
*               current primary CDS. Issue SLSUREQ QCDS requests to
*               read all the VTV records.
*
* Attributes:
*       1. Problem state, user key.
*       2. Non-APF authorized.
*       3. AMODE 24, RMODE 24 (for below-the-line QSAM), reentrant.
*
* Notes:
*       The caller must have read access for the current primary
*       CDS.
*
**ENDPROLOGUE*****************************************************
         PRINT GEN
         ENTRY QCDSVTV
QCDSVTV  CSECT
QCDSVTV  AMODE 24         Below the line for QSAM (PUT macro).
QCDSVTV  RMODE 24
*
* Save the caller's registers, establish CSECT addressability
* and create the module work area:
*
         STM   R14,R12,12(R13)  Save registers
         LR    R12,R15          Load base register R12
         USING QCDSVTV,R12      Declare CSECT base register R12
         GETMAIN R,LV=WKAREAL   Allocate module work area
         ST    R13,WKSAVE-WKAREA+4(,R1) Link new save area to old one
         ST    R1,8(,R13)       Link old save area to new one
         LR    R13,R1           Pointer to module work area
         USING WKAREA,R13       Addressability to module work area
*
* Load module SLSUCAL:
*
         LOAD  EP=SLSUCAL       Load SLSUCAL into storage
         ST    RØ,WKUCAL        Save SLSUCAL routine address
*
* Initialize the QCDS token and the SLSUREQ plist:
*
         XC    WKTOK,WKTOK      QCDS token initially zero
         LA    RØ,WKQCDS        Pointer to SLSUREQ plist storage
         LA    R1,QCDSMLEN      Length of SLSUREQ plist
         LA    R14,QCDSMODL     Pointer to SLSUREQ plist model
         LR    R15,R1           Length of SLSUREQ plist model
         MVCL  RØ,R14           Initialize SLSUREQ plist storage
*
```

Figure 38. Sample 1 - Automatic CDS Allocation

(1 of 4)

```
         MVC   WKFLATDD(KFLATDDL),KFLATDD Initialize the working
         LA    R4,WKFLATDD     storage version of the DCB from the
         OPEN  ((R4),(OUTPUT)) copy in the constants area.
*
* Use QCDS OPEN to automatically allocate the current primary CDS
* and open the VTV record area:
*
OPENVOL  DS    ØH               Open CDS VTV record area:
         SLSUREQ QCDS,                                            +
               REQUEST=OPEN,                                      +
               DDNAME==CL8'CDS1',                                 +
               TYPE=VTV,                                          +
               TOKEN=WKTOK,                                       +
               UCALADR=WKUCAL,                                    +
               MF=(E,WKQCDS)
         C     R15,=A(SLUROPOK) Check for OPEN failure
         BNE   OPENERR          Handle OPEN error
*
* Allocate response area buffer and map the response area:
*
         L     RØ,QCDSBLEN      Load response area buffer length
         GETMAIN R,LV=(Ø)       Request storage
         ST    R1,WKBUFP        Store pointer to response area
         LR    R1Ø,R1           Load pointer to response area
         USING SLUR,R1Ø         Map QCDS READ response area
*
* Outer loop - read CDS VTV record area in blocks:
*
READVOL  DS    ØH               Read block of VTV records:
         SLSUREQ QCDS,                                            +
               REQUEST=READ,                                      +
               DDNAME==CL8'CDS1',                                 +
               TYPE=VTV,                                          +
               BUFFER=WKBUFP,                                     +
               BUFLEN=QCDSBLEN,                                   +
               TOKEN=WKTOK,                                       +
               UCALADR=WKUCAL,                                    +
               MF=(E,WKQCDS)
         ST    R15,WKRDRC       Save READ return code
         C     R15,=A(SLURRDEA) Check for READ failure
         BH    READERR          Handle READ error
         L     R9,SLURQCDN      Get number of VTV records
*                               present in this reply
         L     R7,SLURQCDO      Offset to first VTV record
         LA    R8,SLURRPLY(R7)  Pointer to first VTV record
         USING SLUVTDAT,R8      Map VTV record
*
```

Figure 95. Sample 1 - Automatic CDS Allocation (2 of 4)

```
* Inner loop - process each VTV record in the response area:
*
VOLPROC  DS    ØH               Over all VTV records in reply:
*          ... process VTV record here ...
         PUT   WKFLATDD,((R8))
         LA    R8,VDRECLEN(,R8) Pointer to next VTV record
         BCT   R9,VOLPROC       Process next VTV record
CHECKEOA DS    ØH               Check for more VTV records
         CLC   WKRDRC,=A(SLURRDEA) VTV end-of-area?
         BNE   READVOL          No, read more VTV records
*
* Close the CDS VTV record area:
*
CLOSEVOL DS    ØH               Close VTV record area:
         LA    R4,WKFLATDD
         CLOSE ((R4))
         SLSUREQ QCDS,                                            +
               REQUEST=CLOSE,                                     +
               DDNAME==CL8'CDS1',                                 +
               TYPE=VTV,                                          +
               TOKEN=WKTOK,                                       +
               UCALADR=WKUCAL,                                    +
               MF=(E,WKQCDS)
         LTR   R15,R15          Check for CLOSE failure
         BNZ   CLOSEERR         Handle CLOSE error
         B     EXIT
READERR  WTO   'READ ERROR'
         B     EXIT
CLOSEERR WTO   'CLOSE ERROR'
         B     EXIT
*
* Clean up and return to caller:
*
OPENERR  WTO   'OPEN ERROR'
EXIT     DS    ØH               Clean up and return to caller:
         DELETE EP=SLSUCAL      Unload SLSUCAL routine
         L     RØ,QCDSBLEN      Load response area length
         L     R1,WKBUFP        Pointer to response area
         FREEMAIN R,A=(R1),LV=(RØ) Release response area buffer
         LR    R1,R13           Pointer to module work area
         L     R13,4(,R13)      Restore caller's save area pointer
         FREEMAIN R,A=(R1),LV=WKAREAL Release module work area
         L     R14,12(,R13)     Restore return address
         LM    RØ,R12,2Ø(R13)   Restore caller's registers Ø-12
         XR    R15,R15          Set return code zero
         BR    R14              Return to caller
*
```

Figure 95. Sample 1 - Automatic CDS Allocation (3 of 4)

```
* Constants:
*
QCDSMODL SLSUREQ MF=L           SLSUREQ plist model
QCDSMLEN EQU   *-QCDSMODL       Length of SLSUREQ plist model
QCDSBLEN DC    F'655360'        QCDS READ response area buffer length
KFLATDD  DCB   DDNAME=VDRECDAT,DSORG=PS,MACRF=(PM),                 +
               LRECL=VDRECLEN,                                      +
               BLKSIZE=VDRECLEN*100,RECFM=FB
KFLATDDL EQU   *-KFLATDD
*
* Module work area map:
*
WKAREA   DSECT                  Module work area
WKSAVE   DS    18F              MVS register save area
WKUCAL   DS    A                SLSUCAL routine address
WKTOK    DS    F                QCDS request token
WKRDRC   DS    F                QCDS READ return code
WKBUFP   DS    A                QCDS READ response area buffer addr
WKQCDS   DS    XL(QCDSMLEN)     SLSUREQ plist storage
WKFLATDD DS    XL(KFLATDDL)
WKAREAL  EQU   *-WKAREA         Length of module work area
*
* Mapping macros:
*
         SLSREGS  ,             Register equates
         SLSUREQM ,             SLSUREQ mapping macro
         SLUVTDAT ,             VTV record mapping macro
         END   QCDSVTV
```

Figure 95. Sample 1 - Automatic CDS Allocation (4 of 4)

Sample 2 - Reading the ACS and DRV Record Areas Together

This sample QCDS request reads two different CDS record areas (ACS and DRV), alternating between the two. The job step JCL must include a DDNAME statement for the input CDS DDname (MVS1CDS in this example).

```
QACSDRV TITLE 'QCDS READ ACS AND DRIVE RECORD AREAS TOGETHER'
*
* QACSDRV - QCDS READ ACS AND DRIVE RECORD AREAS TOGETHER.
*
* FUNCTION: USE SEPARATE RESPONSE AREAS TO READ THE ACS AND DRV
*           RECORD AREAS IN AN ALTERNATING FASHION.
*           EACH RESPONSE AREA IS A 1KB BUFFER.
*
* ATTRIBUTES:
*       1. PROBLEM STATE, USER KEY.
*       2. NON-APF AUTHORIZED.
*       3. AMODE 31, RMODE ANY, REENTRANT.
*
* NOTES:
*       THE CALLER MUST HAVE READ ACCESS FOR THE INPUT CDS.
*
**ENDPROLOGUE*****************************************************
         PRINT GEN
         ENTRY QACSDRV
QACSDRV  CSECT
QACSDRV  AMODE 31
QACSDRV  RMODE ANY
*
* SAVE THE CALLER'S REGISTERS, ESTABLISH CSECT ADDRESSABILITY
* AND ESTABLISH NEW REGISTER SAVE AREA:
*
         STM   R14,R12,12(R13)    SAVE REGISTERS
         LR    R12,R15            LOAD BASE REGISTER R12
         USING QACSDRV,R12        DECLARE CSECT BASE REGISTER R12
         GETMAIN R,LV=WKAREAL     ALLOCATE MODULE WORK AREA
         ST    R13,WKSAVE-WKAREA+4(,R1) LINK NEW SAVE AREA TO OLD ONE
         ST    R1,8(,R13)         LINK OLD SAVE AREA TO NEW ONE
         LR    R13,R1             POINTER TO MODULE WORK AREA
         USING WKAREA,R13         ADDRESSABILITY TO MODULE WORK AREA
*
* LOAD MODULE SLSUCAL:
*
         LOAD  EP=SLSUCAL         LOAD SLSUCAL INTO STORAGE
         ST    RØ,WKUCAL          SAVE SLSUCAL ROUTINE ADDRESS
*
* INITIALIZE THE QCDS TOKEN AND THE SLSUREQ PLIST:
*
         XC    WKTOK,WKTOK        QCDS TOKEN INITIALLY ZERO
         LA    RØ,WKQCDS          POINTER TO SLSUREQ PLIST STORAGE
         LA    R1,QCDSMLEN        LENGTH OF SLSUREQ PLIST
         LA    R14,QCDSMODL       POINTER TO SLSUREQ PLIST MODEL
         LR    R15,R1             LENGTH OF SLSUREQ PLIST MODEL
         MVCL  RØ,R14             INITIALIZE SLSUREQ PLIST STORAGE
```

Figure 39. Sample 2 - Reading ACS and DRV Together (1 of 4)

```
*
* OPEN ACS AND DRIVE RECORD AREAS AND MAP THE RESPONSE AREAS:
*
OPEN          DS   ØH               OPEN ACS AND DRIVE RECORD AREAS:
              SLSUREQ QCDS,         OPEN ACS RECORD AREA
                   REQUEST=OPEN,
                   TYPE=ACS,
                   TOKEN=WKTOK,
                   DDNAME=QCDSDD,
                   UCALADR=WKUCAL,
                   MF=(E,WKQCDS)
              SLSUREQ QCDS,         OPEN DRIVE RECORD AREA
                   REQUEST=OPEN,
                   TYPE=DRV,
                   TOKEN=WKTOK,
                   UCALADR=WKUCAL,
                   MF=(E,WKQCDS)
              USING SLUR,R9         MAP QCDS READ RESPONSE AREA
*
* MAIN PROCESSING LOOP - INTERLEAVED PROCESSING OF ACS AND
* DRIVE RECORDS:
*
PROCESS       DS   ØH               MAIN PROCESSING LOOP:
              LA   R9,WKACSBUF      POINTER TO ACS RESPONSE AREA
              SLSUREQ QCDS,         READ ACS RECORD AREA
                   REQUEST=READ,
                   TYPE=ACS,
                   BUFFER=(R9),
                   BUFLEN=QCDSBLEN,
                   TOKEN=WKTOK,
                   UCALADR=WKUCAL,
                   MF=(E,WKQCDS)
              L    R7,SLURQCDO      OFFSET TO FIRST ACS RECORD
              LA   R11,SLURRPLY(R7) POINTER TO FIRST ACS RECORD
              USING SLUVADAT,R11    MAP ACS RECORD FORMAT
*
*              ... PROCESS ACS RECORDS ...
*
              LA   R9,WKDRVBUF      POINTER TO DRIVE RESPONSE AREA
              SLSUREQ QCDS,         READ DRIVE RECORD AREA
                   REQUEST=READ,
                   TYPE=DRV,
                   BUFFER=(R9),
                   BUFLEN=QCDSBLEN,
                   TOKEN=WKTOK,
                   UCALADR=WKUCAL,
                   MF=(E,WKQCDS)
              L    R7,SLURQCDO      OFFSET TO FIRST DRIVE RECORD
              LA   R1Ø,SLURRPLY(R7) POINTER TO FIRST DRIVE RECORD
              USING SLUVDDAT,R1Ø    MAP DRIVE RECORD FORMAT
*
*              ... PROCESS DRIVE RECORDS ...
```

Figure 96. Sample 2 - Reading ACS and DRV Together (2 of 4)

```
*
* CONDITIONALLY BRANCH TO CLOSE LABEL WHEN AN APPROPRIATE
* LOOP TERMINATION CONDITION HAS BEEN SATISFIED (NOT SHOWN).
*
          B    PROCESS          REPEAT MAIN PROCESSING LOOP
*
* CLOSE THE ACS AND DRIVE RECORD AREAS:
*
CLOSE     DS   ØH               CLOSE ACS AND DRIVE RECORD AREAS:
          SLSUREQ QCDS,         CLOSE THE ACS RECORD AREA
               REQUEST=CLOSE,
               TYPE=ACS,
               TOKEN=WKTOK,
               UCALADR=WKUCAL,
               MF=(E,WKQCDS)
          SLSUREQ QCDS,         CLOSE THE DRIVE RECORD AREA
               REQUEST=CLOSE,
               TYPE=DRV,
               TOKEN=WKTOK,
               UCALADR=WKUCAL,
               MF=(E,WKQCDS)
*
* CLEAN UP AND RETURN TO CALLER:
*
EXIT      DS   ØH               CLEAN UP AND RETURN TO CALLER:
          DELETE EP=SLSUCAL     UNLOAD SLSUCAL ROUTINE
          LR   R1,R13           POINTER TO MODULE WORK AREA
          L    R13,4(,R13)      RESTORE CALLER'S SAVE AREA
          FREEMAIN R,A=(R1),LV=WKAREAL RELEASE MODULE WORK AREA
          L    R14,12(,R13)     RESTORE RETURN ADDRESS
          LM   RØ,R12,2Ø(R13)   RESTORE CALLER'S REGISTERS Ø-12
          XR   R15,R15          SET ZERO RETURN CODE
          BR   R14              RETURN TO CALLER
*
* CONSTANTS:
*
QCDSMODL  SLSUREQ MF=L          SLSUREQ PLIST MODEL
QCDSMLEN  EQU  *-QCDSMODL       LENGTH OF SLSUREQ PLIST MODEL
QCDSDD    DC   CL8'MVS1CDS '    8-CHAR BLANK-PADDED CDS DDNAME
QCDSBLEN  DC   F'1Ø24'          QCDS READ RESPONSE AREA BUFFER LENGTH
*
* MODULE WORK AREA MAP:
*
WKAREA    DSECT                 MODULE WORK AREA
WKSAVE    DS   18F              MVS REGISTER SAVE AREA
WKUCAL    DS   A                SLSUCAL ROUTINE ADDRESS
WKTOK     DS   F                QCDS REQUEST TOKEN
WKQCDS    DS   XL(QCDSMLEN)     SLSUREQ PLIST STORAGE
WKACSBUF  DS   XL1Ø24           ACS RESPONSE AREA BUFFER
WKDRVBUF  DS   XL1Ø24           DRV RESPONSE AREA BUFFER
WKAREAL   EQU  *-WKAREA         LENGTH OF MODULE WORK AREA
```

Figure 96. Sample 2- Reading ACS and DRV Together (3 of 4)

```
*
* MAPPING MACROS:
*
                            SLSREGS                          REGISTER
EQUATES
                              SLSUREQM ,                      SLSUREQ
MAPPING MACRO
                                 SLUVADAT ,                       ACS
```

Figure 96. Sample 2 - Reading ACS and DRV Together (4 of 4)

Output Description

Each successful OPEN request returns the name of the input CDS in the SLSUREQ parameter list (SLSUREQM field SLSUQDSN).

Each successful READ request returns one or more library element records in the user-designated response area. Use the SLUR DSECT in the SLSUREQM macro to map the response area reply header. This header contains the number of library element records present within the response area.

Library element records are mapped by the SLUV*x*DAT macros. These macros are SMP/E-distributed and are discussed in "Volume Report and Batch API Mapping Macros" on page 626.

Table 118. Library Element Record Mapping

Request Entered:	Records Returned:
READ ACS	ACS/LSM records mapped by SLUVADAT macro.
READ CAP	CAP records mapped by SLUVPDAT macro.
READ CDS	CDS information records mapped by SLUVIDAT macro.
READ CFG	Configuration information records mapped by SLUVCDAT macro.
READ DRV	Drive records mapped by the SLUVDDAT macro.
READ HST	Host information records mapped by the SLUVHDAT macro.
READ STA	Station records mapped by the SLUVSDAT macro.
READ VOL	Volume records mapped by the SLUVVDAT macro.

SLSUREQM Macro

The SLSUREQM mapping macro must be specified in any assembly that uses the SLSUREQ macro.

Syntax

```
►►─label──SLSUREQM──┬──────────────────────────────────────────────────►◄
                    │          ┌─NO─┐
                    └─PRO=─────┴─YES┴──┘
```

Parameters

PRO={NO|YES}
Specifies whether the prologue should be generated (YES) or not (NO). **The default is NO.**

Batch API Mapping (SLSUREQM) Macro

Table 119. SLSUREQM Record Format

Dec	Hex	Type	Length	Label	Description
MACRO: SLSUREQM - BATCH API USER INTERFACE MAPPING MACRO FUNCTION: THIS MACRO MAPS THE SLSUCAL PARAMETER LIST, REPLY HEADER, AND RETURN CODES.					
0	(0)	STRUCTURE		SLSUREQM	PARAMETER LIST
0	(0)	CHARACTER	4	SLSUHDR	EYE-CATCHER FIELD:
‘SLSU’	(E2D3E2E4)	CHAR CONST		SLSUID	EYE-CATCHER VALUE
4	(4)	A-ADDR	1	SLSUVER	VERSION OF SLSUREQ:
2	(02)	CONST		SLSUVN	CURRENT VERSION
5	(5)	A-ADDR	1	SLSURT	REQUEST TYPE:
1	(01)	CONST		SLSUQCDS	QCDS REQUEST
6	(6)	A-ADDR	1	SLSUQCDT	QCDS REQUEST TYPE:
0	(00)	CONST		SLSUQCDO	OPEN REQUEST
1	(01)	CONST		SLSUQCDR	READ REQUEST
2	(02)	CONST		SLSUQCDC	CLOSE REQUEST
7	(7)	A-ADDR	1	SLSUQCDA	QCDS RECORD AREA:
0	(00)	CONST		SLSUACSA	ACS RECORD AREA
1	(01)	CONST		SLSUCAPA	CAP RECORD AREA
2	(02)	CONST		SLSUCDSA	CDS RECORD AREA
3	(03)	CONST		SLSUCFGA	CONFIGURATION RECORD AREA
4	(04)	CONST		SLSUDRVA	DRIVE RECORD AREA
5	(05)	CONST		SLSUHSTA	HOST RECORD AREA
6	(06)	CONST		SLSUSTAA	STATION RECORD AREA
7	(07)	CONST		SLSUVOLA	VOLUME RECORD AREA
8	(08)	CONST		SLSUMVCA	MVC RECORD AREA
9	(09)	CONST		SLSUVTVA	VTV RECORD AREA
10	(0A)	CONST		SLSUARAN	ABSOLUTE RECORD AREA NUMBER USED WHEN ALLOCATING STORAGE.
8	(8)	A-ADDR	4	SLSUQCDK	QCDS TOKEN POINTER

Table 119. SLSUREQM Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
12	(C)	A-ADDR	4	SLSUQCDB	QCDS RESPONSE AREA BUFFER ADDRESS
16	(10)	SIGNED-FWORD	4	SLSUQCDL	QCDS RESPONSE AREA BUFFER LENGTH
20	(14)	A-ADDR	4	SLSUQCDD	QCDS INPUT CDS DDNAME POINTER
24	(18)	CHARACTER	44	SLSUQDSN	QCDS INPUT CDS DATA SET NAME
68	(44)	CHARACTER	256	-RESERVED-	RESERVED FOR FUTURE PARM EXPANSION
328	(148)	AREA	8	-RESERVED-	ALIGNMENT
328	(148)	LENGTH		SLSULN	LENGTH OF FIXED AREA OF SLSUREQM
SLSUREQ INVOCATION FAILURE RETURN CODES:					
1000	(3E8)	CONST		SLURRQPL	SLSUREQ REQUEST FAILED: INVALID SLSUREQ PARAMETER LIST.
1001	(3E9)	CONST		SLURRQRT	SLSUREQ REQUEST FAILED: INVALID SLSUREQ UTILITY REQUEST TYPE.
1002	(3EA)	CONST		SLURQCRT	SLSUREQ REQUEST FAILED: INVALID QCDS ACCESS REQUEST TYPE.
SLSUREQ RESPONSE AREA:					
0	(0)	STRUCTURE		SLUR	RESPONSE AREA
0	(0)	AREA	1	SLURRPLY	START OF REPLY HEADER
0	(0)	CHARACTER	4	SLURHDR	EYE-CATCHER FIELD:
‘SLUR’	(E2D3E4D9)	CHAR CONST		SLURID	EYE-CATCHER VALUE
4	(4)	SIGNED-HWORD	2	SLURHSCV	HSC VERSION NUMBER
6	(6)	HEXSTRING	1	SLURVER	VERSION NUMBER OF SLSUREQM
7	(7)	HEXSTRING	1	-RESERVED-	****** RESERVED *******
8	(8)	SIGNED-FWORD	4	SLURQCDN	NUMBER OF QCDS LIBRARY ELEMENT RECORDS PRESENT IN THIS REPLY.

Table 119. SLSUREQM Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
12	(C)	SIGNED-FWORD	4	SLURQCDO	OFFSET TO QCDS LIBRARY ELEMENT RECORD SECTION FROM START OF REPLY HEADER. QCDS OPEN RETURN CODES:
0	(00)	CONST		SLUROPOK	RECORD AREA WAS OPENED SUCCESSFULLY.
4	(04)	CONST		SLUROPAO	OPEN FAILED - ATTEMPT TO OPEN A RECORD AREA THAT IS ALREADY OPEN.
8	(08)	CONST		SLUROPIT	OPEN FAILED - INVALID TOKEN VALUE.
12	(0C)	CONST		SLUROPRA	OPEN FAILED - INVALID RECORD AREA TYPE.
16	(10)	CONST		SLUROPIO	OPEN FAILED - I/O ERROR WHILE ACCESSING THE ASSOCIATED CDS.
20	(14)	CONST		SLUROPDD	OPEN FAILED - AN INPUT CDS IS NOT ALLOCATED TO THE DESIGNATED DDNAME.
24	(18)	CONST		SLUROPNA	OPEN FAILED - HSC ADDRESS SPACE NOT OPERATIONAL DURING AUTOMATIC CDS ALLOCATION ATTEMPT.
28	(1C)	CONST		SLUROPDA	OPEN FAILED - ERROR DURING AUTOMATIC CDS DYNAMIC ALLOCATION OPERATION.
QCDS READ RETURN CODES:					
0	(00)	CONST		SLURRDOK	READ SUCCEEDED - ONE OR MORE RECORDS WERE TRANSFERRED TO THE RESPONSE AREA AND ONE OR MORE ADDITIONAL RECORDS CAN BE OBTAINED BY A SUBSEQUENT READ REQUEST.

Table 119. SLSUREQM Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
4	(04)	CONST		SLURRDEA	READ SUCCEEDED - ONE OR MORE RECORDS WERE TRANSFERRED TO THE RESPONSE AREA AND NO ADDITIONAL RECORDS CAN BE READ FROM THE ASSOCIATED RECORD AREA.
8	(08)	CONST		SLURRDIT	READ FAILED - INVALID TOKEN VALUE.
12	(0C)	CONST		SLURRDRA	READ FAILED - INVALID RECORD AREA TYPE.
16	(10)	CONST		SLURRDIO	READ FAILED - I/O ERROR WHILE ACCESSING THE ASSOCIATED CDS.
20	(14)	CONST		SLURRDNO	READ FAILED - ATTEMPT TO READ A RECORD AREA THAT IS NOT CURRENTLY OPEN.
24	(18)	CONST		SLURRDBA	READ FAILED - ATTEMPT TO READ BEYOND THE END OF THE RECORD AREA.
28	(1C)	CONST		SLURRDIB	READ FAILED - INVALID RESPONSE AREA BUFFER ADDRESS.
32	(20)	CONST		SLURRDIL	READ FAILED - RESPONSE AREA BUFFER LENGTH TOO SHORT TO CONTAIN BOTH THE REPLY HEADER AND AT LEAST ONE LIBRARY ELEMENT RECORD.
QCDS CLOSE RETURN CODES:					
0	(00)	CONST		SLURCLOK	RECORD AREA WAS CLOSED SUCCESSFULLY.
4	(04)	CONST		SLURCLAC	CLOSE FAILED - ATTEMPT TO CLOSE A RECORD AREA THAT IS ALREADY CLOSED.
8	(08)	CONST		SLURCLIT	CLOSE FAILED - INVALID TOKEN VALUE.
12	(0C)	CONST		SLURCLRA	CLOSE FAILED - INVALID RECORD AREA TYPE.

Table 119. SLSUREQM Record Format (Continued)

Dec	Hex	Type	Length	Label	Description
16	(10)	CONST		SLURCLIO	CLOSE FAILED - I/O ERROR WHILE ACCESSING THE ASSOCIATED CDS.
16	(10)	LENGTH		SLURRHLN	LENGTH OF REPLY HEADER.
16	(10)	AREA	4	SLURFRS	START OF VARIABLE-LENGTH FORMATTED RECORD SEGMENT.

Cross Reference

Name	Len	Offset Value
SLSUACSA	-	00
SLSUARAN	-	0A
SLSUCAPA	-	01
SLSUCDSA	-	02
SLSUCFGA	-	03
SLSUDRVA	-	04
SLSUHDR	000004	00
SLSUHSTA	-	05
SLSUID	-	‘CVAL’
SLSULN	-	148
SLSUMVCA	-	08
SLSUQCDA	000001	07
SLSUQCDB	000004	0C
SLSUQCDC	-	02
SLSUQCDD	000004	14
SLSUQCDK	000004	08
SLSUQCDL	000004	10
SLSUQCDO	-	00
SLSUQCDR	-	01
SLSUQCDS	-	01
SLSUQCDT	000001	06
SLSUQDSN	000044	18
SLSURT	000001	05
SLSUSTAA	-	06
SLSUVER	000001	04
SLSUVN	-	02
SLSUVOLA	-	07
SLSUVTVA	-	09
SLURCLAC	-	04
SLURCLIO	-	10
SLURCLIT	-	08

Name	Len	Offset Value
SLURCLOK	-	00
SLURCLRA	-	0C
SLURFRS	000004	10
SLURHDR	000004	00
SLURHSCV	000002	04
SLURID	-	‘CVAL’
SLUROPAO	-	04
SLUROPDA	-	1C
SLUROPDD	-	14
SLUROPIO	-	10
SLUROPIT	-	08
SLUROPNA	-	18
SLUROPOK	-	00
SLUROPRA	-	0C
SLURQCDN	000004	08
SLURQCDO	000004	0C
SLURQCRT	-	3EA
SLURRDBA	-	18
SLURRDEA	-	04
SLURRDIB	-	1C
SLURRDIL	-	20
SLURRDIO	-	10
SLURRDIT	-	08
SLURRDNO	-	14
SLURRDOK	-	00
SLURRDRA	-	0C
SLURRHLN	-	10
SLURRPLY	000001	00
SLURRQPL	-	3E8
SLURRQRT	-	3E9
SLURVER	000001	06

Appendix F. Remote-linked Libraries

Overview

This appendix contains illustrations of configurations for remote-linked libraries. In addition, programming and operational considerations for each of the configurations are presented.

Configuration 1

This configuration consists of one ACS remote-linked to one CPU. The primary, secondary, and standby control data sets all run on the one CPU.

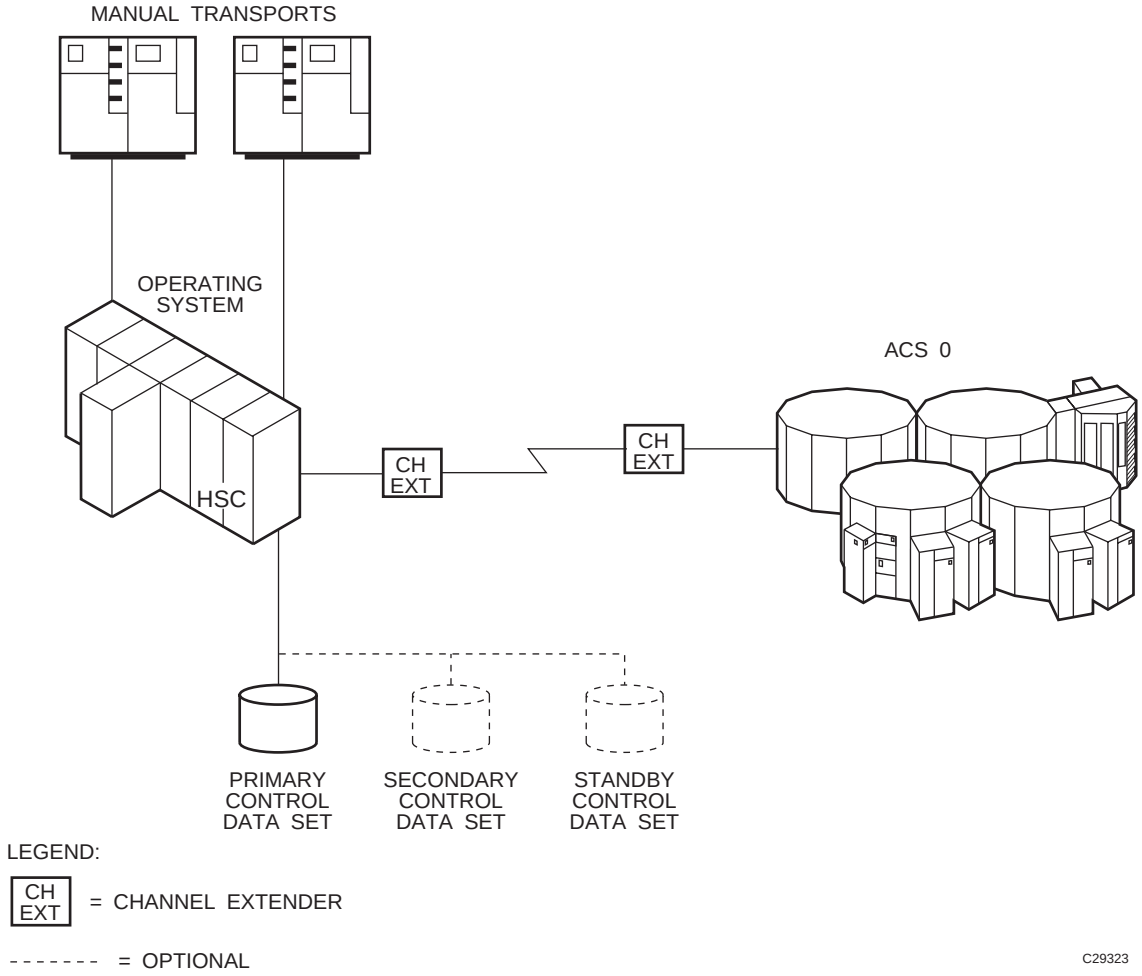

Figure 40. Configuration 1

Configuration 2

This configuration consists of one ACS remote-linked to a CPU with a second ACS local to the same CPU. The primary, secondary, and standby control data sets all run on the one CPU.

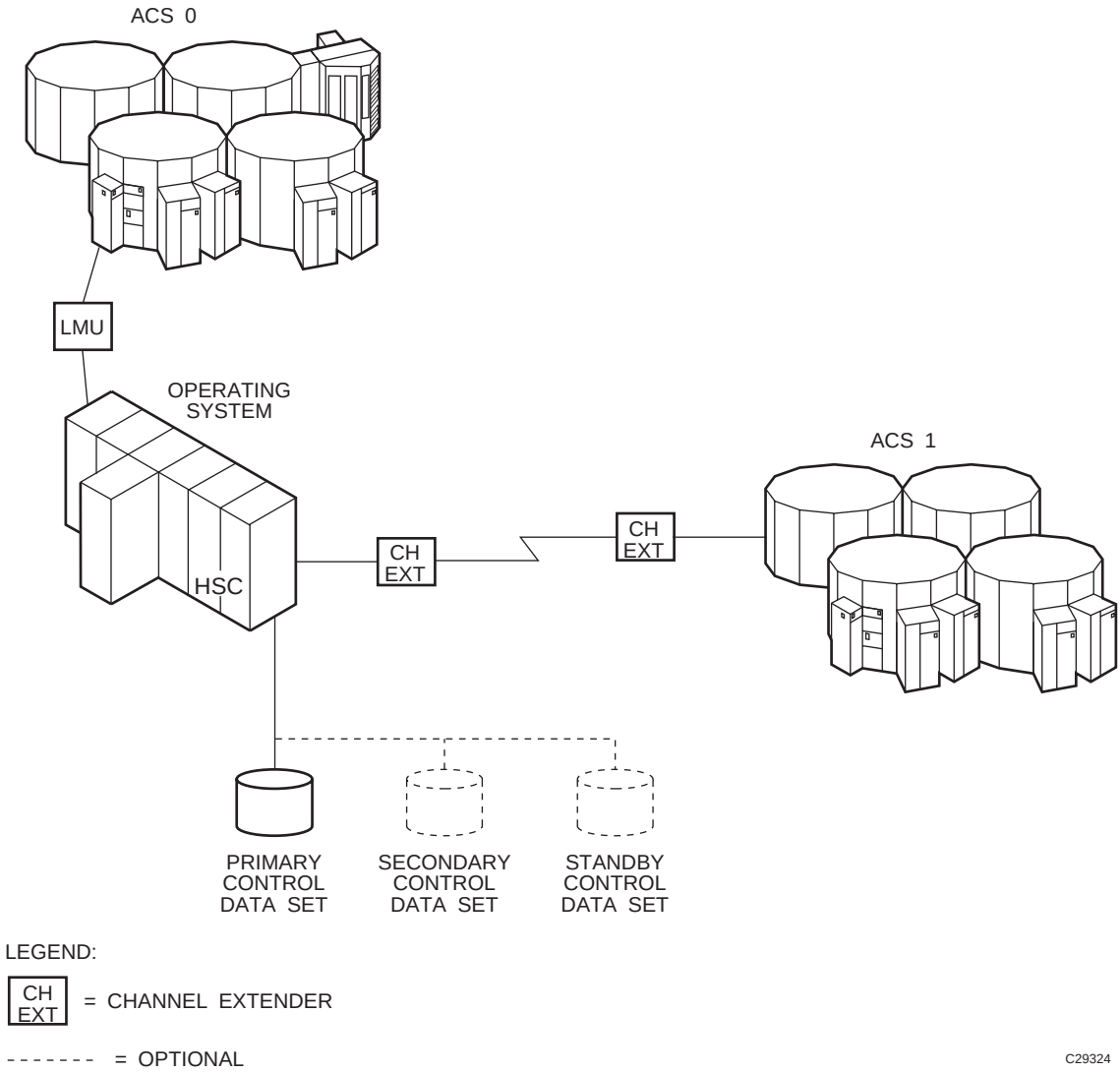

Figure 41. Configuration 2

Configuration 3

This configuration consists of one ACS local to one CPU that is remote-linked to another CPU with one ACS local to it. The primary and secondary control data sets run on separate SSDs each attached to separate CPUs. The standby control data set can be attached to either SSD.

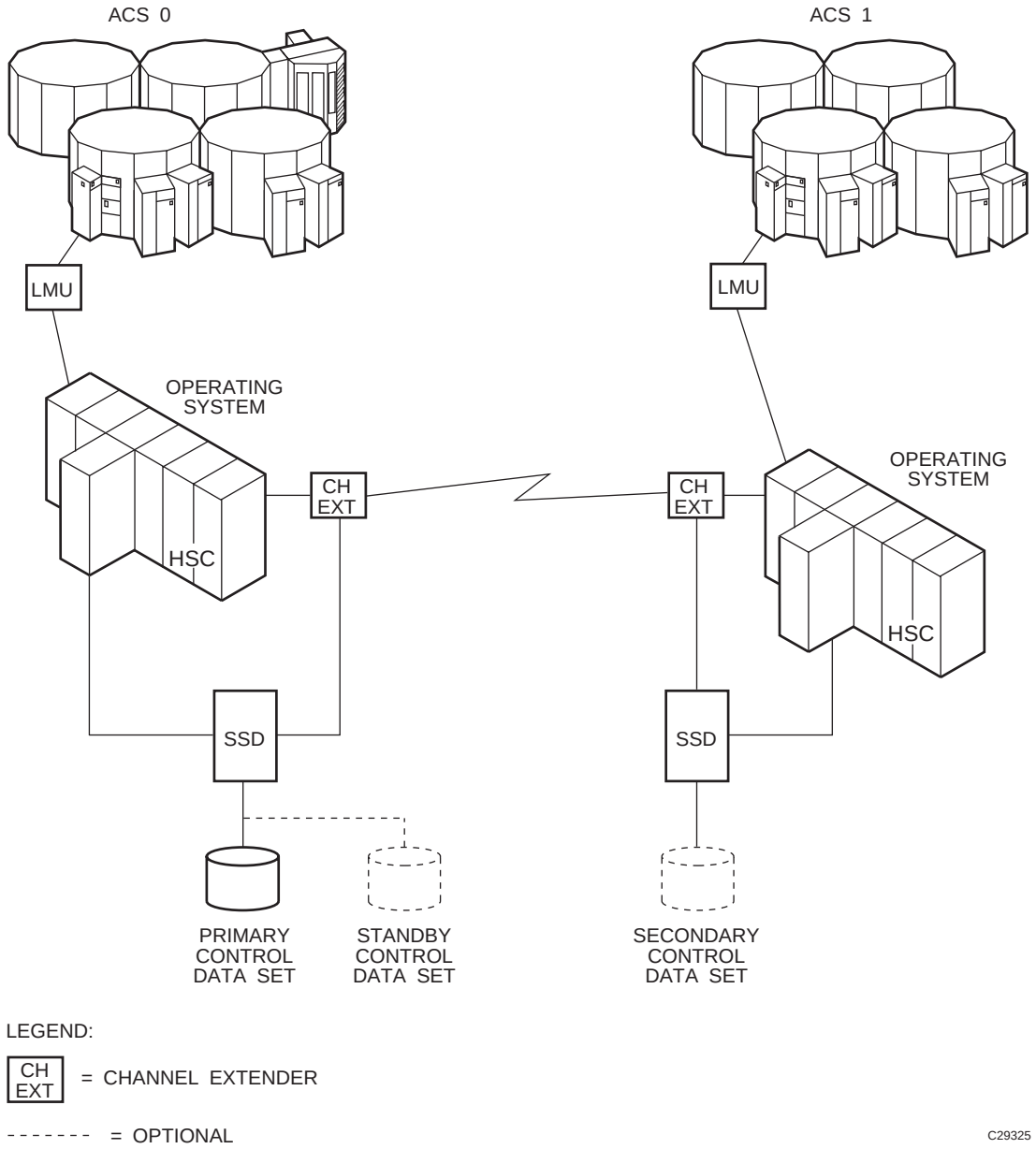

Figure 42. Configuration 3

Configuration 4

This configuration consists of one ACS local to one CPU that is remote-linked to another CPU with one ACS local to it. The primary and secondary control data sets run on separate SSDs each attached to separate CPUs.

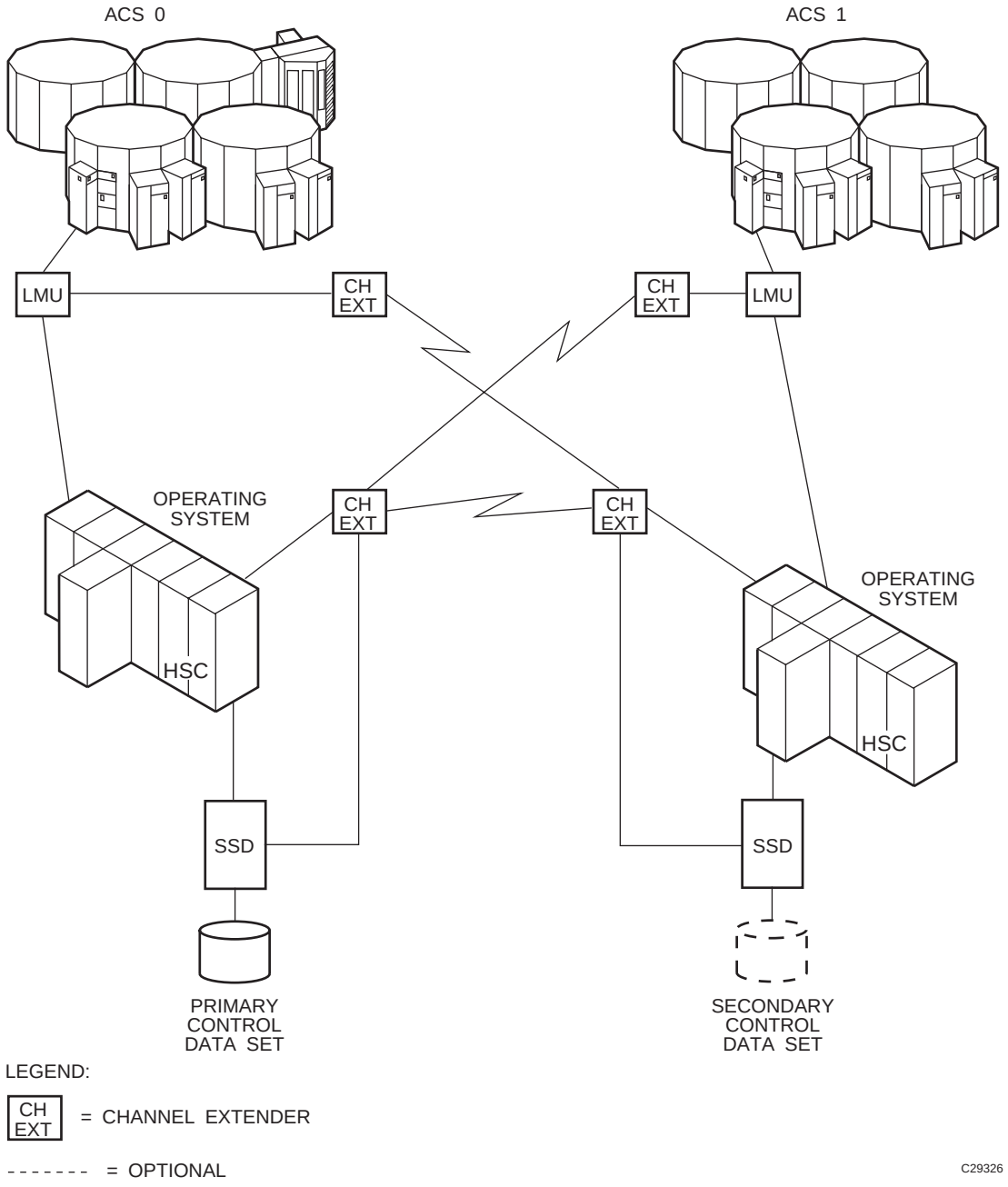

Figure 43. Configuration 4

Configuration 5

This configuration consists of one ACS local to one CPU that is remote-linked to another CPU with one ACS local to it. In addition, a third ACS is remote-linked to both CPUs. The primary and secondary control data sets run on separate SSDs each attached to separate CPUs.

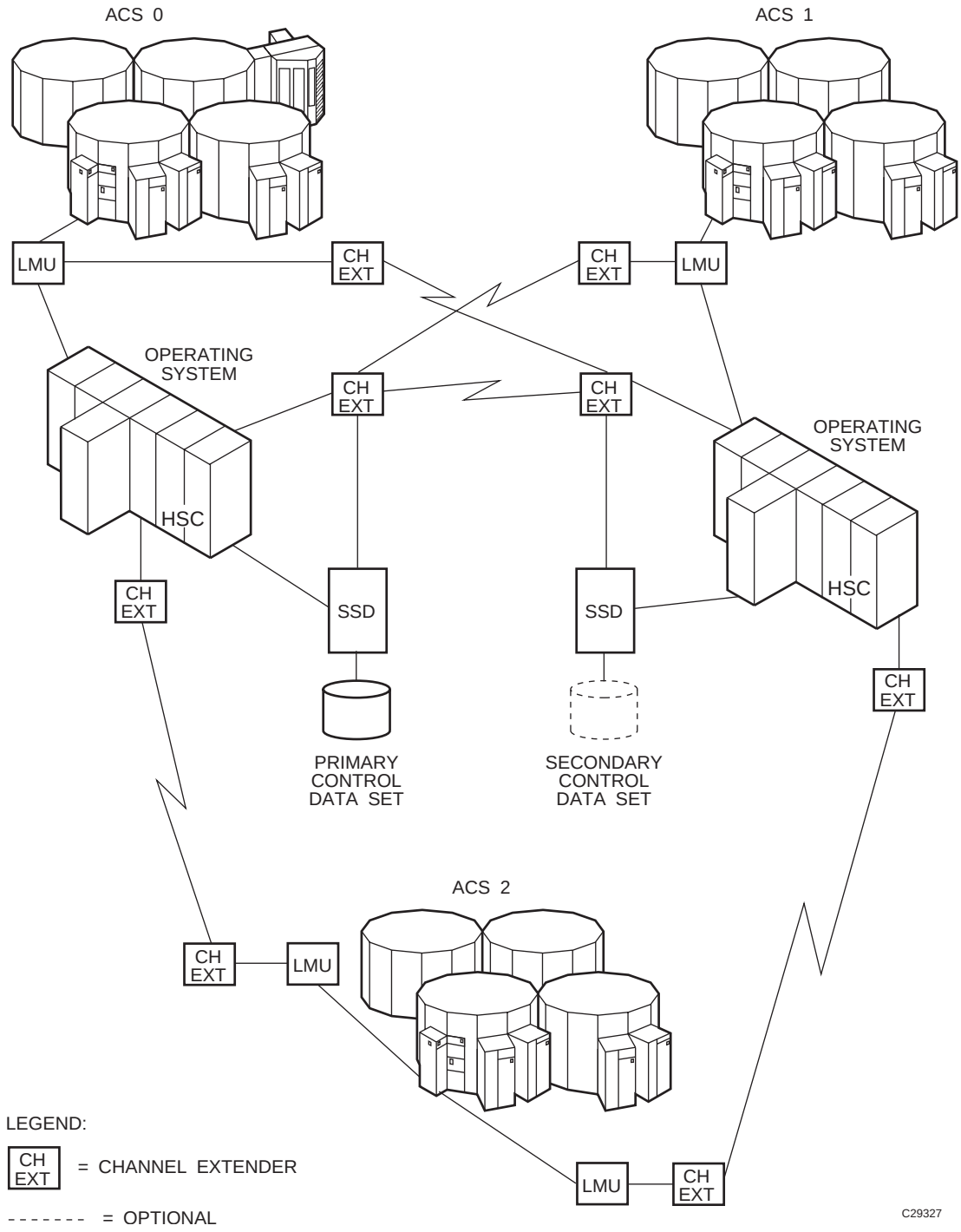

Figure 44. Configuration 5

Programming and Operational Considerations

The following are programming and operational considerations that should be observed if you have libraries resembling any of the illustrated configurations. The HSC permits operation of these library configurations provided that some programming and operational precautions are observed.

These precautions are based on various functional restrictions described in following paragraphs. Table 120 lists the functions and the programming precautions that must be followed for associated configurations.

Table 120. Programming and Operation Precautions for Remote-linked Libraries

Function	Applicable Configuration(s)
Allocation	1 - 5
Resolving CDS issues after a remote-link failure	3 - 5
Restore involving journals from channel extended hosts	3 - 5
Control data set integrity	3 - 5

Allocation

Refer to the *SMC Configuration and Administration Guide* for information about allocation.

Resolving CDS Issues After a Remote-Link Failure

In configurations 3, 4, and 5, if there is a failure in the remote link while ACS1 has a hardware reserve issued against the primary CDS, ACS0 is locked out and is not able to perform any automated tape services until the reserve is released. This problem can happen even if the two ACSs are not remote-linked.

The reserve can be released by disabling the remote-link interface. Operator intervention is required to disable the link.

Restore Involving Journals from Channel-Extended Hosts

In configurations 3, 4, and 5, if a restore of the control data set is needed, and the journaling option is invoked, all journal files must be obtained from every host that was included in the library LIBGEN. If all of the journals are not applied when the RESTore utility is executed, an accurate control data set may not be constructed during the restore operation.

Obtaining all journals from remote-linked hosts can be a problem if the link is down. Consequently, not all journals can be obtained to fully satisfy a successful restore of the control data set.

Careful planning must be done before executing the RESTore utility to ensure that journals are available from each host and that the remote link is fully operational when the restore operation is performed.

Control Data Set Integrity

In configurations 3, 4, and 5, the primary control data set and the secondary control data set are separated across a remote link. If the link is interrupted, the secondary data set becomes the primary control data set for ACS1.

The original primary control data set continues to operate for ACS0 only. As the library operates, any updates occurring to either control data set after the link was severed causes the data sets to be unsynchronized. It is a difficult task to resynchronize the data for both data sets.

Possible solutions to resynchronize the data sets include:

- Execute the AUDIt utility and reconcile the differences between the primary control data set and the secondary data set. This solution is not recommended because of the time required to perform a full audit operation.
- Execute the BACKup utility, specifying OPTion(Analyze), immediately followed by the RESTore utility, specifying GENerate(YES). The BACKup utility performs error and comparison checking of records for the data sets and enables you to reconcile the differences. With this utility, you can ensure that the two data sets are properly synchronized. Library operation can be resumed at a high confidence level.
- Prior to reestablishing the link:
    1. Bring the HSC down.
    2. Reestablish the link.
    3. Run BACKup OPTion(Analyze) and RESTore GENerate(YES).
    4. Bring the HSC up.
    5. Use the discrepancy report produced by the backup to determine discrepancies between copies of the CDS.

Refer to Chapter 5, “Utility Functions” on page 181 and the AUDIt, BACKup, and RESTore utilities for detailed information.

Glossary

Terms are defined as they are used in the text. If you cannot find a term here, check the index.

A

AC— Alternating current.

access method— A technique for moving data between processor storage and I/O devices.

ACS— *See* Automated Cartridge System.

ACSid— A method used to identify an ACS. An ACSid is the result of defining the SLIALIST macro during the library generation (LIBGEN) process. The first ACS listed in this macro acquires a hexadecimal identifier of 00, the second acquires a hexadecimal identifier of 01, and so forth, until all ACSs are identified.

allocation— The selection of a cartridge drive, either inside the library or outside (by the HSC software for HSC allocation, or MVS for MVS allocation without the HSC).

APF— Authorized Program Facility.

APPL— VTAM APPLID definition for the HSC.

archiving— The storage of backup files and associated journals, usually for a given period of time.

Automated Cartridge System (ACS)— The library subsystem consisting of one or two LMUs, and from 1 to 16 attached LSMs.

automated library— *See* library.

automatic mode— A relationship between an LSM and all attached hosts. LSMs operating in automatic mode handle cartridges without operator intervention. This is the normal operating mode of an LSM that has been modified online.

B

basic direct access method (BDAM)— An access method used to directly retrieve or update particular blocks of a data set on a direct access device.

basic sequential access method (BSAM)— An access method for storing and retrieving data blocks in a continuous sequence, using either a sequential access or direct access device.

BDAM— *See* Basic direct access method.

beginning-of-tape (BOT)— The location on a tape where written data begins.

block— A collection of contiguous records recorded as a unit. Blocks are separated by interblock gaps, and each block may contain one or more records.

BOT— *See* beginning-of-tape.

BSAM— *See* Basic Sequential Access Method.

buffer— A routine or storage used to compensate for a difference in rate of data flow, or time of occurrence of events, when transferring data from one device to another.

C

CA-1 (TMS)— Computer Associates Tape Management

System— Third-party software by Computer Associates International, Inc.

CAP— *See* Cartridge Access Port.

capacity— *See* media capacity.

CAPid— A CAPid uniquely defines the location of a CAP by the LSM on which it resides. A CAPid is of the form *AAL:CC* where *AA* is the ACSid, *L* is the LSM number, and *CC* is the CAP number. Some commands and utilities permit an abbreviated CAPid format of *AAL*.

cartridge— The plastic housing around the tape. It is approximately 4 inches (100 mm) by 5 inches (125 mm) by 1 inch (25 mm). The tape is threaded automatically when loaded in a transport. A plastic leader block is attached to the tape for automatic threading. The spine of the cartridge contains a Tri-Optic label listing the VOLSER.

Cartridge Access Port (CAP)— An assembly which allows an operator to enter and eject cartridges during automated operations. The CAP is located on the access door of an LSM.

See also standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Cartridge Drive (CD)— A device containing two or four cartridge transports with associated power and pneumatic supplies.

Cartridge Scratch Loader— An optional feature for the Cartridge Drive. It allows the automatic loading of premounted tape cartridges or the manual loading of single tape cartridges.

cartridge system tape— Also known as a Standard tape. The basic tape cartridge media that can be used with 4480, 4490, or 9490 Cartridge Subsystems. They are visually identified by a one-color cartridge case.

CAW— *See* Channel Address Word.

CD— *See* Cartridge Drive.

CDRM— Cross Domain Resource Manager definition (if not using existing CDRMs).

CDRSC— Cross Domain Resource definition.

CDS— *See* control data set.

CE— Channel End.

CEL— Customer Emulation Lab. cell. A storage slot in the LSM that is used to store a tape cartridge.

Central Support Remote Center (CSRC)— *See* Remote Diagnostics Center.

CFT— Customer Field Test.

channel— A device that connects the host and main storage with the input and output control units.

Channel Address Word (CAW)— An area in storage that specifies the location in main storage where a channel program begins.

channel command— A command received by a CU from a channel.

Channel Status Word (CSW)— An area in storage that provides information about the termination of I/O operations.

check— Detection of an error condition.

CI— Converter/Interpreter (JES3).

connected mode— A relationship between a host and an ACS. In this mode, the host and an ACS are capable of communicating (at least one station to this ACS is online).

control data set (CDS)— The data set containing all configuration and volume information used by the host software to control the functions of the automated library. Also known as a library control data set.

See also Primary CDS, Secondary CDS, and Standby CDS.

control data set allocation map— A CDS subfile that marks individual blocks as used or free.

control data set data blocks— CDS blocks that contain information about the library and its configuration or environment.

control data set directory— A part of the CDS that maps its subdivision into subfiles.

control data set free blocks— CDS blocks available for future subfile expansion.

control data set pointer blocks— CDS blocks that contain pointers to map data blocks belonging to a subfile.

control data set recovery area— A portion of the CDS reserved for maintaining integrity for updates that affect multiple CDS blocks.

control data set subfile— A portion of the CDS consisting of Data Blocks and Pointer Blocks containing related information.

Control Unit (CU)— (1) A microprocessor-based unit situated logically between a host channel (or channels) and from two to sixteen transports. It functions to translate channel commands into transport commands, send transport status to the channel(s), and pass data between the channel(s) and transport(s). (2) A device that controls I/O operations for one or more devices. cross-host recovery. The ability for one host to perform recovery for another host that has failed.

CSE— Customer Service Engineer.

CSI— Consolidated System Inventory.

CSL— *See* Cartridge Scratch Loader.

CSRC— Central Support Remote Center (*See* Remote Diagnostics Center)

CST— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard. (3) *See* Cartridge System Tape.

CSW— *See* Channel Status Word.

CU— *See* Control Unit.

D

DAE— Dump Analysis Elimination.

DASD— Direct access storage device.

data— Any representations such as characters or analog quantities to which meaning is, or might be, assigned.

Database Heartbeat record (DHB)— The record that contains the names of the control data sets recorded by the HSC and identifies the correct primary, secondary, and standby CDS.

data class— A collection of allocation and space attributes, defined by the storage administrator, that are used to create a data set.

data compaction— An algorithmic data-reduction technique that encodes data from the host and stores it in less space than unencoded data. The original data is recovered by an inverse process called decompaction.

data-compaction ratio— The number of host data bytes mathematically divided by the number of encoded bytes. It is variable depending on the characteristics of the data being processed. The more random the data stream, the lower the opportunity to achieve compaction.

Data Control Block (DCB)— A control block used by access routines in storing and retrieving data.

data set— The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

data streaming— A continuous stream of data being transmitted in character or binary-digit form, using a specified format.

DC— Direct current.

DCB— *See* Data Control Block.

DD3— A generic value that can be specified on the MEDia and RECtech parameters and includes all types of helical cartridges and recording techniques.

DD3A, DD3B, DD3C, DD3D— Values that can be specified on the MEDia parameter and include only the specified type of helical cartridge. Aliases are A, B, C, and D, respectively.

DDR— *See* Dynamic Device Reconfiguration.

default value— A value assumed when no value has been specified.

demand allocation— An MVS term meaning that a user has requested a specific unit.

device allocation— The HSC function of *influencing* the MVS device selection process to choose either a manual transport or a transport in a particular ACS, based on the location of the volume (specific requests) or the subpool rules in effect (scratch requests).

device group— A subset of the eligible devices. Device groups are defined by esoteric unit names but also may be created implicitly if common devices exist in different device groups.

device number— A four-digit hexadecimal number that uniquely identifies a device attached to a processor.

device separation— *See* drive exclusion.

DFP— Data Facility Product. A program that isolates applications from storage devices, storage management, and storage device hierarchy management.

DFSMS— Refers to an environment running MVS/ESA SP and DFSMS/MVS, DFSORT, and RACF. This environment helps automate and centralize the management of storage through a combination of hardware, software, and policies.

DFSMS ACS routine— A sequence of instructions for having the system assign data class, storage class, management class, and storage group for a data set.

DHB— *See* Database Heartbeat record.

directed allocation— *See* drive prioritization.

disconnected mode— A relationship between a host and an ACS. In this mode, the host and an ACS are not capable of communicating (there are no online stations to this ACS).

DOMed— Pertaining to a console message that was previously highlighted during execution, but is now at normal intensity.

drive exclusion— (previously referred to as *device separation*) refers to the Storage Management Component (SMC) function of excluding drives for an allocation request based on SMC exclusion criteria. See the *SMC Configuration and Administration Guide* for more information.

drive loaded— A condition of a transport in which a tape cartridge has been inserted in the transport, and the tape has been threaded to the beginning-of-tape position.

drive panel— A wall of an LSM that contains tape transports. Drive panels for 9840 transports have either 10 or 20 transports per panel; drive panels for all other transports contain up to four transports per panel.

drive prioritization— (previously referred to as *directed allocation*) refers to the Storage Management Component (SMC) function of influencing selection of a particular drive based on allocation criteria, including volume location. See the *SMC Configuration and Administration Guide* for more information.

DRIVEid— A DRIVEid uniquely defines the location of a tape transport by its location within an LSM. A DRIVEid is of the form *AAL:PP:NN* where *AA* is the ACSid, *L* is the LSM number, *PP* is the panel where the drive is located, and *NN* is the drive number within the panel.

DSI— Dynamic System Interchange (JES3).

dual LMU— A hardware/µ-software feature that provides a redundant LMU capability.

dual LMU HSC— HSC release 1.1.0 or later that automates a switch-over to the standby LMU in a dual LMU configuration.

dump— To write the contents of storage, or of a part of storage, usually from an internal storage to an external medium, for a specific purpose such as to allow other use of storage, as a safeguard against faults or errors, or in connection with debugging.

Dynamic Device Reconfiguration (DDR)— An MVS facility that allows a dismountable volume to be moved and repositioned if necessary, without abnormally terminating the job or repeating the initial program load procedure.

E

ECAP— *See* enhanced CAP.

ECART— (1) Cartridge system tape with a length of 1100 feet that can be used with 4490 and 9490 Cartridge Drives. These tapes are visually identified by a two-tone (black and tan) colored case. (2) A value that can be specified on the MEDia parameter and that includes only 36-track enhanced capacity cartridge system tapes. (3) *See* Enhanced Capacity Cartridge System Tape.

ECCST— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

EDL— *See* eligible device list.

EDTGEN— Eligible Device Table Generation. A process used to replace an installation-defined and named representation of the devices that are eligible for allocation.

EETape— *See* Extended Enhanced Tape.

Effective Recording Density— The number of user bytes per unit of length of the recording medium.

eject— The process where the LSM robot places a cartridge in a Cartridge Access Port (CAP) so the operator can remove it from the LSM.

eligible device list— (1) A group of transports that are available to satisfy an allocation request. (2) For JES2 and JES3, a list of devices representing the UNIT parameter specified by way of invoking JCL. The EDL can contain both library and nonlibrary transports depending on the I/O GEN.

enable— The modification of system, control unit, or device action through the change of a software module or a hardware switch (circuit jumper) position.

enhanced CAP (ECAP)— An enhanced CAP contains two forty-cell magazine-style CAPs and a one-cell priority CAP (PCAP). Each forty-cell CAP holds four removable magazines of ten cells each. An LSM access door with an enhanced CAP contains no cell locations for storing cartridges.

See also Cartridge Access Port, standard CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Enhanced Capacity Cartridge System Tape— Cartridge system tape with increased capacity that can be used with 4490 and 9490 Cartridge Drives. These tapes are visually identified by a two-tone (black and tan) housing.

EOF— End-of-File.

EOT— End-of-Tape marker.

EPO— Emergency Power Off.

EREP— Environmental Recording, Editing, Printing.

ERP— *See* error recovery procedures.

error recovery procedures (ERP)— Procedures designed to help isolate and, where possible, to recover from errors in equipment.

esoteric— A user-defined name that groups devices into classes.

ETAPE— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

Extended Capacity Tape— *See* Enhanced Capacity Cartridge System Tape.

Extended Enhanced Tape (EETape)— A synonym for a ZCART, which is a cartridge that can only be used with a 9490EE drive. An EETape (ZCART) provides greater storage capacity than an ECART.

ExtendedStore Library— One or more LSMs with no Cartridge Drives (CDs) that are attached by pass-thru ports to other LSMs (with CDs) in an ACS. These LSMs provide archive storage for cartridges containing less active data sets. Cartridges can be entered and ejected directly into and out of this LSM though either a standard CAP or an enhanced CAP.

F

FIFO— First in, first out.

file protected— Pertaining to a tape volume from which data can be read only. Data cannot be written on or erased from the tape.

format— The arrangement or layout of data on a data medium.

frozen panel— A panel to which cartridges cannot be moved. This restriction includes allocating new cartridge locations on a panel as a result of:

- a MOVe command, utility, or PGMI request
- cartridge entry into the ACS
- float, scratch dismount, or scratch redistribution processing.

G

GB— Gigabyte, billion (10^9) bytes.

GDG— Generation Data Group. An MVS data set naming convention. Sequence numbers are appended to the basic data set name to track the generations created for that data set.

GDG Separation— Occurs when a Generation Data Group gets separated because the volumes of different generations reside in different locations. Usually, all generations of a GDG are mounted on a single drive to reduce the number of drives needed for a job.

GTF— Generalized Trace Facility. An MVS facility used to trace software functions and events.

H

HDA— Head/disk assembly.

Helical— A generic value that can be specified on the RECtech parameter and includes all helical transports.

HOSTid— A HOSTid is the host identifier specified in the HOSTID parameter of the SLILIBRY LIBGEN macro. The HOSTid is the system identifier for JES2 or the main processor name for JES3.

High Watermark Setup (HWS)— In JES3, a setting specified on the HWSNAME initialization statement that reduces the number of devices reserved for a job. JES3 accomplishes this task by assessing each jobstep to determine the maximum number of devices needed for each device type and reserving those devices.

Host Software Component (HSC)— That portion of the Automated Cartridge System which executes on host systems attached to an automated library. This component acts as the interface between the operating system and the rest of the automated library.

host system— A data processing system that is used to prepare programs and the operating environments for use on another computer or controller.

HSC— *See* Host Software Component.

HWS— *See* High Watermark Setup.

I

ICRC— *See* Improved Cartridge Recording Capability.

ID— Identifier or identification.

IDAX— Interpreter Dynamic Allocation Exit. This is a subfunction of the DFSMS/MVS subsystem request (SSREQ 55) that the MVS JCL Interpreter and dynamic allocation functions issue for calling DFSMS ACS routines for management of the data set requested.

IDRC— Improved Data Recording Capability.

IML— *See* Initial Microprogram Load.

Improved Cartridge Recording Capability (ICRC)— An improved data recording mode that, when enabled, can increase the effective cartridge data capacity and the effective data rate when invoked.

index— A function performed by the cartridge scratch loader that moves cartridges down the input or output stack one cartridge position. A scratch loader can perform multiple consecutive indexes.

INISH deck— A set of JES3 initialization statements.

Initial Microprogram Load (IML)— A process that activates a machine reset and loads system programs to prepare a computer system for operation. Processors having diagnostic programs activate these programs at IML execution. Devices running µ-software reload the functional µ-software usually from a floppy diskette at IML execution.

Initial Program Load (IPL)— A process that activates a machine reset and loads system programs to prepare a computer system for operation. Processors having diagnostic programs activate these

programs at IPL execution. Devices running µ-software reload the functional µ-software usually from a floppy diskette at IPL execution.

initial value— A value assumed until explicitly changed. It must then be explicitly specified in another command to restore the initial value. An initial value for the HSC is the value in effect when the product is installed.

inline diagnostics— Diagnostic routines that test subsystem components while operating on a time-sharing basis with the functional µ-software in the subsystem component.

input stack— The part of the cartridge loader where cartridges are premounted.

intervention required— Manual action is needed.

IPL— *See* Initial Program Load.

ips— Inches per second.

IVP— Installation Verification Programs. A package of programs that is run by a user after the library is installed in order to verify that the library is functioning properly.

J

JCL— *See* Job Control Language.

Job Control Language— Problem-oriented language designed to express statements in a job that are used to identify the job or describe its requirements to an operating system.

journal— The log associated with journaling. The log (stored in a data set) contains a record of completed work and changes to the control data set since the last backup was created.

journaling— A technique for recovery that involves creating a backup control data set and maintaining a log of all changes (transactions) to that data set.

JST— Job Summary Table (JES3).

K

KB— Kilobyte, thousand (10 3) bytes.

keyword parameter— In command and utility syntax, operands that include keywords and their related values (*See* positional parameter).

Values are concatenated to the keyword either by an equal sign, ‘‘KEYWORD=value,’’ or by parentheses, ‘‘KEYWORD(value).’’ Keyword parameters can be specified in any order. The HSC accepts (tolerates) multiple occurrences of a keyword. The value assigned to a keyword reflects the last occurrence of a keyword within a command.

L

LAN— *See* Local Area Network.

LCU— *See* Library Control Unit.

LED— *See* Light Emitting Diode.

LIBGEN— The process of defining the configuration of the automated library to the host software.

library— An installation of one or more ACSs, attached cartridge drives, volumes placed into the ACSs, host software that controls and manages the ACSs and associated volumes, and the library control data set that describes the state of the ACSs.

library control data set— *See* control data set.

Library Control Unit (LCU)— The portion of the LSM that controls the picking, mounting, dismounting, and replacing of cartridges.

Library Management Unit (LMU)— The portion of the ACS that manages from one to sixteen LSMs and communicates with the host CPU.

Library Storage Module (LSM)— The storage area for cartridges plus the robot necessary to move the cartridges. The term LSM often means the LCU and LSM combined.

Light Emitting Diode (LED)— An electronic device used mainly as an indicator on status panels to show equipment on/off conditions.

LMU— *See* Library Management Unit.

LMUPATH— An HSC control statement contained in the definition data set specified by the LMUPDEF command. An LMUPATH statement allows users to define network LMU attachments.

LMUPDEF— An HSC command used to load the definition data set that contains LMUPATH control statements.

load point— The beginning of the recording area on magnetic tape.

loader— *See* Cartridge Scratch Loader.

Local Area Network (LAN)— A computer network in which devices within the network can access each other for data transmission purposes. The LMU and attached LCUs are connected with a local area network.

logical ejection— The process of removing a volume from the control data set without physically ejecting it from its LSM location.

Logical End Of Tape— A point on the tape where written data normally ends.

LONG— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes (not to be confused with LONGItud). (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

LONGItud— (1) A generic value that can be specified on the RECtech parameter and includes all 18-track and 36-track devices. (2) A generic value that can be specified on the MEDia parameter and includes all standard and enhanced capacity cartridge system tapes.

LSM— *See* Library Storage Module.

LSMid— An LSMid is composed of the ACSid concatenated with the LSM number.

LSM number— A method used to identify an LSM. An LSM number is the result of defining the SLIACS macro LSM parameter during a LIBGEN. The first LSM listed in this parameter acquires the LSM number of 0 (hexadecimal), the second LSM listed acquires a hexadecimal number of 1, and so forth, until all LSMs are identified (maximum of sixteen or hexadecimal F).

M

machine initiated maintenance— *See* ServiceTek.

magnetic recording— A technique of storing data by selectively magnetizing portions of a magnetizable material.

magnetic tape— A tape with a magnetizable surface layer on which data can be stored by magnetic recording.

magnetic tape drive— A mechanism for moving magnetic tape and controlling its movement.

maintenance facility— Hardware contained in the CU and LMU that allows a CSE and the RDC to run diagnostics, retrieve status, and communicate with respective units through their control panels.

management class— A collection of management attributes, assigned by the storage administrator, that are used to control the allocation and use of space by a data set.

manual mode— A relationship between an LSM and all attached hosts. LSMs operating in manual mode have been modified offline and require human assistance to perform cartridge operations.

master LMU— The LMU currently controlling the functional work of the ACS in a dual LMU configuration.

MB— Megabyte, million (10^6) bytes.

MDS— Main Device Scheduler (JES3).

MEDia— The parameter used to specify media type.

This is not to be confused with MEDIA1 or MEDIA2, which are values that can be specified on the MEDia parameter.

MEDIA1— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

MEDIA2— (1) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (2) An alias of ECART. (3) *See* Enhanced Capacity Cartridge System Tape.

media capacity— The amount of data that can be contained on storage media and expressed in bytes of data.

media mismatch— A condition that occurs when the media value defined in a VOLATTR control statement does not match the media value recorded in the CDS VAR record.

micro-software— *See* µ-software under Symbols.

MIM— Multi-Image Manager. Third-party software by Computer Associates International, Inc.

mixed configurations— Installations containing cartridge drives under ACS control and cartridge drives outside of library control. These configurations cause the Host Software Component to alter allocation to one or the other.

MODel— The parameter used to specify model number.

modem— Modulator/demodulator. An electronic device that converts computer digital data to analog data for transmission over a telecommunications line (telephone line). At the receiving end, the modem performs the inverse function.

monitor— A device that observes, records, and verifies selected system activities to determine significant departure from expected operation.

MSM— Multiple Sessions Management. Third-party software by Computer Associates International, Inc.

O

OCR— Optical Character Recognition.

operating system (OS)— Software that controls the execution of programs that facilitate overall system operation.

output stack— The part of the cartridge loader that receives and holds processed cartridges.

over-limit cleaning cartridge— A cleaning cartridge that has been used more than the value (limit) specified by either the MNTD MAXclean or VOLATTR MAXclean settings. This kind of cartridge may not be able to adequately clean a tape transport, however, it can be mounted and will attempt to execute the cleaning process. *See also* spent cleaning cartridge.

over-use cleaning cartridge— A cartridge that has a usage (select) count over the MAXclean value (*see* over-limit cleaning cartridge) or that has used up its cleaning surface (see spent cleaning cartridge).

P

paired-CAP mode— The two forty-cell CAPs in an enhanced CAP function in paired-CAP mode as a single eighty-cell CAP.

PARMLIB control statements— Parameter library (PARMLIB) control statements allow you to statically specify various operation parameters which take effect at HSC initialization. Identifying your system requirements and then specifying the appropriate control statements permits you to customize the HSC to your data center.

pass-thru port (PTP)— A mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

PCAP— *See* priority CAP.

physical end of tape— A point on the tape beyond which the tape is not permitted to move.

playground— The playground is a reserved area of cells where the robot deposits cartridges that it finds in its hands during LSM initialization. Normal LSM initialization recovery processing moves cartridges from the playground cells to either their home cells or their intended destinations, but under abnormal circumstances cartridges may be left in playground cells.

positional parameter— In command and utility syntax, operands that are identified by their position in the command string rather than by keywords (*See* keyword parameter).

Positional parameters must be entered in the order shown in the syntax diagram.

POST— *See* Program for Online System Testing.

PowderHorn (9310) LSM— A high-performance LSM featuring a high-speed robot. The PowderHorn has a capacity of up to approximately 6000 cartridges.

primary CDS— The active control data set. It contains the inventory of all cartridges in the library, the library configuration, information about library hardware and resource ownership across multiple processors, and serves as a vehicle of communication between HSCs running on multiple processors.

priority CAP (PCAP)— A one-cell CAP that is part of an enhanced CAP. A PCAP allows a user to enter or eject a single cartridge that requires immediate action.

See also Cartridge Access Port, standard CAP, enhanced CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

Program for Online System Testing (POST)— A program in a host computer that allows it to test an attached subsystem while the subsystem is online.

Program Temporary Fix (PTF)— A unit of corrective maintenance delivered to a customer to repair a defect in a product, or a means of packaging a Small Programming Enhancement (SPE).

Program Update Tape (PUT)— A tape containing a collection of PTFs. PUTs are shipped to customers on a regular basis under the conditions of the customer's maintenance license.

PTF— *See* Program Temporary Fix.

PTP— *See* pass-thru port.

PUT— *See* Program Update Tape.

Q

QSAM— *See* Queued Sequential Access Method.

Queued Sequential Access Method (QSAM)— An extended version of the basic sequential access method (BSAM). When this method is used, a queue is formed of input data blocks that are awaiting processing or output data blocks that have been processed and are awaiting transfer to auxiliary storage or to an output device.

R

RACF— *See* Resource Access Control Facility.

RDC— *See* Remote Diagnostics Center.

Recording Density— The number of bits in a single linear track measured per unit of length of the recording medium.

RECtech— The parameter used to specify recording technique.

RedWood— (1) The program name of the StorageTek transport that supports a helical recording technique. (2) *See* SD-3.

Remote Diagnostics Center (RDC)— The Remote Diagnostics Center at StorageTek. RDC operators can access and test StorageTek systems and software, through telecommunications lines, from remote customer installations. Also referred to as the Central Support Remote Center (CSRC).

Resource Access Control Facility (RACF)— Security software controlling access to data sets.

S

SCP— *See* System Control Program.

scratch tape subpool— A defined subset of all scratch tapes. Subpools are composed of one or more ranges of VOLSERs with similar physical characteristics (type of volume {reel or cartridge}, reel size, length, physical location, etc.). Some installations may also subdivide their scratch pools by other characteristics, such as label type (AL, SL, NSL, NL).

The purpose of subpooling is to ensure that certain data sets are built only within particular ranges of volumes (for whatever reason the user desires). If a volume which does not belong to the required subpool is mounted for a particular data set, it is dismounted and the mount reissued.

SD-3— The model number of the StorageTek transport that supports a helical recording technique.

secondary CDS— The optional duplicate copy of the primary CDS.

secondary recording— A technique for recovery involving maintaining both a control data set and a copy (secondary) of the control data set.

SER— Software Enhancement Request.

ServiceTek (machine initiated maintenance)— A unique feature of the ACS in which an expert system monitors conditions and performance of subsystems and requests operator attention before a potential problem impacts operations. Customers can set maintenance threshold levels.

servo— A device that uses feedback from a sensing element to control mechanical motion.

Shared Tape Allocation Manager (STAM)— Third-party software by Computer Associates International, Inc.

Silverton— *See* 4490 Cartridge Subsystem.

Small Programming Enhancement (SPE)— A supplement to a released program that can affect several products or components.

SMC— Storage Management Component.

SMF— System Management Facility. An MVS facility used to record system actions which affect system functionality.

SMP— System Modification Program.

SMP/E— *See* System Modification Program Extended.

SMS— Storage Management Subsystem.

SPE— *See* Small Programming Enhancement.

special use cartridge— A generic description for a type of cartridge used on 9840 drives. These include:

- 9840 cleaning cartridge
- 9840 microcode load cartridge
- 9840 dump collection cartridge.

When an attempt is made to mount a special use cartridge, LMU error response code 1012 is generated.

The error code is defined as ‘‘load failure for special use cartridge.’’

If the error code is received for a special use cleaning cartridge, it is either ejected or marked as unusable, and it is retained in the ACS (depending on the MNTD EJctauto setting). The HSC does not mount unusable cartridges.

spent cleaning cartridge— A cleaning cartridge that has exhausted its cleaning material and can no longer be used to clean tape transports. *See also* over-limit cleaning cartridge.

SSD— Solid state disk.

STAM— *See* Shared Tape Allocation Manager.

Standard— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) *See* Cartridge System Tape.

standard CAP— A standard CAP has a capacity of twenty-one cartridges (three rows of seven cells each). An LSM access door with a standard CAP contains cell locations for storing cartridges.

See also Cartridge Access Port, enhanced CAP, priority CAP, WolfCreek CAP, WolfCreek optional CAP, or TimberWolf CAP.

standard (4410) LSM— An LSM which provides a storage capacity of up to approximately 6000 cartridges.

standby— The status of a station that has been varied online but is connected to the standby LMU of a dual LMU ACS.

standby CDS— The optional data set that contains only one valid record, the Database Heartbeat (DHB). The DHB contains the names of the control data sets recorded by the HSC and is used to identify the correct primary, secondary, and standby CDS.

standby LMU— The redundant LMU in a dual LMU configuration that is ready to take over in case of a master LMU failure or when the operator issues the SWitch command.

station— A hardware path between the host computer and an LMU over which the HSC and LMU send control information.

STD— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

STK1— A generic value that can be specified on the MEDia and RECtech parameters and includes all types of 9840 cartridges and recording techniques.

STK1R— Value that can be specified on the MEDia and RECtech parameters and includes only the specified type of 9840 cartridge or recording technique. STK1R can be abbreviated as R.

STK1U— Value that can be specified on the MEDia parameter and includes only the specified type of 9840 cleaning cartridge. STK1U can be abbreviated as U.

STK2— A generic value that can be specified on the MEDia parameter and includes all types of 9940 cartridges and recording techniques.

STK2P— Value that can be specified on the MEDia and RECtech parameters and includes only the specified type of 9940 cartridge or recording technique. STK2P can be abbreviated as P.

STK2W— Value that can be specified on the MEDia parameter and includes only the specified type of 9940 cleaning cartridge. STK2W can be abbreviated as W.

storage class— A named list of storage attributes that identify performance goals and availability requirements for a data set.

storage group— A collection of storage volumes and attributes defined by the storage administrator.

Storage Management Component (SMC)— Required NCS software component that performs the allocation function for NCS, replacing the functions previously performed by HSC and MVS/CSC. The SMC resides on the MVS host with HSC and/or MVS/CSC, and communicates with these products to determine policies, volume locations, and drive ownership.

switchover— The assumption of master LMU functionality by the standby LMU.

SYNCSORT— Third-party software by Syncsort, Inc.; a sort, merge, copy utility program.

System Control Program— The general term to describe a program which controls access to system resources, and allocates those resources among executing tasks.

system-managed storage— Storage that is managed by the Storage Management Subsystem, which attempts to deliver required services for availability, performance, space, and security applications.

System Modification Program Extended— An IBM-licensed program used to install software and software maintenance.

T

tape cartridge— A container holding magnetic tape that can be processed without separating it from the container.

tape drive— A device that is used for moving magnetic tape and includes the mechanisms for writing and reading data to and from the tape.

tape unit— A device that contains tape drives and their associated power supplies and electronics.

TAPEREQ— An HSC control statement that is contained in the definition data set specified by the TREQDEF command. A TAPEREQ statement defines a specific tape request. It is divided into two parts, the input: job name, step name, program name, data set name, expiration date or retention period, and an indication for specific requests or nonspecific (scratch) requests; and the output: media type and recording technique capabilities.

Timberline— *See* 9490 Cartridge Subsystem.

Timberline EE— *See* 9490EE Cartridge Subsystem.

TimberWolf (9740) LSM— A high performance LSM that provides a storage capacity of up to 494 cartridges. Up to 10 drives (STD, 4490, 9490, 9490EE, 9840, and SD-3) can be configured. TimberWolf LSMs can only attach to other TimberWolfs.

TimberWolf CAP— The TimberWolf CAP contains either a 10-cell removable magazine or a 14-cell permanent rack. It is not necessary to define a configuration; the HSC receives CAP information directly from the LMU.

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, or WolfCreek optional CAP.

TP— Tape-to-Print.

transaction— A short series of actions with the control data set. These actions are usually related to a specific function (e.g., Mount, ENter).

transport— An electromechanical device capable of threading tape from a cartridge, moving the tape across a read/write head, and writing data onto or reading data from the tape.

TREQDEF— An HSC command that is used to load the definition data set that contains TAPEREQ control statements.

Tri-Optic label— An external label attached to the spine of a cartridge that is both human and machine readable.

TT— Tape-to-Tape.

U

unit affinity— A request that all cartridges be mounted on a single drive (either for read or write purposes), usually to reduce the number of drives needed for a job.

unit parameter value— A JCL term meaning the value of a JCL UNIT parameter. The value can be a single address of a drive, an esoteric list, or a generic list.

UNITATTR— An HSC control statement that is contained in the definition data set specified by the **UNITDEF command—** A UNITATTR statement defines to the HSC the transport's media type and recording technique capabilities.

UNITDEF— An HSC command that is used to load the definition data set that contains UNITATTR control statements.

utilities— Utility programs. The programs that allow an operator to manage the resources of the library and to monitor overall library performance.

V

VAR— *See* Volume Attribute Record.

VAT— *See* Volume Attribute Table Entry.

Virtual Storage Manager (VSM)— A storage solution that virtualizes volumes and transports in a VTSS buffer in order to improve media and transport use.

Virtual Tape Control System (VTCS)— The primary host code for the Virtual Storage Manager (VSM) solution. This code operates in a separate address space, but communicates closely with HSC.

Virtual Tape Storage Subsystem (VTSS)— The DASD buffer containing virtual volumes (VTVs) and virtual drives (VTDs). The VTSS is a StorageTek RAID 6 hardware device with microcode that enables transport emulation. The RAID device can read and write "tape" data from/to disk, and can read and write the data from/to a real tape drive (RTD).

virtual thumbwheel— An HSC feature that allows read-only access to a volume that is not physically write-protected.

VOLATTR— An HSC control statement that is contained in the definition data set specified by the VOLDEF command. A VOLATTR statement defines to the HSC the media type and recording technique of the specified volumes.

VOLDEF— An HSC command that is used to load the definition data set that contains VOLATTR control statements.

VOLSER— A six-character alphanumeric label used to identify a tape volume.

volume— A data carrier that is mounted or dismounted as a unit. (*See* cartridge).

Volume Attribute Record (VAR)— An HSC internal record that contains the data base-resident information of a cartridge entered into the library.

Volume Attribute Table Entry (VAT)— An HSC internal table that contains entries to the intransit record token and the Volume Attribute Record (VAR). The VAT is used as the communications area for internal service calls.

W

WolfCreek (9360) LSM— A smaller capacity high-performance LSM. WolfCreek LSMs are available in 500, 750, and 1000 cartridge capacities (model numbers 9360-050, 9360-075, and 9360-100, respectively). WolfCreek LSMs can be connected by

pass-thru ports to 4410, 9310, or other WolfCreek LSMs.

WolfCreek CAP— The standard WolfCreek CAP contains a 20-cell magazine-style CAP and a priority CAP (PCAP).

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek optional CAP, or TimberWolf CAP.

WolfCreek optional CAP— The WolfCreek optional CAP contains a 30-cell magazine-style CAP which is added to the standard WolfCreek CAP.

See also Cartridge Access Port, standard CAP, enhanced CAP, priority CAP, WolfCreek CAP, or TimberWolf CAP.

Write Tape Mark (WTM)— The operation performed to record a special magnetic mark on tape. The mark identifies a specific location on the tape.

WTM— *See* Write Tape Mark.

WTO— Write-to-Operator.

WTOR— Write-to-Operator with reply.

Z

ZCART— (1) Cartridge system tape with a length of 2200 feet that can be used only with 9490EE Cartridge Drives. (2) A value that can be specified on the MEDia parameter and that includes only 36-track 9490EE cartridge system tapes. (3) *See also* Extended Enhanced Tape.

Symbols

µ-software— Microprogram. A sequence of microinstructions used to perform preplanned functions and implement machine instructions.

Numerics

18-track— A recording technique that uses 18 tracks on the tape. The tape is written in only the forward motion.

18track— A generic value that can be specified on the RECtech parameter and includes all 18-track transports.

3480— (1) A value that can be specified on the MEDia parameter and that includes only standard capacity cartridge tapes. (2) An alias of Standard.

3480X— The 3480 upgrade that supports ICRC.

3490— The IBM cartridge drive that replaced the 3480X and supports ICRC but not 36-track or long tape. It is equivalent to the IBM 3480X.

3490E— (1) The IBM cartridge drive that replaced the 3490 and supports ICRC, 36-track, and long tape. It reads 18-track but does not write 18-track. (2) A value that can be specified on the MEDia parameter and that includes only enhanced capacity cartridge system tapes. (3) An alias of ECART.

3590— The IBM cartridge drive that supports 128-track recording and holds 10GB of uncompressed data. It has the same form factor as a 3490E.

36-track— A recording technique that uses 36 tracks on the tape. 18 tracks of data are written in the forward motion and then an additional 18 tracks in the backward motion for a total of 36.

36track— A generic value that can be specified on the RECtech parameter and includes all 36-track transports.

36Atrack— A value that can be specified on the RECtech parameter and includes only 4490 (Silverton) 36-track transports.

36Btrack— A value that can be specified on the RECtech parameter and includes only 9490 (Timberline) 36-track transports.

36Ctrack— A value that can be specified on the RECtech parameter and includes only 9490EE (Timberline EE) transports.

4410 LSM— *See* standard LSM.

4480 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 18-track recording format. The StorageTek 4480 Cartridge Subsystem is equivalent to a 3480 device.

4490 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 36-track recording format and extended capacity tape. 4490 transports can also read data recorded in

18-track format. The StorageTek 4490 Cartridge Subsystem is equivalent to a 3490E device.

9310 LSM— *See* PowderHorn LSM.

9360 LSM— *See* WolfCreek LSM.

9490 Cartridge Subsystem— Cartridge tape transports that provide read/write capability for 36-track recording format and extended capacity tape and provide improved performance over the 4490 Cartridge Subsystem. 9490 transports can also read data recorded in 18-track format. The StorageTek 9490 Cartridge Subsystem offers better performance (faster data transfer rate, faster load/unload) than a 3490E device.

9490EE Cartridge Subsystem— A high-performance tape transport that provides read/write capability for Extended Enhanced tape (EETape) cartridges. It is functionally equivalent to the IBM 3490E device.

9740 LSM— *See* TimberWolf LSM.

9840 Cartridge Subsystem— A high performance tape transport for enterprise and open systems environments that reads and writes 9840 cartridges. 9840s can be defined in 10-drive and 20-drive panel configurations. The 9840 can perform as a standalone subsystem with a cartridge scratch loader attached, or it can be attached to a StorageTek ACS.

T9840B—The StorageTek cartridge transport that reads and writes T9840B cartridges.

T9940A— The StorageTek capacity-centric cartridge transport capable of reading and writing 60GB T9940A cartridges.

T9940B— The StorageTek capacity-centric cartridge transport capable of reading and writing 200GB T9940B cartridges.

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