



# **Client System Component for MVS**

## **System Programmer's Guide**

**Release 5.1**

**313486902**

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## What's New With This Release?

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MVS/CSC 5.1 includes the following changes and enhancements:

- SMP/E APPLY and ACCEPT installation steps for MVS/CSC are now included in the NCSAPPLY and NCSACCPT sample members, respectively.
- The following ALTER operator command parameters and/or MVS/CSC startup parameters are no longer honored:
  - ALOtime
  - GDGAll
  - JES3set
  - SMSAcsr
  - SMSMOD
  - UNITAff
  - UXPrms
  - X02sub
  - X08sub
  - XJ3sub.

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 MVS/CSC for the ALLCdata parameter and the following component names:
  - AL (allocation enhancement)
  - JP (job processing)
  - J3 (JES3)

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.
- Message changes, additions and deletions.



## About this Guide

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This guide describes how to use release 5.1 of the StorageTek Client System Component for MVS (MVS/CSC).

### Intended Audience

Part 1, “MVS/CSC System Overview” is intended for all users of the MVS/CSC product.

Part 2, “MVS/CSC System Description” is intended for system programmers and data center operators.

Part 3, “MVS/CSC Administration and Maintenance” is intended primarily for system programmers responsible for maintaining the MVS/CSC software.

Part 4, “Appendices” is intended for system programmers.

### 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:

`sid@stortek.com`

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

### About the Software

MVS/CSC Release 5.1 is supported by this guide.

## How this Guide is Organized

This guide contains the following chapters and appendices:

### Part 1. “MVS/CSC System Overview”

- **Chapter 1, “Introduction”** describes the features and functions provided by the MVS/CSC.

### Part 2. “MVS/CSC System Description”

- **Chapter 2, “User Policy Interface for JES2 and JES3 Without TAPE SETUP Processing”** describes the MVS interface used for job processing in JES2 environments and in JES3 environments that run without TAPE SETUP processing.
- **Chapter 3, “User Policy Interface for JES3 with TAPE SETUP Processing”** describes the JES3 interface used for job processing in JES3 environments that run with TAPE SETUP processing.
- **Chapter 4, “Tape Management System Interface”** describes the tape management system interface, which allows synchronization between the customer’s tape management system and the ACS.
- **Chapter 5, “Communications and Operator Console Interfaces”** describes the communications interface, which provides a communications link between the MVS/CSC and LCS; and the operator console interface, which allows operator interaction.
- **Chapter 6, “Programmatic Interface”** describes the programmatic interface, which allows assembler programs to request certain services from the MVS/CSC.

### Part 3. “MVS/CSC Administration and Maintenance”

- **Chapter 7, “MVS/CSC Utility Functions”** describes the utility programs provided with the MVS/CSC.
- **Chapter 8, “MVS/CSC User Exits for JES Without TAPE SETUP Processing”** describes the user exits provided with the MVS/CSC for JES2 environments and JES3 environments without TAPE SETUP processing.
- **Chapter 9, “MVS/CSC User Exits for JES3 With TAPE SETUP Processing”** describes the user exits provided with the MVS/CSC for JES3 environments with TAPE SETUP processing.
- **Chapter 10, “Performance and Operational Considerations”** describes performance considerations, operational constraints, restrictions on use with MVS/ESA and third-party software, and write protection and virtual thumbwheel processing.

#### **Part 4. “Appendices”**

- **Appendix A, “Programmatic Interface SCSXREQM Macro Mappings”** lists the mappings for the programmatic interface SCSXREQM macro, used to map the parameter list and response areas.
- **Appendix B, “Gathering Diagnostic Materials”** describes diagnostic materials that may be requested by Software Support for problem resolution.
- **Appendix C, “List of Abbreviations”** defines commonly used abbreviations associated with the MVS/CSC.

A glossary and index are also included.

## Conventions Used in this Guide

### Typographic

In the JCL examples in this guide, some fields appear in lower case. You must update these fields to match your installation requirements.

### Symbols

The following symbols are used to highlight text in this guide:



**Note:** Information that may be of special interest to you. Notes are also used to point out exceptions to rules or procedures.



**Warning:** Information necessary to keep you from damaging your hardware or software.

### Syntax Flow Diagrams

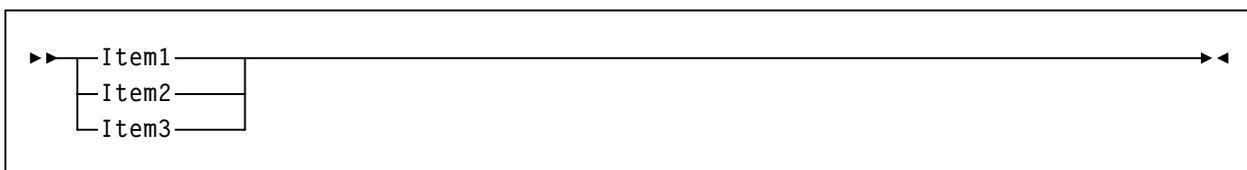
Syntax flow diagramming conventions include the following:

#### Flow Lines

Syntax diagrams consist of a horizontal base line, horizontal and vertical branch lines, and the text for a command, control statement, macro, or utility.



or

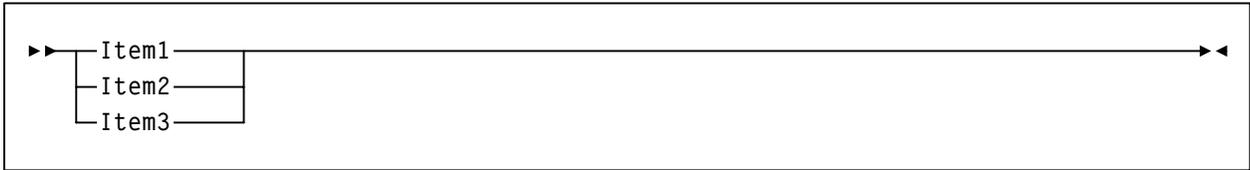


Diagrams are read left to right and top to bottom. Arrows indicate flow and direction.

- a statement begins with ▶▶
- a statement ends with ▶◀
- diagrams continuing to the next line begin with ▶
- fragments begin and end with |

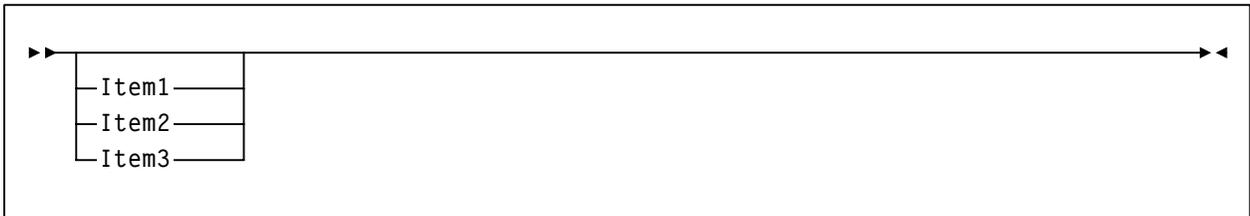
## Single Required Choice

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 positioned on the base line of the diagram, a single choice is required.



## Single Optional Choice

If the first item is positioned on the line below the base line, a single choice of items in the stack is optional.

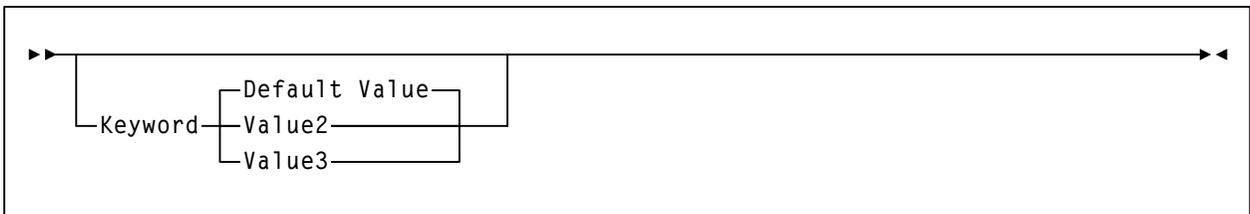


## Defaults

Default values and parameters appear above the base line. In the following example, if a value is not specified with the command, `Default Value` is used by the HSC.

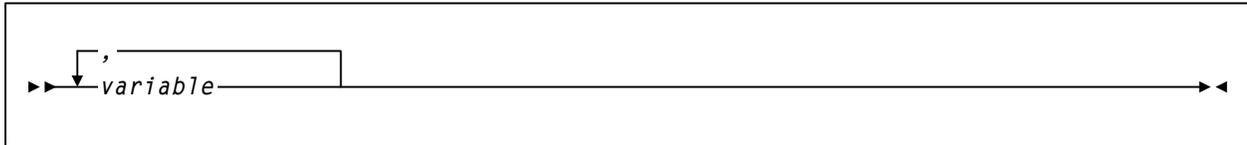


Some keyword parameters provide a choice of values in a stack. When the stack contains a default value, the keyword and the value choices are placed below the base line to indicate that they are optional, and the default value appears above the keyword line. In the following example, if the keyword is not specified with the command, keyword (`Default Value`) is used by the HSC.



## 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 the following example indicates that a comma is required as the repeat delimiter.



## Keywords

All keywords are shown in uppercase or in mixed case. When keywords are not case sensitive, mixed case implies that the lowercase letters may be omitted to form an abbreviation.

## Variables

Italic type is used to indicate a variable.

## Alternatives

A bar (|) is used to separate alternative parameter values.

## Delimiters

If parenthesis (), a comma (,), a semicolon (;), or any other delimiter is shown with an element of the syntax diagram, it must be entered as part of the statement or command unless otherwise stated.

## Ranges

- 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. The decimal portion is referred to as an incremental range. The character positions of the incremental portion of both range elements must match, and the non-incremental characters of the first element must be identical to those of the second element.
- 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.

- 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:

<b><u>A00A0-A99A0</u></b>	increments VOLSERs A00A0 through A09A0, then A10A0 through A99A0.
<b><u>9AA9A-9ZZ9A</u></b>	increments VOLSERs 9AA9A through 9AZ9A, then 9BA9A through 9ZZ9A.
<b><u>111AAA-111ZZZ</u></b>	increments VOLSERs 111AAA through 111AAZ, then 111ABA through 111ZZZ
<b><u>999AM8-999CM8</u></b>	increments VOLSERs 999AM8 through 999AZ8, then 999BA8 through 999CM8
<b><u>A3BZZ9-A3CDE9</u></b>	increments VOLSERs A3BZZ9 through A3CAA9, then A3CAB9 through A3CDE9
<b><u>AAAAAA-AAACCC</u></b>	increments VOLSERs AAAAAA through AAAAAZ, then AAAABA through AAACCC
<b><u>CCCNNN-DDDNNN</u></b>	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.

<b>A-Z</b>	$26^1$	26
<b>AA-ZZ</b>	$26^2$	676
<b>AAA-ZZZ</b>	$26^3$	17,576
<b>AAAA-ZZZZ</b>	$26^4$	456,976
<b>AAAAA-ZZZZZ</b>	$26^5$	11,881,376
<b>AAAAAA-ZZZZZZ</b>	$26^6$	308,915,776

## Lists

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 space, and the entire list must be enclosed in parentheses.

## Blanks

Blanks are not allowed between parameters and parentheses, or between parentheses and arguments. For example:

LS C ID(3218) **is a valid entry.**

LS C ID ( 3218 ) **is not.**

## Control Statements

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.
- /\* and \*/ can be used to enclose comments in the job stream. Comments cannot be nested.
- The maximum length for a control statement is 32,767 characters.

## Related Publications

The following publications contain information about specific topics relating to the use of MVS/CSC.

### **StorageTek Nearline Control Solution (NCS) Publications**

- *NCS (MVS/HSC, LibraryStation, MVS/CSC, SMC) Installation Guide*
- *Requesting Help from Software Support*

### **StorageTek Client System Component (MVS/CSC) Publications**

- *MVS/CSC Configuration Guide*
- *MVS/CSC Operator's Guide*
- *MVS/CSC Messages and Codes Guide*

### **StorageTek Storage Management Component (SMC) Publications**

- *SMC Configuration and Administration Guide*

### **StorageTek Host Software Component (MVS/HSC) Publications**

- *MVS/HSC Configuration Guide*
- *MVS/HSC Operator's Guide*
- *MVS/HSC System Programmer's Guide*
- *MVS/HSC Messages and Codes Guide*

### **StorageTek LibraryStation Publications**

- *LibraryStation Configuration Guide*
- *LibraryStation Operator and System Programmer's Guide*
- *LibraryStation Messages and Codes Guide*

### **StorageTek Virtual Storage Manager Publications**

- *VTCS Installation and Configuration Guide*
- *VTCS Administration Guide*
- *VTCS Messages and Codes Guide*
- *VTCS Reference*

**StorageTek Automated Cartridge System Library Software (ACSL) Publications for the UNIX-Based LCS**

- *ACSL Installation and Services Manual*
- *ACSL Programmer's Guide*
- *ACSL System Administrator's Guide*

**StorageTek Common Library Services (CLS) Publications for the VM-Based LCS**

- *CLS Installation Manual*
- *CLS Messages and Codes Manual*
- *CLS Reference Manual*
- *CLS Reference Summary Card*
- *CLS User's Guide*

## Technical Support

StorageTek Software Support and the StorageTek Customer Resource Center (CRC) maintain information about known NCS Release 5.1 product updates. You can contact Software Support or access the CRC for the latest information available concerning product updates (i.e. documentation, PTFs, PUTs).

See the *Requesting Help from Software Support* guide (included in the NCS package) for information about contacting StorageTek for technical support and for requesting changes to software products, or access StorageTek's CRC homepage at:

<http://www.support.storagetek.com>



**Note:** You must obtain a login ID and password in order to access the CRC. You can request a login ID and password from the CRC homepage.

# **Part 1. MVS/CSC System Overview**

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# Chapter 1. Introduction

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## Overview

MVS/CSC provides client functions and communications between an MVS host and the Library Control System (LCS) or server residing on another MVS or non-MVS host. When combined with the LCS and SMC, the MVS/CSC provides the following benefits:

- a library shared by multiple host systems (both IBM and non-IBM)
- secondary library attachment for remote backup
- library attachment to more than sixteen MVS hosts, with MVS/CSC installed on each attached host system

This chapter summarizes the features and functions provided by MVS/CSC, including:

- MVS/CSC operating environment
- MVS/CSC basic functions
- MVS/CSC system interfaces
- MVS/CSC configurations
- IBM Sysplex support
- Dynamic server switching capability
- StorageTek product support
- StorageTek LCS software products
- Third-party software products that coexist with MVS/CSC
- Communications methods used to transmit commands to the LCS
- Mixed media and devices for the MVS-based and UNIX-based LCS

## MVS/CSC Operating Environment

MVS/CSC runs on any processor that supports IBM MVS/ESA SP,<sup>1</sup> and runs in an IBM multi-processor environment. The MVS/CSC supports both MVS/ESA SP JES2 and MVS/ESA JES3 systems. Except for noted differences, the information in this document applies to both JES2 and JES3 environments.

In addition, references in this document to JES2 apply to both JES2 environments and JES3 environments that run without TAPE SETUP processing; references to JES3 apply only to JES3 environments that run with TAPE SETUP processing.

### Operating System Requirements

JES2 Environment	JES3 Environment
<ul style="list-style-type: none"><li>MVS/ESA SP Version 5.2.2 or higher (including all OS/390 and z/OS versions)</li></ul> <p><b>Note:</b> if using TCP/IP, OS/390 version 2.7 or later is recommended</p>	<ul style="list-style-type: none"><li>MVS/ESA SP Version 5.2.2 or higher (including all OS/390 and z/OS versions)</li><li>JES3 Version 5.1.1 or higher (including all JES3 OS/390 and z/OS versions)</li></ul> <p><b>Note:</b> if using TCP/IP, OS/390 version 2.7 or later is recommended</p>

### MVS/CSC Basic Functions

The MVS/CSC's primary functions are to provide user policy information to the SMC and to transmit information requests and directives to the appropriate LCS.



**Note:** The following functions, previously influenced by the MVS/CSC, are managed by the Storage Management Component (SMC):

- Drive allocation
- Processing of Mount, Dismount, and Swap messages on MVS systems. If a message requests an MVS/CSC drive, the SMC routes the request to the MVS/CSC.

Refer to the *SMC Configuration and Administration Guide* for more information.

Once the cartridge is mounted, the data is transferred using the data path under the control of the MVS client operating system.

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1. However, if IBM has dropped support for a particular MVS/ESA SP level, then the MVS/CSC will no longer support that level. For newly announced IBM operating system levels, it is our intent to support each new level. Program Temporary Fixes (PTFs) might be available for IBM operating system levels that were not supported at the time of this version, or for products that become available after this version of the MVS/CSC. Contact StorageTek Software Support for information about the availability of Tiffs for additional support. See the *Requesting Help from Software Support* guide for information about contacting StorageTek Software Support.

Depending on the configuration, the MVS/CSC communicates with the LCS using one of the following communications methods:

- Virtual Telecommunications Access Method (VTAM) “3270 BISYNC”
- Systems Network Architecture Logical Unit 6.2 (SNA LU 6.2)
- Transmission Control Protocol/Internet Protocol (TCP/IP)
- Cross-system coupling facility (XCF)

The MVS/CSC translates each request to the command format appropriate for the LCS.

In addition to basic functions provided to start and stop the MVS/CSC software, the MVS/CSC provides diagnostic aids (event logging and tracing), utility functions, user exits, and recovery processing. The MVS/CSC also provides an operator interface on MVS consoles through which you can issue commands to MVS/CSC. For the VM-based LCS, commands can be forwarded to the CLS or VM/HSC using the communications link.

## **MVS/CSC System Interfaces**

The MVS/CSC consists of the following system interfaces:

- Tape management system interfaces to communicate with your tape management system
- Communications interfaces to link the MVS/CSC to the LCS for sending and receiving messages
- Operator console interfaces to allow operator commands to be issued for the MVS/CSC
- Programmatic interface to allow programs to request certain services from the MVS/CSC (MVS-based and UNIX-based LCS only)

## MVS/CSC Configurations

The MVS/CSC program runs as a subsystem on the IBM MVS operating system along with the SMC subsystem. MVS/CSC can coexist with the MVS Host Software Component (MVS/HSC) on the same MVS host, thus providing access to multiple libraries from a single MVS host environment. This allows the MVS/HSC to control a local primary library complex<sup>1</sup> while one or more MVS/CSC subsystems access secondary, possibly remote libraries.

When multiple MVS/CSCs (or an HSC with one or more MVS/CSCs) exist on the same MVS host, the SMC on this host determines whether to use the HSC or any of the MVS/CSCs to process a particular allocation or Mount/Dismount/Swap message event. Refer to the *SMC Configuration and Administration Guide* for more information.

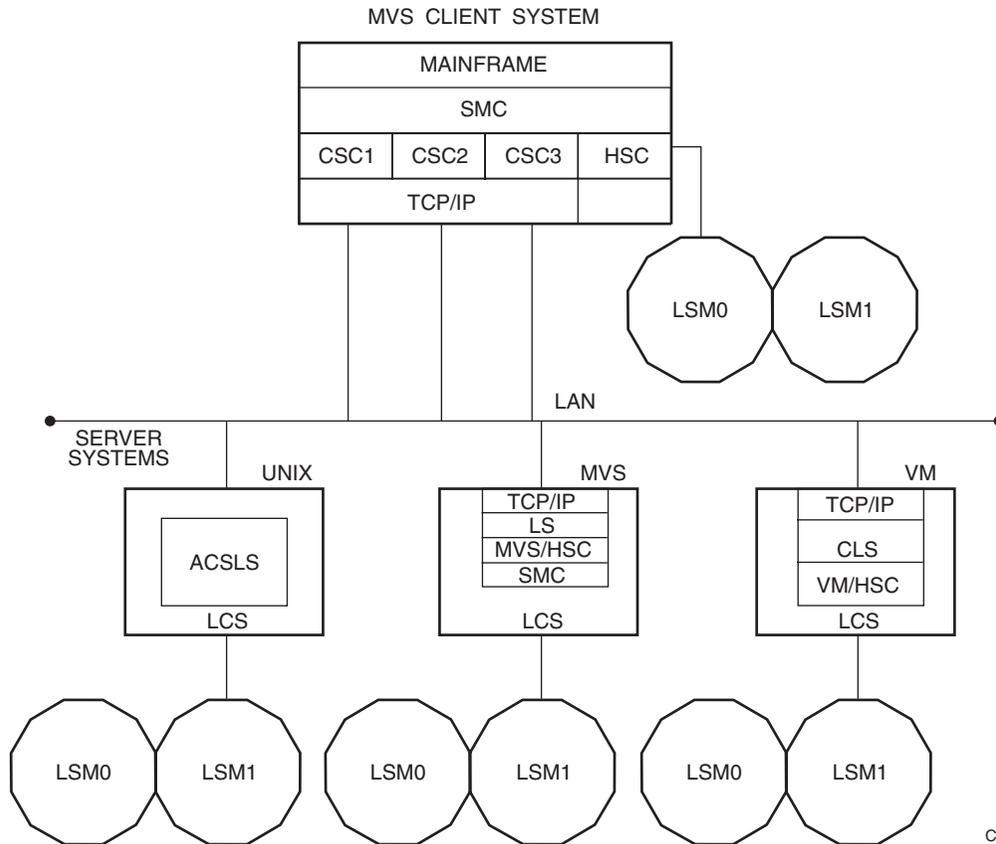
Each MVS/CSC can communicate with only one LCS at a time. In turn, each LCS manages a single library complex. Multiple MVS/CSC subsystems can exist on a single MVS host system, and each MVS/CSC subsystem can be attached to a different LCS. MVS/CSC supports the following LCS platforms:

- UNIX-based
- MVS-based
- VM-based

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1. A library complex consists of one HSC Control Data Set (CDS) and a maximum of 256 Automatic Cartridge Systems (ACSs). Each ACS can contain a maximum of 16 Library Storage Modules (LSMs).

The following figure illustrates a basic client-server configuration using TCP/IP as the communications method.



C46263

**Figure 1. MVS/CSC-to-LCS Configuration**

## IBM Sysplex Support

The MVS/CSC supports the IBM sysplex (systems complex). A sysplex consists of multiple MVS systems cooperating to process work. In a parallel sysplex, applications that run on different MVS systems can simultaneously share data using the coupling facility. The cross-system coupling facility (XCF), SNA LU 6.2, and TCP/IP provide MVS communications for a sysplex environment.

In order to use XCF for communications between the MVS/CSC and the MVS-based LCS, the XCF group name and member name specified in the MVS/CSC startup parameters must match those defined to the MVS-based LCS.

In order to use SNA LU 6.2 for communications between the MVS/CSC and the MVS-based LCS, the partner LU specified in MVS/CSC's side information file must match the partner LU used to identify the LCS.

In order to use TCP/IP for communications between the MVS/CSC and the MVS-based LCS, you must specify the subsystem name or address space name of the TCP/IP stack, if the name was changed during the installation of the TCP/IP software.

## Dynamic Server Switching

The MVS/CSC provides dynamic server switching support for multiple MVS-based LCSs that also support this capability. Dynamic server switching is supported only when the communications method is XCF or SNA LU 6.2. Dynamic server switching is not supported for the VM-based or UNIX-based LCS.

Dynamic server switching allows an MVS/CSC client to dynamically switch to an alternate LCS when it detects that the current LCS is unavailable. Dynamic server switching is initiated and controlled by the client system, and is configured using the MVS/CSC SRVRLIST startup parameter.

For each MVS/CSC client, an ordered server list is specified in the MVS/CSC SRVRLIST startup parameter. You can specify up to three MVS-based LCSs. The first LCS specified is considered to be the primary LCS. When the MVS/CSC detects that the current LCS is unavailable, the client dynamically switches connection to the next LCS specified in the list. When the alternate LCS no longer has requests outstanding, MVS/CSC periodically attempts to re-establish connection to the primary LCS.



**Note:** If you mount a cartridge from the current LCS before dynamic server switching occurs, you can dismount the cartridge from the new, alternate LCS.

## StorageTek Library Product Support

The following sections lists the MVS/CSC Automated Cartridge Systems (ACSs), tape cartridge subsystems, and media types that the MVS/CSC supports.

### StorageTek ACSs

4400 ACS	9360 stand-alone ACS	9740 ACS
<ul style="list-style-type: none"><li>Library Storage Modules (LSMs)—4410 (standard), 9310 (PowderHorn), or 9360 (WolfCreek)</li><li>Library Control Units (LCUs)</li><li>Library Management Unit (LMUs)*</li><li>Cabling for LMUs to the LCUs and LCS</li></ul>	<ul style="list-style-type: none"><li>LSMs—9360 (WolfCreek)</li><li>Integrated LMU*</li></ul>	<ul style="list-style-type: none"><li>LSMs—9740 (TimberWolf)**</li><li>Integrated LMU*</li></ul>

\* LMU Microcode Release 1.5.x or higher is required.

\*\* LMU Microcode Release 1.6.x or higher is required for 9740 LSM and 9840 transport support.

### StorageTek Tape Cartridge Subsystems

- 4480 Cartridge Subsystem (18-track)
- Silverton 4490 Cartridge Subsystem (36-track)
- TimberLine 9490 Cartridge Subsystem (36-track)
- TimberLine 9490EE Cartridge Subsystem (36-track)
- RedWood SD-3 Cartridge Subsystem (helical)
- 9840 Cartridge Subsystem
- T9840B Cartridge Subsystem
- T9940A Cartridge Subsystem

## StorageTek Media Types

### Standard capacity cartridge

This cartridge can be used on any longitudinal transport (i.e. 4480, 4490, 9490, or 9490EE).



**Note:** If data is written to the tape in 36-track mode, the data cannot be read by an 18-track 4480 transport.

### Enhanced capacity cartridge (ECART)

This cartridge has a length of 1100 feet and can be used only on 36-track transports (i.e. 4490, 9490, and 9490EE). This cartridge is visually identified by a two-toned colored housing.

### Extended-enhanced capacity cartridge (ZCART)

This cartridge can be used only on TimberLine 9490EE 36-track transports. These cartridges use a thinner media to provide twice the capacity of the ECART cartridge.

### 9840 cartridge

This cartridge can be used on 9840 or T9840B transports. Physically it is the same size as a standard 3480 cartridge, however, it has a 20 GB media capacity.

### T9840B cartridge

This cartridge can be used only on T9840B transports. Physically it is the same size as a standard 3480 cartridge, however, it has a 20 GB media capacity.

### T9940A cartridge

This cartridge can be used only on T9940A transports. It has a 60 GB media capacity. There are two types of T9940A cartridges: STK2P and STK2W.

### Helical cartridge

This cartridge can be used only on RedWood (SD-3) transports. It is identified by the leader block on the left side of the cartridge. There are four types of helical cartridges: DD3A, DD3B, and DD3C, and DD3D.

In MVS-based and UNIX-based LCS environments, an ACS can contain mixed library transports (i.e. 4480, 4490, 9490, 9490EE, 9840, and SD-3 cartridge transports), and mixed media (i.e. standard, ECART, ZCART, 9840, and helical). In addition, 3480-, 3490E-, 3590, and helical-type cartridge transports can be attached to the MVS system outside the library.

## StorageTek Library Control System (LCS) Software Products

The StorageTek LCS is the control interface between the mainframe computer systems (client systems) and the StorageTek library products. The LCS consists of hardware and software products that are attached to the MVS/CSC through a communications link.

The MVS/CSC receives requests from the SMC or the MVS host system and translates them to messages, which it sends to the LCS. The LCS receives the requests from the MVS/CSC to perform the automated handling of library cartridges. The LCS directs and monitors a single library and manages message and request traffic from one or more connected client systems. The LCS determines where the cartridge resides.

The LCS controls the library and manages the library database, which contains volume location and volume attribute information for all cartridges within the library. The LCS also performs activities such as mounting, dismounting, and entering and ejecting cartridges. The Library Management Unit (LMU) manages the movement (or exchanges) of cartridges between the Library Storage Modules (LSMs).

The MVS/CSC can be attached to any of the following LCSs:

- UNIX-based LCS, which consists of the Automated Cartridge System Library Software (ACSLs)
- MVS-based LCS, which consists of the Host Software Component for MVS (MVS/HSC) with LibraryStation
- VM-based LCS, which consists of the Host Software Component for VM (VM/HSC) and the Common Library Services (CLS)

Each LCS is described in more detail in the following sections.



**Note:** See the *NCS Installation Guide* for specific LCS software release levels.

## UNIX-Based LCS

The UNIX-based LCS consists of the StorageTek ACSLS software product. ACSLS consists of a system administration component, interfaces to client system applications, and library management facilities that support the entire family of Nearline Automated Cartridge Systems.

The UNIX-based LCS resides on a UNIX-based platform. The MVS/CSC using the UNIX-based LCS requires that the ACSLS software be installed.

## MVS-Based LCS

The MVS-based LCS consists of the following StorageTek software products:

- MVS/HSC
- LibraryStation (a feature of MVS/HSC)

**Host Software Component (HSC)** controls the ACS. It runs as a subsystem on the MVS server system. The library database records cell status, characteristics, and disposition of all cartridges stored in the library.

**LibraryStation** is a software communications interface feature of the MVS/HSC; it resides on the MVS server system as a component of the MVS/HSC. LibraryStation provides software support and an interface for the Open Systems Nearline Network protocol. This includes an Open Network Computing Remote Procedure Call (ONC RPC 3.0) client, a Systems Network Architecture (SNA LU 6.2) client, an MVS cross-system coupling facility (XCF) client, and a TCP/IP client. Additionally, LibraryStation provides an operator command set for controlling LibraryStation operation through the MVS/HSC operator console.

The MVS-based LCS software can reside on an MVS processor running MVS/ESA SP. The MVS/CSC using the MVS-based LCS requires that the MVS/HSC, LibraryStation, and communications software be installed.

## VM-based LCS

The VM-based LCS consists of the following StorageTek software products:

- Host Software Component for VM (VM/HSC)
- Common Library Services (CLS)

**Host Software Component (HSC)** controls the ACS. It runs as a VM application on the VM-based LCS. The library database records cell status, characteristics, and disposition of all cartridges stored in the library.

**Common Library Services (CLS)** provides the communications interface between the client system (in this case MVS) and the VM/HSC. The CLS receives client requests and translates them to a form that can be executed by the HSC.

The VM-based LCS resides on an IBM System 370 processor running the Virtual Machine (VM) operating system. The MVS/CSC using the VM-based LCS requires that the CLS and VM/HSC software be installed.

## Third-Party Software Interaction

The MVS/CSC subsystem operates in conjunction with various other third-party software, including:

- CA-1 (TMS) and CA-DYNAM/TLMS Tape Management Systems
- Data Facility Hierarchical Storage Manager (DFHSM)
- MIM
- AutoMedia (Zara) Tape Management System
- Any System Authorization Facility (SAF) compliant software product



**Note:** Only those third-party software products known to coexist with MVS/CSC are listed above. The MVS/CSC should not prevent other third-party software from functioning. However, there are certain restrictions on using third-party software. See Appendix D, “Third-Party Software Restrictions” on page 171.

## Tape Management Systems

The MVS/CSC provides support for the following tape management products:

- CA-1
- CA-DYNAM/TLMS (Tape Library Management System)
- AutoMedia (Zara)

Interaction with tape management systems is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

## Multi-image Manager (MIM)

MIM is a third-party software product that is used in a multi-CPU environment to control the allocation of transports to a particular host. The MVS/CSC can coexist with MIM. However, you must follow certain procedures when using MIM with the MVS/CSC. See Appendix D, “Third-Party Software Restrictions” on page 171 for information about MIM restrictions.



**Note:** With MIM Release 2.0, there are no restrictions for startup and no restrictions on MIM features.

## Data Facility Hierarchical Storage Manager (DFHSM)

The MVS/CSC supports the use of 3480, 3490, 3490E, 3590, and helical-type transports by DFHSM. MVS/CSC supports dynamic allocation of cartridge transports by DFHSM.

## System Authorization Facility (SAF)

The MVS/CSC operates with and does not compromise the integrity of any security facility using the SAF interface.

## Communications Methods

The MVS/CSC subsystem is connected to the LCS using a communications link. The following list describes the communications links that can be used to connect the MVS/CSC:

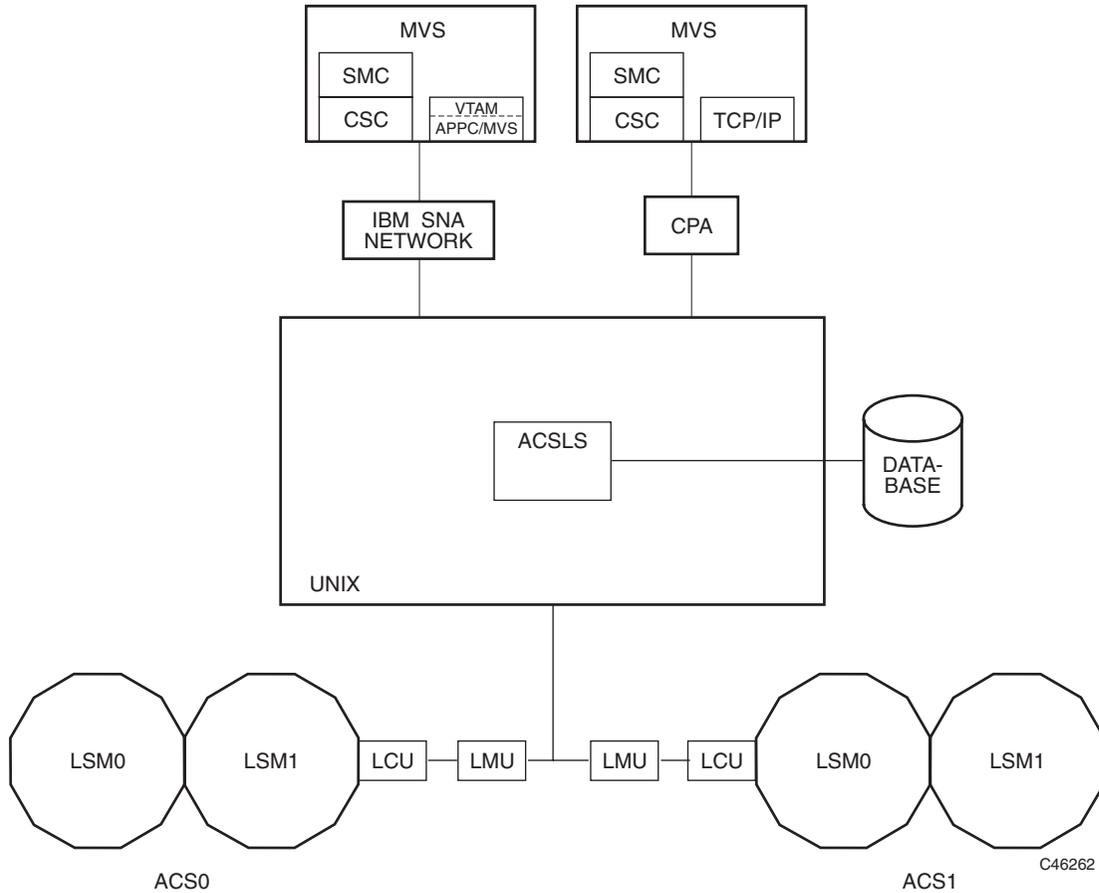
- Transmission Control Protocol/Internet Protocol (TCP/IP) is used by the VM-based, UNIX-based, or MVS-based LCS. You can use the following software for TCP/IP communications:
  - IBM TCP/IP
  - Interlink TCPaccess
  - Interlink CISCO IOS
- Virtual Telecommunications Access Method (VTAM) is divided into two categories:
  - VTAM for “3270 BISYNC” communications, which is used only by the VM-based LCS
  - VTAM for SNA LU 6.2 communications, which is used by the UNIX-based or MVS-based LCS
- Cross-system coupling facility (XCF) is used only by the MVS-based LCS for sysplex environments



**Note:** See the *NCS Installation Guide* for the supported communications software release levels.

The following figure shows the communications connections using the TCP/IP communications protocol and the SNA LU 6.2 communications protocol for a UNIX-based LCS.

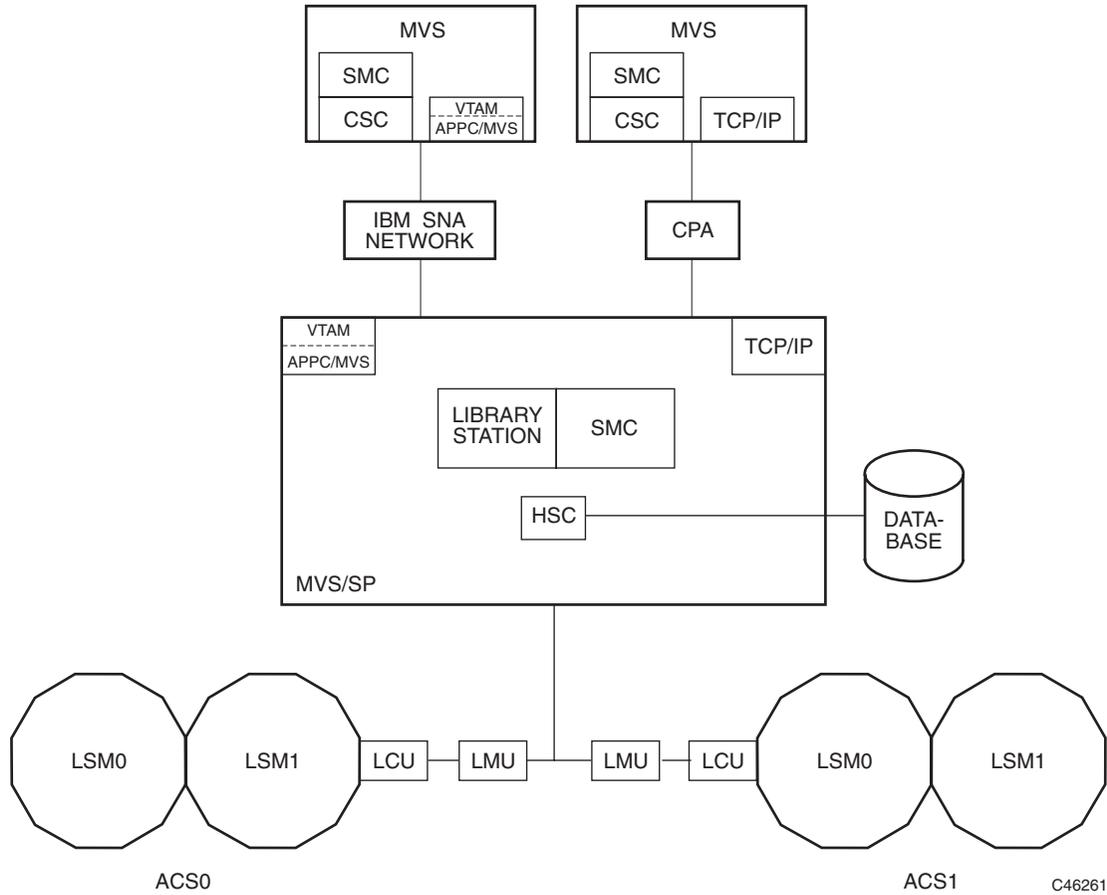
 **Note:** The data path is not shown in this illustration.



**Figure 2. Communications Using TCP/IP and SNA LU6.2 (Unix-Based LCS)**

The following figure shows the communications connections using the TCP/IP communications protocol and the SNA LU 6.2 communications protocol for an MVS-based LCS.

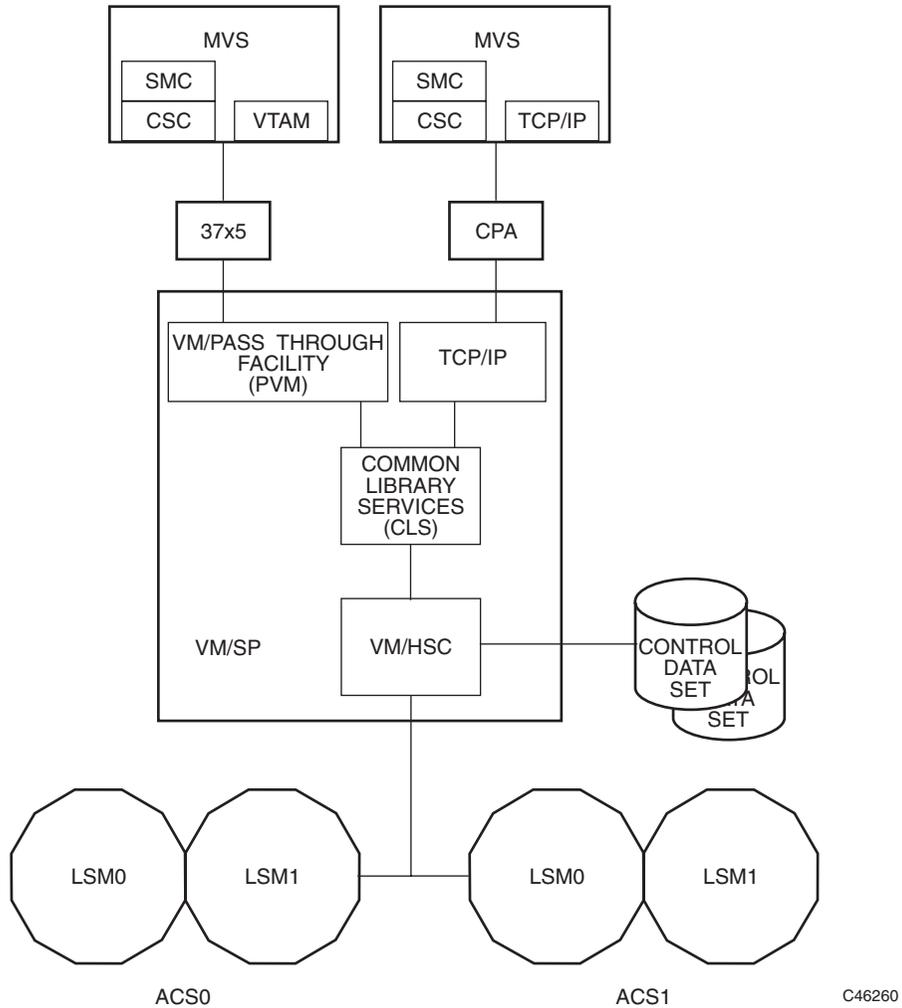
 **Note:** The data path is not shown in this illustration.



**Figure 3. Communications Using TCP/IP and SNA LU 6.2 (MVS-Based LCS)**

The following figure shows the TCP/IP and VTAM “3270 BISYNC” communications protocol for a VM-based LCS.

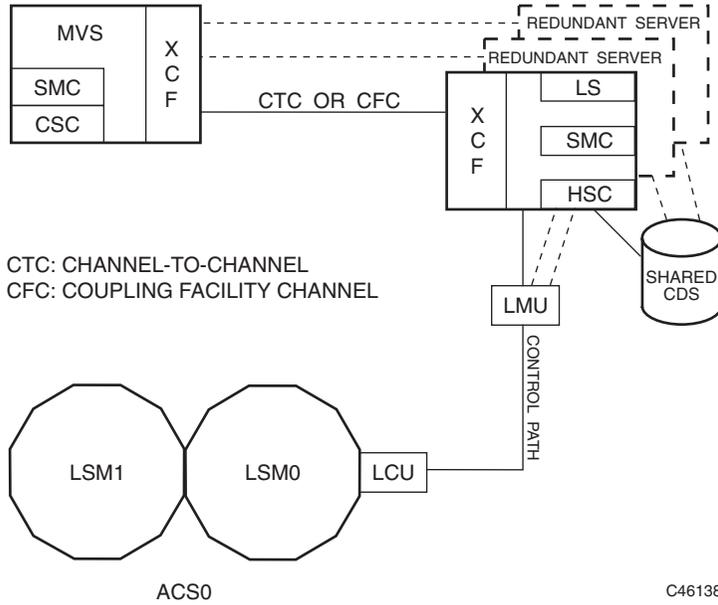
 **Note:** The data path is not shown in this illustration.



**Figure 4. Communications Using TCP/IP and VTAM “3270 BISYNC” (VM-Based LCS,**

The following figure shows the XCF communications protocol in a sysplex environment with either channel-to-channel (CTC) or coupling facility links for dynamic server switching.

 **Note:** The data path is not shown in this illustration



**Figure 5. Communications Using XCF in a Sysplex Environment (MVS-Based LCS)**

## User Policy Definition for Mixed Media and Devices

The MVS/CSC supports mixed media (i.e., standard, ECART, ZCART, 9840, and helical) and mixed cartridge transport devices (i.e., 4480, 4490, 9490, 9490EE, 9840, and SD-3) in an ACS for the MVS-based and UNIX-based LCS. Mixed media and cartridge transport devices are not supported for the VM-based LCS.

The Storage Management Component (SMC) calls on MVS/CSC policies in order to perform drive exclusion and Mount/Dismount/Swap processing in a library environment containing mixed media and cartridge transport devices. This support does not require changes to JCL or the invocation of MVS/CSC user exits. Refer to the *SMC Configuration and Administration Guide* for more information.

TAPEREQ control statements are used to specify tape request attributes to the MVS/CSC. These statements are used to place a data set that meets the criteria specified by the TAPEREQ attributes on a specific media type, and create a data set using a specific recording technique.

You can define parameters for TAPEREQ control statements requesting that a data set be created using the following recording techniques:

- 18-track, thereby requiring that a 4480 transport be assigned to the request
- 36-track, thereby requiring that a 4490, 9490, or 9490EE transport be assigned to the request
- 9840, thereby requiring that a 9840 transport be assigned to the request
- T9940A, thereby requiring that a T9940A transport be assigned to the request
- Helical, thereby requiring that a SD-3 transport be assigned to the request

## Device Preferencing

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

## DFSMS/MVS Storage Management Subsystem Support

User policy specification via SMS is supported by the Storage Management Component (SMC). Refer to the *SMC Administration and Configuration Guide* for more information.



## **Part 2. MVS/CSC System Description**

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## Chapter 2. User Policy Interface for JES2 and JES3 Without TAPE SETUP Processing

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### Overview

This chapter describes the User Policy interface that MVS/CSC provides for SMC job processing in JES2 environments and in JES3 environments that run without TAPE SETUP processing (SETUP=NONE specified on the JES3 STANDARDS initialization statement). If you are running JES3 with TAPE SETUP processing, see Chapter 3, “User Policy Interface for JES3 with TAPE SETUP Processing” on page 27 for information about job processing in that environment.

The following topics are described in this chapter:

- MVS device allocation policy
- MVS mount message processing policy
- MVS dismount message processing policy
- MVS cartridge disposition processing policy



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

### Influencing MVS Device Allocation Policy

The MVS operating system allocates transports when a job needs cartridge resources. When a job step requires a cartridge that is controlled by a library subsystem on the same host, the SMC directs device allocation to the pool of transports it controls. The SMC influences device allocation to cause MVS to choose transports compatible with volume media and location. In addition, SMC preferences devices based on LSM proximity (specific), scratch counts (non-specific), and TAPEREQ DEVTPREF parameters. The SMC function of influencing selection of a particular drive based on allocation criteria, including volume location, is called *drive prioritization*.

Allocation requests are processed one job step at a time. The SMC uses MVS control blocks, subsystem interface, and user parameters to modify internal MVS control structures to achieve the desired transport allocation.

After unacceptable devices are excluded from allocation, SMC applies preferencing criteria to the remaining devices.

Refer to the *SMC Configuration and Administration Guide* for more information about SMC allocation.

## Allocation Policy via User Exits

The MVS/CSC provides the SCSUX02, SCSUX08, and SCSUX10 user exits that let you specify device allocation policy.

- Use SCSUX02 to influence the allocation of non-specific (scratch) volume requests. See “Scratch Allocation User Exit (SCSUX02)” on page 97 for more information.
- Use SCSUX08 to influence the allocation of specific volume requests. “Specific Volume Allocation User Exit (SCSUX08)” on page 104 for more information.
- Use SCSUX10 to override default settings based on unit affinity and GDG ALL separations. See “Unit Affinity Separation User Exit (SCSUX10)” on page 112 for more information.



### Notes:

- See “Scratch Allocation User Exit (SCSUX02)” on page 97 for more information about user exit SCSUX02.
- See “Specific Volume Allocation User Exit (SCSUX08)” on page 104 on page for more information about user exit SCSUX08.
- These user exits are ignored when a specific unit is requested (*demand allocation*) on the UNIT parameter of DD statements.

## Allocation Policy via SMS

MVS device allocation user policy via DFSMS is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

## Allocation Policy for Mixed Media and Mixed Devices

Several sources of information are evaluated by the SMC in deciding the media type and recording technique used to satisfy an allocation request.

If the SMC obtains from SMS the data class constructs for recording technique and media type for the allocation, any MVS/CSC TAPEREQ control statement specifications for recording technique and media are ignored.

If no data class constructs for recording technique or media type apply to the allocation, an MVS/CSC TAPEREQ control statement can provide the media type and recording technique.

Refer to the *SMC Configuration and Administration Guide* for more information about media type and recording technique determinations during allocation processing.

## MVS Mount Message Processing Policy

MVS mount message processing is performed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

SMC requests mount policy from the MVS/CSC. For non-specific cartridge requests, it calls user exit SCSUX01 to obtain information on the scratch pool identifier and label type.

MVS mount messages for MVS/CSC-controlled transports can optionally be deferred until an OPEN is issued for the allocated data set. When deferred mounting is invoked, volumes are mounted only when a data set residing on the cartridge is opened by a calling program. Volumes containing data sets never opened are not mounted; thus, the LSM is free to perform other mount and dismount tasks.

You can defer mounting by specifying YES on the DEFer startup parameter or invoking user exit SCSUX09. You can also use the ALTer operator command to override the setting on the DEFer startup parameter. The deferred mount option has the same effect as if the DEFer option were specified on the JCL DD statement for the data set.

## MVS Dismount Message Processing Policy

MVS mount message processing is performed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information. However, the SMC can be directed by the MVS/CSC when, during dismount, SMC determines that a library cartridge should be scratched.

## MVS Cartridge Disposition Processing Policy

SMC Cartridge disposition processing is invoked if SMC dismount message processing has determined that a library cartridge should be scratched. When the MVS/CSC DELDisp startup parameter is set to SCRTCH and the disposition shown in the MVS dismount message indicates delete (D), the cartridge is returned to the scratch pool. When the MVS/CSC DELDisp startup parameter is set to NOSCRTCH, the disposition shown in the MVS dismount message is ignored.

When a scratch cartridge is used in an output request, the LCS removes it from the scratch list. In some cases, a cartridge may be used as a temporary work volume; it is therefore still eligible to be used in output requests. Cartridge disposition processing occurs after dismount processing, which returns cartridges to a cell location in the library.



**Note:** For the VM-based LCS, each MVS/CSC installed must define a delete disposition option (DELDisp startup parameter) even though this option may also be defined during the CLS configuration process. The MVS/CSC does not recognize the value specified for the delete disposition option for VM/HSC.

Generally, deleted cartridges are retained as non-scratch cartridges during the “grace period” of a tape management system. Therefore, users of a tape management system should usually specify NOSCRTCH for the DELDisp startup parameter.



## Chapter 3. User Policy Interface for JES3 with TAPE SETUP Processing

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### Overview



**Note:** The JES3 interface for job processing previously provided by the MVS/CSC is now provided by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information. However, the SMC utilizes MVS/CSC user policy to perform its functions.

This chapter describes the user policy interface that MVS/CSC provides for SMC's job processing in JES3 environments that run with TAPE SETUP processing. If you are running JES2 or JES3 without TAPE SETUP processing, see Chapter 2, "User Policy Interface for JES2 and JES3 Without TAPE SETUP Processing" on page 23 for information about job processing in those environments.

The following topics are described in this chapter:

- JES3 device allocation policy
- JES3 mount message processing
- JES3 dismount message processing
- JES3 cartridge disposition processing



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

## JES3 Device Allocation Policy

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

### Allocation Policy via User Exits

The MVS/CSC provides the SCSUX04, SCSUX12, and SCSUX13 user exits that let you specify device allocation policy.

- Use SCSUX04 to influence the allocation of non-specific (scratch) volume requests. See “Scratch Allocation User Exit (SCSUX04)” on page 125 for more information.
- Use SCSUX12 to override default settings based on unit affinity and GDG ALL separations. See “Unit Affinity Separation User Exit (SCSUX12)” on page 141 for more information.
- Use SCSUX13 to influence the allocation of specific volume requests. See “Specific Volume Allocation User Exit (SCSUX13)” on page 146 for more information.

### Allocation Policy via SMS

JES3 device allocation user policy via SMS is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

### Allocation Policy for Mixed Media and Mixed Devices

Several sources of information are evaluated by the SMC in deciding the media type and recording technique used to satisfy an allocation request.

If the SMC obtains from SMS the data class constructs for recording technique and media type for the allocation, any MVS/CSC TAPEREQ control statement specifications for recording technique and media are ignored.

If no data class constructs for recording technique or media type apply to allocation, an MVS/CSC TAPEREQ control statement can provide the media type and recording technique.

Refer to the *SMC Configuration and Administration Guide* for more information about media type and recording technique determinations during allocation processing.

## JES3 Mount Message Processing

MVS Mount message processing is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information. SMC requests Mount policy from the MVS/CSC. Specifically it calls user exit SCSUX01 to get information on the scratch pool identifier and label type (for non-specific cartridge requests).

The RING/NORING parameter from the JES3 mount message indicates the write-protection status of a cartridge. If NORING is specified, the write disabled option is passed to the LCS which simulates the thumbwheel as being set in the write protected position. This simulation eliminates the need for ejecting cartridges to manually set the thumbwheel.

JES3 mount messages for MVS/CSC-controlled transports can optionally be deferred. The MVS/CSC IATUX09 JES3 user exit must be installed in order to defer mount messages during common allocation. See the *NCS Installation Guide* for more information about the MVS/CSC IATUX09 JES3 user exit.

The SMC uses the policy defined in the DEFer startup parameter and the settings in user exits SCSUX09 and SCSUX11 to determine whether or not to defer mounts. You can defer mount messages until step allocation time, or until an OPEN is issued for the allocated data set. If a mount message is deferred until step allocation time, volumes are mounted when a system initiator begins the step allocation process. If a mount message is deferred until an OPEN is issued, volumes are mounted only when a data set residing on the cartridge is opened by a calling program. Volumes containing data sets never opened are not mounted; thus, the LSM is free to perform other mount and dismount tasks.

You defer mounting a cartridge until a system initiator begins the step allocation process by specifying JES3 on the DEFer startup parameter or invoking user exit SCSUX11. You defer mounting a cartridge until a data set is opened by specifying YES on the DEFer startup parameter or invoking user exits SCSUX11 and SCSUX09. You must invoke both user exit SCSUX11 and SCSUX09 to defer mounting a cartridge until a data set is opened.

You can also use the ALTer operator command to override the setting on the DEFer startup parameter. The deferred mount option has the same effect as if the DEFer option were specified on the JCL DD statement for the data set.



**Note:** The SMC automatically defers all library mounts for dynamic allocation requests regardless of the setting on the DEFer startup parameter.

## JES3 Dismount Message Processing Policy

JES3 Dismount message processing is managed by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information. However, the SMC can be directed by the MVS/CSC when, during Dismount, SMC determines that a library cartridge should be scratched. See JES3 Cartridge Disposition Processing Policy

## JES3 Cartridge Disposition Processing

SMC cartridge disposition processing is invoked if SMC dismount message processing has determined that a library cartridge should be scratched. When the MVS/CSC DELDisp startup parameter is set to SCRTCH and the disposition shown in the JES3 dismount message indicates delete (D), the cartridge is returned to the scratch pool. When the MVS/CSC DELDisp startup parameter is set to NOSCRTCH, the disposition shown in the JES3 dismount message is ignored.

When a scratch cartridge is used in an output request, the LCS removes it from the scratch list. In some cases, a cartridge may be used as a temporary work volume; it is therefore still eligible to be used in output requests. Cartridge disposition processing occurs after dismount processing, which returns cartridges to a cell location in the library.



**Note:** For the VM-based LCS, each MVS/CSC installed must define a delete disposition option (DELDisp startup parameter) even though this option may also be defined during the CLS configuration process. The MVS/CSC does not recognize the value specified for the delete disposition option for VM/HSC.

Generally, deleted cartridges are retained as non-scratch cartridges during the “grace period” of a tape management system. Therefore, users of a tape management system should usually specify NOSCRTCH for the DELDisp startup parameter.

## Chapter 4. Tape Management System Interface

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### Overview

This chapter describes the tape management system interface provided with the MVS/CSC.

### Synchronizing your Tape Management System with the ACS

A tape management system is a tool for protecting and organizing tape data in a library. Cartridges with active data are designated non-scratch and are protected against accidental data loss. Cartridges available for output are designated as scratch cartridges. A tape management system maintains a list of scratch cartridges available for use and updates the list when they are used and become unavailable.

The MVS/CSC provides a tape management system interface to allow the MVS/CSC to synchronize your tape management system with the library. To do this, your tape management system must provide the cartridge status changes and specification of scratch pools to the MVS/CSC.

### Cartridge Status Changes

The MVS/CSC provides utilities to retrieve the volume serial numbers of scratch cartridges and to change the scratch status of cartridges defined to a tape management system. The Scratch Conversion utility reads the tape management system database to determine changes in cartridge status. These status changes are transferred to the LCS (using the Scratch Update utility) to maintain synchronization between your tape management system and the library. The status of a cartridge may change from non-scratch to scratch or from scratch to non-scratch.

### Specification of Scratch Pools

Scratch pools are defined through the LCS at initialization time. For the UNIX-based LCS, scratch pool information is defined to ACSLS using ACS System Administrator (ACSSA) console commands. Each scratch pool can contain only one label type. For the MVS-based LCS, each scratch pool can contain only one label type. For the VM-based LCS, scratch pool and label type information is defined to the LCS using the CLS Configuration Management (CLSCM) program. The CLS allows scratch pools with different label types.

The MVS/CSC provides user exits and TAPEREQ parameters that allow you to identify a scratch pool. For the VM-based LCS, the user exits allow you to identify a label type for non-specific requests. See Chapter 8, “MVS/CSC User Exits for JES Without TAPE SETUP Processing” on page 89, or Chapter 9, “MVS/CSC User Exits for JES3 With TAPE SETUP Processing” on page 117 for more information about MVS/CSC user exits. See the *MVS/CSC Configuration Guide* for more information about the TAPEREQ statement.

During non-specific mount message processing and transport allocation processing, MVS/CSC user exits can be used to supply scratch pool and label type information. You supply a scratch pool identifier and if necessary a label type specification for each scratch cartridge allocation request and mount message request. If this information is not supplied, MVS/CSC uses transports associated with the default scratch subpool. Scratch pool identifiers supplied by the user exit must match the identifiers specified when the LCS was initialized.

## Tape Management Systems Supported by MVS/CSC

Any of the following tape management systems can be used with the library and the MVS/CSC:

- A third-party software package
- A tape management system that you have designed and implemented
- A set of manual procedures to manage tape resources

The MVS/CSC is designed to coexist with a variety of tape management systems and does not depend on the design of any one system. This coexistence is accomplished through the utilities and user exits provided by the MVS/CSC.

The CA-1 (TMS), CA-DYNAM/TLMS, DFSMSrmm, and Zara third-party tape management systems can function with the MVS/CSC without modification. Other tape management systems or user-designed systems, including any manual procedures for tape management, might require modification to the MVS/CSC Scratch Conversion utility. The Scratch Conversion utility is provided as an interface between the MVS/CSC and your tape management system. If you need multiple scratch pool and label type definitions, you will also need to modify the user exits and/or TAPEREQ statements provided with the MVS/CSC. See “Scratch Conversion Utility” on page 82 for more information about the Scratch Conversion utility. See Chapter 8, “MVS/CSC User Exits for JES Without TAPE SETUP Processing” on page 89, or Chapter 9, “MVS/CSC User Exits for JES3 With TAPE SETUP Processing” on page 117 for more information about MVS/CSC user exits. See the *MVS/CSC Configuration Guide* for more information about the TAPEREQ statement.

# Chapter 5. Communications and Operator Console Interfaces

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## Overview

This chapter describes the communications and operator console interfaces provided with the MVS/CSC.

## Communications Interface

The communications interface provides a link between the MVS/CSC and the LCS system. The MVS/CSC uses this link to send messages to the LCS and receive messages from the LCS. The communications link is provided using one of the following communications methods:

- Transmission Control Protocol/Internet Protocol (TCP/IP)

The MVS/CSC supports Interlink TCPaccess, Interlink CISCO IOS for OS/390, and IBM TCP/IP for TCP/IP communications. You must specify the subsystem name or address space name of the TCP/IP stack in the startup parameter file, if the name changed during the installation of the TCP/IP communications software. Otherwise, the default subsystem name or address space name is used.

- Virtual Telecommunications Access Method (VTAM)

You must specify a VTAM application name in the VTAM configuration tables. The VTAM application name specifies the VTAM application associated with the MVS/CSC.

- Systems Network Architecture Logical Unit 6.2 (SNA LU 6.2)

You must specify a symbolic destination name in the startup parameter file in order for MVS/CSC to register with APPC/MVS. This name must match the name specified on the DESTNAME keyword in the APPC/MVS side information file defined for the MVS/CSC.

- Cross-system coupling facility (XCF)

You must specify an XCF group name and member name(s) in the startup parameter file in order for MVS/CSC to establish communications with the MVS-based LCS. The XCF group name and member name(s) must match those defined for the MVS-based LCS.



**Note:** See the *NCS Installation Guide* for the supported communications software release levels. See the *MVS/CSC Configuration Guide* for information about setting up communications between the MVS/CSC and LCS.

## Operator Console Interface

MVS/CSC commands are provided to display MVS/CSC information, alter startup parameter settings, start recovery processing, and enable diagnostic procedures. MVS commands are used to start, stop, cancel, or force the shutdown of MVS/CSC. These commands are issued from the MVS operator console.

For the VM-based LCS, the MVS operator console interface also supports VM/HSC commands as well as CLS commands. You can also receive and reply to HSC and CLS messages. Information in response messages is also displayed on the MVS operator console.

HSC, CLS, and SLK<sup>1</sup> commands must be prefixed by identifiers that explicitly direct the commands to those software components. If a system qualifier is not entered for these commands, the commands are passed in the following order and executed by the appropriate system:

- MVS/CSC
- CLS
- SCP (with prefix SLK)
- HSC

The MVS/CSC interprets commands as they are entered. It executes MVS/CSC commands and sends CLS and HSC command strings to the CLS. The CLS interprets each command, executes CLS commands, and forwards HSC commands to the HSC for execution.

The following sections list the HSC and CLS commands supported by the MVS operator console interface.

### HSC Commands

The MVS operator console interface supports the following VM/HSC commands:

- Cappref
- Clean
- Dismount
- Display
- Drain

---

1. SLK identifies the VM/HSC Control Program

- Eject
- Enter
- Modify
- Mount
- Senter
- Set

Commands intended for the MVS/CSC are not prefixed with a component identifier. Commands intended for the HSC must be prefixed with (1) either the MVS/CSC command prefix character or the MVS/CSC subsystem name *and* (2) the HSC component identifier (HSC). In the following example, the first HSC Display command is prefixed with the MVS/CSC command prefix character (!). The second HSC Display command is prefixed with the MVS/CSC subsystem name (CSC0).

```
!HSC DISPLAY LSM 000
CSC0 HSC DISPLAY LSM 000
```

Because the commands contain the HSC component identifier, the MVS/CSC sends them first to the CLS for interpretation. The CLS, in turn, sends them to the HSC for execution.

The MVS/CSC command shown in the following example is interpreted and executed by the MVS/CSC:

```
CSC0 DISPLAY AVAIL
```

If the command were not an MVS/CSC command, it would be passed on to the CLS. If the command is a CLS command, it is processed by the CLS, otherwise CLS passes the command to the HSC for processing.

For HSC commands that are also MVS/CSC commands, the HSC component identifier must be specified in order to execute the command for the HSC. For example, the Display command is both an MVS/CSC and an HSC command. The first command in the following example shows the Display command for the MVS/CSC; it has no component identifier. The second command shows the Display command for the HSC; it specifies the HSC component identifier.

```
CSC0 DISPLAY .....
CSC0 HSC DISPLAY .....
```

See the *VM/HSC Operator's Guide* for a complete list of HSC commands and descriptions of each command.

## CLS Commands

The MVS operator console interface supports the following CLS commands:

- Query
- Release
- Reserve
- Tell

See the *CLS Reference Manual* for a complete list of CLS commands and descriptions of each command.

## Operator Response

Some HSC and CLS commands require a reply to the response returned by the HSC or CLS. The MVS/CSC coordinates the local response with the MVS system console so that replies should use the MVS reply identifier. The CLS and HSC systems may also send unsolicited messages to the MVS host system. Responses from unsolicited messages are routed through the CLS. The ACSLS and LibraryStation do not send unsolicited messages to the MVS/CSC.

## Chapter 6. Programmatic Interface

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### Overview

This chapter describes the programmatic interface (PGMI) provided with the MVS/CSC for the MVS-based and UNIX-based LCS. The PGMI allows S/370 or S/390 assembler programs to request certain services from the MVS/CSC, such as:

- MVS/CSC subsystem status (QCSC request)
- Drive configuration (QDRIVES request)
- Tape cartridge status (QVOLUME request)

The MVS/CSC provides the SCSXREQ macro to allow programs to request these services. A program uses the SCSXREQ macro to query the MVS/CSC to determine if a volume is resident in the ACS, or to retrieve drive-related configuration data. A program can also request that the MVS/CSC return the response(s) that were associated with an asynchronous request that was previously issued (READ request). See “PGMI Supported Requests” on page 44 for more information about the requests supported by the PGMI.



**Note:** Virtual Storage Manager (VSM) support has been added for certain PGMI services. Refer to the VTCS customer documentation for more information.

### Command Syntax

See “Syntax Flow Diagrams” on page xx for syntax flow diagramming conventions.

### PGMI Interface Processing

The SCSXREQ macro is used to request services from the MVS/CSC. The request parameter list and response areas are mapped by the SCSXREQM macro. An assembler program that issues the SCSXREQ macro must also include the SCSXREQM macro in order to generate the DSECTs used by the SCSXREQ macro.

The SCSXREQ macro calls the SCSXCAL module to transfer the request to the MVS/CSC. The SCSXCAL module locates the MVS/CSC program call (PC) number for cross address space communication. SCSXCAL's address is passed to the SCSXREQ macro.



**Note:** The SCSXCAL module must already be loaded. SCSXCAL is reentrant, so you need only to load it once.

A return code of zero in register 15 (R15) from the SCSXREQ macro indicates that the request was successfully initiated. A return code of 20 in R15 indicates that the MVS/CSC was inactive to initiate the request. (See “Return Codes” on page 41 for a description of return codes). A program can issue the query MVS/CSC (QCSC) request to periodically poll the MVS/CSC subsystem status to determine when it becomes active.

When request processing completes, the MVS/CSC returns the address of the response area along with its length. Register 1 (R1) contains the address of the response area and register 0 (R0) contains the length of the response. The response area is in non-fetch protected MVS/CSC key storage. A program should not attempt to alter or free the virtual storage (FREEMAIN) for the response area. This response area is valid until the next SCSXREQ call, after which it no longer contains the response.

Both synchronous and asynchronous interfaces are provided. Synchronous requests cause the requesting program to wait until a request is complete before continuing processing. Asynchronous requests allow the requesting program to have multiple requests processed at once, and returns control to the requesting program immediately.



**Note:** Asynchronous requests are not supported for the QCSC and READ requests.

After issuing an asynchronous request, R0 contains a token and R1 contains the address of an Event Control Block (ECB). The ECB is posted after the request is complete. After the ECB is posted, the program must issue a SCSXREQ READ request specifying the returned token. This causes a single response to be made available to the requesting program. 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 verify that all requests have completed, the PGMI application must wait for all ECBs to be posted.

The SCSXREQM macro maps the responses associated with a request. The response block always contains a reply header that is mapped by the SCX DSECT. The contents of the directory sections that follow the SCX header depend on the type of request that was made. Elements of a similar type are always contiguous (i.e., all drive elements are together).

The directory sections contain:

- 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
- The length of each element type.

In order to ensure compatibility with future enhancements, reference the field names that are in the reply area, and not the calculated offsets.

In the event that the MVS/CSC becomes inactive during request processing, the ECB is posted and the response area indicates that the MVS/CSC is inactive.

A request can only be issued in task mode with no locks held. A task can have multiple requests active at once.



**Note:** See “SCSXREQ Macro Format” on page 39 for the syntax of the SCSXREQ macro. See Appendix A, “Programmatic Interface SCSXREQM Macro Mappings” on page 161 for the syntax and mappings of the SCSXREQM macro.

## Multiple MVS/CSCs and the PGMI

Multiple MVS/CSCs can run on a single MVS system. Each MVS/CSC is assigned a unique four-character subsystem name. The PGMI is able to route requests to a particular MVS/CSC subsystem if the subsystem name is included on a request. A program can issue the QCSC request to determine which MVS/CSC subsystems are active, and in turn select the appropriate MVS/CSC to process a request. If an MVS/CSC subsystem name is not included on a request, the first active MVS/CSC found in the MVS subsystem name table is used to process the request.

## Authorization Checking for the PGMI

The MVS/CSC provides user exit SCSUX05 to perform authorization checking on programs that request PGMI services. If the user exit is disabled (setting return code UX05NOPR) or ABENDs, the MVS/CSC allows all programs to issue the query and read requests. You can also code user exit SCSUX05 to interface with existing security products (i.e. RACF).

The SCSUX05 user exit is invoked for all requests received from the PGMI interface. This user exit should evaluate the request and set a return code to indicate whether the MVS/CSC should allow the request to be executed. See Chapter 8, “MVS/CSC User Exits for JES Without TAPE SETUP Processing” or Chapter 9, “MVS/CSC User Exits for JES3 With TAPE SETUP Processing” for more information about the SCSUX05 user exit.

## SCSXREQ Macro Format

The SCSXREQ macro is used to request MVS/CSC services. There are two forms of the SCSXREQ macro: list and execute. You use the list form of the SCSXREQ macro to define a parameter list, and the execute form to process PGMI requests. The following sections describe both forms of the SCSXREQ macro.

## Specifying the List Form

Use the list form of the SCSXREQ macro to define a parameter list that is referenced when the SCSXREQ macro is executed for request processing. The following diagram shows the syntax for the list form.

```
▶▶ label — SCSXREQ — MF=L —————▶▶
```

### Parameters

#### **MF=L**

Specifies that a parameter list is generated. All other options are ignored.

## Specifying the Execute Form

Use the execute form of the SCSXREQ macro for request processing. The following diagram shows the syntax for the execute form.

```
▶▶ label — SCSXREQ — request — parameter . . ., MF=(E, parmaddr) —————▶▶
```

When SCSXREQ is executed for request processing, it stores parameters in the parameter list defined by the SCSXREQ macro, and calls the SCSXCAL module.

### Parameters

The *request* variable corresponds to one of the following requests:

#### **QCSC**

Determine MVS/CSC status

#### **QDRIVES**

Retrieve drive information

#### **QVOLUME**

Retrieve volume status

#### **READ**

Read a response

The *parameter* variable corresponds to one or more of the following parameters, depending on the type of request being processed:

```
,ACSID= acsidaddr
,COUNT= countaddr
,CSCNAME= subsysaddr
,LIST= itemlistaddr
,MF=(E, parmaddr)
,OPTION={SYNCH|ASYNCH}
,TOKEN= tokenaddr
,VOLSER= voladdr or volumeaddr
,XCALADR= rtnaddr or subrtnaddr
```

See “PGMI Supported Requests” on page 44 for more information about PGMI requests and their associated parameters.

## SCSXREQ Return Specifications

The following sections describe the return codes and reason codes associated with PGMI request processing.

### Return Codes

After executing the SCSXREQ macro, R15 contains one of the following return codes:

Return Field Name	Decimal Value and Description
SCXR0K	0 - Wait can be issued (OPTION=ASYNCH) or check response area for status (OPTION=SYNCH).
SCXRNCSC	20 - MVS/CSC not active; no SCX response is returned.

After the ECB associated with the request for asynchronous processing is posted, or upon return for synchronous requests, the SCXCMDRC return code field indicates the status of the request.

Table 1 on page 42 lists possible return codes.

**Table 1. Return Code Specifications**

<b>Return Field Name</b>	<b>Decimal Value and Description</b>
SCXR0K	0 - Request completed successfully.
SCXRWARN	4 - The request completed successfully. However, an anomalous condition occurred (e.g., a QVOLUME request specified a volume not in the library).
SCXRBADP	8 - Request unsuccessful. Bad parameter list (e.g., incompatible options). SCXPEOFF provides an offset to the bad parameter.
SCXRIERR	12 - Request unsuccessful. Unrecoverable error occurred while processing the request.
SCXRFAIL	16 - Request unsuccessful. SCXSRC contains the request specific reason code or message. Note: PGMI reason codes are described in "Reason Codes". MVS/CSC messages and non-PGMI reason codes are described in the <i>MVS/CSC Messages and Codes Guide</i> .
SCXRNCSC	20 - Request unsuccessful. MVS/CSC not active.
SCXRNAUT	24 - Request unsuccessful. User not authorized. The request was failed by SCSUX05, or the MVS/CSC default authorization.
SCXNTCB	28 - Request unsuccessful. The caller was not in task mode.
SCXLOCKD	32 - Request unsuccessful. The caller held at least one lock.
SCXTPROT	36 - Request unsuccessful. The caller did not have fetch/store authority to the SCSXREQM parameter list.
SCXNORSP	40 - Request unsuccessful. No response element with the specified token existed.

## Reason Codes

If the request is unsuccessful (return code 16), the SCXSRC reason code field contains the reason code or message indicating the problem. The following table lists possible reason codes and messages.

**Table 2. Reason Code Specifications**

Reason Code Field Name	Hex Value and Description
SCXVNF	X'700C' - One or more volumes where not found in the library.
SCXNOALS	X'8004' - MVS/CSC is not active.
SCXMCSC	X'8008' - Multiple MVS/CSCs active.
SCXQNOA	X'8014' - ASCOMM is not active.
SCXINVOP	X'8018' - Invalid QUAB option. Internal error; contact StorageTek Software Support.
SCXINVFC	X'800C' - Invalid function code. Internal error; contact StorageTek Software Support.
SCXNOLVT	X'8010' - No LVT. Internal error; contact StorageTek Software Support.
SCXNODRV	X'801C' - No drives found.
SCXTABND	X'8024' - ASCOMM server task abended.
SCXTINTR	X'8032' - Current task interrupted.
SCXSANF	X'8036' - Search argument not found.
SCXMSTT	X'803A' - Mismatched token types.
SCXTRNF	X'8040' - Token request area not found.
SCXSFUL	X'8050' - Reply area space full.
SCXDVMM	X'8051' - Drive/media mismatch.
SCXCMAx	X'8052' - Maximum number of active MVS/CSCs found while processing the QCSC request.
SCXSRVU	X'8053' - LCS became unavailable either before or during request processing.
SCXUNSP	X'8054' - Request type not supported.
SCXLMAX	X'8055' - Number of list items specified by requesting program exceeds maximum amount allowed.
SCXLCSF	X'8056' - LCS failed the request that was sent by the MVS/CSC. The SCXLCSRC field contains the server reason code.
SCXVINV	X'8057' - An invalid volume serial number was found during QVOLUME request processing.

## PGMI Supported Requests

The following sections describe the requests supported by the PGMI.

### QCSC

Use the QCSC request to determine if the MVS/CSC subsystem(s) are active. This allows programs to poll periodically to determine when the MVS/CSC becomes active. All MVS/CSC subsystems must run on the same system as the PGMI.



**Note:** The QCSC request is synchronous only.

### Syntax

```
▶▶—label—SCSXREQ QCSC—,MF=(E,parmaddr)—,CSCNAME=subsysaddr—,XCALADR=rtnaddr—▶▶
```

### Parameters

#### **MF=(E, parmaddr)**

Specifies that the SCSXREQ macro be executed for request processing using a parameter list.

Specify an RX-type address, or the number of the register (1 - 12) that contains the parameter list address.

This parameter is required.

#### **CSCNAME**

Identifies the MVS/CSC subsystem for status checking, where *subsysaddr* specifies the address of a 4-byte field containing either the MVS/CSC subsystem name, or the literal \*ALL, which indicates that the status of all MVS/CSC subsystems is checked. *subsysaddr* can either be an RX-type address of the 4-byte field, or the number of the register (2 - 12) that contains the address of the 4-byte field.

This parameter is optional. If CSCNAME is not specified, the status of all MVS/CSC subsystems is checked.

#### **XCALADR**

Specifies a location containing the address of the SCSXCAL module, where *rtnaddr* is the address. Specify either an RX-type address of the module, or the number of the register (2 - 12, or 15) that contains the address of the SCSXCAL module.

This parameter is required.

## Request Responses

If *subsysaddr* points to an MVS/CSC subsystem name, a return code in R15 indicates whether the MVS/CSC subsystem is active (0) or not (20). The response length (R0) and response address (R1) are zero.

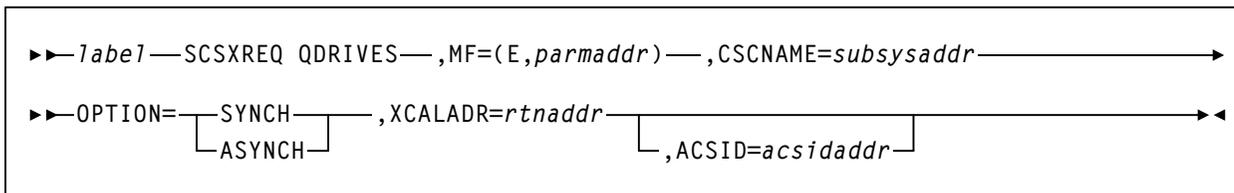
If *subsysaddr* points to the literal \*ALL, and only one MVS/CSC subsystem is active, both R15 and the SCXCMDRC field contain return code 0. If *subsysaddr* points to the literal \*ALL, and more than one MVS/CSC subsystem is active, R15 contains return code 0; the SCXCMDRC field contains return code 4, indicating that the request was successful but a warning was issued. The SCXSRC field in the response area contains a reason code (X'8008') indicating that multiple MVS/CSCs are active. R1 contains the address of the response; R0 contains the length of the response. See "Return Codes" on page 41 for a description of the return codes. See "Reason Codes" on page 43 for a description of the reason codes.

In addition to the reply header, the MVS/CSC Subsystem Name Information Element that is mapped by the SCXSNAM DSECT is returned when *subsysaddr* points to the literal \*ALL. If no MVS/CSC subsystem is active, R15 contains return code 20; R0 and R1 both contain zero.

## QDRIVES

Use the QDRIVES request to retrieve drive-related configuration data. The response includes the ACS and LSM address of the transports, as well as the control unit address of each transport. The response also includes the recording technique used by each transport.

### Syntax



### Parameters

#### **MF=(E, *parmaddr*)**

Specifies that the SCSXREQ macro be executed for request processing using a parameter list.

Specify an RX-type address, or the number of the register (1 - 12) that contains the parameter list address.

This parameter is required.

#### **CSCNAME**

Identifies the MVS/CSC subsystem for request processing, where *subsysaddr* specifies the address of a 4-byte field containing the MVS/CSC subsystem name. *subsysaddr* can either be an RX-type address of the 4-byte field, or the number of the register (2 - 12) that contains the address of the 4-byte field.

This parameter is optional. If it is not specified, the first active MVS/CSC in the MVS subsystem name table processes the request.

#### **OPTION**

Specifies whether the requesting program is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

#### **SYNCH**

Specifies that the requesting program wait until the request is complete.

#### **ASYNCH**

Specifies that the requesting program continue processing while the request is active.

After control is returned to the requesting program, R1 contains the address of an ECB that is posted when the response completed. R0 contains the token used by SCSXREQ READ to read the response.

**XCALADR**

Specifies a location containing the address of the SCSXCAL module, where *rtnaddr* is the address. Specify either an RX-type address of the module, or the number of the register (2 - 12, or 15) that contains the address of the SCSXCAL module.

This parameter is required.

**ACSID**

Specifies the address of the ACS used to satisfy the request, where *acsidaddr* is the ACS address.

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 you do not specify an ACS address, drive information for all of the ACSs that are managed by the processing MVS/CSC subsystem is returned.

**Request Responses**

A return code in the SCXCMDRC field indicates whether or not the request was successful. If the request failed, a reason code is placed in the SCXSRC field. See “Return Codes” on page 41 for a description of the return codes. See “Reason Codes” on page 43 for a description of the reason codes.

In addition to the reply header, the Drive Information Element that is mapped by the SCXSDRV DSECT is returned.

## QVOLUME

Use the QVOLUME request to obtain the library status of a cartridge.

### Syntax

```
▶▶ label — SCSXREQ QVOLUME — ,MF=(E,parmaddr) — ,CSCNAME=subsysaddr —▶▶
▶▶ OPTION= — SYNCH — ,VOLSER=voladdr — ,XCALADR=rtnaddr —▶▶
           — ASYNCH — ,LIST=listitemaddr — ,COUNT=countaddr —▶▶
```

### Parameters

#### MF=(E, *parmaddr*)

Specifies that the SCSXREQ macro be executed for request processing using a parameter list.

Specify an RX-type address, or the number of the register (1 - 12) that contains the parameter list address.

This parameter is required.

#### CSCNAME

Identifies the MVS/CSC subsystem for request processing, where *subsysaddr* specifies the address of a 4-byte field containing the MVS/CSC subsystem name. *subsysaddr* can either be an RX-type address of the 4-byte field, or the number of the register (2 - 12) that contains the address of the 4-byte field.

This parameter is optional. If it is not specified, the first active MVS/CSC in the MVS subsystem name table processes the request.

#### OPTION

Specifies whether the requesting program is to wait until the request is complete or continue processing while the request is active.

This parameter is required.

#### SYNCH

Specifies that the requesting program wait until the request is complete.

#### ASYNCH

Specifies that the requesting program continue processing while the request is active.

After control is returned to the requesting program, R1 contains the address of an ECB posted when the response completed. R0 contains the token used by SCSXREQ READ to read the response.

## **VOLSER**

Specifies the address of a six-character volume serial number, where *voladdr* is the VOLSER address.

Specify either an RX-type address, or the number of the register (2 -12) that contains the volume serial number address. Valid characters for the volume serial number are A-Z, 0-9, #, \$, @, and trailing blanks.



### **Notes:**

- The at sign (@) character is only valid for the VM-based LCS.
- The yen (¥) and pound sterling (£) characters correspond to the same EBCDIC values as the dollar sign (\$) and pound sign (#) characters (X '5B' and X '7B'), and can also be used in volume serial numbers if the LMU microcode level is at Release 3.5 or later.

This parameter is required.

## **LIST**

Specifies the address of a list of elements, where *listitemaddr* is 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 volume serial numbers.

This parameter is required if VOLSER is not specified.

## **COUNT**

Specifies the address of a two-byte count value, where *countaddr* is 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 SCSXCAL module, where *rtnaddr* is the address. Specify either an RX-type address of the module, or the number of the register (2 - 12, or 15) that contains the address of the SCSXCAL module.

This parameter is required.

## **Request Responses**

A return code in the SCXCMDRC field indicates whether or not the request was successful. If the request failed, a reason code is placed in the SCXSRC field. If the volume is not in the library, SCXRWARN is placed in the SCXCMDRC field and a reason code is placed in the SCXSRC field. See “Return Codes” on page 41 for a description of the return codes. See “Reason Codes” on page 43 for a description of the reason codes.

In addition to the reply header, the Volume Information Section that is mapped by the SCXSVOL DSECT is returned.

## READ

Use the READ request to direct the MVS/CSC to return the response(s) associated with a request that has completed as indicated by a posted ECB. The READ request is used to read a response associated with a particular token. The requesting program specifies the token that was returned on the original request.

The READ request is synchronous only.

### Syntax

```
▶▶ label — SCSXREQ READ — , MF=(E, parmaddr) — , CSCNAME=subsysaddr —————▶  
▶▶ , TOKEN=tokenaddr — , XCALADR=rtnaddr —————▶◀
```

### Parameters

#### **MF=(E, *parmaddr*)**

Specifies that the SCSXREQ macro be executed for request processing using a parameter list.

Specify an RX-type address, or the number of the register (1 - 12) that contains the parameter list address.

This parameter is required.

#### **CSCNAME**

Identifies the MVS/CSC subsystem for request processing, where *subsysaddr* specifies the address of a 4-byte field containing the MVS/CSC subsystem name. *subsysaddr* can either be an RX-type address of the 4-byte field, or the number of the register (2 - 12) that contains the address of the 4-byte field.

This parameter is optional. If it is not specified, the first active MVS/CSC in the MVS subsystem name table processes the request.

#### **TOKEN**

Specifies the address of the token originally returned in R0 when the request was initiated, where *tokenaddr* is the token address.

Specify either an RX-type address of the token, or the number of the register (2 - 12) that contains the address of the token.

This parameter is required.

**XCALADR**

Specifies a location containing the address of the SCSXCAL module, where *rtnaddr* is the address. Specify either an RX-type address of the module, or the number of the register (2 - 12, or 15) that contains the address of the SCSXCAL module.

This parameter is required.

**Request Responses**

A return code in the SCXCMDRC field indicates whether or not the request was successful. If the request failed, a reason code is placed in the SCXSRC field. See “Return Codes” on page 41 for a description of the return codes. See “Reason Codes” on page 43 for a description of the reason codes.

In addition to the reply header, the appropriate Information Elements are returned based on the original request.

## Sample PGM Requests

The following sections show sample PGM requests for querying a volume in a single and multiple MVS/CSC environment.

### Sample QVOLUME Request (Single MVS/CSC Environment)

The following figure shows a sample QVOLUME request issued in a single MVS/CSC environment. This sample resides in member PGMISAM1 of the SAMPLIB library.

```
PSAM1    TITLE 'PGMISAM1 - PGM Sample Program 1'
**PROLOGUE*****
*
* PGMISAM1 - PGM Sample Program 1
*
* FUNCTION:  This sample routine demonstrates the use of the
*            QVOLUME request.
*            WTOs are used in this module as a diagnostic aid to
*            trace the execution flow.
*
* ATTRIBUTES: REENTRANT, RMODE(ANY), AMODE(31).
*
* SERIALIZATION REQUIREMENTS: None
*
* REGISTER CONVENTIONS:
*
*     R13 - PGMISAM1 workarea base register.
*     R12 - PGMISAM1 module base register.
*     R10 - SCX Response Area base register.
*     R8  - Volume Information Element base register.
*
* ENTRY POINTS (EXECUTABLE):
*
*     PGMISAM1
*
*             PARAMETER DESCRIPTION:
*             None
*
```

**Figure 6. QVOLUME Request (Single MVS/CSC)**  
(1 of 5)

```

* EXIT (NORMAL):
*
* RETURN CODE: N/A
*
* REGISTER CONDITION: All registers are the same as upon entry
* except R15 = zero.
*
* DATA PASSED:
*
* SPECIAL CONDITIONS: None
*
* EXIT (ABNORMAL): None
*
* EXTERNAL REFERENCES:
*
* WTO - MVS Write to Operator.
* SCSXCAL - MVS/CSC PGMI Interface Module
*
* MESSAGES GENERATED: None
*
* DATA AREAS:
*
* SCSXREQM - PGMI Request/Response Mapping Macro
*
* SPECIAL CONSIDERATIONS: None
*
* CHANGE HISTORY:
* 01/29/97-CRTD-MJD Created initial version.
*
**ENDPROLOGUE*****
EJECT
COPY SCSGLBL
PGMISAM1 CSECT
PGMISAM1 AMODE 31
PGMISAM1 RMODE ANY
**
EJECT
**
** Store callers registers
** Establish CSECT base address
**
SPACE
STM R14,R12,12(R13) Store callers regs
LR R12,R15 Establish primary
USING PGMISAM1,R12 address.
SPACE
**
** Getmain a workarea
**
GETMAIN RU,LV=PSAM1WKL,SP=0,LOC=ANY

```

**Figure 6. QVOLUME Request (Single MVS/CSC)**  
**(2 of 5)**

```

        ST    R13,4(,R1)      Store backward pointer
        ST    R1,8(,R13)     Store forward pointer
        LR    R13,R1         Point to new savearea
        USING PSAM1WK,R13    Map it

**
**                               MAINLINE
**
*
        WTO   'PGMISAM1 - Entered'

*
**
**   Load the MVS/CSC Interface Module, SCSXCAL
**
        LOAD  EP=SCSXCAL      Load PGMI interface routine
        ST    R0,WKXCAL@      Save the EPA

*
**
**   In this sample module, we hard-code a volume serial number
**   to be used on the subsequent QVOLUME request.
**
*
        MVC   WKVOLSR,=CL6'MYVOL1' Set volser we're looking for.

*
**
**   Issue a QVOLUME request to retrieve information about the
**   specified volume. Because CSCNAME is not specified, the
**   request will be directed to the first active MVS/CSC subsystem
**   in the MVS Subsystem Vector Table.
**
*
QVOLUME EQU   *
        WTO   'PGMISAM1 - Issuing QVOLUME request.'
        SCSXREQ QVOLUME,
            VOLSER=WKVOLSR,
            XCALADR=WKXCAL@,
            OPTION=SYNCH,
            MF=(E,WKXPLST)
            +
            +
            +
            +

*
        LTR   R15,R15        Request successfully initiated?
        BNZ   NOCSC          No, CSC not active.
        LR    R10,R1         Get addr of SCX into R10.
        USING SCX,R10        Map the SCX.
        LR    R8,R10         Copy into R8.
        A     R8,SCXXVOL0    Get offset to vol info entry.
        USING SCXSVOL,R8    Map the vol info entry.
        TM    SCXVSTA,SCXVILB Volume in library?
        BO    LIBVOL         Yes, go do stuff for vol in library.

*

```

**Figure 6. QVOLUME Request (Single MVS/CSC)**  
(3 of 5)

```

NOLIBVOL EQU *
          WTO 'PGMISAM1 - Volume not in library.'
*
*      Insert code here to take the appropriate action for a
*      non-library volume.
*
          B      RETURN          Go return to caller.
*
LIBVOL   EQU *
          WTO 'PGMISAM1 - Volume in library.'
*
*      Insert code here to take the appropriate action for a
*      library volume.
*
          B      RETURN          Go return to caller.
*
NOCSC    EQU *
          WTO 'PGMISAM1 - No CSC subsystem active.'
*
*      Insert code here to take the appropriate action for the
*      condition where no CSC subsystems are active.
*
          B      RETURN          Go return to caller.
*
**
**      RETURN: **      Return to Caller.
**
RETURN   EQU *
          WTO 'PGMISAM1 - Exiting'
          L      R13,4(R13)      Get addr of callers savearea
          LM     R14,R12,12(R13) Load callers regs
          XR     R15,R15         Give zero return code.
          BR     R14            And return.
*
*
*
*
          TITLE 'PGMISAM1 Constants'
**
** Constants.
**
*
**
** Literals.
**
          LTORG
          EJECT ,
          TITLE 'PGMISAM1 Module Workarea'

```

**Figure 6. QVOLUME Request (Single MVS/CSC)**  
(4 of 5)

```

PSAM1WK DSECT
          DS      18F                SCSCALL Register Save Area.
WKXPLST SCSXREQ MF=L
WKVOLSR DS      CL6                Volser
WKXCAL@ DS      F                  Pointer to SCSXCAL EPA
          DS      0D
PSAM1WKL EQU *-PSAM1WK
*
*
          SPACE 2
          SCSXREQM                PGMI Request/Response Mapping Macro
***      SYMBOLIC REGISTER EQUATES
          SPACE
R0       EQU    0
R1       EQU    1
R2       EQU    2
R3       EQU    3
R4       EQU    4
R5       EQU    5
R6       EQU    6
R7       EQU    7
R8       EQU    8
R9       EQU    9
R10      EQU   10
R11      EQU   11
R12      EQU   12
R13      EQU   13
R14      EQU   14
R15      EQU   15
*
          END

```

**Figure 6. QVOLUME Request (Single MVS/CSC)**  
**(5 of 5)**

## Sample QVOLUME Request (Multiple MVS/CSC Environment)

The following figure shows a sample QVOLUME request issued in a multiple MVS/CSC environment. This sample resides in member PGMISAM2 of the SAMPLIB library.

```
PSAM2    TITLE 'PGMISAM2 - PGMI Sample Program 2'
**PROLOGUE*****
*
* PGMISAM2 - PGMI Sample Program 2
*
* FUNCTION: This sample routine illustrates several features of
*           the MVS/CSC PGMI. This module assumes that it is
*           possible to have more than one MVS/CSC subsystem active
*           on a single MVS image. The QCSC request is used to
*           determine all active CSC subsystems. We then want to
*           retrieve volume information for a particular volser.
*           We loop through all active subsystems issuing QVOLUME
*           requests until a CSC tells us that it has the volume in
*           its library, or, until we exhaust the list of active
*           subsystems.
*           WTOs are used in this module as a diagnostic aid to
*           trace the execution flow.
*
* ATTRIBUTES: REENTRANT, RMODE(ANY), AMODE(31).
*
* SERIALIZATION REQUIREMENTS: None
*
* REGISTER CONVENTIONS:
*
*   R13 - PGMISAM2 workarea base register.
*   R12 - PGMISAM2 module base register.
*   R10 - SCX Response Area base register.
*   R9  - CSC Name Information Element base register.
*   R8  - Volume Information Element base register.
```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
(1 of 6)

```

*
* ENTRY POINTS (EXECUTABLE):
*
*   PGMISAM2
*
*           PARAMETER DESCRIPTION:
*           None
*
* EXIT (NORMAL):
*
*   RETURN CODE: N/A
*
*   REGISTER CONDITION: All registers are the same as upon entry
*   except R15 = zero.
*
*   DATA PASSED:
*
*   SPECIAL CONDITIONS: None
*
* EXIT (ABNORMAL): None
*
* EXTERNAL REFERENCES:
*
*   WTO - MVS Write to Operator.
*   SCSXCAL - MVS/CSC PGMI Interface Module
*
* MESSAGES GENERATED: None
*
* DATA AREAS:
*
*   SCSXREQM - PGMI Request/Response Mapping Macro
*
* SPECIAL CONSIDERATIONS: None
*
* CHANGE HISTORY:
*   01/29/97-CRTD-MJD   Created initial version.
*
**ENDPROLOGUE*****
      EJECT
      COPY  SCSGLBL
PGMISAM2 CSECT
PGMISAM2 AMODE 31
PGMISAM2 RMODE ANY
**
      EJECT
**
** Store callers registers
** Establish CSECT base address
**

```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
**(2 of 6)**

```

SPACE
STM  R14,R12,12(R13)  Store callers regs
LR   R12,R15          Establish primary
USING PGMISAM2,R12    address.
SPACE

**
** Getmain a workarea
**
GETMAIN RU,LV=PSAM2WKL,SP=0,LOC=ANY
ST   R13,4(,R1)       Store backward pointer
ST   R1,8(,R13)       Store forward pointer
LR   R13,R1           Point to new savearea
USING PSAM2WK,R13     Map it

**
**             MAINLINE
**
*
WTO  'PGMISAM2 - Entered'

*
**
** Load the MVS/CSC Interface Module, SCSXCAL
**

LOAD EP=SCSXCAL       Load PGMI interface routine
ST   R0,WKXCAL@       Save the EPA

*
**
** Find the names of all active MVS/CSC subsystems. Preserve
** these names in a table in the workarea.
**
*
SCSXREQ QCSC,          Locate all active CSC subsystems  +
      XCALADR=WKXCAL@,
      MF=(E,WKXPLST)
*

LTR  R15,R15          Is any CSC active?
BZ   CSCOK            Yes, proceed.
B    NOCSC            Anything else -> can't talk to CSC.
CSCOK EQU *
LR   R10,R1           Get address of SCX response area.
USING SCX,R10         Map the SCX.
L    R3,SCXXNAMN      Get number of active CSCs.
ST   R3,WKCSCNUM      Save for future use.
LA   R4,WKNAMES       Get addr of CSC name save table.
LR   R9,R10           Get address of SCX into R9.
A    R9,SCXXNAM0      Add offset to first CSC name element.
USING SCXSNAM,R9     Map the CSC name element.

*

```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
**(3 of 6)**

```

NAMELOOP EQU *
          WTO 'PGMISAM2 - Active CSC subsystem found.'
          MVC 0(4,R4),SCXNAME Save the CSC name.
          LA  R4,4(R4) Bump pointer to next table entry.
          A   R9,SCXXNAML Move to next CSC name element.
          BCT R3,NAMELOOP Go process next CSC name.

*
**
** In this sample module, we hard-code a volume serial number
** to be used on the subsequent QVOLUME request.
**
*
          MVC WKVOLSR,=CL6'MYVOL1' Set volser we're looking for.

*
**
** Loop thru the active MVS/CSC subsystems that we found by
** doing the QCSC request and issue a QVOLUME request for our
** volser. As soon as it is found, exit the loop and go perform
** whatever logic is necessary to process a library volume. If
** we loop through all the active MVS/CSC subsystems and don't
** find the volume, go perform whatever logic is necessary to
** to process a non-library volume.
**
*
          LA R4,WKNAMES Get addr of CSC name save table.
          L  R3,WKCSCNUM Get number of active CSCs.
QVOLUME EQU *
          WTO 'PGMISAM2 - Checking active CSC for volume.'
          SCSXREQ QVOLUME,
              VOLSER=WKVOLSR,
              CSCNAME=(R4),
              XCALADR=WKXCAL@,
              OPTION=SYNCH,
              MF=(E,WKXPLST)
              +
              +
              +
              +

*
          LTR R15,R15 Request successfully initiated?
          BNZ NEXTCSC No, go try next CSC subsystem.
          LR R10,R1 Get addr of SCX into R10.
          LR R8,R10 Copy into R8.
          A R8,SCXXVOLO Get offset to vol info entry.
          USING SCXSVOL,R8 Map the vol info entry.
          TM SCXVSTA,SCXVILB Volume in library?
          BO LIBVOL Yes, go do stuff for vol in library.
NEXTCSC EQU *
          LA R4,4(R4) Position to next CSC in table.
          BCT R3,QVOLUME Go see if next CSC has the volume.

*

```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
**(4 of 6)**

```

NOLIBVOL EQU *
           WTO  'PGMISAM2 - Volume not in library.'
*
*      Insert code here to take the appropriate action for a
*      non-library volume.
*
           B    RETURN          Go return to caller.
*
LIBVOL    EQU *
           WTO  'PGMISAM2 - Volume in library.'
*
*      Insert code here to take the appropriate action for a
*      library volume.
*
           B    RETURN          Go return to caller.
*
NOCSC    EQU *
           WTO  'PGMISAM2 - No CSC subsystem active.'
*
*      Insert code here to take the appropriate action for the
*      condition where no CSC subsystems are active.
*
           B    RETURN          Go return to caller.
*
**
**      RETURN:
**      Return to Caller.
**
RETURN    EQU *
           WTO  'PGMISAM2 - Exiting'
           L    R13,4(,R13)      Get addr of callers savearea
           LM   R14,R12,12(R13)  Load callers regs
           XR   R15,R15          Give zero return code.
           BR   R14              And return.
*
*
*
*
           TITLE 'PGMISAM2 Constants'
**
**      Constants.
**
*
**
**      Literals.
**
           LTORG
           EJECT ,
           TITLE 'PGMISAM2 Module Workarea'

```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
(5 of 6)

```

PSAM2WK DSECT
          DS      18F                SCSCALL Register Save Area.
WKXPLST SCSXREQ MF=L
WKNNAMES DS      128CL4            CSC Subsystem Name Table area.
WKVOLSR  DS      CL6              Volser
WKXCAL@  DS      F                Pointer to SCSXCAL EPA
WKCSCNUM DS      F                Number of active CSC subsystems
          DS      0D
PSAM2WKL EQU *-PSAM2WK
*
*
          SPACE 2
SCSXREQM PGMI Request/Response Mapping Macro
***
SYMBOLIC REGISTER EQUATES
SPACE
R0       EQU    0
R1       EQU    1
R2       EQU    2
R3       EQU    3
R4       EQU    4
R5       EQU    5
R6       EQU    6
R7       EQU    7
R8       EQU    8
R9       EQU    9
R10      EQU    10
R11      EQU    11
R12      EQU    12
R13      EQU    13
R14      EQU    14
R15      EQU    15
*
          END

```

**Figure 7. QVOLUME Request (Multiple MVS/CSCs)**  
**(6 of 6)**

## **Part 3. MVS/CSC Administration and Maintenance**

---



# Chapter 7. MVS/CSC Utility Functions

---

## Overview

This chapter describes the following utilities provided with MVS/CSC:

- SCUADMIN utility program
- Event Log Report utility function
- Configuration Verification utility function
- Scratch Update utility function
- Scratch Conversion utility function

It also describes syntax conventions for utility control statements.



**Note:** Virtual Storage Manager (VSM) support has been added for the Scratch Update utility function. Refer to the VTCS customer documentation for more information.

Utilities are provided to assist in managing library resources and reporting information. Some utility functions may require that the Library Control System (LCS) and MVS/CSC are active.

For convenience, most utility functions are packaged to appear as a single user-invoked program that is invoked as a normal batch job using the SCUADMIN utility program and user-specified control statements. The exception is the Scratch Conversion utility, which is invoked by the SCUCONDB program.

## Control Statement Syntax Conventions

A control statement consists of a command (indicating the utility function) followed by zero or more parameters in 80-character card-image records. Rules for specifying control statements are as follows:

- Control statement information must be contained between columns 2 and 72.
- Parameters must be separated by one or more blanks or commas.
- A value is associated with a parameter by enclosing the value in parentheses and concatenating it immediately after the parameter.
  - Case (upper or lower) is ignored in actual control statements.
  - Lists identify several specific elements (each one separated by a comma), an inclusive range of elements, or a single element. Lists may be a combination of both ranges and specific identifiers if commas are placed between the elements.
  - Inclusive ranges specify a beginning element identifier and an ending identifier separated by a dash.
- Control statement card images may be interspersed with comment card images designated by an asterisk in column 1.
- A control statement is terminated by a non-continued card image.
- The 80-character card-image records use conventional continuation rules.
  - A space and a dash (-) anywhere before column 73 specify that the continued control information is on the next card image. The continuation starts after column 1 in the first non-blank column.
  - A plus sign (+) anywhere before column 73 specifies that the continued control information is to be concatenated directly after the character preceding the +. This allows continuation of the parameter or parameter value.
- A vol-list can consist of a volume serial number (volser), a list of volume serial numbers, ranges of volume serial numbers, or combinations of lists and ranges separated by commas. The entire list must be enclosed in parentheses. Rules for specifying a range of volume serial numbers (volsers) follows:
  - Both volsers specified must contain the same number of characters. For example, a range from volser 1 through volser 1800 must be specified as 0001–1800.
  - The specified beginning and ending elements must contain an incremental decimal numeric portion.

- If the volser contains more than one incremental range, the portion that is lowest in order of magnitude is the portion that is incremented. Examples are shown as follows:

<u>A00B00</u>	The largest range is A00B00-A00B99
A0B <u>0CC</u>	The largest range is A0B0CC-A0B9CC
<u>000XXX</u>	The largest range is 000XXX-999XXX

- Any single utility control statement cannot contain more than 32767 characters.

In the sample control statements described in the remainder of this chapter, the following rules apply:

- Acceptable abbreviations of parameters are identified by capitalization of the required string.
- Optional parameters are enclosed in brackets [ ].
- Choices are indicated by separating items with a vertical bar |.
- Defaults are indicated by underscoring \_.



**Note:** Unexpected results may occur if the SCSIN DD statement locates a data set that contains anything other than 80-byte logical records.

## Command Syntax

See “Syntax Flow Diagrams” on page xx for syntax flow diagramming conventions.

## SCUADMIN Utility Program

The SCUADMIN utility program performs initialization processing for each utility function, except for SCUCONDB. It operates in a user address space. The SCUADMIN program accepts multiple control statements, which are handled as serial requests for multiple utility functions. If all requirements needed to execute the requested utility function are met, the SCUADMIN utility program passes control to the utility that handles the actual processing.

Utility functions specified in additional control statements are not started until the previous utility completes and control is returned to the SCUADMIN program.

Figure 8 shows a sample JCL stream that invokes three utilities: the Scratch Update utility, the Configuration Verification utility, and the Event Log Report utility.



**Note:** The DD statements required by the particular utility function being invoked must be specified.

```
//JOB1      JOB  ACCT,PGMR
//STEP1     EXEC PGM=SCUADMIN,PARM='MIXED,DATE=4YR'
//STEPLIB   DD DISP=SHR,DSN=your.SCSLINK
//          DD DISP=SHR,DSN=your.TCPLINK /* optional for Interlink TCP */
//          DD DISP=SHR,DSN=your.SACLINK
//          DD DISP=SHR,DSN=your.CSLLINK
//SCSLOG    DD  DSN=EVENTLOG,DISP=SHR
//SCSPARM   DD  DSN=your.parmlib(csc-member)
//SCSPRINT  DD  SYSOUT=*
//SCSIN     DD  *
LOGR BEGIN(19990130) HEART(NO)
CONFIGV
SCRATCH VOLSER(A1B1C1,A1B1C2,A1B1C3,A1B1C4)
/*
//
```

**Figure 8. Sample JCL for Invoking Multiple Utility Functions**



### Notes:

- If you are running MVS/CSC and MVS/HSC on the same MVS system, the STEPLIB DD statement that identifies the MVS/CSC load libraries is required (see Figure 8). If you omit the STEPLIB DD statement, unpredictable MVS/CSC operations may occur.
- If you installed the MVS/CSC into the HSC and LibraryStation target and distribution zones, all references to SACLINK must point to the LibraryStation's SACLINK data set.

## SCUADMIN PARM Parameter

The PARM parameter specifies the case for printing output and the format for the date that appears in the body of printed reports. The following section describes the values you can specify on the PARM parameter.

### MIXED

Specifies that the SCSPRINT output be printed in mixed case. MIXED is the only value that you can specify on the PARM parameter for printed output.

If you do not specify MIXED on the PARM parameter, the SCSPRINT output is printed in uppercase.

### DATE

Specifies the format for the date that appears in the body of printed reports.



**Note:** This parameter applies only to dates that are printed in the body of reports. Dates printed in report headings always appear in four-year format.

### 2YR

Specifies that the date appears in two-year format (mm/dd/yy).

### 4YR

Specifies that the date appears in four-year format (yyyymmdd).

4YR is the default value.

## SCUADMIN Return Codes

The SCUADMIN utility program sets a return code for the execution of the job step as defined in Table 3. The return code for each utility function is reported in the SCS0155I message. For return codes other than 0, additional messages are reported providing more information and description of the error condition. See the *MVS/CSC Messages and Codes Guide* for message descriptions.

Examples of output from utility functions, including messages and return codes, are provided throughout this chapter.

**Table 3. SCUADMIN Return Codes**

Return Code	Description
0	All utility functions requested by control statements completed normally.
4	At least one utility function encountered an abnormal condition, but the abnormal condition did not terminate that utility function or any subsequent utility functions.
8	At least one utility function encountered an error condition that prevented that utility function from continuing. Any subsequent utility functions specified in control statements were attempted.
12	A fatal error occurred and no further processing will occur. The utility function cannot continue.

## Event Log Report Utility (VM-based LCS only)

The primary purpose of event logging is to record all message traffic between the MVS/CSC and the associated server systems. Some of the items written to the event-log data set include:

- Starts, stops, and cancellations of the MVS/CSC system
- Messages and responses sent to and received from the server
- MVS/CSC trace recordings
- Missed heartbeat intervals (for VM-based LCS)
- Miscellaneous communications events (for UNIX-based LCS and MVS-based LCS)

For VM-based configurations, you can print the event log using the Event Log Report Utility. You can run the Event Log Report utility regardless of whether or not the MVS/CSC is running.



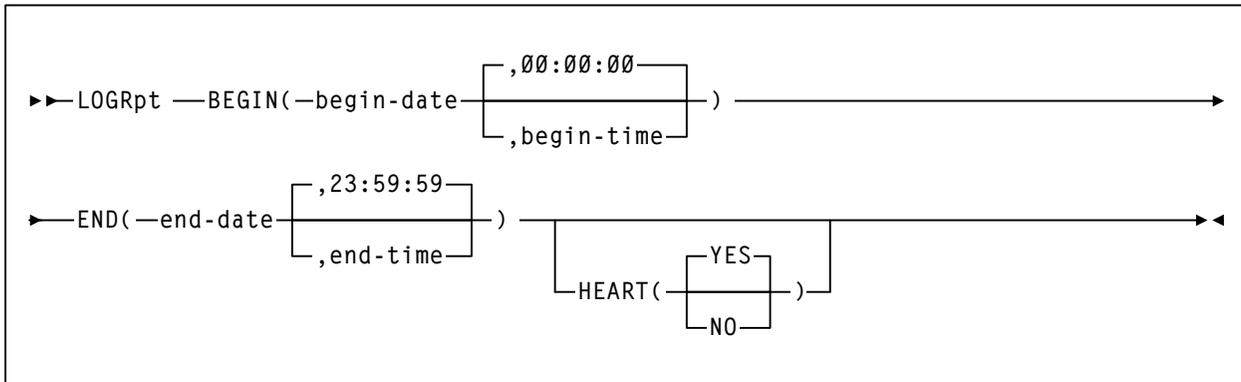
### Notes:

- The Event Log Report utility is not used for MVS-based or UNIX-based LCS configurations; log records are formatted when written to the event-log data set. See the *MVS/CSC Operator's Guide* for information about using the Event Log Facility to log events for MVS-based and UNIX-based configurations.
- If the Event Log Report utility is run against an active event-log data set, unpredictable results may occur. Therefore, the utility should be run against an inactive event-log data set. This can be done either with the MVS/CSC not running or by issuing the LOG NO command to close the current event-log data set.

## LOGRPT Control Statement

Use the LOGRPT control statement to invoke the Event Log Report utility.

### Syntax



### Parameter Descriptions

This section describes the values you can specify with the Event Log Report utility LOGRPT control statement.

#### BEGIN

Specifies the beginning of the period to start extracting data for the activities.

*begin-date* is the starting date of the reporting, expressed in either two-year or four-year format (mm/dd/yy or yyyyymmdd).

*begin-time* is the beginning time of day (twenty-four-hour value), expressed in hh:mm:ss format. The default value is 00:00:00.

#### END

Specifies the end of the period for the reporting.

*end-date* is the ending date of the reporting, expressed in either two-year or four-year format (mm/dd/yy or yyyyymmdd).



**Note:** The END date format must match the BEGIN date format.

*end-time* is the ending time of day (twenty-four-hour value), expressed in hh:mm:ss format. The default value is 23:59:59.



**Note:** The END parameter is valid only if the BEGIN parameter is specified.

## HEART

Specifies whether CLS heartbeat messages are included in the Event Log Report.

YES specifies that heartbeat messages are included in the Event Log Report. This is the default value.

NO specifies that heartbeat messages are not included in the Event Log Report.

## Example of LOGRPT Control Statement

The following example shows a control statement used to invoke the Event Log Report utility to begin at 10:00 A.M. and end at 10:00 P.M. on January 7, 2001 and to include CLS heartbeat message. Notice that the date appears in four-year format (yyyymmdd).

```
LOGR BEGIN(20010107,10:00:00) END(20010107,22:00:00) HEART(YES)
```

## Sample JCL

Figure 9 shows sample JCL used to invoke the Event Log Report utility.

```
//CSCØLOGR JOB ACCT,PGMR
//STEPØ EXEC PGM=SCUADMIN,PARM='MIXED,DATE=4YR'
//STEPLIB DD DISP=SHR,DSN=your.SCSLINK
// DD DISP=SHR,DSN=your.TCPLINK /* Optional TCP load modules */
// DD DISP=SHR,DSN=your.SACLINK
// DD DISP=SHR,DSN=your.CSLLINK
//SCSLOG DD DISP=SHR,DSN=your.log.file
//SCSPRINT DD SYSOUT=*
//SCSIN DD *
LOGR [BEGIN(begin-date[,begin-time]] -
      [END(end-date[,end-time]] -
      [HEART(YES|NO)]
/*
//
```

**Figure 9. Sample JCL for Event Log Report Utility**

The JCL to invoke the Event Log Report utility is contained in sample member JCLLOGR in the SAMPLIB library.



### Notes:

- If you are running MVS/CSC and MVS/HSC on the same MVS system, the STEPLIB DD statement that identifies the MVS/CSC load libraries is required (see Figure 9). If you omit the STEPLIB DD statement, unpredictable MVS/CSC operations may occur.
- If you installed the MVS/CSC into the HSC and LibraryStation target and distribution zones, all references to SACLINK must point to the LibraryStation's SACLINK data set.

## Sample Output

Output resulting from the execution of the Event Log Report utility includes:

- A listing of input control statements with appropriate messages when syntax errors occur. Sample output is shown in Figure 10.
- A formatted printout of all the events recorded in the event-log data set for the specified time period. Sample output for the VM-based LCS is shown in Figure 11.

```

SCUADMIN (5.1.0)      StorageTek MVS Client/Server System Utility   PAGE 001
TIME 10:51:02        Control Card Image Listing                   DATE 2001-06-07

LOGR  BEGIN(20010107,15:00:00) -
      END(20010107,23:30:00)
  
```

**Figure 10. Event Log Report Utility Sample Output-Input Control Statement**

```

CUADMIN (5.1.0)      StorageTek MVS Client/Server System Utility   PAGE 0002
TIME 16:34:10        MVS/CSC Event Log Report                   DATE 2001-06-07
|-----| Event or -----|           1  1  2  2  3 (Detail)  4  5  5  6  6  7  7
Type Msg From/To Req ID Date -GMT- Time
0-----5-----0-----5-----0-----5-----0-----5-----0-----5-----0-----5

Event Started MVS/CSC      20010107 15:00:00 Starting MVS/CSC Subsystem CSC0
Logon      CLS->CSC          LOGON ACCEPTED
Avail Req CLS->CSC 000000 20010607 22:01:07 03.0301SMYTHE1
Avail Rsp CLS<-CSC 000000 20010607 22:02:01 10001
Hrtbt Req CLS->CSC 000000 20010607 22:26:00
Hrtbt Rsp CLS<-CSC 000000 20010607 22:26:29
Comnd Req CLS<-CSC 000013 20010607 22:26:23 01123HSC D V 000200
Comnd Rsp CLS<-CSC 000045 20010607 22:26:38 10001
Comnd Req CLS<-CSC 000013 20010607 22:26:15 02021.SLS0602I SCRATCH: NO
Comnd Rsp CLS<-CSC 000045 20010607 22:26:43 10001
Comnd Req CLS->CSC 000013 20010607 22:26:22 02022.SLS0602I SELECTED: NO
Comnd Rsp CLS<-CSC 000045 20010607 22:26:47 10001
Comnd Req CLS->CSC 000013 20010607 22:26:35 02031.SLS0602I LAST KNOWN LOCATIONS:
Comnd Rsp CLS<-CSC 000045 20010607 22:26:51 10001
Comnd Req CLS->CSC 000013 20010607 22:26:54 02032.SLS0602I HOME: CELL 001:18:02:15
Comnd Rsp CLS<-CSC 000045 20010607 22:26:55 10001
Comnd Req CLS->CSC 000013 20010607 22:26:57 02035.SLS0602I SOURCE: CELL 001:18:02:15
Comnd Rsp CLS<-CSC 000045 20010607 22:26:58 10001
Comnd Req CLS->CSC 000013 20010607 22:27:01 02033.SLS0602I DESTINATION: DRIVE 0A23
Comnd Rsp CLS<-CSC 000045 20010607 22:27:02 10001
Comnd Req CLS->CSC 000000 20010607 23:16:01 02073.CLS3700 CLS system Shutting down due to
                                     STOP ALL command issued by SMYTHE1
SCS0155I Condition Code for Utility Function is 0
  
```

**Figure 11. Event Log Report Utility Sample Output with VM-Based LCS-Formatted Event Log**

## Configuration Verification Utility

The Configuration Verification utility allows you to verify and report on the following resources:

- User-selected startup parameters
- Device esoteric definitions
- LCS configuration compatibility

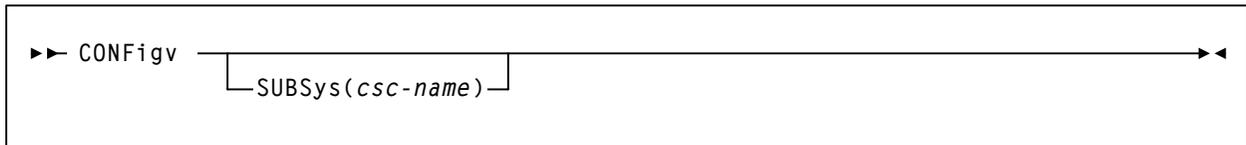
The Configuration Verification utility is primarily used to verify the values specified for the startup parameters at initialization time. If the optional SUBSYS parameter is specified, the Configuration Verification utility is used to verify that the LCS configuration is compatible with what is defined in the startup parameters.

The MVS/CSC modules must be installed before you can use the Configuration Verification utility.

### CONFIGV Control Statement

#### Syntax

The syntax of the CONFIGV control statement is:



#### Parameter Descriptions

This section describes the value you can specify with the CONFIGV control statement.

#### SUBSYS

Specifies the MVS/CSC subsystem name to test the LCS.

#### *csc-name*

specifies the name of the MVS/CSC subsystem as defined in the IEFSSNyy member of SYS1.PARMLIB.



**Note:** If you specify the SUBSYS parameter, both the MVS/CSC and LCS must be running.

## Example of CONFIGV Control Statement

The following example shows a control statement used to invoke the Configuration Verification utility for subsystem CSC1:

```
CONF SUBS(CSC1)
```

In this example, the Configuration Verification utility generates a report on the status of the MVS/CSC installation.

## Sample JCL

Figure 12 shows sample JCL used to invoke the Configuration Verification utility.

```
//CSCØCFGV JOB ACCT,PGMR
//STEPØ EXEC PGM=SCUADMIN,PARM='MIXED,DATE=4YR'
//STEPLIB DD DISP=SHR,DSN=your.SCSLINK
// DD DISP=SHR,DSN=your.TCPLINK /* optional TCP load modules */
// DD DISP=SHR,DSN=your.SACLINK
// DD DISP=SHR,DSN=your.CSLLINK
//SCSPARM DD DISP=SHR,DSN=your.parmlib(csc-parm-member)
//SCSPRINT DD SYSOUT=*
//SCSIN DD *
CONFIGV [SUBS(CSC1)]
/*
//
```

**Figure 12. Sample JCL for Configuration Verification Utility**

The JCL to invoke the Configuration Verification utility is contained in sample members JCLCFGV1 and JCLCFGV2 in the SAMPLIB library.



### Notes:

- If you are running MVS/CSC and MVS/HSC on the same MVS system, the STEPLIB DD statement that identifies the MVS/CSC load libraries is required (see Figure 12). If you omit the STEPLIB DD statement, unpredictable MVS/CSC operations may occur.
- If you installed the MVS/CSC into the HSC and LibraryStation CSI, all references to SACLINK must point to the LibraryStation's SACLINK data set.

## Sample Output

Output resulting from the execution of the Configuration Verification utility includes:

- A listing of input control statements with appropriate messages when syntax errors occur. Sample output is shown in Figure 13.
- A formatted printout of MVS/CSC startup parameters verified (when all parameters are valid). Sample output is shown in Figure 14 on page 78.
- A formatted printout of MVS/CSC startup parameters verified including error conditions for invalid parameters. Sample output is shown in Figure 15 on page 79.

```
SCUADMIN (5.1.0)   StorageTek MVS Client/Server System Utility   PAGE 001
TIME 10:51:02           Control Card Image Listing           DATE 2002-06-07

CONF SUBS(CSC1)
```

**Figure 13. Configuration Verification Utility Sample Output-Input Control Statement**

```

*****
*****
SERVER(LS) * SERVER TYPE
LIBDEV(LIB0,LIB1) * LIBRARY ESOTERIC
NONLIB(NLIB) * NON-LIB ESOTERIC
LIBUNIT(10A0,10A1,10A2,10A3, - * LIBRARY DEVICES
        10A4,10A5,10A6,10A7, - * LIBRARY DEVICES
        10B0,10B1,10B2,10B3, - * LIBRARY DEVICES
        10B4,10B5,10B6,10B7) * LIBRARY DEVICES
UNITMAP(10A0,00:00:8:6,10A1,00:00:8:5, - * UNIT MAPPINGS
        10A2,00:00:8:8,10A3,00:00:8:7, - * UNIT MAPPINGS
        10A4,00:00:9:6,10A5,00:00:9:5, - * UNIT MAPPINGS
        10A6,00:00:9:8,10A7,00:00:9:7, - * UNIT MAPPINGS
        10B0,01:00:8:6,10B1,01:00:8:5, - * UNIT MAPPINGS
        10B2,01:00:8:8,10B3,01:00:8:7, - * UNIT MAPPINGS
        10B4,01:00:9:6,10B5,01:00:9:5, - * UNIT MAPPINGS
        10B6,01:00:9:8,10B7,01:00:9:7) * UNIT MAPPINGS
*
COM(TCPIP) * TCPIP COMMUNICATIONS
COMPRFX('') * MVS/CSC COMMAND PREFIX
MSGCASE(MIXED) * OUTPUT CASE
DELDISP(NOSCRATCH) * DELETE DISPOSITION
SCRLABL(SL) * SCRATCH LABEL TYPE
DEFER(NO) * DEFERRED MOUNTS
TCPNAME(TCPIP) * IBM's TCP/IP ADDRESS SPACE NAME
INTERNET(129.80.41.126) * INTERNET ADDRESS
TRACDEST(LOG) * TRACE DESTINATION
Trace(YES) * TRACE ACTIVITY
TREQDEF(MY.TAPEREQ.FILE) * TAPEREQ DEFINITIONS
LOG(RESET) * LOGGING OPTION

SCS0159I MVS/CSC Startup parameters verified
SCS0155I Condition code for utility function is 0
    
```

Figure 14. CONFIGV Sample Output - All Parameters Valid (MVS-Based LCS with TCP/IP)

```

*****
*****
SERVER(LS) * SERVER TYPE
LIBDEV(LIB0,LIB1) * LIBRARY ESOTERIC
NONLIB(NLIB) * NON-LIB ESOTERIC
LIBUNIT(1A00,10A1,10A2,10A3, - * LIBRARY DEVICES
        10A4,10A5,10A6,10A7, - * LIBRARY DEVICES
        10B0,10B1,10B2,10B3, - * LIBRARY DEVICES
        10B4,10B5,10B6,10B7) * LIBRARY DEVICES
UNITMAP(10A0,00:00:8:6,10A1,00:00:8:5, - * UNIT MAPPINGS
        10A2,00:00:8:8,10A3,00:00:8:7, - * UNIT MAPPINGS
        10A4,00:00:9:6,10A5,00:00:9:5, - * UNIT MAPPINGS
        10A6,00:00:9:8,10A7,00:00:9:7, - * UNIT MAPPINGS
        10B0,01:00:8:6,10B1,01:00:8:5, - * UNIT MAPPINGS
        10B2,01:00:8:8,10B3,01:00:8:7, - * UNIT MAPPINGS
        10B4,01:00:9:6,10B5,01:00:9:5, - * UNIT MAPPINGS
        10B6,01:00:9:8,10B7,01:00:9:7) * UNIT MAPPINGS
*
COM(TCPIP) * TCPIP COMMUNICATIONS
COMPRFX('/') * MVS/CSC COMMAND PREFIX
MSGCASE(MIXED) * OUTPUT CASE
DELDISP(NOSCRTH) * DELETE DISPOSITION
SCRLABL(SL) * SCRATCH LABEL TYPE
SMSA(OFF) * CSC/DFSMS INTERFACE
SMSM(OFF) * DISP=MOD SMS DATASET PROCESSING
DEFER(YEA) * DEFERRED MOUNTS
TCPNAME(TCPIP) * IBM's TCP/IP ADDRESS SPACE NAME
INTERNET(129.80.41.126) * INTERNET ADDRESS
TRACDEST(LOG) * TRACE DESTINATION
Trace(YES) * TRACE ACTIVITY
TREQDEF(MY.TAPEREQ.FILE) * TAPEREQ DEFINITIONS
X02SUB(HONOR) * HONOR UX02 ESOTERIC SUBSTITUTION
X08SUB(HONOR) * HONOR UX08 ESOTERIC SUBSTITUTION
LOG(RESET) * LOGGING OPTION

SCS0836E SCSPARM parameter DEFER value invalid; must be YES, NO, or JES3
SCS0723E Library device 1A00 supplied in the SCSPARM LIBUNIT parameter not
        contained in any ACS esoteric
SCS0155I Condition code for utility function is 8
    
```

Figure 15. CONFIGV Sample Output - Some Invalid Parameters (MVS-Based LCS with TCP/IP)

## Scratch Update Utility

The Scratch Update utility accepts a list of volume serial numbers and generates a message to the LCS. The message directs the LCS to either add or delete the volume serial numbers from the existing scratch list contained in the LCS database.

The Scratch Update utility must be run with both the MVS/CSC and the LCS systems running.

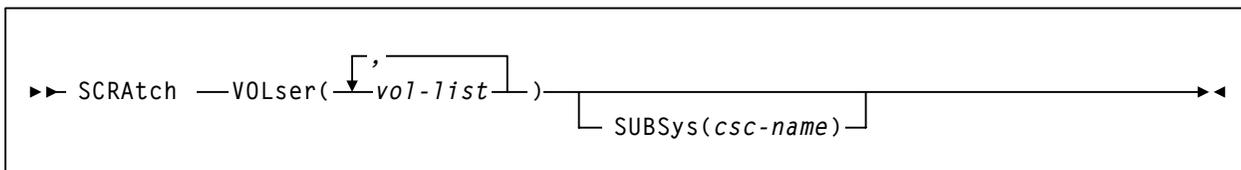


**Note:** Virtual Storage Manager (VSM) support has been added for the Scratch Update utility function. Refer to the VTCS customer documentation for more information.

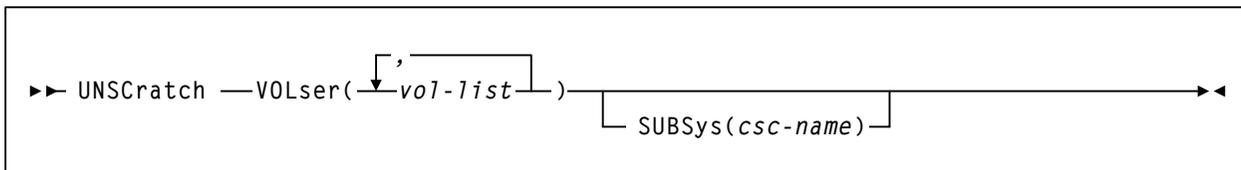
### SCRATCH and UNSCRATCH Control Statements

#### Syntax

The syntax of the SCRATCH control statement is:



The syntax of the UNSCRATCH control statement is:



#### Parameter Descriptions

This section describes the values you can specify with the SCRATCH and UNSCRATCH control statements.

##### **VOLSER**

Specifies the volume serial numbers to be added to or deleted from the scratch list.

*vol-list* is a list of volume serial numbers to be added to or deleted from the scratch list. The values specified can consist of a list of volume serial numbers, ranges of volume serial numbers, or combinations of lists and ranges delimited by commas.

##### **SUBSYS**

Specifies the name of the MVS/CSC subsystem to receive the scratch transaction. The default is the first active MVS/CSC subsystem in the SSCVT chain.

*csc-name* specifies the name of the MVS/CSC subsystem as defined in the IEFSSNyy member of SYS1.PARMLIB.

## Example of UNSCRATCH Control Statement

The following example shows a control statement used to invoke the Scratch Update utility:

```
UNSC VOL(U01180,U01183-U01185) SUBS(CSC0)
```

## Sample JCL

Figure 16 shows sample JCL used to invoke the Scratch Update utility.

```
//CSC0SCUP JOB ACCT,PGMR
//STEP0 EXEC PGM=SCUADMIN,PARM='MIXED,DATE=4YR'
//STEPLIB DD DISP=SHR,DSN=your.SCSLINK
// DD DISP=SHR,DSN=your.TCPLINK /* optional TCP load modules */
// DD DISP=SHR,DSN=your.SACLINK
// DD DISP=SHR,DSN=your.CSLLINK
//SCSPRINT DD SYSOUT=*
//SCSIN DD *
 SCRA VOLSER(vol-list) [SUBSYS(csc-name)]
/* or
 UNSC VOLSER(vol-list) [SUBSYS(csc-name)]
/*
//
```

**Figure 16. Sample JCL for Scratch Update utility**

The JCL to invoke the Scratch Update utility is contained in sample member JCLSCRUP in the SAMPLIB library.



### Notes:

- If you are running MVS/CSC and MVS/HSC on the same MVS system, the STEPLIB DD statement that identifies the MVS/CSC load libraries is required (see Figure 16). If you omit the STEPLIB DD statement, unpredictable MVS/CSC operations may occur.
- If you installed the MVS/CSC into the HSC and LibraryStation target and distribution zones, all references to SACLINK must point to the LibraryStation's SACLINK data set.

## Sample Output

Output resulting from execution of the Scratch Update utility includes the following:

- A listing of input control statements with appropriate messages when syntax errors occur. Sample output is shown in Figure 17 on page 82.
- Messages indicating any errors encountered during execution of the utility. Sample output is shown in Figure 18 on page 82.
- Messages indicating successful scratching or unscratching of specific volumes. Sample output is shown in Figure 18 on page 82.
- An update to the LCS database reflecting cartridges added to or deleted from the scratch lists.

```
SCUADMIN (5.1.0)  StorageTek MVS Client/Server System Utility      PAGE001
TIME 10:51:02      Control Card Image Listing                          DATE 2002-01-07

SCRA VOL(104212,104214,VACANT)
```

**Figure 17. Scratch Update Utility Sample Output-Input Control Statement**

```
SCUADMIN (5.1.0)  StorageTek MVS Client/Server System Utility      PAGE 002
TIME 10:51:02      Scratch Update                          DATE 2002-01-07

SCS0167I Volume 104212 successfully added to library as scratch
SCS0168I Volume 104214 successfully deleted from library scratch pool
SCS0163E Volume VACANT not in library or not in LCS Scratch Subpool definition
SCS0155I Condition code for utility function is 4
```

**Figure 18. Scratch Update Utility Sample Output-Messages**

## Scratch Conversion Utility

The Scratch Conversion utility allows a tape management system to indicate to the LCS which of its volumes are in scratch status. The Scratch Conversion utility is invoked by the SCUCONDB program. It is the only MVS/CSC utility not invoked by SCUADMIN. You can run the Scratch Conversion utility regardless of whether or not the MVS/CSC is running.

SCUCONDB processes the CA-1 Tape Management Catalog (TMC), the CA-DYNAM/TLMS Volume Master File (VMF), the DFSMSrmm report extract file, or the Zara database, and selects the volume serial numbers for processing based on information specified on the PARM parameter of the JCL EXEC statement.

For CA-1, CA-DYNAM/TLMS, and DFSMSrmm, SCUCONDB calls the appropriate tape management system database READ routine to produce a list of volume serial numbers for scratch cartridges. For Zara, SCUCONDB invokes the SCUDRZAR module, which in turn invokes an application programming interface (API) to read Zara's database and produce a list of volume serial numbers for scratch cartridges. The format of these lists is acceptable as input to the Scratch Update utility.

The following list describes the READ routines that are called for the CA-1, CA-DYNAM/TLMS, DFSMSrmm, and Zara tape management systems.

#### **SCUDRCA1**

Called to read the CA-1 TMC when CA-1 is defined as the tape management system. This routine uses CA-1 macros to map the layout of the TMC.

#### **SCUDRTL**

Called to read the CA-DYNAM/TLMS VMF when CA-DYNAM/TLMS is defined as the tape management system. This routine uses a CA-DYNAM/TLMS COPY member to map the layout of the VMF.

#### **SCUDRRMM**

Called to read the DFSMSrmm report extract file when DFSMSrmm is defined as the tape management system. This routine uses the DFSMSrmm EDGRVEXT macro to map the layout of the report extract file.

#### **SCUDRZAR**

Called to invoke an API to read Zara's database when Zara is defined as the tape management system.

If your installation uses a different tape management system, you can develop a program (using the source code provided in the sample library) to process the tape management system database into a format acceptable for the Scratch Update utility. Alternatively, you can manually generate the control statements and run the Scratch Update utility stand-alone.

SCUCONDB, SCUDRCA1, SCUDRTL, SCUDRRMM, and SCUDRZAR are provided as load modules. You can use the current versions of these load modules with CA-DYNAM/TLMS Release 5.4 and above, CA-1 Release 5.0 and above, DFSMSrmm 1.1, and Zara 1.2. The MVS/CSC SAMPLIB file on the base installation tape contains the sample source code.



#### **Notes:**

- If there are local modifications to your tape management system, you must reassemble the associated READ routine.
- If your tape management system is CA-1 Release 4.9 or below, you must modify and reassemble the SCUDRCA1 routine. See “Using SCUCONDB with CA-DYNAM/TLMS Release 5.3 or Below” for information about modifying and reassembling this routine.
- If your tape management system is CA-DYNAM/TLMS Release 5.3 or below, you must reassemble the SCUDRTL routine. See “Using SCUCONDB with

CA-DYNAM/TLMS Release 5.3 or Below” for information about reassembling this routine.

- If your tape management system is Zara, the SCUCONDB utility must be able to access the data set that contains the Zara API module (ZARAAPI1). You can either store this module in the LINKLIST, or include a JOBLIB or STEPLIB DD statement in the SCUCONDB JCL that points to the library containing the module.
- Any routine that you modify and reassemble must be re-linked as non-reentrant (NORENT parameter) with AMODE=24 and RMODE=24.

### **Using SCUCONDB with CA-1 Release 4.9 or Below**

To use SCUCONDB with CA-1 Release 4.9 or below, you must modify and reassemble the SCUDRCA1 routine. The CA-1 MACLIB containing the TMRECORD MACRO must be accessible during the assembly.

Perform the following steps for CA-1 Release 4.9:

1. Delete the asterisk in column 1 of the following line:

```
TMRECORD
```

2. Add an asterisk in column 1 of the following line:

```
TMMTMREC
```

3. Reassemble the SCUDRCA1 routine.

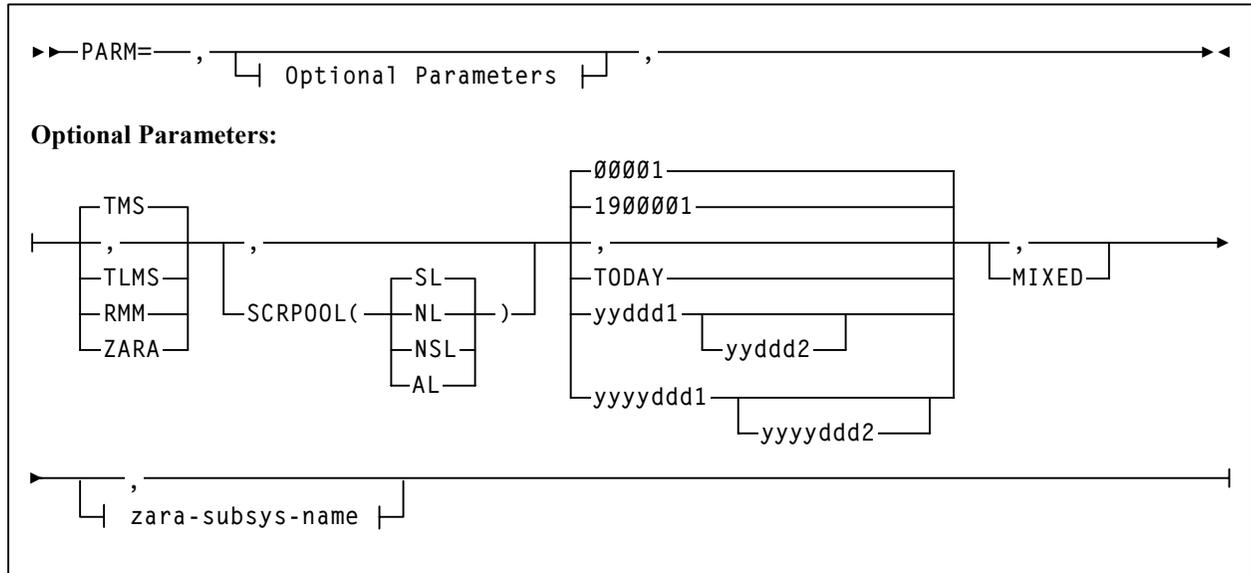
### **Using SCUCONDB with CA-DYNAM/TLMS Release 5.3 or Below**

Perform the following steps to use SCUCONDB with CA-DYNAM/TLMS Release 5.3 or below:

1. Verify that the CA-DYNAM/TLMS Release 5.3 MACLIB containing the VMFBASE MACRO is accessible for the re-assembly of the SCUDRTL routine.
2. Reassemble the SCUDRTL routine; no modifications to the source code are required.

## Specifying Values for the PARM Parameter

You can specify the following values for the PARM parameter on the JCL EXEC statement when running the Scratch Conversion utility.



The keywords for the PARM parameter are positional. If the PARM parameter is not specified, default values are used.

### Parameter Descriptions

This section describes the values you can specify for the PARM parameter on the JCL EXEC statement.

#### TMS

Specifies the CA-1 tape management system.

This is the default value.

#### TLMS

Specifies the CA-DYNAM/TLMS tape management system.

#### RMM

Specifies the DFSMSrmm tape management system.

#### ZARA

Specifies the Zara tape management system.

## SCRPOOL

Specifies the label type for the scratch pool used by the MVS/CSC. The value specified for this keyword must match the value specified for the SCRLABL startup parameter. Acceptable values are:

**SL** specifies standard label. This is the default value.

**NL** specifies non-labeled.

**AL** specifies ANSI label.

**NSL** specifies non-standard label.

## 00001|1900001

Specifies January 1, 1900 as the date. This is the default date and can be specified in either two-year (00001) or four-year (1900001) format.



**Note:** You must specify a four-year format for year 2000 dates. For example, specify 2000001 for January 1, 2000.

## TODAY

Specifies the current system date.

## *yyddd1|yyyyddd1*

Specifies a single date in either two-year or four-year format. This date becomes the *from* date. The *to* date is the current system date (which is not specified). All dates must be specified in Julian notation (year-day).

## *yyddd1 - yyddd2|yyyyddd1-yyyddd2*

Specifies a range of dates in which the volumes became scratch. You can specify either a two-year or four-year format for the range of dates. Neither date specified can be greater than the current system date, and the first date cannot be greater than the second date.



**Note:** A comma (,) or no keyword (blank) results in the system default date of January 1, 1900 (00001|1900001).

## MIXED

Specifies to print all report headings and messages in mixed-case characters (uppercase and lowercase).



**Note:** A comma (,) or no keyword (blank) results in headings and messages being printed in uppercase characters.

## *zara-subsys-name*

Specifies the subsystem name for the Zara tape management system, where *zara-subsys-name* is the four-character name. The default subsystem name is ZARA.

This parameter is required for the Zara tape management system since SCUCONDB does not read the Zara database directly. This parameter is ignored if specified for any other tape management system.

## Sample JCL

The following definitions apply to the JCL used for the Scratch Conversion utility to process scratch report files.

### SCSTMS

Input to the Scratch Conversion utility in the form of the CA-1 TMC, the CA-DYNAM/TLMS VMF, or the DFSMSrmm report extract file.

For Zara, you must specify a DUMMY DD for SCSTMS, because SCUCONDB does not read the Zara database directly. For example:

```
//SCSTMS DD DUMMY
```

### SCSSOUT

Output from the Scratch Conversion utility specifying the Scratch Update utility control statement.

### SCSPRINT

Output messages from the Scratch Conversion utility program.

If Zara is the tape management system, the Zara API module must either reside in the MVS LINKLIST, or you must include one of the following JCL statements to access the module.

```
//STEPLIB DD DISP=SHR, DSN=your.zaraapi1.library
           or
//JOB LIB DD DISP=SHR, DSN=your.zaraapi1.library
```

Figure 19 shows sample JCL used to invoke the Scratch Conversion utility to process the CA-DYNAM/TLMS VMF for all tapes scratched in 1998.

```
//SCUCNVT JOB ACCT,PGMR
//STEP0 EXEC PGM=SCUCONDB,PARM='TLMS,,1998001-1998365'
//STEPLIB DD DISP=SHR,DSN=your.SCSLINK
//SCSTMS DD DISP=SHR,DSN=your.tlms.database
//SCSSOUT DD DISP=(NEW,KEEP),DSN=scratch.update.trans,
//          SPACE=(TRK,(5,1)),UNIT=SYSDA
//SCSPRINT DD SYSOUT=*
/*
```

**Figure 19. Sample JCL for Scratch Conversion Utility**

The JCL to invoke the Scratch Conversion utility is contained in sample member JCLCONDB in the SAMPLIB library.



**Note:** If you are running MVS/CSC and MVS/HSC on the same MVS system, the STEPLIB DD statement that identifies the MVS/CSC load library is required (see Figure 19). If you omit the STEPLIB DD statement, unpredictable MVS/CSC operations may occur.

## Sample Output

Output resulting from the execution of the Scratch Conversion utility includes:

- Messages associated with error conditions resulting from an unsuccessful attempt to execute scratch conversion processing.
- Messages indicating errors or actions occurring during processing.
- An output data set containing Scratch Update utility control statements.

For example, Figure 20 shows the output that would be produced if an output data set contained the following Scratch Update utility control statement.

```
SCRATCH VOLS(U01180,U01181,U01187,U01188)
```

```
SCUCONDB      StorageTek MVS Client/Server Conversion Utility      Page 002
Time 10:51:02                                     Date 2002-01-07

SCS0286I 00004 volumes have been selected
SCS0155I Condition code for utility function is 0
```

**Figure 20. Scratch Conversion Utility Sample Output-Messages**

# Chapter 8. MVS/CSC User Exits for JES Without TAPE SETUP Processing

---

## Overview

This chapter describes the user exits provided with MVS/CSC for JES2 environments and JES3 environments running without TAPE SETUP processing. If you are running the MVS/CSC in a JES3 environment with TAPE SETUP processing, see Chapter 9, “MVS/CSC User Exits for JES3 With TAPE SETUP Processing” on page 117 for information about the user exits provided for that environment.



### Notes:

- Refer to the *Storage Management Component (SMC) Configuration and Administration Guide* for information on TAPEREQ and user exit interaction.
- Virtual Storage Manager (VSM) support has been added for certain MVS/CSC user exits. Refer to the VTCS customer documentation for more information.

The following user exits are described in this chapter:

#### **Job Processing User Exit (SCSUX01)**

This exit is invoked for all MVS console messages. It can be used to automate mounts and dismounts for non-standard tape management system messages, to automate replies to WTORs, and to specify subpooling for scratch mount requests.

#### **Scratch Allocation User Exit (SCSUX02)**

This exit is used to influence allocation and selection of transports to satisfy a non-specific (scratch) volume request. It is also used to specify subpooling for scratch allocation requests.

#### **Programmatic Interface (PGMI) Authorization User Exit (SCSUX05)**

This exit is used to perform authorization checking of PGMI requesting programs.

#### **Specific Volume Allocation User Exit (SCSUX08)**

This exit is used to influence allocation and selection of transports to satisfy a specific volume request.

#### **Deferred Mount User Exit (SCSUX09)**

This exit is used to determine whether or not MVS mount messages are deferred until a data set is opened. The value specified in this exit overrides the setting on the DEFer startup parameter.

### **Unit Affinity Separation User Exit (SCSUX10)**

This exit is used to determine whether or not unit affinity separation and/or GDG ALL separation occurs for specific volume requests.

## **User Exit Implementation**



**Note:** User exits 2, 8, 9, and 10 are managed by the MVS/CSC but invoked by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

User exits are implemented using either of the following methods:

- Replacing the StorageTek supplied dummy entry in the executables library with a locally assembled and link-edited copy.
- Concatenating a library containing a local version of the user exit in front of the MVS/CSC executable library in the STEPLIB DD statement of the MVS/CSC cataloged procedure.

If you choose the second method, the library containing the exits must be authorized even though the user exit routines do not require authorization.

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 the following sections.

## User Exits and Scratch Subpooling

Tape management systems, such as CA-1 (TMS), CA-DYNAM/TLMS, DFSMSrmm, and Zara allow definition of relationships between job names or data set names and cartridge volume serial numbers. This concept is sometimes referred to as scratch subpooling. When scratch subpooling is used, the tape management system only allows certain scratch mounts to be satisfied by cartridges in qualified scratch subpools.

Scratch subpooling can be facilitated by using both MVS/CSC user exits in conjunction with the definitions of scratch subpools in the tape management system and the Library Control System (LCS).

- User exits SCSUX01 and SCSUX02 are used to implement scratch subpooling.
- SCSUX01 is called at volume mount time to select a scratch volume. The subpool information provided by SCSUX01 allows the selection of a tape volume from the correct subpool.
- SCSUX02 is called at device allocation time to select a scratch volume of the correct subpool type.



### Notes:

- The MVS/CSC supports subpool specification by name using the SUBPool keyword parameter on the TAPEREQ control statement. See the *MVS/CSC Configuration Guide* for more information about the TAPEREQ control statement.
- See Chapter 4, “Tape Management System Interface” on page 31 for more information about the Tape Management System and scratch subpooling.

## Job Processing User Exit (SCSUX01)

This exit is provided to allow installations with tape management systems other than CA-1 (TMS), CA-DYNAM/TLMS, DFSMSrmm, or Zara to interface with the MVS/CSC.

Each installation should examine all WTOs and WTORs issued by their tape management system and, if action is required, direct the subsystem to perform the necessary operation by setting values in the parameter list passed to it.

Use this exit to perform automated mounts of scratch cartridges from different scratch subpools or of label types other than the library scratch label type. You can also use this exit to automate responses to WTOR-type messages.

This exit is invoked for every WTO or WTOR issued in the MVS host system. The exit should evaluate the message and, if owned by the exit, fill in the appropriate fields in the parameter list.

### Entry Specifications

Upon entry to SCSUX01, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX01

### Return Specifications

Return specifications for the SCSUX01 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code (hexadecimal)

## Return Codes

Return codes for the SCSUX01 user exit are shown in the following table.

Return Code	Description
0	The MVS/CSC interprets the message.
4	The message is interpreted by the user exit. The MVS/CSC follows user exit direction.
64	The user exit is not operational. The message is interpreted by the MVS/CSC.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	0	SCSUX01P	Job Processing Parameter List	I
A	0	0	4	UX01WQE	Address of MVS WQE for messages	I
A	4	4	4	UX01USER	Address of USERDATA parameter value	I
F	8	8	4	UX01ULEN	Length of USERDATA value	I
C	12	C	1	UX01FUNC	Function code	O
			C'1'	UX01MNT	Mount a cartridge	O
			C'2'	UX01DMNT	Dismount a cartridge	O
			C'3'	UX01SWAP	Swap cartridge FROM xxx TO yyy (JES2 only)	O
			C'4'	UX01RPLY	Reply to a message*	O
			C'5'	UX01NOP	No operation to be performed	O
X	13	D	1	UX01OPEN	Operator intervention flag	O
			X'10'	UX01ON	Operator intervention requested	O
C	14	E	6	UX01VOLS	Volume serial number of cartridge	O
C	20	14	1	UX01RPTX	Reply text area*	O
C	21	15	7		Reserved	O
X	28	1C	2	UX01REID	Message reply ID*	O
C	30	1E	1	UX01DISP	Disposition of volume	O
			C'K'	UX01KEEP	Keep volume	O
			C'D'	UX01DELT	Delete volume	O

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
X	31	1F	1	UX01LABT	Label type	O
			X'00'	UX01DFLT	Library default label type	O
			X'01'	UX01SL	Standard label (SL)	O
			X'02'	UX01AL	ANSI label (AL)	O
			X'03'	UX01NL	Non-labeled (NL)	O
			X'04'	UX01NSL	Non-standard label (NSL)	O
C	32	20	4	UX01FUNT	Mount/dismount/swap from unit address (JES2 only)	O
C	36	24	4	UX01TUNT	Swap to unit address (JES2 only)	O
X	40	28	1	UX01SSUB	Scratch subpool to be performed	O
X	41	29	3		Reserved	
X	44	2C	4	UX01RID2	Reply ID for 4-digit reply*	O
			48	UX01L	Length of user exit 01 parameter list	

\* Services not available for this version of MVS/CSC.

## Programming Considerations

- The exit routine should examine each message, set the operation to be performed in UX01FUNC, and fill in the appropriate fields that apply to the function.
- The MVS/CSC does not perform automated mounts, dismounts, or swaps (JES2 only) for transports not under its control. Invoking SCSUX01 for actions directed against any transports not known to the MVS/CSC through its LIBUNIT startup parameter results in no operation being performed.
- In a multiple MVS/CSC subsystem environment, each active MVS/CSC subsystem invokes SCSUX01 separately. When using the same version of SCSUX01 for all MVS/CSC subsystems, each invocation may direct the MVS/CSC to perform a particular operation. Only the MVS/CSC handling that library transport actually performs the operation.
- The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

## Examples

In the following example, the user exit is set to mount a scratch cartridge from the scratch pool of the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB TO ZERO.
set UX01LABT to UX01DFLT.
```

In the following example, the user exit is set to mount a scratch cartridge from a scratch subpool of the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB to subpool index.
set UX01LABT to UX01DFLT.
```

In the following example, the user exit is set to mount a scratch cartridge from the scratch subpool of a label type different than the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB to subpool index.
set UX01LABT to label type.
```

In the following example, the user exit is set to mount a specific cartridge.

```
set UX01FUNC to C'1'.
set UX01VOLS to appropriate VOLSER for specific request.
set UX01FUNT to drive address.
set UX01LABT to label type.
```

In the following example, the user exit is set to dismount a cartridge.

```
set UX01FUNC to C'2'.
set UX01FUNT to drive address.
set UX01DISP to disposition.
```

In the following example, the user exit is set to swap a cartridge. Swap processing occurs only in JES2 environments.

```
set UX01FUNC to C'3'.  
set UX01FUNT to drive address.  
set UX01TUNT to TO drive address.
```

In the following example, the user exit is set to allow for operator intervention.

```
set UX01FUNC to C'5'.  
set UX01OPIN to UX01ON.  
set UX01VOLS to cartridge serial number.  
set UX01FUNT to FROM drive address.  
set UX01TUNT to TO drive address.  
set UX01LABT to label type.
```

## Scratch Allocation User Exit (SCSUX02)

The scratch allocation user exit (SCSUX02) allows you to specify values that influence device allocation based on installation-dependent criteria. SMC allocation invokes SCSUX02 providing it with the job name, data set name, DD name, step name, procedure step name, address of job accounting information, address of step accounting information, and the text specified in the USERdata startup parameter.



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

SCSUX02 is invoked for each MVS/CSC subsystem in a multiple MVS/CSC subsystem environment. The copy in use is that of the first active MVS/CSC (in SSCVT order).

### Entry Specifications

Upon entry to SCSUX02, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX02

### Return Specifications

Return specifications for the SCSUX02 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX02 user exit are shown in the following table.

Return Code	Description
0	No user technique specified.
4	Request eligible transports based on the server device list returned during drive exclusion.
8	Request non-library transports to satisfy allocation request.
12	Either library or non-library transports can be used to satisfy allocation request; library transports are preferred.
16	Request esoteric substitution.
20	Direct allocation of transports to a specific ACS or MVS/CSC subsystem.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX02 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session.

When the user specifies the first or third scratch technique (return code 4 or 12), a scratch subpool index and label type or a specified MVS/CSC subsystem name (for multiple MVS/CSC subsystems) may also be returned to permit drive prioritization to prefer the transports in the LSM with the greatest number of scratch volumes of that subpool and label type and of a particular MVS/CSC.

When the user specifies the fifth scratch technique (return code 20), a specific MVS/CSC subsystem name must be supplied and an ACS ID might optionally be returned. If a non-zero ACS ID is not returned, ACS0 is assumed.

When running with the HSC (on the same MVS host system), the HSC JES2 Scratch Allocation user exit (SLSUX02) must be used in conjunction with this MVS/CSC user exit to cause the desired results.

### Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	0	SCSUX02P	Scratch Allocation Parameter List	I
C	0	0	4	UX02UX02	Acronym	I
F	4	4	4	UX02LEN	Length of UX02 parameter list	I
A	8	8	1	UX02SUBP	Subpool number	I
			230	UX02SPID	Subpool ID	I
A	9	9	1	UX02KEY	Storage protect key	I
H	10	A	2		Reserved	
C	12	C	8	UX02JOBNAME	Job name	I
C	20	14	8	UX02STPN	Step name	I
C	28	1C	8	UX02PRSN	Procedure step name	I
C	36	24	8	UX02DDN	DD name	I
A	44	2C	4	UX02USER	Address of USERDATA parameter value	I
F	48	30	4	UX02ULEN	Length of USERDATA parameter value	I
A	52	34	4	UX02JACC	Address of Job accounting information	I
A	56	38	4	UX02SACC	Address of Step accounting information	I
C	60	3C	44	UX02DSN	Data set name	I
X	104	68	1	UX02SSUB	Scratch subpool	O
X	105	69	1	UX02LABT	Label type	O
			X'00'	UX02LBDF	Library default label type	O
			X'01'	UX02LBSL	Standard label (SL)	O
			X'02'	UX02LBAL	ANSI label (AL)	O
			X'03'	UX02LBNL	Non-labeled (NL)	O
			X'04'	UX02LBNS	Non-standard label (NSL)	O
C	106	6A	3	UX02XPDT	Data set expiration date from JFCB	I
C	109	6D	3		Reserved	
C	112	70	8	UX02ESO	Esoteric name to substitute in place of what is specified in the JCL	O
C	120	78	4	UX02CSCN	MVS/CSC subsystem to process	O
C	124	7C	1	UX02ACS	ACS ID for substitution	O
C	125	7D	13	UX02SNAM	Scratch subpool name	O

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
A	140	8C	4	UX02JFCB	Address of JFCB	I
D	144	90			Round out to double word	
			144	UX02LSTL	Length of user exit 02 parameter list	

### Programming Considerations

The StorageTek-supplied version of SCSUX02, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.



**Note:** A scratch subpool (UX02SSUB) value of X'00' is designated to be the “default” subpool. If SCSUX02 returns a UX02SSUB value of X'00', it **must** also return the “default” label type (UX02LBDF=X'00'). Likewise, the default label type is UX02LBDF and it must return the default subpool (UX02SSUB=X'00').

### Examples

In the following example, the user exit instructs the SMC to direct the allocation for a scratch request to non-library devices.

```
set Register 15 to 8.
```

In the following example, the user exit instructs the SMC to direct the allocation to the library transports controlled by MVS/CSC subsystem CSC1. The devices in the LSM with the most standard-labeled scratch volumes of subpool 2 should be preferred.

```
set Register 15 to 20.
set UX02CSCN to 'CSC1'.
set UX02ACS to 1.
set UX02SSUB to 2.
set UX02LABT to UX02LBSL.
```

## Programmatic Interface Authorization User Exit (SCSUX05)

The Programmatic Interface (PGMI) Authorization user exit (SCSUX05) allows you to perform authorization checking of programs requesting PGMI services. If the user exit disables itself (setting return code UX05NOPR) or abends, the MVS/CSC allows all programs to issue the query and read requests. In addition, you can use the SCSUX05 to interface with existing security products (i.e., RACF).

SCSUX05 is invoked for all requests received from the programmatic interface. SCSUX05 should evaluate the request and set a return code to indicate whether or not the MVS/CSC should allow the request to be executed. This exit is called from a non-space switch program call (PC) in the requestor's address space under the requestor's request block (RB).

### Entry Specifications

Upon entry to SCSUX05, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX05

### Return Specifications

Return specifications for the SCSUX05 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code (hexadecimal)

## Return Codes

Return codes for the SCSUX05 user exit are shown in the following table.

Return Code	Description
0	Allow the request.
4	Deny the request.
40	User exit is not operational. <b>Note:</b> MVS/CSC will not call the exit again.

The StorageTek supplied version of SCSUX05 sets the return code to 40, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX05.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	(0)	DSECT	SCSUX05P	PGMI Authorization Parameter List	I
A	0	(0)	4	UX05HDR	Eyecatcher	I
			C'UX05 ,	UX05ID		
A	4	(4)	4	UX05LEN	Length of UX05 parameter list	I
			230	UX05SPID	Subpool ID	I
A	8	(8)	4	UX05REQA	SCSXREQM parameter list address	I
F	12	(C)	4	UX05USER	User word - initially zero; passed from invocation to invocation. It can be used as an anchor for a user control block.	I
F	16	10	4	UX05UDAT	Address of USERDATA parameter value from MVS/CSC startup parameter.	I
F	20	14	4	UX05ULEN	Length of USERDATA parameter value	I
F	24	18	8	UX05RESV	Reserved	

## 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 can change the contents. After an IPL or MVS/CSC COLD start, the contents of the word is initially zero; otherwise the contents are maintained across MVS/CSC startups. If the user word is used as a pointer, the area pointed to should be in common storage.



**Note:** There is no serialization provided. The user exit can be executing simultaneously under two task control blocks (TCBs). The user exit might want to serialize updates to any work area in which the user word might point to.

## Specific Volume Allocation User Exit (SCSUX08)

The specific volume allocation user exit (SCSUX08) allows modification of the actions the SMC takes during the allocation of a specific volume DD statement that references cartridge transports. Use this exit to:

- Change the esoteric name (unit name) used for device allocation
- Request allocation of non-library transports
- Request allocation of library transports
- Indicate a specific MVS/CSC subsystem name to use for allocation
- Bypass drive exclusion logic



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

User exit SCSUX08 is called for every allocation request for a specific volume to be mounted on a cartridge transport.

### Entry Specifications

Upon entry to SCSUX08, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX08

### Return Specifications

Return specifications for the SCSUX08 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX08 user exit are shown in the following table.

Return Code	Description
0	Honor unit information in JCL.
4	Request esoteric substitution; change esoteric name (unit name) defined in JCL.
12	Request non-library transports to satisfy allocation request.
16	Direct allocation of transports to a specific ACS or MVS/CSC subsystem.
20	Bypass drive exclusion.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX08 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX08.

When running with the HSC (on the same MVS host system), the HSC JES2 Specific Volume Allocation user exit (SLSUX08) may need to be used in conjunction with this MVS/CSC user exit to cause the desired results.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	DSECT	SCSUX08P	Specific Volume Allocation Parameter List	I
C	0	0	4	UX08UX08	Acronym	I
F	4	4	4	UX08LEN	Length of UX08 parameter list	I
A	8	8	1	UX08SUBP	Subpool number	I
			230	UX08SPID	Subpool ID	I
A	9	9	1	UX08KEY	Storage key	I
H	10	A	2		Reserved	
C	12	C	8	UX08JOBN	Job name	I
C	20	14	8	UX08STPN	Step name	I
C	28	1C	8	UX08PRSN	Procedure step name	I
C	36	24	8	UX08DDN	DD name	I

## SCSUX08

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
A	44	2C	4	UX08USER	Address of USERDATA parameter value	I
F	48	30	4	UX08LEN	Address of USERDATA parameter value	I
A	52	34	4	UX08JACC	Address of job accounting information	I
A	56	38	4	UX08SACC	Address of step accounting information	I
C	60	3C	44	UX08DSN	Data set name	I
A	104	68	4		Reserved	
F	108	6C	4	UX08NUMV	Number of volumes in data set	I
C	112	70	8	UX08ESO	Esoteric name to substitute in place of what is specified in the JCL	O
C	120	78	4	UX08CSCN	MVS/CSC subsystem to process	O
X	124	7C	1	UX08ACS	ACS ID for substitution	O
C	125	7D	3	UX08XPDT	Data set expiration date from JFCB	I
X	128	80	1	UX08LABT	Label type from JFCB	I
			X'40'	UX08LBAL	ANSI label (AL)	I
			X'04'	UX08LBNS	Non-standard label (NSL)	I
			X'02'	UX08LBSL	Standard label (SL)	I
			X'01'	UX08LBNL	Non-labeled (NL)	I
X	129	81	3			
D	136	88				
			136	UX08LSTL	Length of user exit 08 parameter list	

## Programming Considerations

- Information regarding bypassing drive exclusion UX08BSEP:

The use of UX08BSEP (return code 20) should be carefully considered. There are several factors that will affect the final device that is allocated for a request that does not have drive exclusion performed on its behalf. These include:

- UNITNAME used in JCL (or SVC 99 request)
- DEVPREF setting
- Volume location (library vs. non-library)
- TAPEREQ control statements
- DFSMS data class definitions
- Addresses of library and non-library drives
- Presence of Cartridge Stacker Loaders (CSL) transports
- SELTAPE specification in IEAOPT member of PARMLIB
- Increased passthru events and ENTER/EJECT sequences requiring operator intervention will be experienced if this return code is used.
- A job should not go into allocation recovery if a device is available in the supplied UNITNAME if UX08BSEP is requested.
- The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

## Examples

In the following example, the user exit instructs the SMC to direct the allocation for a specific volume request to non-library devices.

```
set Register 15 to 12.
```

In the following example, the user exit requests esoteric substitution (LIBVOL), and instructs the SMC to direct the allocation to the library transports controlled by MVS/CSC subsystem CSC1.

```
set Register 15 to 16.
set UX08ESO to 'LIBVOL'.
set UX08ESO to 'CSC1'.
set UX08ACS to 1.
```

## Deferred Mount User Exit (SCSUX09)

The deferred mount user exit allows you to determine whether or not a mount is MVS deferred.



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

By default, the MVS/CSC honors the specifications in your JCL, or the specification on the DEFer startup parameter. For example, if you do not request that a mount is deferred in your JCL or set DEFer(NO), the cartridge is mounted at step allocation time. If the mount request is for a specific volume and the data set is never opened, the cartridge is mounted and dismounted without being used. If the mount request is for a scratch volume and the data set is never opened, the cartridge is not dismounted.

If you request that a mount is deferred in your JCL or set DEFer(YES), the cartridge is not mounted until the data set is opened, thus leaving the LSM robot free to perform other tasks. While deferred mounting can reduce the number of mounts the LSM robot must perform, it might increase the time required to run a job. This occurs because the job waits until the cartridge is mounted before proceeding.

SCSUX09 provides you with the flexibility to allow or disallow the DEFer setting on an individual mount request. For example, if certain data sets need to be mounted prior to open time for performance reasons and your data center normally operates in deferred mode, SCSUX09 lets you override deferred mounting for the mount request. This exit is only invoked during common allocation; dynamic allocation requests are not deferred.

For JES3 environments running TAPE SETUP processing, you can set user exit SCSUX09 to override the DEFer(NO) and DEFer(JES3) settings and defer a mount until data set open time. JES3 user exit SCSUX11 is called first to defer a mount until step allocation processing, and then SCSUX09 is called to defer the mount until data set open time. See “Deferred Mount User Exit (SCSUX11)” on page 137 for more information about user exit SCSUX11.

### Entry Specifications

Upon entry to SCSUX09, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX09

## Return Specifications

Return specifications for the SCSUX09 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX09 user exit are shown in the following table.

Return Code	Description
0	Process normally; exit does not influence MVS defer status.
4	Defer the mount until the data set is opened.
8	Honor the JCL defer status.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX09 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX09.

### Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description
The following fields are inputs to the user exit. The values for these fields are sent to the user exit when it is invoked. There are no outputs from this user exit.					
	0	0	DSECT	SCSUX09P	Defer Allocation User Exit Parameter List
C	0	0	4	UX09UX09	Acronym
F	4	4	4	UX09LEN	Length of UX09 parameter list
A	8	8	1	UX09SUBP	Subpool number
			230	UX09SPID	Subpool ID
A	9	9	1	UX09KEY	Storage key
H	10	A	2		Reserved
C	12	C	8	UX09JOBN	Job name
C	20	14	8	UX09STPN	Step name
C	28	1C	8	UX09PRSN	Procedure step name
C	36	24	8	UX09PGMN	EXEC=pgmname
C	44	2C	8	UX09DDN	DD name
A	52	34	4	UX09USER	Address of USERDATA parameter value
F	56	38	4	UX09ULEN	Length of USERDATA parameter value
C	60	3C	44	UX09DSN	Data set name
F	104	68	4	UX09RSV1	Reserved
F	108	6C	4	UX09RSV2	Reserved
F	112	70	4	UX09RSV3	Reserved
F	116	74	4	UX09RSV4	Reserved
X	120	78	1	UX09DDCH	Data set characteristics
			X'80'	UX09SPEC	Specific volume request
			X'40'	UX09NSPC	Scratch volume request
D	128	80			Round out to double word
			128	UX09LSTL	Length of user exit 09 parameter list

## Programming Considerations

The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

### Examples

In the following example, the user exit directs the MVS/CSC to defer the mount of a cartridge until the data set is opened.

```
set Register 15 to 4.
```

In the following example, the user exit directs the MVS/CSC to honor the defer status in the JCL.

```
set Register 15 to 8.
```

## Unit Affinity Separation User Exit (SCSUX10)

The unit affinity separation user exit allows you to request modification of the actions the SMC takes during allocation of a unit affinity chain or GDG ALL chain that references cartridge transports.

SCSUX10 lets you request that unit affinity chains and GDG ALL chains be broken, regardless of the setting on the GDGAll or UNITAff startup parameters. Thus, transports are allocated based on the physical location of a volume. SCSUX10 also lets you specify an esoteric name for use in device allocation of unit affinity and GDG ALL chains that remain unbroken.

The number of devices allocated to a job step requesting both library and non-library devices, or multiple-ACS volumes might be increased during the separation of unit affinity or GDG ALL chains; instead of allocating one device, both library and non-library devices might be allocated in order to satisfy volume requests.

You can use this exit to:

- Change the esoteric name (unit name) used to allocate the chain
- Override the current settings on the SMC ALLOCDEF command SEPLVL parameter
- Request allocation of library transports for the chain
- Request allocation of non-library transports for the chain
- Indicate a specific MVS/CSC subsystem name to use for allocation



**Note:** Because allocation functions are performed by the SMC, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

SCSUX10 is called for every unit affinity chain or GDG ALL chain that requires allocation.

### Entry Specifications

Upon entry to SCSUX10, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX10

## Return Specifications

Return specifications for the SCSUX10 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX10 user exit are shown in the following table.

Return Code	Description
0	Perform separation according to current GDGALL and UNITAFF settings.
4	Do not separate the chain.
8	Separate the chain.
12	Allocate library transports, but do not separate the chain.
16	Allocate non-library transports, but do not separate the chain.
20	Perform esoteric substitution using the specified esoteric name, but do not separate the chain.
24	Direct allocation to a specific ACS or MVS/CSC subsystem name, but do not separate the chain.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX10 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX10.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	DSECT	SCSUX10P	Unit Affinity Separation User Exit Parameter List	I
C	0	0	4	UX10UX10	Acronym	I
F	4	4	4	UX10LEN	Length of UX10 parameter list	I
A	8	8	1	UX10SUBP	Subpool number	I
			230	UX10SPID	Subpool ID	I
A	9	9	1	UX10KEY	Storage key	I
H	10	A	2		Reserved	
C	12	C	8	UX10JOBN	Job name	I
C	20	14	8	UX10STPN	Step name	I
C	28	1C	8	UX10PRSN	Procedure step name	I
A	36	24	4	UX10USER	Address of USERDATA parameter value	I
F	40	28	4	UX10ULEN	Length of USERDATA parameter value	I
A	44	2C	4	UX10JACC	Address of Job accounting information	I
A	48	30	4	UX10SACC	Address of Step accounting information	I
F	52	34	4	UX10DCNT	Number of DSN's in affinity chain	I
C	56	38	8	UX10ESO	Esoteric name used in substitution	O
C	64	40	4	UX10CSCN	MVS/CSC subsystem name to process	O
X	68	44	1	UX10ACS	ACS ID used for substitution	O
D	72	48			Round out to double word	
			72	UX10FIXL	Length of fixed portion of user exit 10 parameter list	
	0	0	DSECT	SCSUX10D	Variable data set section of parameter list	

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
The following fields immediately follow the SCSUX10P fixed data area. This area is repeated once for each DD statement in the affinity chain. The number of DD statements in the affinity chain is stored in field UX10DCNT.						
C	0	0	8	UX10DDN	DD name	I
C	8	8	44	UX10DSN	Data set name	I
A	52	34	4	UX10VOLP	Pointer to volume information	I
F	56	38	4	UX10VCNT	Number of volumes in data set	I
C	60	3C	3	UX10XPDT	Data set expiration data from JFCB	I
X	63	3F	1	UX10LABT	Label type from JFCB	I
			X'40'	UX10LBAL	ANSI label (AL)	
			X'04'	UX10LBNS	Non-standard label (NSL)	
			X'02'	UX10LBSL	Standard label (SL)	
			X'01'	UX10LBNL	Non-labeled (NL)	
X	64	40	1	UX10GDGI	GDG information	I
			X'80'	UX10GDG	Data set is part of GDGALL chain	
			X'40'	UX10NGDG	Data set is a GDG single	
X	65	41	14		Reserved	
D	80	50		UX08LSTL	Round out to double word	
			80	UX10DSNL	Length of variable data set section of the parameter list	
	0	0	DSECT	SCSUX10V	Variable volume section of parameter list	
The following fields are pointed to be UX10VOLP. For specific requests, UX10VSER contains the volume serial number. For scratch requests, UX10VSER contains CL6'SCRTCH'. If a specific volume resides in the library, UX10LSM contains the library location of the volume. For all other requests, UX10LSM contains X'0000'.						
C			6	UX10VSER	Volume serial number	I
X			1	UX10VLOC	Volume location (inside or outside the library)	I
			X'80'	UX10VLIB	Specific volume resides inside the library	I
			X'40'	UX10VNLB	Specific volume resides outside the library	I
			X'20'	UX10VSCR	Scratch volume request	I
X	7	7	2	UX10LSM	LSM location (if volume resides in library)	I
D	16	10			Round out to double word	
			16	UX10VOLL	Length of volume entry section of the parameter list	

## Programming Considerations

- This exit can request esoteric substitution (or ACS specification) or separation, but not both. These requests are mutually exclusive.
- The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

## Example

In the following example, the user exit directs the MVS/CSC to perform separation according to the current UNITAff and GDGAll settings.

```
set Register 15 to Ø.
```

# Chapter 9. MVS/CSC User Exits for JES3 With TAPE SETUP Processing

---

## Overview

This chapter describes the user exits provided with MVS/CSC for JES3 environments running with TAPE SETUP processing. If you are running the MVS/CSC in a JES2 environment or JES3 environment without TAPE SETUP processing, see Chapter 8, “MVS/CSC User Exits for JES Without TAPE SETUP Processing” on page 89 for information about the user exits provided for those environments.



### Notes:

- Refer to the *Storage Management Component (SMC) Configuration and Administration Guide* for information on TAPEREQ and user exit interaction.
- Virtual Storage Manager (VSM) support has been added for certain MVS/CSC user exits. Refer to the VTCS customer documentation for more information.

The following user exits are described in this chapter:

#### **Job Processing User Exit (SCSUX01)**

This exit is invoked for all console messages. It can be used to automate mounts and dismounts for non-standard tape management system messages, to automate replies to WTORs, and to specify subpooling for scratch mount requests.

#### **Scratch Allocation User Exit (SCSUX04)**

This exit is used to influence allocation and selection of transports to satisfy a non-specific (scratch) volume request. It is also used to specify subpooling for scratch allocation requests.

#### **Programmatic Interface (PGMI) Authorization User Exit (SCSUX05)**

This exit is used to perform authorization checking of PGMI requesting programs.

#### **Deferred Mount User Exit (SCSUX09)**

This exit is used to determine whether or not mount messages are deferred until a data set is opened. The value specified in this exit overrides the setting on the DEFer startup parameter.

### **Deferred Mount User Exit (SCSUX11)**

This exit is used to determine whether or not JES3 mount messages are deferred until the step allocation process. The value specified in this exit overrides the setting on the DEFer startup parameter.

### **Unit Affinity Separation User Exit (SCSUX12)**

This exit is used to determine whether on not unit affinity separation and/or GDG ALL separation occurs for specific volume requests. The values specified in this exit override the settings on the GDGAll and UNITAff startup parameters.

### **Specific Volume Allocation User Exit (SCSUX13)**

This exit is used to influence allocation and selection of transports to satisfy a specific volume request under JES3.

## **User Exit Implementation**



**Note:** User exits 4, 9, 11, 12 and 13 are managed by the MVS/CSC but invoked by the Storage Management Component (SMC). Refer to the *SMC Configuration and Administration Guide* for more information.

User exits are implemented using either of the following methods:

- Replacing the StorageTek supplied dummy entry in the executables library with a locally assembled and link-edited copy.
- Concatenating a library containing a local version of the user exit in front of the MVS/CSC executable library in the STEPLIB DD statement of the MVS/CSC cataloged procedure.

If you choose the second method, the library containing the exits must be authorized even though the user exit routines do not require authorization.

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 the following sections.

## User Exits and Scratch Subpooling

Tape management systems, such as CA-1 (TMS), CA-DYNAM/TLMS, DFSMSrmm, and Zara allow definition of relationships between job names or data set names and cartridge volume serial numbers. This concept is sometimes referred to as scratch subpooling. When scratch subpooling is used, the tape management system only allows certain scratch mounts to be satisfied by cartridges in qualified scratch subpools.

Scratch subpooling can be facilitated by using both MVS/CSC user exits in conjunction with the definitions of scratch subpools in the tape management system and the Library Control System (LCS).

- User exits SCSUX01 and SCSUX04 are used to implement scratch subpooling.
- SCSUX01 is called at volume mount time to select a scratch volume. The subpool information provided by SCSUX01 allows the selection of a tape volume from the correct subpool.
- SCSUX04 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 SCSUX04 allows the selection of a tape transport in the LSM with the most scratch volumes of the correct subpool type.



### Note:

- The MVS/CSC supports subpool specification by name using the SUBPool keyword parameter on the TAPEREQ control statement. See the *MVS/CSC Configuration Guide* for more information about the TAPEREQ control statement.

## Job Processing User Exit (SCSUX01)

This exit is provided to allow installations with tape management systems other than CA-1 (TMS), CA-DYNAM/TLMS, DFSMSrmm, or Zara to interface with the MVS/CSC.

Each installation should examine all WTOs and WTORs issued by their tape management system and, if action is required, direct the subsystem to perform the necessary operation by setting values in the parameter list passed to it.

Use this exit to perform automated mounts of scratch cartridges from different scratch subpools or of label types other than the library scratch label type. You can also use this exit to automate responses to WTOR-type messages.

This exit is invoked for every WTO or WTOR issued in the MVS host system. The exit should evaluate the message and, if owned by the exit, fill in the appropriate fields in the parameter list.

### Entry Specifications

Upon entry to SCSUX01, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX01

### Return Specifications

Return specifications for the SCSUX01 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code (hexadecimal)

## Return Codes

Return codes for the SCSUX01 user exit are shown in the following table.

Return Code	Description
0	The MVS/CSC interprets the message.
4	The message is interpreted by the user exit. The MVS/CSC follows user exit direction.
64	The user exit is not operational. The message is interpreted by the MVS/CSC.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	0	SCSUX01P	Job Processing Parameter List	I
A	0	0	4	UX01WQE	Address of MVS WQE for messages	I
A	4	4	4	UX01USER	Address of USERDATA parameter value	I
F	8	8	4	UX01ULEN	Length of USERDATA value	I
C	12	C	1	UX01FUNC	Function code	O
			C'1'	UX01MNT	Mount a cartridge	O
			C'2'	UX01DMNT	Dismount a cartridge	O
			C'3'	UX01SWAP	Swap cartridge FROM xxx TO yyy (JES2 only)	O
			C'4'	UX01RPLY	Reply to a message*	O
			C'5'	UX01NOP	No operation to be performed	O
X	13	D	1	UX01OPEN	Operator intervention flag	O
			X'10'	UX01ON	Operator intervention requested	O
C	14	E	6	UX01VOLS	Volume serial number of cartridge	O
C	20	14	1	UX01RPTX	Reply text area*	O
C	21	15	7		Reserved	O
X	28	1C	2	UX01REID	Message reply ID*	O
C	30	1E	1	UX01DISP	Disposition of volume	O
			C'K'	UX01KEEP	Keep volume	O
			C'D'	UX01DELT	Delete volume	O
X	31	1F	1	UX01LABT	Label type	O
			X'00'	UX01DFLT	Library default label type	O

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
			X'01'	UX01SL	Standard label (SL)	O
			X'02'	UX01AL	ANSI label (AL)	O
			X'03'	UX01NL	Non-labeled (NL)	O
			X'04'	UX01NSL	Non-standard label (NSL)	O
C	32	20	4	UX01FUNT	Mount/dismount/swap from unit address (JES2 only)	O
C	36	24	4	UX01TUNT	Swap to unit address (JES2 only)	O
X	40	28	1	UX01SSUB	Scratch subpool to be performed	O
X	41	29	3		Reserved	
X	44	2C	4	UX01RID2	Reply ID for 4-digit reply*	O
			48	UX01L	Length of user exit 01 parameter list	

\* Services not available for this version of the MVS/CSC.

## Programming Considerations

The exit routine should examine each message, set the operation to be performed in UX01FUNC, and fill in the appropriate fields that apply to the function.

The StorageTek version, distributed in object form, sets the exit inactive (return code 64).

The MVS/CSC does not perform automated mounts, dismounts, or swaps (JES2 only) for transports not under its control. Invoking SCSUX01 for actions directed against any transports not known to the MVS/CSC through its LIBUnit startup parameter results in no operation being performed.

In a multiple MVS/CSC subsystem environment, each active MVS/CSC subsystem invokes SCSUX01 separately. When using the same version of SCSUX01 for all MVS/CSC subsystems, each invocation may direct the MVS/CSC to perform a particular operation. Only the MVS/CSC handling that library transport actually performs the operation.

The SAMPLIB library includes samples for defining this user exit.

## Examples

In the following example, the user exit is set to mount a scratch cartridge from the scratch pool of the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB TO ZERO
set UX01LABT to UX01DFLT.
```

In the following example, the user exit is set to mount a scratch cartridge from a scratch subpool of the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB to subpool index.
set UX01LABT to UX01DFLT.
```

In the following example, the user exit is set to mount a scratch cartridge from the scratch subpool of a label type different than the library label type.

```
set UX01FUNC to C'1'.
set UX01VOLS to 'SCRATCH' or 'PRIVAT'.
set UX01FUNT to drive address.
set UX01SSUB to subpool index.
set UX01LABT to label type.
```

In the following example, the user exit is set to mount a specific cartridge.

```
set UX01FUNC to C'1'.
set UX01VOLS to appropriate VOLSER for specific request..
set UX01FUNT to drive address.
set UX01LABT to label type.
```

In the following example, the user exit is set to dismount a cartridge.

```
set UX01FUNC to C'2'.
set UX01FUNT to drive address.
set UX01DISP to disposition.
```

In the following example, the user exit is set to swap a cartridge. Swap processing occurs only in JES2 environments.

```
set UX01FUNC to C'3'.  
set UX01FUNT to FROM drive address.  
set UX01TUNT to TO drive address.
```

In the following example, the user exit is set to allow for operator intervention.

```
set UX01FUNC to C'5'.  
set UX01OPIN to UX01ON.  
set UX01VOLS to cartridge serial number.  
set UX01FUNT to FROM drive address.  
set UX01TUNT to TO drive address.  
set UX01LABT to label type.
```

## Scratch Allocation User Exit (SCSUX04)

The scratch allocation user exit (SCSUX04) allows you to specify values that influence device allocation based on installation-dependent criteria. SMC allocation invokes SCSUX04 providing it with the job name, data set name, DD name, step name, procedure step name, and the text specified in the USERdata startup parameter.



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

SCSUX04 is invoked for each MVS/CSC subsystem in a multiple MVS/CSC subsystem environment. The copy in use is that of the first active MVS/CSC (in SSCVT order). SCSUX04 is applicable in JES3 during the POSTSCAN phase of the converter/interpreter scheduling element, the JES3 main device scheduler (MDS) function, and dynamic allocation.

### Entry Specifications

Upon entry to SCSUX04, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX04

### Return Specifications

Return specifications for the SCSUX04 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

**Return Codes**

Return codes for the SCSUX04 user exit are shown in the following table.

<b>Return Code</b>	<b>Description</b>
0	No user technique specified.
4	MVS/CSC influences JES3 device allocation to select eligible library transports based on the server device list returned during drive exclusion.
8	Request non-library transports to satisfy allocation request.
12	Request esoteric substitution.
16	Direct allocation of transports to a specific ACS or MVS/CSC subsystem.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX04 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX04.

When running with the HSC (on the same MVS host system), the HSC JES3 Scratch Allocation user exit (SLSUX04) must be used in conjunction with this MVS/CSC user exit to cause the desired results.

### Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	0	SCSUX04P	Scratch Allocation Parameter List	I
C	0	0	4	UX04UX04	Acronym	I
F	4	4	4	UX04LEN	Length of Ux04 parameter list	I
A	8	8	1	UX04SUBP	Subpool number	I
			230	UX04SPID	Subpool ID	I
A	9	9	1	UX04KEY	Storage protect key	I
A	10	A	1	UX04CFLG	UX04 caller flag	I
			X'80'	UX04DIRA	UX04 call from drive prioritization	I
			X'00'	UX04CI	UX04 call from converter/interpreter	I
A	11	B	1	UX04FLAG	UX04 General Flag	I
			X'80'	UX04UAFF	Element resides on UNITAFF chain ON only if UX04DIRA is OFF	I
			X'40'	UX04GAFF	Element resides on GDGALL chain ON only if UX04DIRA is OFF	I
C	12	C	8	UX04JOBN	Job name	I
C	20	14	8	UX04STPN	Step name	I
C	28	1C	8	UX04PRSN	Procedure step name	I
C	36	24	8	UX04DDN	DD name	I
A	44	2C	4	UX04USER	Address of USERDATA parameter value	I
F	48	30	4	UX04ULEN	Length of USERDATA parameter value	I
C	52	34	44	UX04DSN	Data set name	I
X	96	60	1	UX04SSUB	Scratch subpool	O
X	97	61	1	UX04LABT	Label type	O
			X'00'	UX04LBDF	Library default label type	O
			X'01'	UX04LBSL	Standard label (SL)	O
			X'02'	UX04LBAL	ANSI label (AL)	O
			X'03'	UX04LBNL	Non-labeled (NL)	O
			X'04'	UX04LBNS	Non-standard label (NSL)	O
C	98	62	8	UX04MAIN	JES3 processor where job setup is active	I
C	106	6A	8	UX04UNIT	JCL unit name	I

## SCSUX04

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
C	114	72	8	UX04ESOT	Esoteric name to substitute in place of what is specified in the JCL	O
C	122	7A	4	UX04CSCN	MVS/CSC subsystem to process	O
F	128	80	4	UX04ACS	ACS ID for substitution	O
F	132	84	4	UX04RSV1	Reserved for future use	
F	136	88	4	UX04RSV2	Reserved for future use	
F	140	8C	4	UX04RSV3	Reserved for future use	
F	144	90	4	UX04RSV4	Reserved for future use	
F	148	94	4	UX04RSV5	Reserved for future use	
F	152	98	4	UX04RSV6	Reserved for future use	
F	156	9C	4	UX04RSV7	Reserved for future use	
F	160	A0	4	UX04RSV8	Reserved for future use	
D	168	A8			Round out to double word	
			168	UX04LSTL	Length of user exit 04 parameter list	

### Programming Considerations

The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.



**Note:** A scratch subpool (UX04SSUB) value of X'00' is designated to be the "default" subpool. If SCSUX04 returns a UX04SSUB value of X'00', it **must** also return the "default" label type (UX04LBDF=X'00'). Likewise, the default label type is UX04LBDF and it must return the default subpool (UX04SSUB=X'00').

### Examples

In the following example, the user exit instructs the SMC to direct the allocation for a scratch request to non-library devices.

```
set Register 15 to 8.
```

In the following example, the user exit instructs the SMC to direct the allocation to the library transports controlled by MVS/CSC subsystem CSC1. The devices in the LSM with the most standard-labeled scratch volumes of subpool 2 should be preferred.

```
set Register 15 to 16.  
set UX04CSCN to 'CSC1'.  
set UX04ACS to 1.  
set UX04SSUB to 2.  
set UX04LABT to UX04LBSL.
```

## Programmatic Interface Authorization User Exit (SCSUX05)

The Programmatic Interface (PGMI) Authorization user exit (SCSUX05) allows you to perform authorization checking of programs requesting PGMI services. If the user exit disables itself (setting return code UX05NOPR) or abends, the MVS/CSC allows all programs to issue the query and read requests. In addition, you can use the SCSUX05 to interface with existing security products (i.e., RACF).

SCSUX05 is invoked for all requests received from the programmatic interface. SCSUX05 should evaluate the request and set a return code to indicate whether or not the MVS/CSC should allow the request to be executed. This exit is called from a non-space switch program call (PC) in the requestor's address space under the requestor's request block (RB).

### Entry Specifications

Upon entry to SCSUX05, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX05

### Return Specifications

Return specifications for the SCSUX05 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code (hexadecimal)

## Return Codes

Return codes for the SCSUX05 user exit are shown in the following table.

Return Code	Description
0	Allow the request.
4	Deny the request.
40	User exit is not operational. <b>Note:</b> MVS/CSC will not call the exit again.

The StorageTek supplied version of SCSUX05 sets the return code to 40, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX05.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	(0)	DSECT	SCSUX05P	PGMI Authorization Parameter List	I
A	0	(0)	4	UX05HDR	Eyecatcher	I
			C'UX05'	UX05ID		
A	4	(4)	4	UX05LEN	Length of UX05 parameter list	I
			230	UX05SPID	Subpool ID	I
A	8	(8)	4	UX05REQA	SCSXREQM parameter list address	I
F	12	(C)	4	UX05USER	User word - initially zero; passed from invocation to invocation. It can be used as an anchor for a user control block.	I
F	16	10	4	UX05UDAT	Address of USERDATA parameter value from MVS/CSC startup parameter.	I
F	20	14	4	UX05ULEN	Length of USERDATA parameter value	I
F	24	18	8	UX05RESV	Reserved	

## 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 can change the contents. After an IPL or MVS/CSC COLD start, the contents of the word is initially zero; otherwise the contents are maintained across MVS/CSC startups. If the user word is used as a pointer, the area pointed to should be in common storage.



**Note:** There is no serialization provided. The user exit can be executing simultaneously under two task control blocks (TCBs). The user exit might want to serialize updates to any work area in which the user word might point to.

## Deferred Mount User Exit (SCSUX09)

The deferred mount user exit allows you to determine whether or not a mount is MVS deferred.



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

By default, the MVS/CSC honors the specifications in your JCL, or the specification on the DEFer startup parameter. For example, if you do not request that a mount is deferred in your JCL or set DEFer(NO), the cartridge is mounted at step allocation time. If the mount request is for a specific volume and the data set is never opened, the cartridge is mounted and dismounted without being used. If the mount request is for a scratch volume and the data set is never opened, the cartridge is not dismounted.

If you request that a mount is deferred in your JCL or set DEFer(YES), the cartridge is not mounted until the data set is opened, thus leaving the LSM robot free to perform other tasks. While deferred mounting can reduce the number of mounts the LSM robot must perform, it might increase the time required to run a job. This occurs because the job waits until the cartridge is mounted before proceeding.

SCSUX09 provides you with the flexibility to allow or disallow the DEFer setting on an individual mount request. For example, if certain data sets need to be mounted prior to open time for performance reasons and your data center normally operates in deferred mode, SCSUX09 lets you override deferred mounting for the mount request. This exit is only invoked during common allocation; dynamic allocation requests are not deferred.

For JES3 environments running TAPE SETUP processing, you can set user exit SCSUX09 to override the DEFer(NO) and DEFer(JES3) settings and defer a mount until data set open time. JES3 user exit SCSUX11 is called first to defer a mount until step allocation processing, and then SCSUX09 is called to defer the mount until data set open time. See “Deferred Mount User Exit (SCSUX11)” on page 137 for more information about user exit SCSUX11.

### Entry Specifications

Upon entry to SCSUX09, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX09

## Return Specifications

Return specifications for the SCSUX09 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX09 user exit are shown in the following table.

Return Code	Description
0	Process normally; exit does not influence MVS defer status.
4	Defer the mount until the data set is opened.
8	Honor the JCL defer status.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX09 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX09.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description
The following fields are inputs to the user exit. The values for these fields are sent to the user exit when it is invoked. There are no outputs from this user exit.					
	0	0	DSECT	SCSUX09P	Defer Allocation User Exit Parameter List
C	0	0	4	UX09UX09	Acronym
F	4	4	4	UX09LEN	Length of UX09 parameter list
A	8	8	1	UX09SUBP	Subpool number
			230	UX09SPID	Subpool ID
A	9	9	1	UX09KEY	Storage key
H	10	A	2		Reserved
C	12	C	8	UX09JOBN	Job name
C	20	14	8	UX09STPN	Step name
C	28	1C	8	UX09PRSN	Procedure step name
C	36	24	8	UX09PGMN	EXEC=pgmname
C	44	2C	8	UX09DDN	DD name
A	52	34	4	UX09USER	Address of USERDATA parameter value
F	56	38	4	UX09ULEN	Length of USERDATA parameter value
C	60	3C	44	UX09DSN	Data set name
F	104	68	4	UX09RSV1	Reserved
F	108	6C	4	UX09RSV2	Reserved
F	112	70	4	UX09RSV3	Reserved
F	116	74	4	UX09RSV4	Reserved
X	120	78	1	UX09DDCH	Data set characteristics
			X'80'	UX09SPEC	Specific volume request
			X'40'	UX09NSPC	Scratch volume request
D	128	80			Round out to double word
			128	UX09LSTL	Length of user exit 09 parameter list

## Programming Considerations

The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

### Examples

In the following example, the user exit directs the MVS/CSC to defer the mount of a cartridge until the data set is opened.

```
set Register 15 to 4.
```

In the following example, the user exit directs the MVS/CSC to honor the defer status in the JCL.

```
set Register 15 to 8.
```

## Deferred Mount User Exit (SCSUX11)

The deferred mount user exit is invoked during JES3 converter/interpreter (CI) processing. This user exit allows you to determine whether or not a mount is deferred until step allocation processing.



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

By default, the MVS/CSC honors the specifications in your JCL, or the specification on the DEFer startup parameter. You can use SCSUX11 to override the settings on the DEFer startup parameter.

When user exit SCSUX11 is set to defer a mount until step allocation processing, user exit SCSUX09 is also called during step allocation processing. You can use user exit SCSUX09 to override the DEFer(NO) and DEFer(JES3) settings and defer a mount until data set open time.

See “Deferred Mount User Exit (SCSUX09)” on page 133 for more information about user exit SCSUX09.

### Entry Specifications

Upon entry to SCSUX11, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX11

### Return Specifications

Return specifications for the SCSUX11 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

**Return Codes**

Return codes for the SCSUX11 user exit are shown in the following table.

<b>Return Code</b>	<b>Description</b>
0	Process normally; exit does not influence JES3 defer status.
4	Defer the mount until a system initiator begins the step allocation process.
8	Honor the JCL's JES3 defer status.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX11 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX11.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description
The following fields are inputs to the user exit. The values for these fields are sent to the user exit when it is invoked. There are no outputs from this user exit.					
	0	0	DSECT	SCSUX11P	Defer Allocation User Exit Parameter List
C	0	0	4	UX11UX11	Acronym
F	4	4	4	UX11LEN	Length of UX11 parameter list
A	8	8	1	UX11SUBP	Subpool number
			230	UX11SPID	Subpool ID
A	9	9	1	UX11KEY	Storage key
H	10	A	2		Reserved
C	12	C	8	UX11JOBN	Job name
C	20	14	8	UX11STPN	Step name
C	28	1C	8	UX11PRSN	Procedure step name
C	36	24	8	UX11DDN	DD name
C	44	2C	44	UX11DSN	Data set name
A	88	58	4	UX11USER	Address of USERDATA parameter value
F	92	5C	4	UX11ULEN	Length of USERDATA parameter value
F	96	60	4	UX11RSV1	Reserved
F	100	64	4	UX11RSV2	Reserved
F	104	68	4	UX11RSV3	Reserved
F	108	6C	4	UX11RSV4	Reserved
X	112	70	1	UX11DDCH	Data set characteristics
			X'80'	UX11SPEC	Specific volume request
			X'40'	UX11NSPC	Scratch volume request
D	120	78			Round out to double word
			120	UX11LSTL	Length of user exit 11 parameter list

## Programming Considerations

The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

### Examples

In the following example, the user exit directs the MVS/CSC to defer the mount of a cartridge until a system initiator begins the step allocation process.

```
set Register 15 to 4.
```

In the following example, the user exit directs the MVS/CSC to honor the JCL defer status.

```
set Register 15 to 8.
```

## Unit Affinity Separation User Exit (SCSUX12)

The unit affinity separation user exit allows you to request modification of the actions the SMC takes during allocation of a unit affinity chain or GDG ALL chain that references cartridge transports.

You can use this exit to:

- Override the setting of the SMC ALLOCDEF command SEPLVL parameter.
- Change the esoteric name (unit name) used to allocate the chain
- Override the current settings on the GDGAll and UNITAff startup parameters
- Request allocation of library transports for the chain
- Request allocation of non-library transports for the chain
- Indicate a specific MVS/CSC subsystem name to use for allocation



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

SCSUX12 is called for every unit affinity chain or GDG ALL chain.

### Entry Specifications

Upon entry to SCSUX12, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX12

## Return Specifications

Return specifications for the SCSUX12 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX12 user exit are shown in the following table.

Return Code	Description
0	Perform separation according to current GDGAll and UNITAff settings.
4	Do not separate the chain and allocate library drives.
8	Do not separate the chain and allocate non-library drives.
12	Do not separate the chain and substitute the returned esoteric.
16	Direct allocation of transports to a specific ACS or MVS/CSC subsystem, but do not separate the chain.
20	Separate the chain.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX12 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX12.

### Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	DSECT	SCSUX12P	Unit Affinity Separation User Exit Parameter List	I
C	0	0	4	UX12UX12	Acronym	I
F	4	4	4	UX12LEN	Length of UX12 parameter list	I
A	8	8	1	UX12SUBP	Subpool number	I
			230	UX12SPID	Subpool ID	I
A	9	9	1	UX12KEY	Storage key	I
A	10	A	2		Reserved	
C	12	C	8	UX12JOBN	Job name	I
C	20	14	8	UX12STPN	Step name	I
C	28	1C	8	UX12PRSN	Procedure step name	I
A	36	24	4	UX12USER	Address of USERDATA parameter value	I
F	40	28	4	UX12ULEN	Length of USERDATA parameter value	I
F	44	2C	4	UX12DCNT	Number of DD's in affinity chain	I
C	48	30	8	UX12UNIT	Unit name	O
C	56	38	8	UX12ESOT	Esoteric name used in substitution	O
C	64	40	4	UX12CSCN	MVS/CSC subsystem name to process	O
F	68	44	4	UX12ACS	ACS ID used for substitution	O
C	72	48	8	UX12MAIN	JES3 processor where job setup is active	I
X	80	50	1	UX12AFF	Affinity type	I
			X'80'	UX12GDG	GDG affinity	I
			X'40'	UX12UAFF	Unit affinity (UNIT=AFF=affinity)	I
X	81	51	3		Reserved	
			84	UX12FIXL	Length of fixed portion of user exit 12 parameter list	
The following fields immediately follow the SCSUX12P fixed data area. This area is repeated once for each DD statement in the affinity chain. The number of DD statements in the affinity chain is stored in field UX12DCNT.						
C	0	0	8	UX12DDN	DD name	I
C	8	8	44	UX12DSN	Data set name	I
F	52	34	4	UX12NUMV	Number of volumes in data set	I

# SCSUX12

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
X	56	38	1	UX12LABT	Label type	I
			X'00'	UX12LBDF	Library default label type	I
			X'01'	UX12LBSL	Standard label (SL)	I
			X'02'	UX12LBAL	ANSI label (AL)	I
			X'03'	UX12LBNL	Non-labeled (NL)	I
			X'04'	UX12LBNS	Non-standard label (NSL)	I
X	57	39	1	UX12SSUB	Scratch subpool number	I
X	58	3A	2	Reserved	I	
F	60	3C	4	UX12VOLP	Pointer to volume information	I
			64	UX12VARL	Length of the variable section of the parameter list	
<p>The following fields are pointed to by UX12VOLP. It contains the volume serial number and the location of each volume in the data set. The number of volume entries in the list is provided by UX12NUMV.</p>						
C	0	0	6	UX12VLSR	Volume serial number	I
X	6	6	1	UX12VREQ	Volume requested	I
			X'80'	UX12SPEC	Specific volume request	I
			X'40'	UX12NSPC	Nonspecific volume request	I
X	7	7	1	UX12VLOC	Volume location	I
			X'80'	UX12VLIB	Volume resides in library	I
			X'40'	UX12VNLB	Volume resides outside library	I
X	8	8	2	UX12AALL	If volume resides in library, this field contains the library location in ACS/LSM format. For example, 'AALL'. This value is in hexadecimal format.	I
			12	UX12VLTL	Length of volume entry section of the parameter list	

## Programming Considerations

- Unit affinity separation might cause the number of units, in which the requester needs to allocate, to increase. Separation will not be performed if this increase causes the job to fail.
- The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

### Example

In the following example, the user exit directs the MVS/CSC to perform separation according to the current UNITAff and GDGAll settings.

```
set Register 15 to 0.
```

## Specific Volume Allocation User Exit (SCSUX13)

The specific volume allocation user exit (SCSUX13) allows modification of the actions the SMC takes during the allocation of a specific volume DD statement that references cartridge transports. Use this exit to:

- Change the esoteric name (unit name) used for device allocation
- Request allocation of non-library transports
- Request allocation of library transports
- Indicate a specific MVS/CSC subsystem name to use for allocation
- Bypass drive exclusion logic



**Note:** Because allocation functions are performed by the Storage Management Component, this exit is actually invoked by the SMC. Refer to the *SMC Configuration and Administration Guide* for more information.

User exit SCSUX13 is called for every allocation request for a specific volume to be mounted on a cartridge transport.

### Entry Specifications

Upon entry to SCSUX13, the register contents are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
14	Return address
15	Entry point address for SCSUX13

### Return Specifications

Return specifications for the SCSUX13 user exit are shown in the following table.

Register	Contents
0	Undefined
1	Pointer to parameter list
2 - 12	Undefined
13	Pointer to register save area
15	Return code

## Return Codes

Return codes for the SCSUX13 user exit are shown in the following table.

Return Code	Description
0	Perform normal SMC allocation.
4	Select library transports to satisfy allocation requirements.
8	Select non-library transports to satisfy allocation requirements.
12	Replace unit name with a different esoteric.
16	Direct allocation of transports to a specific ACS or MVS/CSC subsystem.
64	The user exit is inactive.

The StorageTek supplied version of SCSUX13 sets the return code to 64, which indicates an inactive user exit, and prevents the exit from being invoked again during the current MVS/CSC subsystem session. The MVS/CSC must be restarted before you can install and invoke a different version of SCSUX13.

When running with the HSC (on the same MVS host system), the HSC JES3 Specific Volume Allocation user exit (SLSUX13) may need to be used in conjunction with this MVS/CSC user exit to cause the desired results.

## Parameter List (Description and Record Layout)

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
	0	0	DSECT	SCSUX13P	Specific Volume Allocation Parameter List	I
C	0	0	4	UX13UX13	Acronym	I
F	4	4	4	UX13LEN	Length of UX13 parameter list	I
A	8	8	1	UX13SUBP	Subpool number	I
			230	UX13SPID	Subpool ID	I
A	9	9	1	UX13KEY	Storage key	I
A	10	A	2		Reserved	
C	12	C	8	UX13JOBNAME	Job name	I
C	20	14	8	UX13STPN	Step name	I
C	28	1C	8	UX13PRSN	Procedure step name	I
C	36	24	8	UX13DDN	DD name	I
A	44	2C	4	UX13USER	Address of USERDATA parameter value	I
F	48	30	4	UX13ULEN	Length of USERDATA parameter value	I
C	52	34	8	UX13UNIT	Unit name	O
C	60	3C	8	UX13ESOT	Replace unit name with esoteric	O
C	68	44	4	UX13CSCN	MVS/CSC subsystem name to process	O
F	72	48	4	UX13ACS	ACS ID for substitution	O
C	76	4C	44	UX13DSN	Data set name	I
X	120	78	1	UX13LABT	Label type	I
			X'00'	UX13LBDF	Library default label type	I
			X'01'	UX13LBSL	Standard label (SL)	I
			X'02'	UX13LBAL	ANSI label (AL)	I
			X'03'	UX13LBNL	Non-labeled (NL)	I
			X'04'	UX13LBNS	Non-standard label (NSL)	I
C	121	79	8	UX13MAIN	JES3 processor where job setup is active	I
F	132	84	4	UX13NUMV	Number of volumes in data set	I
F	136	88	4	UX13VOLP	Pointer to volume information	I
X	140	8C	1	UX13FLG1	UX13 flag	I
			X'80'	UX13UAFF	Element resides on UNITAFF chain ON only if UX04DIRA is OFF	I

Type	Offset (dec)	Offset (hex)	Length	Name	Description	I/O
			X'40'	UX13GAFF	Element resides on GDGALL chain ON only if UX04DIRA is OFF	I
X	141	8D	3		Reserved for future use	
F	144	90	4	UX13RSV2	Reserved for future use	
F	148	94	4	UX13RSV3	Reserved for future use	
F	152	98	4	UX13RSV4	Reserved for future use	
F	156	9C	4	UX13RSV5	Reserved for future use	
F	160	A0	4	UX13RSV6	Reserved for future use	
F	164	A4	4	UX13RSV7	Reserved for future use	
F	168	A8	4	UX13RSV8	Reserved for future use	
F	172	AC	4	UX13RSV9	Reserved for future use	
D	176				Round out to double word	
			176	UX13LSTL	Length of user exit 13 parameter list	
The following fields are pointed to by UX13VOLP. It contains the volume serial number and location of each volume in the data set. The number of volume entries in the list is provided by UX13NUMV.						
			0	UX13VLST	Volume list	I
C	0	0	6	UX13VLSR	Volume serial number	I
X	6	6	1	UX13VLOC	Volume location	I
			X'80'	UX13VLIB	Volume resides in library	I
			X'40'	UX13VNLB	Volume resides outside library	I
X	7	7	2	UX13AALL	If volume resides in library, this field contains the library location in ACS/LSM format. For example, 'AALL'.	I
			9	UX13VLTL	Length of volume entry	

## Programming Considerations

The StorageTek version, distributed in object form, sets the exit inactive (return code 64). The SAMPLIB library includes samples for defining this user exit.

### Examples

In the following example, the user exit instructs the SMC to direct the allocation for a specific volume request to non-library transports.

```
set Register 15 to 8.
```

In the following example, the user exit requests esoteric substitution (LIBVOL), and instructs the SMC to direct the allocation to the library transports controlled by MVS/CSC subsystem CSC1.

```
set Register 15 to 16.  
set UX13ESOT to 'LIBVOL'.  
set UX13CSCN to 'CSC1'.  
set UX13ACS to 1.
```

# Chapter 10. Performance and Operational Considerations

---

## Overview

This chapter describes the following performance and operational considerations:

- Performance considerations
- Operational constraints
- Sharing MVS/CSC-controlled transports
- Third-party software restrictions
- Write protection and virtual thumbwheel processing

## Performance Considerations

This section describes the following factors that can affect MVS/CSC performance:

- Redistributing scratch cartridges
- Maintaining quantities of scratch cartridges
- Reducing scheduling contention
- Reducing pass-through activity

### Redistributing Scratch Cartridges

In the VM- and MVS-based LCS environments, the HSC Scratch Redistribution utility can be used to redistribute scratch cartridges across the LSMs within a particular ACS. You can choose to have the scratch cartridges go to only specified LSMs or all LSMs within an ACS. If necessary, the Scratch Redistribution utility swaps scratch cartridges with non-scratch cartridges to equalize the count of scratch cartridges in an ACS.

In the UNIX-based LCS environment, you can manually scratch and redistribute cartridges in order to equalize the distribution of scratch cartridges. You can then run volume reports to verify the distribution.

## Maintaining Quantities of Scratch Cartridges

Scratch cartridges are maintained in scratch pools that are defined across the library LSMs. The number of cartridges maintained in the scratch pools should be sufficient for normal library operation at your data center.

In CLS and LibraryStation server environments, the HSC Warn command can be used to control when the HSC warns of low quantities of scratch cartridges. The Warn command establishes thresholds that 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.

## Reducing Scheduling Contention

Effective scheduling can increase library performance. Scheduling activities that require library robotic functions and server functions away from peak production times can help improve performance time. Controlling the following scheduling related areas can help significantly in further increasing library performance:

- Balancing the workload
- Scheduling library activity

### *Balancing the Workload*

If you experience mount times that are higher than average, but at the same time experience an improvement in production through-put, 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 contention for transports for the first few minutes of each hour while the transports are unused for the remainder of each hour.

These situations tend to increase 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 Library Activity*

Library activities that require many pass-throughs (for example, redistributing scratch cartridges, moving large quantities of cartridges, or entering and ejecting many cartridges) can impact mount and dismount time. These activities should be scheduled during low periods so they do not contend with mounts and dismounts for high-priority production jobs. Running these activities during low periods also ensures that the tasks complete faster. In the case of large quantities of enters or ejects, operator time can also be optimized.

## Reducing Cartridge Exchange Activity

Scratch mounts, dismounts, enters, and ejects that require cartridge exchanges 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 correctly defined and managed, scratch cartridges normally are not involved in cartridge exchanges. Scratch mounts are the same as specific mounts in that exchanges often cannot be avoided. In general, scratch cartridges should not require a cartridge exchange.

## Operational Constraints

This section describes the following restrictions that can affect MVS/CSC operations:

- Cartridge naming restrictions
- Transport address restrictions
- Association with a Library Control System (LCS)
- Message processing (WTO responses)

## Cartridge Naming Restrictions

Each cartridge in any library must have a unique volume serial number; no duplicate volume serial numbers are allowed. Volume serial numbers are contained on the external labels of each cartridge. If the cartridge is not labeled or the label cannot be read, a unique volume serial number must be assigned to the cartridge when it is entered into the LSM. For the VM server, you can enter the HSC Enter command from the MVS client console; the HSC responds with a message on the MVS client console prompting for a *volser*. For LibraryStation, you can enter the HSC Enter command from the HSC server console; the HSC responds with a message on the HSC server console prompting for a *volser*. For the ACSLS server, you can enter the ACSLS Venter command from the ACS System Administrator (ACSSA) console. The Venter command requires that you enter a *capid* and *volser*. The specified *volser* is permanently assigned to the cartridge in the library database.

Cartridges in (1) libraries controlled by multiple MVS/CSC subsystems in an MVS host system, or (2) libraries controlled by an MVS/CSC coexisting with an HSC on an MVS host system, must have unique volume serial numbers across all libraries.

Cartridge volume serial numbers must follow the ACS hardware guidelines. Valid volume serial numbers are limited to the following characters:

- Letters A to Z
- Numbers 0 to 9
- Trailing blanks
- National characters: #, @, and \$

 **Notes:**

- The at sign (@) character is only valid for the VM-based LCS.
- The yen (¥) and pound sterling (£) characters correspond to the same EBCDIC values as the dollar sign (\$) and pound sign (#) characters (X'5B' and X'7B'), and can also be used in volume serial numbers.

The ACS does not recognize volume serial numbers that contain characters other than those listed above, including leading blanks.

## Transport Address Restrictions

Each MVS/CSC must have unique library transports available for processing. No two library transports can respond to the same address from the same host. No single library transport can be controlled by an MVS/CSC and an HSC on the same MVS host system.

## Association with a Library Control System (LCS)

Each MVS/CSC subsystem must be associated with a separate LCS operating on a different server system. An alternate LCS can be defined to the MVS/CSC if two Internet addresses and port numbers have been specified (using the INTERNET and PORT startup parameters for CLS or using SRVRLIST for LibraryStation). Alternate ACSLS servers are not supported.

## Sharing MVS/CSC-controlled Transports

MVS/CSC-controlled transports can be shared with other MVS and non-MVS host systems. These transports can be shared by manually varying devices online/offline between systems, or in some cases shared dynamically using MIM or automatic tape switching. See “MIM” on page 156 for information about MIM restrictions.

The following sections describe how transports can be shared between MVS and non-MVS host systems.

 **Note:** There are certain restrictions for defining devices used in automatic tape switching. See *MVS/ESA Planning: Installation and Migration* for these restrictions.

## Sharing Transports Between MVS/CSC Clients on Different MVS Host Systems

In order to share transports between MVS/CSC clients residing on different MVS host systems, each MVS/CSC must be attached to the same LCS. MVS/CSC-controlled transports can be shared by manually varying transports online/offline between MVS systems, or shared dynamically using MIM or automatic tape switching.

A transport can be online to only one MVS system at a time when manually varying MVS/CSC-controlled transports online/offline between MVS/CSC subsystems. After manually varying an MVS/CSC-controlled transport online, you must issue the MVS/CSC RESYNCH operator command to synchronize the current state of the device with the current state of the MVS/CSC. If using MIM, or automatic tape switching for device sharing, MVS/CSC-controlled transports are online to both systems simultaneously.

## Sharing Transports Between MVS/CSC Clients and Non-MVS Clients

In order to share transports between MVS/CSC clients and non-MVS clients, each client sharing transports must either be attached to the same LCS, or attached to multiple LCSs sharing the same library. MVS/CSC-controlled transports can only be shared by manually varying transports online/offline between clients. MVS/CSC-controlled transports cannot be shared dynamically in this environment.

A transport can be online to only one client at a time when manually varying MVS/CSC-controlled transports online/offline between clients. After manually varying an MVS/CSC-controlled transport online, you must issue the MVS/CSC RESYNCH operator command to synchronize the current state of the device with the current state of the MVS/CSC.

## Sharing Transports Between MVS/CSC and HSC's Residing on Different MVS Systems

Library transports can be shared between MVS/CSC and HSC's residing on different MVS systems. However, MVS systems running the MVS/CSC can only be attached to one LCS running HSC. MVS/CSC-controlled transports and HSC-controlled transports can be shared by manually varying transports online/offline between the MVS/CSC and HSC subsystems, or shared dynamically using MIM or automatic tape switching.

A transport can be online to only one MVS system at a time when manually varying transports online/offline between MVS/CSC and HSC subsystems. After manually varying a transport online, you must issue the MVS/CSC RESYNCh operator command to synchronize the current state of the device with the current state of the MVS/CSC. If using MIM or automatic tape switching for device sharing, MVS/CSC-controlled transports and HSC-controlled transports are online to both systems simultaneously.



**Note:** MVS/CSC-controlled transports cannot be shared by both the MVS/CSC and HSC if they reside on the same MVS system.

## Third-Party Software Restrictions

This section describes restrictions using the following IBM macro and third-party software products:

- Open Type-J
- MIM
- SAMS:DISK (DMS)
- ASM2

### Open Type-J

The MVS/CSC device allocation enhancement may not work if you use the MVS Open Type-J macro. Since this macro allows you to change volume serial numbers at open time, information available to the MVS/CSC (at job-step allocation time) may be incorrect. This can cause the MVS/CSC to influence device allocation incorrectly. Therefore, users of Open Type-J should explicitly specify the JCL to refer to the appropriate library or non-library esoteric name, as necessary. This precaution prevents the MVS/CSC from requesting MVS or JES3 to allocate resources incorrectly.

In addition to specifying the explicit esoteric name in JCL, users of Open Type-J should also specify deferred mounts to prevent extraneous mount requests from being issued.

### MIM

Multi-image Manager (MIM) is used in a multi-CPU environment to control the allocation of transports to a particular host.

The MVS/CSC can coexist with MIM, however, the following procedures must be followed when using MIM with MVS/CSC:

- Devices within the MVS/CSC-controlled library cannot be in the MIM device-preference list. However, manual transports can remain in the device-preference list.
- MIM should not be used to control the ENQ in the MVS/CSC startup parameters.

### SAMS:DISK (DMS)

Sterling Software's SAMS:DISK (DMS) has two methods of allocating transports:

- One method allocates transports at startup, keeps the transports throughout the session, and uses Open Type-J.
- One method uses dynamic allocation (DYNALLOC macro) to allocate transports.

The MVS/CSC performs better when Open Type-J is **not** used. Therefore, using the dynamic allocation method of allocating transports is recommended.

## **ASM2**

Automatic Reload uses Open Type-J for automatic data set reloading. The user explicitly specifies the appropriate transport pool for automatic data set reloading. If you want to have all reloads done for the library, specify the esoteric name associated with all library transports. If you do not want all reloads done for the library, specify the esoteric name for the manual transport.



## **Part 4. Appendices**

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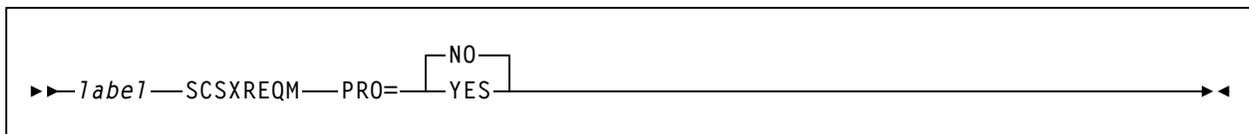


## Appendix A. Programmatic Interface SCSXREQM Macro Mappings

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The SCSXREQM macro must be specified in any program assembly that issues the SCSXREQ macro. SCSXREQM generates symbols used by the SCSXREQ macro, and generates the DSECTs of the response areas. The SCX DSECT maps the reply header. The remaining DSECTs map the information elements returned from Programmatic Interface (PGMI) requests. The prologue (if requested) in each information element lists the PGMI request that it is returned for.

The syntax for the SCSXREQM macro is:



### **PRO**

Specifies whether or not to generate a macro prologue.

### **YES**

Generates a macro prologue.

### **NO**

Does not generate a macro prologue.

# SCSXREQM Macro Mappings

Table 4. SCSXREQM Macro

Dec	Hex	Type	Len	Label	Description
0	(0)	STRUCTURE		SCSXREQM	USER INTERFACE
0	(0)	CHARACTER	4	SCSXHDR	EYECATCHER
'SCSX'	(E2D3E2E7)	CHAR CONST		SCSXID	IS AN SCSXREQ
4	(4)	SIGNED-FWORD	4	SCSXLEN	LENGTH OF CONTROL BLOCK
8	(8)	A-ADDR	1	SCSXVER	VERSION OF SCSXREQ
6	(06)	CONST		SCSXVN	CURRENT VERSION
230	(E6)	BINARY CONST		SCSXSP	SUB-POOL NUMBER

THE FOLLOWING FLAGS DEFINE THE TYPE OF PROCESSING REQUESTED

**NOTE:** ONLY A LIMITED SUBSET OF THESE FLAGS ARE CURRENTLY USED BY MVS/CSC. THEY ARE THE FLAGS REQUIRED TO SUPPORT THE QCSC, QVOLUME, QDRIVES, AND READ FUNCTIONS. ALL OTHER FLAGS WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE.

9	(9)	A-ADDR	1	SCSXRT	REQUEST TYPE
0	(00)	CONST		SCSXNOOP	NOOP - NO OPERATION
1	(01)	CONST		SCSXQCSC	QCSC - IS CSC UP?
2	(02)	CONST		SCSXREST	RESET - DISMOUNT ALL VOL
3	(03)	CONST		SCSXREAD	READ - READ A RESPONSE
4	(04)	CONST		SCSXSTOP	STOP - STOP A PROCESS
5	(05)	CONST		SCSXRS05	Reserved - VM Only
20	(14)	CONST		SCSXQCNF	QCONFIG - QUERY CONFIG
21	(15)	CONST		SCSXQDRV	QDRIVES - QUERY DRIVES
22	(16)	CONST		SCSXQDRL	QDRLIST - QUERY DRIVES
23	(17)	CONST		SCSXQSCR	QSCRATCH - QUERY SCRATCH
24	(18)	CONST		SCSXQVOL	QVOLUME - QUERY VOLUME

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
25	(19)	CONST		SCSXQEJT	QEJECT - QUERY EJECT TASK
26	(1A)	CONST		SCSXQCAP	QCAP - QUERY CAP CONFIG
27	(1B)	CONST		SCSXRS17	Reserved - VM Only
28	(1C)	CONST		SCSXQRQS	QREQUEST - QUERY REQUESTS
29	(1D)	CONST		SCSXQDSN	QDSN - QUERY DATASET
40	(28)	CONST		SCSXMNT	MOUNT - MOUNT A VOLUME
41	(29)	CONST		SCSXMOVE	MOVE - MOVE A CARTRIDGE
42	(2A)	CONST		SCSXDSM	DISMOUNT - DISMOUNT A VOLUME
43	(2B)	CONST		SCSXEJCT	EJECT - EJECT A VOLUME
60	(3C)	CONST		SCSXSSCR	SELSCR - SELECT SCRATCH
61	(3D)	CONST		SCSXSCRA	SCRATCH - SCRATCH A VOLUME
62	(3E)	CONST		SCSXUNSC	UNSCRATCH - UNSCRATCH A VOLUME
63	(3F)	CONST		SCSXRS63	Reserved - VM Only
64	(40)	CONST		SCSXRS64	Reserved - VM Only
10	(A)	BITSTRING	1	SCSXFLG1	FLAG BYTE 1 (PGMI Control 1)
		1... .... X'80'		SCSXSYNC	OPTION=SYNC SPECIFIED
		.1.. .... X'40'		SCSXF140	Reserved VM User=option
		..1. .... X'20'		SCSXF120	Reserved VM Dialog OFF
		...1 .... X'10'		SCSXF110	Reserved VM Dialog ON
		.... 1... X'08'		SCSXF108	Reserved VM Notify=INSEDL
		.... .1.. X'04'		SCSXF104	Reserved VM Notify=NOINSEDL
		.... ..1. X'02'		SCSXF102	Reserved VM ACCT2
		.... ....1 X'01'		SCSXF101	Reserved VM ACCT1

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
11	(B)	HEXSTRING	1	SCSXFLG2	FLAG BYTE 2 (PGMI Control 2)
12	(C)	BITSTRING	1	SCSXFLG3	FLAG BYTE 3 (Movement Control 1)
		1... .... X'80'		SCSXVHST	SCSXHOST CONTAINS A HOSTID
		.1.. .... X'40'		SCSXVACS	
		..1. .... X'20'		SCSXVLSM	SCSXLSMI CONTAINS THE LSMID
		...1 ... X'10'		SCSXVCAP	SCSXCAP CONTAINS CAP
		.... 1.. X'08'		SCSXF308	Reserved Future Use
		.... .1.. X'04'		SCSXVVOL	SCSXVOLS CONTAINS A VOLSER
		.... ..1. X'02'		SCSXVLST	SCSXLSTA CONTAINS A LIST ADR
		.... ...1 X'01'		SCSXVCNT	SCSXCNT CONTAINS LIST COUNT
13	(D)	BITSTRING	1	SCSXFLG4	FLAG BYTE 4 (Movement Control 2)
		1... .... X'80'		SCSXVTLM	SCSXTLSM CONTAINS TOLSM
		.1.. .... X'40'		SCSXVTPN	SCSXTPAN CONTAINS TOPANEL
		..1. .... X'20'		SCSXF420	Reserved Future Use
		...1 ... X'10'		SCSXF410	Reserved Future Use
		.... 1.. X'08'		SCSXVPAN	SCSXPAN CONTAINS PANEL #
		.... .1.. X'04'		SCSXVROW	SCSXROW CONTAINS ROW #
		.... ..1. X'02'		SCSXVCOL	SCSXCOL CONTAINS COLUMN #
		.... ...1 X'01'		SCSXVDRV	SCSXDRIV CONTAINS DEVICE NUMBER
14	(E)	HEXSTRING	1	SCSXFLG5	FLAG BYTE 5 (Movement Control 3)

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
15	(F)	BITSTRING	1	SCSXFLG6	FLAG BYTE 6 (Miscellaneous Control 1)
		1... .... X'80'		SCSXPROT	PROTECT=YES SPECIFIED
		.1.. .... X'40'		SCSXSCR	SCRATCH=YES SPECIFIED
		..1. .... X'20'		SCSXVSCP	SCSXPOOL HAS A SCRATCH POOL NUM
		...1 .... X'10'		SCSXSUBN	SCXSUBP CONTAINS TEXT
		.... 1... X'08'		SCSXVTKN	SCSXTKNO CONTAINS TOKEN NUM
		.... .1.. X'04'		SCSXVTXT	SCSXTEXT CONTAINS TEXT
		.... ..1. X'02'		SCSXF602	Reserved Future Use
		.... ...1 X'01'		SCSXF601	Reserved Future Use
		16		(10)	HEXSTRING
1... .... X'80'	SCSXSSN		CSC SUBSYSTEM NAME SPECIFIED		
17	(11)	BITSTRING	1	SCSXLABT	LABEL TYPE
0	(00)	CONST		SCSXLLDT	LDT (LIBRARY DEFAULT TYPE)
1	(01)	CONST		SCSXLSL	SL (STANDARD LABEL)
2	(02)	CONST		SCSXLAL	AL (ANSI LABEL)
3	(03)	CONST		SCSXLNL	NL (NON-LABELED)
4	(04)	CONST		SCSXLNS	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
44	(2C)	SIGNED-FWORD	4	SCSXRLN	RESPONSE LENGTH
48	(30)	SIGNED-FWORD	4	SCSXTKNO	PGMI PASS THRU TOKEN NUMBER

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
52	(34)	A-ADDR	4	SCSXLSTA	ADDRESS OF LIST
56	(38)	SIGNED-HWORD	2	SCSXCNT	COUNT OF ELEMENTS IN LIST
58	(3A)	SIGNED-HWORD	2	SCSXLOFF	OFFSET, FROM START OF PARAMETER LIST TO START OF THE ELEMENT LIST AREA
60	(3C)	CHARACTER	6	SCSXVOLS	VOLSER FROM VOLSER= PARAMETER
66	(42)	CHARACTER	8	SCSXHOST	ASSOCIATED HOSTID
74	(4A)	AREA	4	SCSXALC	ACS / LSM / CAP IDENTIFICATION
74	(4A)	HEXSTRING	1	SCSXACS	ACS ID NUMBER
74	(4A)	HEXSTRING	2	SCSXLSMI	LSM ID NUMBER
74	(4A)	HEXSTRING	4	SCSXCAP	CAP-ID
77	(4D)	HEXSTRING	1	-RESERVED-	NOT IMPLEMENTED (ALWAYS X'00')
78	(4E)	HEXSTRING	1	SCSXPAN	CELL- PANEL
79	(4F)	HEXSTRING	1	SCSXROW	CELL- ROW
80	(50)	HEXSTRING	1	SCSXCOL	CELL- COLUMN
81	(51)	HEXSTRING	2	SCSXTLSM	TO LSM ID FOR MOVE FUNCTION
83	(53)	HEXSTRING	1	SCSXTPAN	"TO" PANEL FOR MOVE FUNCTION
84	(54)	A-ADDR	2	SCSXDRIV	DRIVE DEVICE NUMBER
86	(56)	A-ADDR	1	SCSXPOOL	SCRATCH POOL NUMBER
87	(57)	CHARACTER	32	SCSXTEXT	TEXT ASSOCIATED WITH REQUEST
119	(77)	CHARACTER	13	SCSXSUBP	SCRATCH SUBPOOL NAME

**NOTE:** THE FOLLOWING FIELDS ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE.

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
TAPEREQ INPUT KEY VALUES.					
THE FOLLOWING VALUES ARE USED AS THE KEY IN SEARCHING THE CURRENT TAPEREQ PARAMETER FILE.					
132	(84)	BITSTRING	1	SCSXFLG8	FLAG BYTE 8 (TAPEREQ CONTROL 1)
		1... .... X'80'		SCSXFJOB	SCSXJOBN PRESENT
		.1.. .... X'40'		SCSXFSTP	SCSXSTEP PRESENT
		..1. .... X'20'		SCSXFPGM	SCSXPGMN PRESENT
		...1 ... X'10'		SCSXFDSN	SCSXDSN PRESENT
		.... 1... X'08'		SCSXFEXP	SCSXEXPD PRESENT
		.... .1.. X'04'		SCSXFRET	SCSXRETP PRESENT
		.... ..1. X'02'		SCSXFVOL	SCSXVOLT PRESENT
133	(85)	CHARACTER	8	SCSXJOBN	STRING TO MATCH TAPEREQ JOBNAME VALUE
141	(8D)	CHARACTER	8	SCSXSTEP	STRING TO MATCH TAPEREQ STEPNAME VALUE
149	(95)	CHARACTER	8	SCSXPGMN	STRING TO MATCH TAPEREQ PROGNAME VALUE
157	(9D)	CHARACTER	44	SCSXDSN	STRING TO MATCH TAPEREQ DSN VALUE
201	(C9)	HEXSTRING	3	SCSXEXPD	VALUE TO MATCH TAPEREQ EXPDT VALUE
204	(CC)	HEXSTRING	2	SCSXRETP	VALUE TO MATCH TAPEREQ RETPD VALUE
206	(CE)	CHARACTER	1	SCSXVOLT	VALUE TO MATCH TAPEREQ VOLTYPE VALUE
<b>NOTE:</b> THE FOLLOWING FIELDS ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE.					
TAPEREQ OUTPUT VALUES.					

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
THE FOLLOWING VALUES ARE USED AS OVERRIDE (OR SPECIFIC) VALUES TO THE VALUES FOUND IN THE CURRENT TAPEREQ PARAMETER FILE.					
207	(CF)	BITSTRING	1	SCSXFLG9	FLAG BYTE 9 (TAPEREQ CONTROL 2)
		1... .... X'80'		SCSXFREC	SCSXRECT PRESENT
		.1.. .... X'40'		SCSXFMED	SCSXMED PRESENT
208	(D0)	CHARACTER	8	SCSXRECT	RECORDING TECHNIQUE
216	(D8)	CHARACTER	8	SCSXMED	MEDIA
224	(E0)	CHARACTER	4	SCSXNAME	CSC SUBSYSTEM NAME
228	(E4)	AREA	252	-RESERVED-	FUTURE PARM EXPANSION
480	(1E0)	AREA	1	SCSXLIST	ELEMENT LIST DESIGNATED BY LIST= PARAMETER BEGINS HERE (FIELD SCSXCNT CONTAINS NUMBER OF ELEMENTS IN THIS LIST)
6	(06)	CONST		SCSXLVSL	LENGTH OF EACH ELEMENT (VOLSER) IN THE LIST USED BY THE QVOLUME FUNCTION
500	(1F4)	CONST		SCSXMVSL	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE QVOLUME FUNCTION
4	(04)	CONST		SCSXLCAP	LENGTH OF EACH ELEMENT (CAP IDENTIFIER) IN THE LIST USED BY THE QCAP FUNCTION
500	(1F4)	CONST		SCSXMCAP	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE QCAP FUNCTION
4	(04)	CONST		SCSXLTK	LENGTH OF EACH ELEMENT (UNIQUE TOKEN) IN THE LIST USED BY THE QCAP FUNCTION

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
500	(1F4)	CONST		SCSXMTOK	MAXIMUM NUMBER OF ELEMENTS ALLOWED IN THE LIST USED BY THE QEJECT/STOP FUNCTIONS
256	(100)	CONST		SCSXMCSC	MAXIMUM NUMBER OF CSC NAME INFORMATION ELEMENTS THAT CAN BE RETURNED ON A QCSC REQUEST
REPLY HEADER					
0	(0)	STRUCTURE		SCX	
0	(0)	AREA	1	SCXRPLY	
0	(0)	CHARACTER	3	SCXHID	HEADER IDENTIFIER
230	(E6)	BINARY CONST		SCXSP	SUB-POOL NUMBER
3	(3)	A-ADDR	1	SCXCMDRC	RETURN CODE
0	(00)	CONST		SCXROK	REQUEST SUCCESSFUL
4	(04)	CONST		SCXRWARN	REQUEST SUCCESSFUL WITH WARNING - SCXSRC WILL PROVIDE THE SPECIFIC REASON FOR THE WARNING
8	(08)	CONST		SCXRBADP	REQUEST FAILED - THE PARAMETER LIST (SCSXREQM) CONTAINED INVALID DATA (E.G. INCOMPATIBLE OPTIONS) SCXPEOFF (PARM ERROR OFFSET) WILL PROVIDE AN OFFSET OF THE SCSXREQM FIELD FOUND IN ERROR
12	(0C)	CONST		SCXRIERR	REQUEST FAILED - AN UNRECOVERABLE INTERNAL ERROR OCCURRED WHILE PROCESSING THE REQUEST
16	(10)	CONST		SCXRFAIL	REQUEST FAILED - SCXSRC WILL PROVIDE THE SPECIFIC REASON FOR THE FAILURE

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
20	(14)	CONST		SCXRNCSC	REQUEST FAILED - CSC NOT AVAILABLE (MVS ONLY)
24	(18)	CONST		SCXRNAUT	REQUEST FAILED - USER NOT AUTHORIZED. THE REQUEST WAS FAILED BY SCSUX05 OR THE CSC DEFAULT AUTHORIZATION
28	(1C)	CONST		SCXNTCB	REQUEST FAILED - THE CALLER WAS NOT IN TASK MODE (MVS ONLY)
32	(20)	CONST		SCXLOCKD	REQUEST FAILED - THE CALLER HELD AT LEAST ONE LOCK (MVS ONLY)
36	(24)	CONST		SCXTPROT	
REQUEST FAILED - THE CALLER DID NOT HAVE FETCH/STORE AUTHORITY TO THE SCSXREQM PARAMETER LIST (MVS ONLY)					
40	(28)	CONST		SCXNORSP	REQUEST FAILED - NO RESPONSE ELEMENT WITH THE SPECIFIED TOKEN EXISTED (MVS ONLY)
4	(4)	A-ADDR	1	SCXVERS	REPLY VERSION CODE
7	(07)	CONST		SCXVCODE	VERSION 7 OF THE REPLY AREA
5	(5)	BITSTRING	1	SCXRFLG1	RESPONSE FLAGS
		1... .... X'80'		SCXROKM	MORE RESPONSES CAN BE READ
6	(6)	HEXSTRING	2	-RESERVED-	RESERVED
8	(8)	SIGNED-FWORD	4	SCXSRC	FAILURE/WARNING REASON CODE
28684	(700C)	CONST	4	SCXVNF	ONE OR MORE VOLUMES WERE NOT FOUND IN THE LIBRARY ON A QVOLUME REQUEST
32772	(8004)	CONST		SCXNOALS	CSC IS NOT ACTIVE

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
32776	(8008)	CONST		SCXMCSC	MULTIPLE CSCs ARE ACTIVE
32788	(8014)	CONST		SCXQNOA	ASCOMM IS NOT ACTIVE
32792	(8018)	CONST		SCXINVOP	INVALID QUAB OPTION INTERNAL ERROR - CONTACT STK.
32780	(800C)	CONST		SCXINVFC	INVALID FUNCTION CODE INTERNAL ERROR - CONTACT STK.
32784	(8010)	CONST		SCXNOLVT	NO LVT INTERNAL ERROR - CONTACT STK.
32796	(801C)	CONST		SCXNODRV	NO DRIVES FOUND ON QDRIVE CALL THAT ARE OWNED BY THE PROCESSING CSC
32804	(8024)	CONST		SCXTABND	ASCOMM SERVER TASK ABENDED
32818	(8032)	CONST		SCXTINTR	CURRENT TASK INTERRUPTED
32822	(8036)	CONST		SCXSANF	SEARCH ARGUMENT NOT FOUND
32826	(803A)	CONST		SCXMSTT	MIS-MATCHED TOKEN TYPES
32832	(8040)	CONST		SCXTRNF	TOKEN REQUEST AREA NOT FOUND
32848	(8050)	CONST		SCXSFUL	REPLY AREA SPACE FULL
32849	(8051)	CONST		SCXDVMM	DRIVE/MEDIA MISMATCH - THE REQUESTED MEDIA IS NOT COMPATIBLE WITH THE DRIVE SPECIFIED IN THE PGM CALL
32850	(8052)	CONST		SCXCMAx	MAX NUMBER OF ACTIVE CSC'S FOUND WHILE PROCESSING A QCSC REQUEST
32851	(8053)	CONST		SCXSRVU	THE LCS BECAME UNAVAILABLE BEFORE OR DURING A REQUEST. THE RESPONSE MAY NOT CONTAIN ALL EXPECTED INFORMATION ELEMENTS

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
32852	(8054)	CONST		SCXUNSP	THE REQUEST TYPE IS NOT SUPPORTED IN THIS CSC'S SERVER ENVIRONMENT
32853	(8055)	CONST		SCXLMAX	THE NUMBER OF LIST ITEMS SPECIFIED BY THE REQUESTOR EXCEEDS THE MAXIMUM (SEE SCSXMOVSL)
32854	(8056)	CONST		SCXLCSF	THE LCS FAILED THE REQUEST SENT BY MVS/CSC; SCXLCSRC CONTAINS THE SERVER REASON CODE
12	(0C)	A-ADDR	4	SCXLCSRC	FAILURE REASON CODE FROM THE LCS
16	(10)	A-ADDR	4	SCXLEN	TOTAL RESPONSE LENGTH
20	(14)	SIGNED-FWORD	4	SCXPEOFF	PARAMETER ERROR OFFSET
24	(18)	CHARACTER	4	SCXCSCNM	CSC SUBSYSTEM THAT PROCESSED THE REQUEST
28	(1C)	LENGTH		SCXHL	SCX HEADER LENGTH
<p><b>NOTE:</b> THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE</p>					
<p>CONFIGURATION SUMMARY SECTION DIRECTORY</p>					
68	(44)	SIGNED-FWORD	4	SCXXCFGN	NUMBER OF CONFIGURATION ELEMENTS PRESENT IN THIS REPLY
72	(48)	SIGNED-FWORD	4	SCXXCFGO	OFFSET TO CONFIGURATION SECTION FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN ANY CONFIGURATION ELEMENTS
76	(4C)	SIGNED-FWORD	4	SCXXCFGL	LENGTH OF A CONFIGURATION ELEMENT, OR 0 IF REPLY DOESN'T CONTAIN ANY CONFIGURATION ELEMENTS

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
VOLUME INFORMATION SECTION DIRECTORY					
80	(50)	SIGNED-FWORD	4	SCXXVOLN	NUMBER OF VOLUME ELEMENTS PRESENT THIS REPLY
84	(54)	SIGNED-FWORD	4	SCXXVOLO	OFFSET TO VOLUME SECTION FROM START OF REPLY
88	(58)	SIGNED-FWORD	4	SCXXVOLL	LENGTH OF A VOLUME ELEMENT
DRIVE INFORMATION SECTION DIRECTORY					
92	(5C)	SIGNED-FWORD	4	SCXXDRVN	NUMBER OF DRIVE ELEMENTS PRESENT IN THIS REPLY
96	(60)	SIGNED-FWORD	4	SCXXDRVO	OFFSET TO DRIVE SECTION FROM START OF REPLY
100	(64)	SIGNED-FWORD	4	SCXXDRVL	LENGTH OF A DRIVE ELEMENTS
NOTE: THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE					
MESSAGE TEXT SECTION DIRECTORY					
104	(68)	SIGNED-FWORD	4	SCXXMSGN	NUMBER OF MESSAGE ELEMENTS PRESENT IN THIS REPLY
108	(6C)	SIGNED-FWORD	4	SCXXMSGO	OFFSET TO MESSAGE SECTION, FROM START OF REPLY, OR 0 IF REPLY DOESN'T CONTAIN ANY MESSAGE ELEMENTS

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
112	(70)	SIGNED-FWORD	4	SCXXMSGL	LENGTH OF A MESSAGE ELEMENT
NOTE: THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE					
QCAP INFORMATION SECTION DIRECTORY					
116	(74)	SIGNED-FWORD	4	SCXXCAPN	NUMBER OF CAP ELEMENTS PRESENT IN THIS REPLY
120	(78)	SIGNED-FWORD	4	SCXXCAPO	OFFSET TO CAP SECTION FROM START OF REPLY
124	(7C)	SIGNED-FWORD	4	SCXXCAPL	LENGTH OF A CAP ELEMENT
NOTE: THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE					
QEJECT INFORMATION SECTION DIRECTORY					
128	(80)	SIGNED-FWORD	4	SCXXQJTN	NUMBER OF QEJECT ELEMENTS PRESENT THIS REPLY
132	(84)	SIGNED-FWORD	4	SCXXQJTO	OFFSET TO QEJECT SECTION FROM START OF REPLY
136	(88)	SIGNED-FWORD	4	SCXXQJTL	LENGTH OF A QEJECT ELEMENT
NOTE: THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE					
STOP INFORMATION SECTION DIRECTORY					
140	(8C)	SIGNED-FWORD	4	SCXXSTPN	NUMBER OF STOP ELEMENTS PRESENT IN THIS REPLY

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
144	(90)	SIGNED-FWORD	4	SCXXSTPO	OFFSET TO STOP SECTION FROM START OF REPLY
148	(94)	SIGNED-FWORD	4	SCXXSTPL	LENGTH OF A STOP ELEMENT
NOTE: THE FIELDS IN THIS SECTION ARE CURRENTLY UNUSED BY MVS/CSC, BUT WILL REMAIN DEFINED FOR POSSIBLE FUTURE USE					
QDSN INFORMATION SECTION DIRECTORY					
152	(98)	SIGNED-FWORD	4	SCXXQDSN	NUMBER OF QDSN ELEMENTS PRESENT IN THIS REPLY
156	(9C)	SIGNED-FWORD	4	SCXXQDSO	OFFSET TO QDSN SECTION FROM START OF REPLY
160	(A0)	SIGNED-FWORD	4	SCXXQDSL	LENGTH OF A QDSN ELEMENT
CSC SUBSYSTEM NAME INFORMATION SECTION DIRECTORY					
152	(98)	SIGNED-FWORD	4	SCXXNAMN	NUMBER OF CSC SUBSYSTEM NAME ELEMENTS PRESENT IN THIS REPLY
156	(9C)	SIGNED-FWORD	4	SCXXNAMO	OFFSET TO CSC SUBSYSTEM NAME SECTION FROM START OF REPLY
160	(A0)	SIGNED-FWORD	4	SCXXNAML	LENGTH OF A CSC SUBSYSTEM NAME ELEMENT
11	(B)	AREA	8	SCXEND	LABEL FOR ADDRESSING NEXT AREA.
15	(F)	LENGTH		SCXL	SCX LENGTH
VOLUME INFORMATION ELEMENT					

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
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		SCXSVOL	
0	(0)	CHARACTER	3	SCXVID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SCXVSTA	VOLUME STATUS:
		1... .... X'80'		SCXVILB	VOLUME IS IN LIBRARY
		.1.. .... X'40'		SCXVOHST	RESERVED FOR FUTURE USE
		..1. .... X'20'		SCXVSCR	RESERVED FOR FUTURE USE
		...1 .... X'10'		SCXVMAL	RESERVED FOR FUTURE USE
		.... 1... X'08'		SCXVDSC	RESERVED FOR FUTURE USE
		.... .1.. X'04'		SCXVMNT	VOLUME IS MOUNTED ON A DRIVE
		.... ..1. X'02'		SCXVERR	RESERVED FOR FUTURE USE
		.... ...1 X'01'		RESERVED	RESERVED FOR FUTURE USE
4	(4)	CHARACTER	6	SCXVSER	VOLUME SERIAL
10	(A)	A-ADDR	1	SCXVLC	VOLUME LOCATION CODE:
0	(00)	CONST		SCXVUNK	LOCATION DATA UNAVAILABLE
1	(01)	CONST		SCXVCEL	LOCATION DATA IS A CELL ADDRESS
2	(02)	CONST		SCXVDRV	LOCATION DATA IS A DRIVE ADDRESS
11	(B)	AREA	5	SCXVLOC	VOLUME LOCATION DATA:

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
11	(B)	HEXSTRING	1	SCXVACS	ACS ADDRESS
12	(C)	HEXSTRING	1	SCXVLSM	LSM ADDRESS
13	(D)	HEXSTRING	3	SCXVPNL	PANEL, ROW, COL
13	(D)	HEXSTRING	2	SCXVDRIV	DRIVE ADDRESS (0CUU)
15	(F)	HEXSTRING	1	SCXVFILL	RESERVED
16	(10)	CHARACTER	8	SCXVMED	TYPE OF MEDIA. POSSIBLE VALUES: 'LONGItud', 'STANDARD', 'ECART', 'ZCART', 'DD3A', 'DD3B', 'DD3C', 'DD3D', 'STK1U', 'STK1R', 'VIRTUAL'
24	(18)	CHARACTER	8	SCXVTSNN	VTSS NAME
32	(20)		8		RESERVED FOR FUTURE USE
40	(28)	LENGTH		SCXSVOLL	LENGTH OF SCXSVOL

**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 REQUEST:

**QDRIVES - RETURN DRIVE AND LSM INFORMATION**

0	(0)	STRUCTURE		SCXSDRV	
0	(0)	CHARACTER	3	SCXDID	SECTION IDENTIFIER
3	(3)	BITSTRING	1	SCXDSTA	LIBRARY STATUS
		...1 .... X'10'		SCXDMANU	RESERVED FOR FUTURE USE
		.... 1... X'08'		SCXDDISC	RESERVED FOR FUTURE USE
4	(4)	HEXSTRING	1	SCXQDEAC	ACS ADDRESS
5	(5)	HEXSTRING	1	SCXQDELS	LSM ADDRESS
6	(6)	HEXSTRING	2	SCXQDECU	DRIVE ADDRESS (0CUA)

**Table 4. SCSXREQM Macro (Continued)**

Dec	Hex	Type	Len	Label	Description
8	(8)	CHARACTER	8	SCXQDRT	RECORDING TECHNIQUE OF DRIVE. POSSIBLE VALUES: '18TRACK', 36ATRACK', '36BTRACK', 36CTRACK', 'DD3', 'STK1R'
16	(10)	AREA	8	-RESERVED-	ALIGN
20	(20)	LENGTH		SCXSDRVL	LENGTH OF SCSXDRV

**CSC SUBSYSTEM NAME INFORMATION ELEMENT**

THIS ELEMENT SUPPLIES THE NAME OF AN ACTIVE CSC. IT IS REPEATED FOR EACH ACTIVE CSC FOUND. THESE ELEMENTS WILL APPEAR IN THE SAME ORDER AS THE ACTIVE CSC SUBSYSTEMS APPEAR IN THE MVS SUBSYSTEM NAME TABLE. THIS ELEMENT MAY APPEAR IN REPLIES TO THE FOLLOWING REQUEST:

QCSC \*ALL - QUERY ALL ACTIVE CSC SUBSYSTEMS

0	(0)	STRUCTURE		SCXSNAM	
0	(0)	CHARACTER	3	SCXNID	SECTION IDENTIFIER
3	(3)	BITSTRING	1		UNUSED
4	(4)	CHARACTER	4	SCXNAME	CSC SUBSYSTEM NAME
8	(8)	AREA	8	-RESERVED-	ALIGN
32	(20)	LENGTH		SCXSNAML	LENGTH OF SCSXNAM

## Appendix B. Gathering Diagnostic Materials

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### Overview

During problem resolution, Software Support may request that you provide specific diagnostic material. While printed format may be accepted, machine readable data (on magnetic tape) is preferred. For small amounts of data, Software Support may request that you FAX the data. Doing this may significantly reduce the time needed to resolve your problem.

### MVS Diagnostic Materials

The following MVS/CSC diagnostic materials may be requested by Software Support:

- Details of circumstances
- MVS SYSLOG
- SCSLOG data set
- SCSTRACE data set
- SYSxDUMP and SYS1.DUMPnn data sets
- Event Log Report (VM-based LCS)
- Event log data set (MVS-based and UNIX-based LCS)
- EREP records (software)
- MVS/CSC startup parameter file
- MVS/CSC startup procedure (cataloged procedure)
- MVSCP/IOCP definition or HCD

## Tape Format

If Software Support requests a tape containing your diagnostic materials, copy the requested files to tape using standard utility programs.

Include a description of the tape contents, including any information necessary for Software Support to retrieve the files from the tape (i.e. tape volume serial number and label attributes, number of files, file names and attributes, etc.).

See the *Requesting Help from Software Support* guide for more information.

## Appendix C. List of Abbreviations

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abend	Abnormal end of task
ACS	Automated Cartridge System
APPC	Advanced-Program-to-Program Communications
CAP	Cartridge access port
CDS	Control data set
CLS	Common Library Services
CLSCOMM	CLS Communications
CLSCM	CLS Configuration Management
CLSLP	CLS logical port
CLSM	CLS Manager
CLSOC	CLS operator console
CMS	Conversational monitor system
CP	Control program
CPA	Control Path Adaptor
CSA	Common service area
CSC	Client System Component
CSSC	Customer Service Support Center
DASD	Direct access storage device
DFSMS	Data Facility Storage Management Subsystem
DMS/OS	DASD Management System/Operating System
EC	Engineering change
EDL	Eligible Device List
ESC	European Support Center
HCD	Hardware Configuration Definition
HSC	Host Software Component

IBM	International Business Machines Corporation
ICRC	Improved Cartridge Recording Capacity
ID	Identifier or identification
IJS	Intermediate Job Summary table
IML	Initial microcode load
I/O	Input/output
IOCP	I/O Configuration Program
IP	Internet Protocol
IPL	Initial program load
ISMF	Interactive Storage Management Facility
JCL	Job control language
JES	Job entry subsystem
JST	Job Summary Table
LAN	Local area network
LCU	Library Control Unit
LMU	Library Management Unit
LP	Logical port
LU	Logical unit
LSM	Library Storage Module
MB	Megabyte
MIM	Multi-image Manager
MVS	Multiple virtual storage
MVS/ESA	Multiple Virtual Storage/Enterprise Systems Architecture
MVS/SP	Multiple Virtual Storage/System Product
PCR	Product change request
PGMI	Programmatic interface
PIB	Product Information Bulletin
PN	Part number
PROP	Programmable operator facility
PTF	Program temporary fix
PUT	Program update tape
PVM	VM/Pass-Through Facility

RACF	Resource access control facility
RPC	Remote procedure call
SAF	System Authorization Facility
SER	Software Enhancement Request
SCP	System control program
SLK	Refers to the SCP
SMP/E	System Modification Program Extended
SMC	Storage Management Component
SMS	Storage Management Subsystem
SNA	Systems Network Architecture
SP	System Product
SSR	System Support Representative
STK	StorageTek
Sysplex	<u>System complex</u>
TCP/IP	Transmission Control Protocol/Internet Protocol
TLMS	Tape library management system
TMI	Tape management interface
TMS	Tape management system
VLR	Volume location record
VM	Virtual machine
VOLSER	Volume serial number
VSM	Virtual Storage Manager
VTAM	Virtual Telecommunications Access Method
VTCS	Virtual Tape Control System
VTSS	Virtual Tape Storage Subsystem
WSC	World Wide Support Center
WTO	Write-to-operator
WTOR	Write-to-operator with reply
XCF	Cross-system coupling facility



## Glossary

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Terms are defined as they are used in the text. If you cannot find a term here, check the index.

### A

**Abnormal end of task (abend)**— A software or hardware problem that terminates a computer processing task.

**ACS-id**— A method used in the LIBGEN process to identify ACSs by using hexadecimal digits, 00 to nn.

**ACS**— *See* Automated Cartridge System.

**ACS library**— A library is composed of one or more Automated Cartridge Systems (ACSs), attached 4480, 4490, 9490, 9490EE, SD3, or 9840 cartridge drives, and cartridges residing in the ACSs.

**ACSSA**— The ACS System Administrator console provides access to the LCS and the library for the UNIX-based LCS.

**ACSLs**— *See* Automated Cartridge System Library Software.

**address**— Coded representation of hardware id, or the destination or origination of data.

**allocation**— The assignment of resources to a specific task.

**asynchronous transmission**— Character-oriented data transmission (as distinct from IBM's block-mode transmission).

**authorization**— The granting of VM userids access to the CLS system.

**Automated Cartridge System (ACS)**— The library subsystem consisting of one or two Library Management Units (LMUs) and from one to 16 Library Storage Modules (LSMs) attached to the LMUs.

**Automated Cartridge System Library Software (ACSLs)**— The library control software, which runs in the UNIX®-based Library Control System.

**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. The opposite situation is “manual mode.” *See* manual mode.

### B

**bar code**— A code consisting of a series of bars of varying widths. This code appears on the external label attached to the spine of a cartridge and is equivalent to the volume serial number (volser). This code is read by the robot's machine vision system.

**BISYNC**— Binary Synchronous Communications. An early low-level protocol developed by IBM and used to transmit data on a synchronous communications link. It is a form of data transmission in which synchronization of characters is controlled by timing signals generated at the sending and receiving stations.

### C

**CAPid**— A CAPid uniquely defines the location of a CAP by the LSM on which it resides. A CAPid is of the form “AAL” where “AA” is the acs-id and “L” is the LSM number.

**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 an OCR/Bar Code label listing the VOLSER (tape volume identifier).

**Cartridge Access Port (CAP)**— An assembly that allows several cartridges to be inserted into or ejected from an LSM without human entry into the LSM.

**cartridge drive (CD)**— A hardware device containing two or four cartridge transports and associated power and pneumatic supplies.

**cartridge tape I/O driver**— Operating system software that issues commands (for example, read, write, and rewind) to cartridge subsystems. It is the software focal point for attaching a particular type of control unit. (An example is the StorageTek CARTLIB product.)

**cartridge transport**— *See* transport.

**cell**— A receptacle in the LSM in which a single cartridge is stored.

**channel**— A device that connects the host and main storage with the input and output devices' control units. A full-duplex channel has two paths (that is, 2 wires, or one wire with signals at two frequencies). A half-duplex channel requires that one port receives while the other transmits.

**channel-to-channel (CTC)**— Refers to the communication (transfer of data) between programs on opposite sides of a channel-to-channel adapter.(I)

**client**— The ultimate user of the ACS services as provided by the Library Control System.

**client computing system (CCS)**— A computer and an operating system.

**client-initiated utilities (CIU)**— VM/HSC utilities that can be executed from a CLS or client operator console.

**client link**— The communications link between the LCS and a client.

**client-server**— A model of interaction in a distributed system in which a program at one site serves a request to a program at another site and awaits a response. The requesting program is called a client; the program satisfying the request is called a server.

**client system**— The system to which the LCS provides an interface to a StorageTek Automated Cartridge System.

**Client System Component (CSC)**— Software that provides an interface between the Client Computing System's operating system and the StorageTek Library Control (LCS).

**Client System Interface**— Software that provides a transport and translation mechanism between the Library Control System (LCS) and the Client System Component (CSC).

**CLS**— *See* Common Library Services.

**CLSCM**— *See* Common Library Services Manager.

**CLSCOMM**— *See* Common Library Services Communication.

**CLSM**— *See* Common Library Services Manager.

**CLSLP**— *See* Common Library Services Logical Port.

**CLSOC**— *See* Common Library Services Operator Console.

**coaxial cable**— A transmission medium used in data transmissions for networks using synchronous communications, as opposed to twisted-pair, the primary medium for asynchronous RS-232 communications.

**Common Library Services (CLS)**— A Storage Technology software system that allows single or multiple non-IBM systems (client systems) to use the ACS.

**Common Library Services Communication (CLSCOMM)**— 3270 communication interface that connects CLS logical port to the client system.

**Common Library Services Configuration Management (CLSCM)**— *See* Configuration Management.

**Common Library Services Logical Port (CLSLP)**— The CLS software that resides on the CLS, and interfaces with the client system. The CLSLP is one of the software components used to pass data between the client system and the VM/HSC.

**Common Library Services Manager (CLSM)**— The CLS administrator virtual machine from where all CLS functions are controlled. This virtual machine controls the CLS Operator Consoles, routes commands and responses, and keeps logs of what the CLS has done.

**Common Library Services Operator Console (CLSOC)**— A VM-attached console that is used by CLS operators to monitor CLS events and from which CLS-related commands are issued.

**communication parameters**— Keywords that need to be specified for a client's mode of access to CLS (VM/Pass-Through facility or TCP/IP).

**complex**— A system composed of other systems, specifically the ACS server system and the client system.

**configuration data base (CDB)**— Data used by CLS to maintain the CLS configuration.

**Configuration Management (CM)**— A CLS program that provides a menu-driven facility for users to define and maintain CLS configurations.

**connected mode**— A relationship between a host and an ACS. In this mode, the host and an ACS are capable of communicating (in the sense that at least one station to this ACS is online).

**connection number**— The unique identifier on the server for a communications path. The number is assigned by TCP/IP to identify the unique connection between the server node and a specific port on the server, and the client node and a specific port on the client. The connection number exists only as long as the connection exists.

**console**— The primary I/O device to control a session on a system.

**control data set (CDS)**— The data set used by the host software to control the functions of the automated library. Also called a library database.

**Control Path Adaptor (CPA)**— A Bus-Tech, Inc. hardware device that allows communications between a host processor's block multiplexer channel and a local area network.

**control program (CP)**— The piece of the VM operating system that controls the real hardware, provides services to virtual machines so that they appear to be real machines, and provides the timesharing services on the processor.

**Control Unit (CU)**— A microprocessor-based unit situated locally between a channel and an I/O device. It translates channel commands into device commands and sends device status to the channel.

**conversational monitor system (CMS)**— A virtual machine operating system that provides a general interactive environment and operates only under the control of VM.

**coupling facility**— A special logical partition that provides high-speed caching, list processing, and locking functions in a sysplex.(I)

**coupling facility channel**— A high bandwidth fiber optic channel that provides the high-speed connectivity required for data sharing between a coupling facility and the central processor complexes directly attached to it.(I)

**coupling services**— In a sysplex, the functions of XCF that transfer data and status between members of a group residing on one or more MVS systems in the sysplex.(I)

**cross-system coupling facility (XCF)**— XCF is a component of MVS that provides functions to support cooperation between authorized programs running within a sysplex.(I)

**CTC**— Channel-to-channel.

## D

**Data Path Adapter**— A hardware device which translates from a client computing system's data protocol to the data protocol of the StorageTek Control Unit or IMU. An example is DEC's TC44-AA/BA STI-to-4400 ACS Interconnect.

**data set**— A set of records treated as a unit.

**data sharing**— The ability of concurrent subsystems or application programs to directly access and change the same data while maintaining data integrity.(I)

**device number**— A four-digit hexadecimal number that uniquely identifies a device attached to a processor.

**device preferencing**— The process of preferring one 36-track transport type over another 36-track transport type.

**device separation**— *See* drive exclusion.

**DFSMS**— Data Facility Storage Management Subsystem.

**direct access storage device (DASD)**— IBM's term for a disk drive storage device.

**directed allocation**— *See* drive prioritization.

**disconnected mode**— A relationship between a host and an ACS. In this mode, the host and the ACS are not capable of communicating (there are no online stations to this ACS).

**DMS/OS**— DASD Management System/Operating System.

**dotted-decimal notation**— The syntactic representation of a 32-bit integer that consists of four 8-bit numbers written in base ten with periods (dots) separating them. In TCP/IP descriptions, dotted-decimal notation is used for Internet addresses.

**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 panel**— An LSM wall containing tape transports. The drive panel for a 9840 transport can contain either 10 or 20 transports. The drive panel for a non-9840 transport can contain a maximum of 4 transports.

**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.

**Dual LMU**— A hardware/microcode feature that provides a redundant LMU capability.

**Dual LMU VM/HSC**— VM/HSC release 1.1.0 or later that automates a switchover to the standby LMU in a dual LMU configuration.

**dump**— A printed representation of the contents of main storage at time *t*. This representation is used for debugging purposes.

**dynamic server switching**— The capability of switching server processors when a system failure occurs on the active server.

## E

**ECART**— Enhanced Capacity Cartridge.

**Enhanced Capacity Cartridge**— A cartridge that has a length of 1100 feet and can be used only on 36-track transports (i.e. 4490, 9490, and 9490EE).

**Enterprise Systems Connection (ESCON)**— A set of products and services that provides a dynamically connected environment using optical cables as a transmission medium.(I)

**error codes (EC)**— Numeric codes displayed by messages indicating the type of problem that caused an error.

**error recovery procedures (ERP)**— Procedures designed to help isolate and, where possible, to recover from errors in equipment.

**ESCON**— Enterprise Systems Connection.

**esoteric name**— The name assigned to transports that have the same device type.

**Ethernet**— One LAN architecture using a bus topology that allows a variety of computers to be connected to a common shielded coaxial spine. The Ethernet architecture is similar to the IEEE 802.3 standard.

**event control block (ECB)**— Provides an area for a completion code to be stored when an operation has completed.

**EXEC**— VM CMS command.

## F

**file**— A set of related records treated as a unit.

**File Transfer Protocol (FTP)**— A TCP/IP command that provides a way to transfer files between machines connected through TCP/IP.

**foreign socket**— One of two end-points in a TCP/IP connection-oriented protocol. Specifies the address of a foreign host that can connect to the server.

## G

**GB**— 1,073,741,834 bytes of storage

## H

**handshake**— A flow-of-control signal sent by one process to another.

**heartbeat interval**— Specifies how often CLS checks the communications link to a client to make sure it is still “up.”

**helical cartridge**— A high capacity, helical scan cartridge that can hold up to 50GB of uncompressed data. This cartridge can be used only on RedWood (SD-3) transports.

**heterogeneous systems**— Systems of dissimilar processor or system type.

**homogeneous**— Of the same or a similar kind or nature.

**host computer**— A computer that controls a network of computers.

**Host Software Component (HSC)**— Software running on the Library Control System processor that controls the functions of the ACS.

**Host Software Component utilities**— Utilities provided by the VM/HSC that can be executed from the HSCUTIL virtual machine. *See* client-initiated utilities.

**HSC**— *See* Host Software Component.

## I

**IEEE 802.3**— A standard produced by the IEEE and accepted worldwide for local area networks using CSMA/CD (Carrier Sense Multiple Access with Collision Detection).

**ICRC**— Improved Cartridge Recording Capacity. A compression and compaction feature that increases the amount of data that can be stored on a 1/2-inch cartridge.

**initial program load (IPL)**— A process that activates a machine reset.

**Intelligent Management Unit (IMU)**— Hardware similar to a Control Unit. This term is reserved for future products.

**Interactive Storage Management Facility**— A series of applications for defining DFSMS/MVS storage groups and classes.

**Internet**— A collection of networks using TCP/IP that functions as a virtual network.

**Internet address**— The numbering system used to specify a network or host on that network for TCP/IP communications. Standard Internet address notation is dotted-decimal format.

**Internet Protocol (IP)**— Formal description of messages and rules two networks use to exchange messages.

**Inter-User Communication Vehicle (IUCV)**— A CP communications facility that allows users to pass information between properly authorized virtual machines.

**ISMF**— Interactive Storage Management Facility.

## J

**job control language (JCL)**— A problem oriented language designed to describe a job’s processing requirements to an operating system.

**JES**— Job entry subsystem.(I)

**JES2**—An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for execution, processes their output, and purges them from the system. In an installation with more than one processor, each JES2 processor independently controls its job input, scheduling, and output processing. *See also* JES3.(I)

**JES3**—An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for execution, processes their output, and purges them from the system. In complexes that have several loosely coupled processing units, the JES3 program manages processors so that the global processor exercises centralized control over the local processors and distributes jobs to them via a common job queue. *See also* JES2.(I)

## L

**LAN**— *See* local area network.

**LCS**— *See* Library Control System.

**LCS processor console**— The Library Control System processor console is used to control the VM operating system (for the VM-based LCS).

**LCU**— *See* Library Control Unit.

**LIBGEN**— The process of defining the configuration of a library to the VM/HSC.

**library**— An installation of one or more ACSs, attached 4480, 4490, 9490, 9490EE, SD3, or 9840 cartridge drives (also known as transports), volumes (cartridges) 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 cartridge transport**— *See* transport.

**library complex**— A library complex consists of one HSC Control Data Set (CDS) and may contain up to 256 Automatic Cartridge Systems (ACSs), each of which may contain up to 16 Library Storage Modules (LSMs).

**library control component**— Software that controls the mounting and dismounting of cartridges in an ACS.

**library control platform**— The hardware and software that provides the proper environment for the Library Control System.

**library control processor**— Properly configured computer hardware that supports the operation of the Library Control System.

**Library Control Software**— A library control component, the client system interface, and library utilities.

**Library Control System (LCS)**— The library control platform and the Library Control Software.

**Library Control Unit (LCU)**— The portion of an LSM that controls the movements of the robot.

**library database**— A file or data set containing information about the location and status of the removable media volumes, such as cell location, scratch status. Also called a control data set (CDS).

**library drive**— A cartridge drive in the ACS, as distinct from a stand-alone cartridge drive.

**Library Management Unit (LMU)**— A hardware and software product that coordinates the activities of one or more LSMs/LCUs.

**library mode**— The operation of a 4480 Cartridge Subsystem as part of a 4400 Automated Cartridge System, as opposed to manual mode, in which the operator inserts cartridges into the transports. *See* manual mode.

**LibraryStation**— Software that allows MVS hosts to share ACS facilities with client systems.

**Library Storage Module (LSM)**— The standard LSM (4410) a twelve-sided structure with storage space for up to around 6000 cartridges. It also contains a free-standing, vision-assisted robot that moves the cartridges between their storage cells and attached transports. *See also* PowderHorn and WolfCreek.

**LMU**— *See* Library Management Unit.

**local area network (LAN)**— A network in a small (local) geographic area.

**local port**— The designation of a given application or process among many that are available for a TCP/IP-capable host processor.

**local socket**— The address combination of a TCP/IP-capable host's network address and a specific port for an application process.

**logical port (LP)**— CLS software that interfaces with the client system. The CLSLP is one of the software components used to pass data between the client system and the VM/HSC.

**LP**— *See* logical port.

**LSM**— *See* Library Storage Module.

**LSM-id**— An LSM-id is composed of the ACS-id joined to (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 number of 1, and so forth, until all LSMs are identified (up to a maximum of sixteen or hexadecimal F).

## M

**manual mode**— Operation of a 4480, 4490, 9490, 9490EE, SD3, or 9840 cartridge drive apart from an ACS. *See* library mode.

**master LMU**— The LMU currently controlling the functional work of the ACS in a dual LMU configuration.

**mixed configuration**— A configuration that contains different types of cartridge drives in both manual and library modes.

**modem**— A device that enables digital data to be transmitted over an analog transmission facility.

**multi-client**— The environment where more than one (homogenous or heterogeneous) client system is connected to one LCS.

**MVS system console**— The MVS/CSC provides an operator interface through the MVS system console.

## N

**Nearline Storage Server**— The hardware and software necessary to use ACS libraries by client computing systems.

## O

**OCR label**— Optical character recognition label. An external label attached to the spine of a cartridge that is both human and machine readable.

**operator console**— In this document, the operator console refers to the MVS client system console.

**operating system (OS)**— Software that controls the execution of programs that facilitate overall system operation.

## P

**Pass-thru Port (PTP)**— A mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

**physical port**— The communications hardware required to support a server/client link.

**physical volume**— A physically bound unit of data file media. *See* cartridge.

**pipe**— VM Inter-User Communications Vehicle (IUCV) path.

**PowderHorn (9310)**— The high-performance version of the standard LSM.

**pre-configured package**— A storage server package including all hardware, software, and configuration parameter settings delivered by the vendor.

**privilege class**— Applicable to both the VM and CLS environments, userids are granted access to either system based on assigned rights to execute various commands.

**product change request (PCR)**— A request for enhancement to a product. Normally, this request comes from a client, but may come from StorageTek.

**program temporary fix (PTF)**— A software release designed to remedy one or a series of defects.

**program update tape (PUT)**— One or more tapes containing updates to, or new versions of, the MVS/CSC system software.

**protocol**— A formal description of message formats and the rules two or more machines must follow to exchange these messages.

## R

**recovery**— Automatic or manual procedures to resolve problems in the server system.

**reel-id**— Identifier of a specific tape volume. Equivalent to volume serial number (VOLSER).

**request**— Term used to refer to commands issued to the 4400 ACS to perform a tape-related function.

**request status record (RSR)**— An in-memory record, maintained by CLS, that tracks the status and disposition of each client request to the VM/HSC.

## S

**scratch tape**— A tape that is available to any user because it is not owned.

**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, and so on). Some installations may also subdivide their scratch pools by other characteristics such as label type.

**SD-3**— The StorageTek helical cartridge transport. Also known as RedWood.

**shadow recording**— A technique for recovery involving maintaining both a control data set and a copy (shadow) of the data set.

**signon script**— A series of statements used by CLS to initiate or verify VM Pass Through communications with the CSC. Signon scripts are defined by the CLSCM EXEC.

**socket**— A unique address on a network plus a node address plus the id of one specific application on a specific network. An abstraction used by TCP/IP.

**standard capacity cartridge**— A cartridge that can be used on any longitudinal transport (i.e., 4480, 4490, 9490, or 9490EE).

**standby**— The status of a station that has been varied online but is connected to the standby LMU of a dual LMU ACS.

**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 a SWITCH command.

**station**— A hardware path between the host computer and an LMU over which the VM/HSC and LMU send control information.

**Storage Management Component (SMC)**— Software interface between IBM's OS/390 and z/OS operating systems and StorageTek real and virtual tape hardware. SMC performs the allocation processing, message handling, and SMS processing for the NCS solution. It resides on the MVS host system with HSC and/or MVS/CSC, and communicates with these products to determine policies, volume locations, and drive ownership.

**storage server**— A set of hardware and software products designed to enable heterogeneous computer systems to use automated tape cartridge library services.

**switchover**— The assumption of master LMU function by the standby LMU.

**synchronous**— *See* BISYNC.

**synchronous LAN**— Local area network built on synchronous communications.

**sysplex**— A set of MVS systems communicating and cooperating with each other through certain multisystem hardware components and software services to process customer workloads.(I)

**System Control Program (SCP)**— A control program that provides the required environment in a virtual machine to run VM/HSC. The SCP is a component of the VM/HSC.

**Systems Network Architecture (SNA)**— A description of the logical structure, formats, protocols, and operational sequences for transmitting information units through and controlling the configuration and operation of networks.

## T

**tape drive**— A tape processing device consisting of up to four transports in a cabinet. A drive can refer to an individual transport.

**tape library management system (TLMS)**— TLMS, as used in this document, refers to any tape library management system, not to CA-1.

**trace event type**— Types of event traced through the system when tracing is enabled.

**trace file**— A file that contains information useful for debugging the system.

**transaction**— A specific set of input that triggers the execution of a specific process.

**Transmission Control Protocol (TCP)**— An inter-network standard protocol that provides a full-duplex stream service.

**transport**— An electro-mechanical device used to thread, position, and read or write from a tape.

## U

**userid**— Sometimes referred to as the VM userid, the userid is the name that identifies a specific “virtual machine” user or client.

**utility**— Program that performs a function ancillary to the chief function(s) of a computer system.

## V

**virtual machine (VM)**— A functional simulation of a computer and its associated devices. Each virtual machine is controlled by a suitable operating system.

**virtual storage**— A feature of the OS where main storage requirements are allocated by segments (or pages) as needed by programs, thus creating the apparent existence of unlimited or virtual storage.

**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 Telecommunications Access Method (VTAM)**— IBM host-resident communications software that serves as a common interface for communications.

**VM**— *See* virtual machine.

**VM/Pass-Through Facility**— IBM’s software utility for implementing synchronous communications between CLS and client.

**VM/SP or VM/XA**— A proprietary operating system of IBM corporation that consists mainly of two major components, CP and CMS.

**volume**— A tape cartridge (data carrier) that is mounted or dismounted as a unit.

**volume location record (VLR)**— A record, maintained by the CLS system, that tracks the status of each volume from the time it is mounted until it is dismounted.

**volume serial number (VOLSER)**— An identifier of a physical volume.

## W

**WolfCreek (9360)**— The high-performance LSM with a smaller capacity than the standard LSM.

## X

**XCF**— Cross-system coupling facility.

## Z

**ZCART**— An extended-enhanced cartridge that uses a thinner media to provide twice the capacity of the enhanced capacity (ECART) cartridge. This cartridge has a length of 2200 feet and can be used only on TimberLine 9490EE 36-track transports.

## Numerics

**802.3**— See IEEE 802.3.

**3270**— IBM synchronous, block-mode, half-duplex terminals preferred for use with IBM 370 and related types of machine.

**3270 protocol**— A telecommunications protocol that supports networks of 327x CRTs on IBM mainframes.

**3274**— Terminal control unit used on the ACS for processor-to-LMU communications.

**3480**— IBM's 18-track half-inch cartridge tape drive model.

**3490**— IBM's 36-track half-inch cartridge tape drive model.

**3590**— IBM's newest cartridge tape drive model that supports 128-track recording technique.

**4400 Automated Cartridge System (ACS)**— A fully automated, cartridge-based, 18-track storage and retrieval library. A 4400 ACS consists of from one to two hundred and fifty-six LMUs with each LMU connected to from one to sixteen LSMs.

**4410**— The standard Library Storage Module (LSM).

**4411**— Library Control Unit (LCU).

**4480**— The StorageTek 18-track 1/2-inch cartridge transport.

**4480 Cartridge Subsystem**— The StorageTek 4480 Cartridge Subsystem consists of a control unit (CU) plus cartridge drives (CDs).

**4490**— The StorageTek 36-track long-tape cartridge transport with ESCON support. Also known as Silverton.

**4780**— Same as a 4480, but is used for attachment to certain non-IBM computers.

**8380**— StorageTek DASD system.

**9310**— The PowderHorn, a high-performance version of the standard LSM (4410)

**9360**— The WolfCreek, a high-performance LSM with a smaller capacity than the standard LSM (4410).

**9490**— The StorageTek 36-track cartridge transport. Also known as TimberLine.

**9490EE**— The StorageTek 36-track cartridge transport. Also known as TimberLine EE.

**9740**— A small, four-sided StorageTek library that supports large-style cartridge transports. This library can be configured to contain either 326 cartridges or 494 cartridges.

**9840**—The StorageTek cartridge transport that reads and writes 9840 cartridges.

**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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