ULTRAOPT™
User Guide

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Before Contacting BMC Software

Before you contact BMC Software, have the following information available so that Customer Support can begin working on your problem immediately:

- product information
  - product name
  - product version (release number)
  - license number and password (trial or permanent)
- operating system and environment information
  - machine type
  - operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
  - product error messages
  - messages from the operating system, such as `file system full`
  - messages from related software

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About This Book

This book contains detailed information about ULTRAOPT™/CICS and ULTRAOPT™/IMS and is intended for system programmers and other computer personnel who tune and use ULTRAOPT. You are expected to know the names (Applids) of each VTAM application whose data streams you intend to intercept, including IMS, if applicable.

In this book, ULTRAOPT/CICS and ULTRAOPT/IMS are referred to as *ULTRAOPT*, except where a distinction is required.

To use this book, you should be familiar with the following items:

- Multiple Virtual Storage (MVS) systems
- job control language (JCL)
- Interactive System Productivity Facility (ISPF)

For example, you should know how to respond to ISPF panels.

How This Book Is Organized

This book is organized as follows. In addition, a glossary of terms and an index appear at the end of the book.

Chapter/Appendix	Description
Chapter 1, “Introduction”	provides an overview of optimization and how to use ULTRAOPT to optimize data streams
Chapter 2, “Using ULTRAOPT”	describes how to start the ULTRAOPT Monitor, use the Primary Menu panel, and stop the Monitor
Chapter 3, “Include/Exclude Tables”	explains how tables are used to list data streams that are to be included in, or excluded from, optimization
Chapter 4, “Optimization Control”	explains how to specify which data streams are to be included in, or excluded from, the various kinds of optimization
Chapter 5, “User Exits”	explains how to write a user exit for inbound and outbound data steams before and after optimization
Chapter 6, “Optimization Statistics”	describes the statistics panels
Chapter 7, “Data Stream Analysis”	explains some of the data stream errors and how to take traces
Chapter 8, “Status Information”	describes the three status panels that are used to display status information about include and exclude tables, optimized data streams, and monitor usage
Chapter 9, “Response Time Monitor”	describes how to set up your system to control and evaluate host and network response times
Chapter 10, “TN3270 Application Monitor”	describes how to use the TN3270 optimization feature
Chapter 11, “Printing or Resetting of Statistics”	describes how to send the various statistics views and certain other panels to a printer and how to reset the accumulated values to zero
Chapter 12, “Batch Utilities”	describes batch programs that are provided to perform the following tasks: • set ULTRAOPT options • print the contents of the VSAM print file • rename and switch VSAM options files • check ULTRAOPT status • count VTAM sessions
Appendix A, “Operator Commands”	lists the operator commands available for ULTRAOPT

Related Documentation

BMC Software products are supported by several types of documentation:

- online and printed books
- online Help
- release notes and other notices

In addition to this book and the online Help, you can find useful information in the publications listed in the following table.

Category	Document	Description
installation documents	*OS/390 and z/OS Installer Guide*	provides information about the OS/390 and z/OS Installer
	ULTRAOPT Customization Guide	provides installation preparation information, instructions for setup and testing, and instructions for customizing ULTRAOPT after it has been installed
core documents	*BMC Software Subsystem User Guide*	provides information about the operation, implementation, and messages that are issued by the BMC Software Subsystems
	ULTRAOPT General Information	provides an overview of ULTRAOPT
	ULTRAOPT Messages Manual	provides a list of messages that you can receive while using ULTRAOPT
supplemental documents	release notes, technical bulletins, flashes	provide current information about ULTRAOPT

Online and Printed Books

The books that accompany BMC Software products are available in online format and printed format. If you are a Windows or Unix user, you can view online books with Acrobat Reader from Adobe Systems.

To Access Online Books

Online books are formatted as Portable Document Format (PDF) files. You can view them, print them, or copy them to your computer by using Acrobat Reader 3.0 or later.

You can access online books from the documentation compact disc (CD) that accompanies your product or from the World Wide Web.

In some cases, installation of Acrobat Reader and downloading the online books is an optional part of the product-installation process. For information about downloading the free reader from the Web, go to the Adobe Systems site at **http://www.adobe.com**.

To view any online book that BMC Software offers, visit the support page of the BMC Software Web site at **http://www.bmc.com/support.html**. Log on and select a product to access the related documentation. (To log on, first-time users can request a user name and password by registering at the support page or by contacting a BMC Software sales representative.)

To Request Additional Printed Books

BMC Software provides printed books with your product order. To request additional books, go to **http://www.bmc.com/support.html.**

Online Help

ULTRAOPT includes online Help. In the ULTRAOPT ISPF interface, you can access Help by pressing **F1** from any ISPF panel.

Release Notes and Other Notices

Printed release notes accompany each BMC Software product. Release notes provide current information such as

- updates to the installation instructions
- last-minute product information

In addition, BMC Software sometimes provides updated product information between releases (in the form of a flash or a technical bulletin, for example). The latest versions of the release notes and other notices are available on the Web at **http://www.bmc.com/support.html**.

Conventions

This section provides examples of the conventions used in this book and explains how to read ISPF panel-flow diagrams and syntax statements.

General Conventions

This book uses the following general conventions:

Item	Example
information that you are instructed to type	Type **SEARCH DB** in the designated field.
specific (standard) keyboard key names	Press **Enter**.
field names, text on a panel	Type the appropriate entry in the **Command** field.
directories, file names, Web addresses	The BMC Software home page is at **www.bmc.com**.
nonspecific key names, option names	Use the HELP function key. KEEPDICTIONARY option
MVS calls, commands, control statements, keywords, parameters, reserved words	Use the SEARCH command to find a particular object. The product generates the SQL TABLE statement next.

code examples, syntax statements, system messages, screen text	`//STEPLIB DD`
	
	`The table table_name is not available.`

emphasized words, new terms, variables	The instructions that you give to the software are called *commands*. In this message, the variable *file_name* represents the file that caused the error.

This book uses the following types of special text:

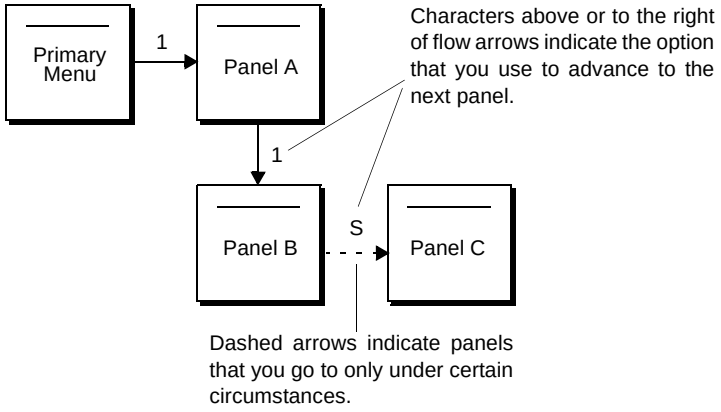
Note: Notes contain important information that you should consider.

Warning! Warnings alert you to situations that could cause problems, such as loss of data, if you do not follow instructions carefully.

Tip: Tips contain useful information that may improve product performance or that may make procedures easier to follow.

Panel-Flow Diagrams

Panel-flow diagrams summarize the ISPF panels that you see while completing specific tasks. The following example explains how to read a panel-flow diagram:



Syntax Statements

Syntax statements appear in Courier. The following example shows a sample syntax statement:

```
COMMAND KEYWORD1 [KEYWORD2|KEYWORD3] KEYWORD4={YES|NO}
       file_name...
```

The following table explains conventions for syntax statements and provides examples:

Item	Example
Items in italic type represent variables that you must replace with a name or value. Use an underscore for variables with more than one word.	`dtsbackup` *`control_directory`*
Brackets indicate a group of options. You can choose at least one of the items in the group, but none of them is required. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option.	`[`*`table_name, column_name, field`*`]`
Braces enclose a list of required items. You must enter at least one of the items. Do not type the braces when you enter the item.	`{`*`DBD_name`* `|` *`table_name`*`}`
A vertical bar means that you can choose only one of the listed items. In the example, you would choose either *commit* or *cancel*.	`{commit | cancel}`
An ellipsis indicates that you can repeat the previous item or items as many times as necessary.	*`column_name`* `. . .`

Chapter 1 Introduction

This chapter describes the features and functions of ULTRAOPT. This chapter contains the following sections:

Optimizer Component

BMC Software developed ULTRAOPT to reduce the lengths of Virtual Telecommunications Access Method (VTAM) data streams in the OS/390 and z/OS environments. For example, ULTRAOPT can substitute shorter commands for repeated characters.

Optimizer Subsystems

The Optimizer component is a set of reentrant Assembler-language programs that intercept VTAM data streams. The Optimizer consists of the following subsystems:

- BMC Software Primary Subsystem (BMCP)
- ULTRAOPT subsystem

For descriptions of the functions of these subsystems, see the *ULTRAOPT Customization Guide*. For instructions on starting or stopping these subsystems, see Chapter 2, “Using ULTRAOPT.”

Optimization and Compression Techniques

When the Optimizer component receives control of a data stream, it uses several methods to produce smaller data streams that accomplish the same function. All optimization techniques are controlled from the Monitor. For detailed descriptions of these techniques, see the *ULTRAOPT Customization Guide*. For instructions on how to use these techniques, see Chapter 4, “Optimization Control,” in this book.

The Optimizer component uses the following optimization techniques:

- Global optimization
- Imaging® optimization:
  - Imaging
  - Input Suppression
  - Erase Input Key Allowed
- Selective optimization:
  - SCS Printer
  - SCS Horizontal Tabs
  - PT Order Generation
  - SNA Data Compression
  - Local Format Storage

- Conventional optimization:
  - Field Merge
  - Blank Elimination
  - Non-Display Fields
  - Attribute Elimination
- User Exits

Additional Features

ULTRAOPT provides additional features to improve response time and reduce CPU time. The following features are detailed in the *ULTRAOPT Customization Guide*:

- Bypass Send and Receive
- Session Managers
- Local Format Storage Optimization

Monitor Component

The Monitor component provides an interface with the Optimizer component through a series of panels. These panels provide the Optimizer component with control and status information.

Using the Monitor component, you can perform the following actions:

- tune the Optimizer component for maximum data stream optimization
- diagnose problems in VTAM 3270 data streams
- trace any data stream in VTAM, inbound and outbound
- display and print statistics

Sample SAS Program

BMC Software provides a sample Statistical Analysis System (SAS) program in *hilevel*.BBSAMP(SMF251). You can use this program to format the information that is recorded to system management facility (SMF).

The default startup parameters for SMF recording are specified in ULTRAOPT by using the SMFINT and SMFREC startup parameters. For more information about the SMF recording startup parameters, see the *ULTRAOPT Customization Guide*. For information about writing statistics to SMF, see Chapter 6, “Optimization Statistics.”

For information about SMF records, setting up the SMF data set, and specifying the SMF record type numbers, see the IBM *System Management Facilities* documentation.

Chapter 2 Using ULTRAOPT

This chapter describes how to start and stop the BMC Software Primary Subsystem (BMCP) and the ULTRAOPT product subsystem. This chapter also describes how to use and navigate through the Monitor component panels.

This chapter contains the following sections:

Navigating in ULTRAOPT

Table 2-1 describes the F*n* function keys that are available on the Monitor component.

Table 2-1 Monitor Function Key Definitions

F*n* Key	Name	Description
F1 or F13	Help	displays the Help panels
F2 or F14	F Keys	displays the F key assignments
F3 or F15	End	returns to the previous level
F4 or F16	Return	returns to the Primary Menu, or clears the screen from the Primary Menu
F6 or F18	CAPS On/Off	lets you switch from CAPS On to Off and back again The default is CAPS On. Unless this F key is switched to CAPS Off, the Monitor automatically translates any data entered to uppercase characters.
F7 or F19	Scroll Up	lets you scroll up through the data being displayed
F8 or F20	Scroll Down	lets you scroll down through the data being displayed
F10 or F22	Table List	displays the User Installation Tables panel (Option 4.1); valid only on panels displaying a **Table Name** field
F12 or F24	Cancel	cancels the task before it is completed Any data that was changed on the current panel is not saved, and the previous panel is displayed.

To apply the selected option (if no errors exist), press the appropriate function key or **Enter**. On statistics panels, pressing the appropriate function key or **Enter** refreshes the displayed values with the current values.

Note: The Monitor component's use of function keys has no effect on any other application-defined function key usage.

Working with ULTRAOPT

To enter data, you do not need to delete any underscores in a field. The Monitor component treats the underscore characters as blanks. For example, all of the following entries are considered a 1:

1_, **_1**, or **1**

The syntax of the data that you type in some fields is checked when you press **Enter**. If an error is found, a message is displayed, and no change occurs. If the fields have no errors, the changed data is accepted, and the SOPOPT VSAM file is updated (if present). If a function (F*n*) key was used, its function is executed (*n* is a number 1 through 24).

If you enter any alphabetic characters in lowercase, the Monitor component translates them to uppercase characters by default. For example, **LU ps01** is translated to **LU PS01**. If the data should not be translated to uppercase, use **F6** or **F18** to activate the CAPS OFF mode.

Warning! If two or more operators simultaneously change the options that are provided by the Monitor component, the last command that was processed by the Monitor component is retained. If caution is not used, authorized operators changing options can interfere with each other.

If two or more authorized operators are using the Monitor component to change any trace options or exclude any data streams from optimization, they might interfere with each other.

Monitor Component Panels

The Monitor component consists of a set of panels that are divided into the following areas:

- Subsystem Menu
- Primary Menu
  - Password Control
  - Optimization Control Menu
  - Data Stream Statistics Menu
  - Data Stream Analysis Menu
  - Status Menu
  - Print or Reset Statistics
  - Online Help

All Monitor panels have an **Option** field. The panels also have a common header that displays the current date and time and your CPU SYSID. The last line on each panel is reserved for error messages.

You can go directly to any panel by using the **Option** field. When you start the Monitor, you can type an equal sign (=) in the **Option** field at the top of the panel, type the panel ID, and press **Enter**. The panel ID is displayed in the upper left corner of each panel.

Subsystem Menu

After initialization, the first panel that is displayed is the ULTRAOPT Subsystem Menu. The ULTRAOPT Subsystem Menu displays the following information:

- selectable towers (ULTRAOPT/CICS and ULTRAOPT/IMS)
- status of license for that tower
- number of sessions that are licensed for that tower
- number of active sessions for that tower
- maximum number of sessions for that tower
- number of sessions exceeding the licensed limit for that tower (see Note)
- ULTRAOPT subsystem version
- date of distribution tape

Note: Unlicensed sessions are active sessions that are not being optimized because the license limit has been exceeded. Using a MAXOPT value that is less than the license limit might cause this number to be less than the actual limit.

Primary Menu

The ULTRAOPT Primary Menu (Figure 2-1 on page 2-5) is displayed when you start a Monitor session and select the ULTRAOPT section by typing **1** in the **Select a monitor** field. This panel displays the following information:

- options for controlling optimization
- status of the Optimizer component (Active or Inactive)
- status of Erase Input Key Allowed optimization (Yes or No)
- date of the product distribution tape
- status of Imaging, Input Suppression, SCS Printer, and Local Format Storage optimization (On or Off)

This panel also provides a password field that lets you control who is authorized to change the Monitor component's optimization controls and features.

From the Primary Menu (Figure 2-1), you can display the other Monitor panels by entering an option number in the **Option** field.

Figure 2-1 ULTRAOPT Monitor Primary Menu

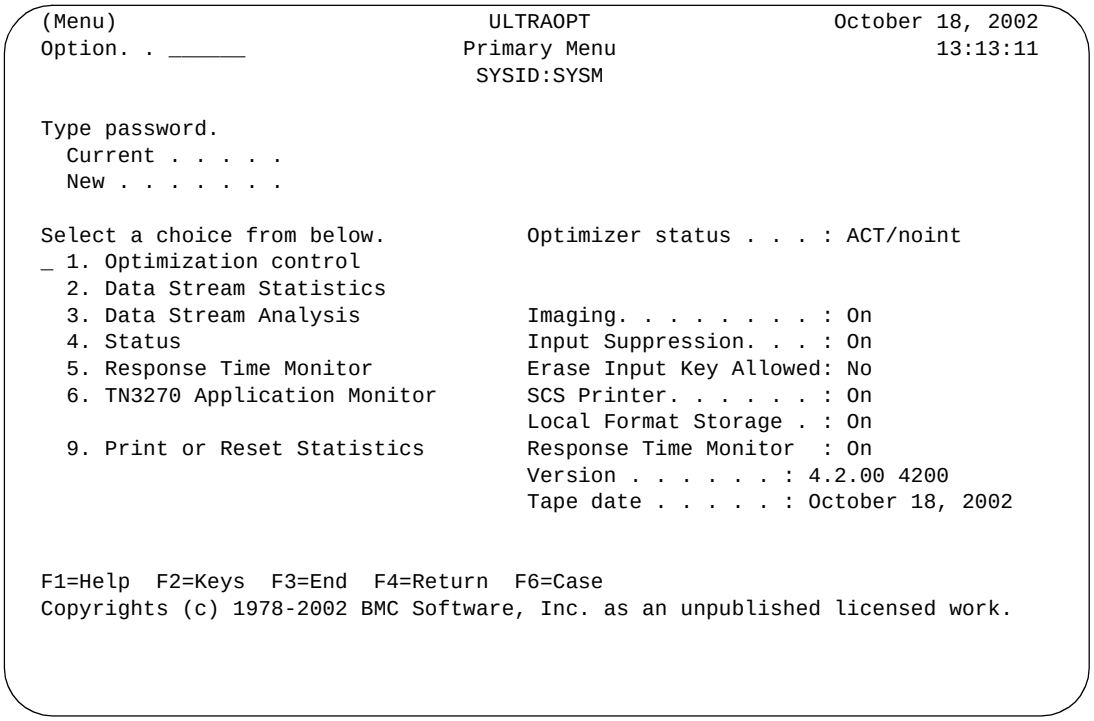


Table 2-2 describes the fields on the Primary Menu.

Table 2-2 Primary Menu Fields (Part 1 of 2)

Field	Description
Option	lets you go directly to any panel To go directly to any panel, type an equal sign and the panel ID, and press **Enter**. For example, **=4.1.0**, **=410**, and **=41** are all valid entries.
Type password Current	lets you enter a password If the Monitor is password-protected, type a password in this field before changing any Optimizer component options. For more information about passwords, see “Passwords” on page 2-7.
Type password New	lets you change a password If you are changing your password, type the new password in this field.
Select a choice from below	lets you choose a menu selection Type the number of the menu selection representing the functions that you want to perform, and press **Enter**.

Table 2-2 Primary Menu Fields (Part 2 of 2)

Field	Description
Optimizer status	displays the status of the Optimizer component: • **ACT/noint** (the subsystem was started with the NOINT startup parameter) • **ACT/ready to int** (the subsystem has not yet intercepted any applications) • **ACT/intercepting** (the subsystem is intercepting at least one application) • **ACT/ACB not open** (interception cannot occur because the ULTRAOPT application control block is closed)
ULTRAOPT/CICS	indicates whether the product authorization code is permanent or temporary If the code is temporary, this field displays the number of days remaining until expiration. This field label is **ULTRAOPT/IMS** if you are using ULTRAOPT/IMS.
Imaging	indicates whether Imaging optimization is on
Input Suppression	indicates whether Input Suppression optimization is on
Erase Input Key Allowed	indicates whether Erase Input Key Allowed optimization is on
SCS Printer	indicates whether SCS Printer optimization is on
Local Format Storage	indicates whether LFS optimization is on
Response Time Monitor	indicates whether the Response Time Monitor is on
Version	displays the ULTRAOPT version number
Tape date	displays the date on the BMC Software distribution tape from which you installed ULTRAOPT

Passwords

The ULTRAOPT Primary Menu has two password fields: **Current** and **New**. By using these fields, you can control who is authorized to modify the Monitor component's options and features. To save passwords between sessions, you must have the ULTRAOPT VSAM options file (SOPOPT).

Warning! Do *not* forget your password!

If you forget your password, you must perform the following tasks:

1. Shut down all applications that are intercepted by the subsystem.

2. Shut down the ULTRAOPT subsystem as described in the *ULTRAOPT Customization Guide*. If you do not use an options file, continue with Task 4.

3. Delete the VSAM options file (SOPOPT) and re-create it by using the procedure described in the *ULTRAOPT Customization Guide*.

4. Restart ULTRAOPT and the applications that you shut down in Task 1. With a new VSAM options file, ULTRAOPT restarts with password protection inactivated.

5. If you use an options file, reenter all tables and other options.

Activating Password Protection

Summary: In this task, you will activate the password protection feature.

You can control who can change the Monitor component's options and features by using the password protection feature. A password can be one to eight characters. Any characters that you type in the password fields are not displayed. To activate password protection, perform the following steps:

Step 1 Type **ULTRAOPT** in the **Current** password field on the Monitor Primary Menu.

Step 2 Type the new password in the **New** password field.

Step 3 Press **Enter**.

The Monitor displays message BMC7184A, requesting that you reenter the new password.

Step 4 Type the new password in the **New** password field again.

Step 5 Press **Enter**.

If this password matches the first password that you entered, the new password is accepted, and your password is changed.

If the password does not match, message BMC7185A requests that you reenter the new password.

Note: ULTRAOPT activates the password only after you have entered two consecutive matching passwords in the **New** password field.

When password protection is turned on, operators who do not know the password can use only the following fields and panels:

- **Option** field (at the top of every panel)
- panel 2.1 **Select** and **By** fields
- panel 2.2 **Select** fields
- panel 2.5 **Select** fields
- panel 4.1 BROWSE option

Only one password at a time can be in effect for the Monitor component. If more than one person needs to make changes by using the Monitor component, each person needs to know the password.

Changing Your Password

Summary: In this task, you will change your password.

You can change your password for the Monitor component when you start a Monitor session. Entries that are made in the password fields are not displayed, ensuring the security of your password. To change your password, perform the following steps:

Step 1 Type your current password in the **Current** password field on the Monitor Primary Menu.

Step 2 Type the new password in the **New** password field.

Step 3 Press **Enter**.

The Monitor displays message BMC7184A, requesting that you reenter the new password.

Step 4 Type the new password in the **New** password field again.

Step 5 Press **Enter**.

If this password matches the first password that you entered, the new password is accepted, and your password is changed.

If the password does not match, message BMC7185A requests that you reenter the new password. ULTRAOPT activates the password only after you have entered two consecutive matching passwords in the **New** password field.

Note: If the password that you entered in the **New** password field the second time does not match the one that you entered originally, you can enter the password a third time. The third password must match the second password that you entered, not the first one.

Inactivating Password Protection

Summary: In this task, you will inactivate the password protection feature.

If you no longer require password protection, you can inactivate it. To inactivate password protection, perform the following steps:

Step 1 Type your current password in the **Current** password field on the Monitor Primary Menu.

Step 2 Type ***NOPASS*** in the **New** password field.

Step 3 Press **Enter**.

The Monitor displays message BMC7184A, requesting that you reenter the new password.

Step 4 Type ***NOPASS*** in the **New** password field again.

Step 5 Press **Enter**.

If this password matches the first password that you entered, the password protection feature is inactivated. You are no longer required to type a password to change the Monitor component's options and features.

Optimization Control Menu

To achieve the highest optimization possible, fine-tune the way your data streams are optimized by selecting one of the options that are displayed on the Optimization Control Menu panel. Table 2-3 describes the Optimization Control Menu options.

Table 2-3 Optimization Control Menu Options

Option		Description
1.1.1	Global Optimization	lets you control the optimization of all data streams
1.2.x	Imaging Optimization	lets you control the optimization of data streams by using Imaging, Input Suppression, or Erase Input Key Allowed techniques
1.3.x	Selective Optimization	lets you control optimization for SCS printers by using SCS Printer, SCS Horizontal Tabs, or PT Order Generation techniques This option also controls the use of SNA Data Compression optimization of 3600/4700 or 3790 User Program data streams and the use of Local Format Storage optimization.
1.4.x	Conventional Optimization	lets you control the use of Conventional optimization during optimization of data streams The following features can be controlled with this option: • Field Merge • Blank Elimination • Non-Display Fields • Attribute Elimination
1.5.1	User Exits	lets you specify a user exit program to use for processing inbound and outbound data streams before and after optimization

For more information about using these options, see Chapter 3, “Include/Exclude Tables.”

Data Stream Statistics Menu

You can display information about data stream optimization by selecting one of the options that are displayed on the Data Stream Statistics Menu. Table 2-4 describes the Data Stream Statistics Menu options.

Table 2-4 Data Stream Statistics Menu Options

Option		Description
2.1	Summary of Data Streams Optimized	displays statistics about the optimization of all data streams
2.2	Data Streams Optimized by LU/Applid	displays statistics about the optimization of data streams by LU or Applid
2.3	Data Streams Excluded by Installation	displays information about any data streams that are excluded from optimization by your data center
2.4	Data Streams Excluded by Optimizer	displays information about any data streams that are excluded from optimization by the Optimizer
2.5	Local Format Storage	displays information for any IBM 3174s that are used for Local Format Storage optimization

For more information about using these options, see Chapter 6, “Optimization Statistics.”

Data Stream Analysis Menu

You can display information about the frequency and types of errors found in VTAM data streams by selecting one of the options that are displayed on the Data Stream Analysis Menu. You can also capture and examine VTAM data streams. Table 2-5 describes the Data Stream Analysis Menu options.

Table 2-5 Data Stream Analysis Menu Options

Option		Description
3.1	Application Outbound Data Stream Errors	displays information about application outbound data stream errors that are found by the Optimizer component
3.2	Hardware Inbound Data Stream Errors	displays information about the hardware inbound data stream errors that are found by the Optimizer component
3.4	Wraparound Data Stream Trace	provides you with the ability to continually capture data streams by wrapping around the storage that is allocated This trace can be stopped when you have determined that the target data stream has been captured.

For more information about using these options, see Chapter 7, “Data Stream Analysis.”

Status Menu

You can display information about the optimization of your data streams by selecting one of the options on the Status Menu. Table 2-6 describes the Status Menu options.

Table 2-6 Status Menu Options

Option		Description
4.1	User Installation Tables	displays information about any user installation tables that are created by your data center
4.2	Optimizer and Monitor Usage	displays information about the Optimizer component and the Monitor component's usage by your data center
4.3	CPU Wall-Clock Time	displays information about the CPU wall-clock time that is used by the Optimizer component

For more information about using these options, see Chapter 8, "Status Information."

Print or Reset Statistics Panel

If you select Option 9 from any Monitor panel, the Print or Reset Statistics panel is displayed. This panel lets you print and reset the statistics immediately, at an interval, or when the Optimizer component is shut down. For more information about using this option, see Chapter 11, "Printing or Resetting of Statistics."

Online Help

Each Monitor panel has one or more Help panels. The Help facility provides general information about the panel and information about data entry fields.

To display a Help panel from any Monitor panel, press **F1** or **F13**.

To return to the Monitor panel from which Help was requested, press **F3** or **F15**.

To return to the Monitor's Primary Menu, press **F4** or **F16**.

VTAM Application Start Order

BMC Software recommends the application start order that is listed in Table 2-7.

Table 2-7 VTAM Application Start Order

Order	Action
1	Start JES before any VTAM applications are started.
2	Start VTAM.
3	Vary active all VTAM applications (including the product major node—SOPAPPL).
4	Start all VTAM applications that you *are not* going to intercept.
5	Start the BMC Software Primary Subsystem and *wait for it to finish initializing* (approximately 6 seconds).
6	Start the product subsystem and *wait for it to finish initializing*.
7	Start VTAM applications that you *are* going to intercept.

How to Start the BMC Software Primary Subsystem

Note: For more information about the BMC Software Primary Subsystem (BMCP), see the *BMC Software Subsystem User Guide*.

To start the BMCP, issue the following command from the MVS console:

```
S | START BMCP
```

BMCP is the name of the BMC Software Primary Subsystem procedure that was copied into SYS1.PROCLIB when ULTRAOPT was installed.

Note: The BMCP is also used by other BMC Software products. Because BMCP supports all BMC Software products at one time, only one BMCP is required for each initial program load (IPL). After that, the BMCP can be shut down.

If someone attempts to start a second BMCP, message BMC10022S is issued. When this message is received, the BMCP has already been started, and the product subsystem can be started.

BMCP performs its job when it is started. After that, it can be shut down with no harmful effects and does not need to be restarted until after the next IPL.

When BMCP has been started at a particular release, it cannot be stopped and restarted at an earlier release without performing an IPL to the system. If this action is attempted, message BMC10021S is issued.

BMCP is designed to be downward-compatible; new copies of BMCP will support earlier versions of ULTRAOPT. If you are upgrading from an earlier release and want to test with the newer copy of BMCP, you may leave that version active on your system without attempting to back it out.

How to Start the Product Subsystem

Note: Before starting the product subsystem for the first time, review the customization considerations that are described in the *ULTRAOPT Customization Guide*. Also, verify that any startup parameters you want to use are entered in the product subsystem startup procedure. For information about startup parameters, see the *ULTRAOPT Customization Guide*.

To start the product subsystem, perform the following steps:

Step 1 Issue the following MVS console command:

```
S | START ULTRPROC
```

ULTRPROC is the name of the startup procedure that you customized and copied to SYS1.PROCLIB during installation.

Tip: To enable the subsystem to intercept all VTAM Applids in your system, start the subsystem immediately after VTAM and before any VTAM applications.

Step 2 If the subsystem procedure name is the same as the SUBSYSID parameter in the procedure, you must use `SUB=JES2 | JES3`.

Example

If the procedure name is BSOP, and you use the following parameter:

SUBSYSID PARM=BSOP

use the following command:

START BSOP,SUB=JES2 | JES3

Using the same names is not recommended.

When you have issued the START command for the subsystem, if the product was installed correctly and has a valid product authorization code, the following messages are issued:

- BMC7147I *subsysid: product* is being started automatically
- BMC7096I *subsysid: product* has been successfully started or restarted
- BMC13282I Subsystem initialization complete *subsysid*

The product is not fully activated until all of these messages are displayed. If the product is not authorized, only BMC13282I is issued. If the SOP Applid is not varied active to VTAM, BMC13282I is not issued.

Monitor Sessions

One ULTRAOPT Monitor session lets you control and monitor the optimization of data streams for every application on an MVS system. This feature is an improvement over previous optimizer products.

To start a Monitor session, perform one of the following tasks:

- Leave the load module in the load library and use the Time Sharing Option (TSO) Command Processor to call the module. For example,

  ```
  CALL 'hilevel.BBLINK(ULTRAOPT)'
  ```

- Start the Monitor as an Interactive System Productivity Facility (ISPF) application.

- Edit your TSO LOGON procedure to add *hilevel*.BBLINK to the STEPLIB, or copy the product load module to a link list data set.

Starting a Monitor Session—Method 1

Summary: In this task, you will start a Monitor session by using the TSO Command Processor.

To start a Monitor session by using the TSO Command Processor, perform the following steps:

Step 3 Using the TSO Command Processor, type the following command:

```
CALL 'hilevel.BBLINK(ULTRAOPT)'
```

Note: This command can also be invoked from within a CLIST.

The ULTRAOPT Menu is displayed.

Step 4 Select the ULTRAOPT product.

The Primary Menu (Figure 2-1 on page 2-5) is displayed.

Starting a Monitor Session—Method 2

Summary: In this task, you will start a Monitor session by invoking the ULTRAOPT Monitor component as an ISPF application.

Before You Begin

Beginning with ULTRAOPT 2.0.02, the ULTRAOPT Monitor component can be invoked as an ISPF application. Invoking the Monitor component as an ISPF application lets you use the split-screen (**PF2**) and swap-screen (**PF9**) features.

To start the Monitor component as an ISPF application, you must first add *hilevel*.BBLINK, *hilevel*.BBCLIB, *hilevel*.BBTLIB, and *hilevel*.BBPLIB to your TSO Logon Procedure's STEPLIB, SYSPROC, ISPTLIB, and ISPPLIB concatenated lists.

To Start a Monitor Session as an ISPF Application

Step 1 From the TSO Command Panel (Option 6), type the following command:

```
ULTRASPF
```

The ULTRAOPT Menu is displayed.

Step 2 Select the ULTRAOPT product.

The Primary Menu (Figure 2-1 on page 2-5) is displayed.

Starting a Monitor Session—Method 3

Summary: In this task, you will start a Monitor session by executing the Monitor component's command processor.

Before You Begin

Edit your TSO logon procedure to add *hilevel*.BBLINK to the STEPLIB or to copy the ULTRAOPT load module to a link list data set.

Note: The Monitor component can be accessed from any 3270 Model 2 or later by using the IBM TSO program product to execute the Monitor component's command processor.

To Start a Monitor Session by Executing the Monitor Component's Command Processor

Step 1 Start the Monitor session by performing one of the following steps:

- If your terminal is displaying the IBM ISPF/PDF Primary Option Menu or an IBM ISPF/PDF command panel, type the following command:

  ```
  TSO ULTRAOPT
  ```

- If your terminal is displaying the TSO Ready message or the IBM ISPF/PDF TSO Commands Utility panel, type the following command:

  ```
  ULTRAOPT
  ```

- To start the Monitor from within an ISPF panel, type the following command:

  ```
  CMD 'ULTRAOPT'
  ```

The ULTRAOPT Menu is displayed.

Step 2 Select the ULTRAOPT product.

The Primary Menu (Figure 2-1 on page 2-5) is displayed. For more information about the Primary Menu, see "Primary Menu" on page 2-4.

Exiting the Monitor

Summary: In this task, you will exit the Monitor session.

To exit the Monitor session, complete the following step:

From the Primary Menu, terminate the session by pressing one of the following function keys:

- **F3** (END)
- **F4** (RETURN)
- **F15** (END)
- **F16** (RETURN)

For more information about the function keys that are available on the Monitor component, see “Navigating in ULTRAOPT” on page 2-2.

How to Shut Down the Product Subsystem

To shut down the product subsystem, perform one of the following tasks:

- (Recommended) Perform an orderly shutdown sequence for a system with VTAM applications and the ULTRAOPT subsystem by performing the startup actions in reverse order. The applications should be shut down first, followed by this subsystem, then VTAM (if a total network shutdown is desired).

- (Not recommended) You can shut down the VTAM network without a prior shutdown of the subsystem by using `Z NET,QUICK` or `Z NET,CANCEL`.

  Warning! If you shut down the product subsystem while any application is being intercepted, the application will lose communications with VTAM and might abend. You should first stop any such applications normally. To help prevent shutdown when applications are being intercepted, turn on the SHUTMSG startup parameter.

You can shut down the subsystem at any time from the MVS console by entering one of the following commands:

- Z *subsysid*
- HALT *subsysid*
- Z *subsysid*,QUICK
- HALT *subsysid*,QUICK
- Z *subsysid*,CANCEL
- HALT *subsysid*,CANCEL

subsysid is the four-character name that was established for the ULTRAOPT subsystem.

Warning! Z | HALT means Z *or* HALT. If you use the Z | HALT *subsysid* command (without QUICK or CANCEL), this subsystem does not shut down until all VTAM applications being intercepted close their ACBs. All intercepted VTAM applications are notified of the intended shutdown. However, not all applications respond the same way, and many applications close their ACB *immediately* as if Z | HALT *subsysid*,CANCEL was entered.

For an orderly and safe shutdown, you should display the active intercepted applications with the D | DISPLAY *subsysid*,ACTIVE command, then terminate the applications or close their ACBs before using Z | HALT *subsysid*. The Z | HALT *subsysid* command has the same implications as a Z | HALT NET command to VTAM.

When this subsystem has completed its shutdown procedure, it is no longer in your system. If Z | HALT *subsysid*,CANCEL is entered, an abend S0A9 error message is generated. This error message is a normal occurrence.

When the product subsystem has been shut down by using Z NET or Z *subsysid* the following message is issued when the subsystem completes its cleanup:

```
BMC13123I SUBSYSTEM ECSA STORAGE CLEANUP COMPLETE
```

This message is issued when the subsystem is terminated and when its address space is ended.

Warning! Do not restart VTAM or the subsystem again until this message is displayed or until the next IPL occurs, because access to VTAM applications might not be available until this process is completed. Benchmark testing has shown that this cleanup process takes several minutes.

When the Product Subsystem Is Shut Down

The following actions occur when the subsystem has been shut down successfully:

- The Optimizer components are inactive. They will not intercept any VTAM data streams, and the product subsystem is terminated when the quiesce process is complete.
- Message BMC13123I is issued:

  ```
  BMC13123I ECSA CLEANUP COMPLETE
  ```

  This final message is issued after ECSA cleanup and address-space termination.
- If Print/Reset at Shutdown is specified, any printing or resetting is done at this time. Printing is performed under the started task name.

- If this subsystem is restarted and the options files are present, the following actions occur:

  — The statistics that were gathered before shutdown are not available.
  — Any options that were changed before shutdown are still in effect.
  — Data streams will be optimized when the subsystem has successfully completed its restart procedure.

- If this subsystem is restarted and the options files are not present, the following actions occur:

  — The statistics that were gathered before shutdown are not available.
  — No options that were changed before shutdown are in effect.
  — Data streams will be optimized when the subsystem has successfully completed its restart procedure.

How to Shut Down the Primary Subsystem

When the product subsystem has completed initialization, you can shut down the BMCP. BMCP does not affect anything if it is left in the system; it remains inactive, and no CPU time is used.

To shut down BMCP, enter the following command from the MVS console:

```
BMCP SHUTDOWN
```

BMCP is the BMC Software Primary Subsystem name that was determined during installation.

Chapter 3 Include/Exclude Tables

This chapter describes how to use include/exclude tables to determine whether an application is intercepted and whether the application data streams are optimized. This chapter also describes how to create and modify tables.

This chapter contains the following sections:

Overview

The primary method of controlling optimization is to group application IDs (Applids), logical units (LUs—terminal units, controllers, or PTERMS), application/transaction combinations (Applid.Transids), and application/logical unit combinations (Applid.LUs) into lists or tables. After grouping the items, you can include these tables for various types of optimization.

When an LU and the Applid that it is logged on to are included for optimization, the data streams between them are optimized. You can include or exclude tables of LUs (terminal units, controllers, or PTERMS), Applids, application/transactions (Applid.Transids), or application/logical units (Applid.LUs) for several optimization controls:

- Global optimization (whether to optimize at all)
- Imaging® optimization
- SCS Printer optimization
- SCS Horizontal Tabs optimization
- PT Order Generation optimization
- SNA Data Compression optimization
- Local Format Storage (LFS) optimization

Data stream optimization is controlled by using include/exclude options that let you specify the following items:

- all CRTs or all printers
- a single LU, Applid, Applid.Transid pair, or Applid.LU pair
- a table of LUs, Applids, Applid.Transid pairs, or Applid.LU pairs

To optimize data streams between an LU and the Applid that it is logged on to, you must include both the LU and Applid for optimization. The techniques that ULTRAOPT uses to optimize a particular data stream depend on the instructions that you give ULTRAOPT by using the Monitor component's Optimization Control panels or by using the include/exclude tables that are stored in the Virtual Storage Access Method (VSAM) options file, SOPOPT.

Rules of Optimization

Before you set up ULTRAOPT, read the rules in this section. Instructions for including and excluding LUs, Applids, Applid.Transids, or Applid.LUs and setting other controls are described in subsequent chapters.

Interception Rules

To optimize an application's data streams, ULTRAOPT must intercept the application's request to the Virtual Telecommunications Access Method (VTAM) to open an application control block (ACB). After that, ULTRAOPT intercepts all communications between the program (now a VTAM application) and VTAM.

An application *must* be intercepted for its data streams to be optimized.

Note: When an application is intercepted, *all* of its sessions are intercepted; the optimization of its sessions can be controlled by inclusion/exclusion rules.

ULTRAOPT uses extended common storage area (ECSA) storage for each intercepted ACB and also for *every* session to an intercepted Applid. For this reason, it is important to understand the rules of interception when estimating your ECSA usage. Estimating ECSA usage is described in the *ULTRAOPT Customization Guide*.

Warning! If you shut down ULTRAOPT while intercepted applications are running, the applications lose communications with VTAM. This loss of communications causes the ACB to close, causes VTAM sessions to terminate, and might cause the applications to abend.

To undo an interception, you must shut down the application and start it again by using Rule 4 (see Table 3-1 on page 3-4). Rule 4 ensures that the application is not intercepted.

Table 3-1 describes the rules that control application interception.

Table 3-1 Rules for Application Interception

Rule	Description
1	The ULTRAOPT subsystem must be running when the application first opens an ACB. If the subsystem is not running when the application starts, the application cannot be intercepted.
2	If the subsystem is running and if the Applid is included for optimization, an application is intercepted when its ACB is opened. *Included* means that the Applid was included for optimization according to the include/exclude rules on page 3-5.
3	You can prevent all interceptions (even included applications) by specifying the NOINT startup parameter when you start the subsystem.
4	You can prevent the interception of specific applications (even included applications) by excluding them (unless they have already been intercepted or are included by Rule 5). *Excluded* means that the Applid was excluded from optimization according to the include/exclude rules on page 3-5.
5	No newly opened ACBs are intercepted if, at the time the ACB is opened, the total system ECSA use exceeds 80 percent or the CSALVLS threshold is exceeded.
6	The application might not be intercepted as expected if it opens multiple ACBs: The handling of the first ACB that is opened for one TCB (task) determines whether the others that are opened for the same TCB are intercepted. Under one TCB, if the first ACB opened *is not* intercepted, *no* subsequent ACBs will be intercepted (regardless of any other rule). If the first ACB *is* intercepted, *all* subsequent ACBs will be intercepted (regardless of any other rule). **Note**: Rule 6 has very important ramifications for tasks that open multiple ACBs (such as session managers) because the tasks open many ACBs under the same TCB, and the tasks would all be intercepted.
7	No newly opened ACBs for TN3270 are intercepted if the first TCP/IP Telnet session is not intercepted.

Inclusion and Exclusion Rules

ULTRAOPT enables you to specify individual or tables of Applids, LUs, Applid.Transids, and Applid.LUs to include for, or exclude from, optimization. The Applid tables affect the interception of the Applid's ACBs (the LU tables do not). An LU can be any secondary logical unit. An LU is usually a terminal or other 3270 or SNA character string (SCS) device, but it can also be an application. (In application-to-application sessions, one session is the primary LU and is listed in the Applid table; the other session is the secondary LU and is listed in an LU table.)

Note: Applid.Transid include/exclude tables determine which transactions are optimized, *not which transactions are intercepted*. The Applid include/exclude tables specify the applications that are intercepted. When an Information Management System (IMS) or Customer Information Control System (CICS) application is intercepted, the Applid.Transid include/exclude tables are used to determine which transactions are optimized.

Table 3-2 describes the rules that control inclusion for session optimization.

Table 3-2 Rules for Including and Excluding Sessions (Part 1 of 2)

Rule	Description
1	If no Applid include entries exist (no single Applid nor an include table), ULTRAOPT/CICS intercepts only CICS. Interception occurs for all CICS applications that are started after ULTRAOPT/CICS. If no Applid include entries exist (no single Applid nor an include table), ULTRAOPT/IMS intercepts only IMS. Interception occurs for all IMS systems opening their ACBs after ULTRAOPT/IMS is started.
2	If an Applid include table (*even if empty*) or a single entry is included for optimization, ULTRAOPT ignores its default list and optimizes any included Applids' data streams (except those to excluded LUs). Consequently, ULTRAOPT excludes data streams for any applications that are not specifically included.
3	If an Applid is excluded from optimization, data stream optimization cannot be performed for that application.
4	If no LUs are included, ULTRAOPT optimizes all LUs in session with optimized Applids.
5	If LUs are included for optimization, ULTRAOPT optimizes all data streams for them (to included Applids), and ULTRAOPT will not optimize data streams for any LUs that are not specifically included.
6	If an LU is excluded from global optimization, its data streams are not optimized.
7	If an Applid or its LU is not excluded from global optimization but is excluded from one or more optimization techniques, the data stream is optimized by using only the techniques that are not excluded.
8	If an Applid or an LU is included *and* excluded, the exclude overrides the include, and the associated data streams are not optimized.

Table 3-2 Rules for Including and Excluding Sessions (Part 2 of 2)

Rule	Description
9	When ECSA use reaches 90 percent, all sessions are excluded. (When it reaches 95 percent, you cannot log on to a new session.)
10	Sessions to unsupported device types, such as LU 6.2 and non-3270, are not optimized. The type is checked when the session starts.
11	If optimization for CRTs and printers is turned off globally on the Global Optimization Control panel (1.1.1), *no* sessions are optimized.

Table 3-3 describes the rules that control inclusion for data stream optimization.

Table 3-3 Rules for Including and Excluding Individual Data Streams

Rule	Description
1	If a data stream contains an application outbound error or a hardware inbound error, the data stream is not optimized.
2	All IMS transactions are included for all forms of optimization by default (if IMS is intercepted). If you have IMS transactions that cannot be optimized, you can exclude them globally through the ULTRAOPT Monitor component.
3	All CICS transactions are included for all forms of optimization by default (if CICS is intercepted). You must install the CICS exit program and populate the Applid.Transid table or single entry to include/exclude these data streams. For more information about installing the CICS exit program, see the *ULTRAOPT Customization Guide*.
4	File transfers are not optimized. (The Optimizer recognizes most file transfers.)
5	User-written exit programs can selectively prevent certain data streams from being optimized.

Table 3-4 describes the rules that control inclusion and exclusion with startup parameters.

Table 3-4 Rules for Including and Excluding with Startup Parameters

Rule	Description
1	If you specify the MAXOPT=0 startup parameter in the startup procedure, no optimization of data streams is performed.
2	Application-to-application data streams (such as session manager virtual terminals to applications) are optimized because the OPTAPPLS startup parameter is the default in ULTRAOPT/CICS and ULTRAOPT/IMS.
3	The BSR startup parameter prevents the unnecessary optimization of data streams between local applications (applications in the same host). (It also bypasses VTAM's SEND and RECEIVE protocols between local applications.) The BSR parameter preempts OPTAPPLS for those sessions. BSR is the default.
4	The MODEL2 startup parameter forces Model 2 type optimization of data streams for 3270 devices whose sessions are bound with no screen sizes in the PSERVIC.
5	The APSTAT startup parameter allows optimization of data streams to some supported devices (such as LU 0, local, bisync 3270, and non-SNA 3270 devices) that initially cannot be differentiated from applications.
6	The NOLU0 startup parameter prevents optimization of LU0 data streams.

Examples

Table 3-5 describes examples of interception rules and inclusion rules.

Table 3-5 Rules Examples

Scenario	Rules	Result
You create a table of Applids containing just the applications that you want to intercept and optimize, and you include a single LU.	Table 3-2 Rule 2 and Rule 5	All the data streams for included Applids are intercepted, but only those for the specified LU are optimized.
You include a single Applid of ABC* and exclude a single LU of ENG*.	Table 3-2 Rule 2, Rule 6, and Rule 7	All applications that begin with *ABC* are included, and all other Applids are excluded. All LUs that begin with *ENG* are excluded, and all other LUs are included.
From the same TCB, Applid1 and Applid2 both request to open an ACB. Applid1 is in the exclude table and Applid2 is in the include table. (All LUs are included.)	Table 3-1 Rule 7	If Applid1, which is excluded, is opened first, the application is started but not intercepted; no optimization is possible, even for Applid2. If Applid2, which is included, is opened first, the application is started and intercepted. Applid2's sessions are optimized. Applid1 is intercepted, but its sessions are not optimized because it is excluded.

Entries

Many of the Monitor component's panels have a **Single** field and a **Table** field. These fields let you specify the following information:

- data streams to exclude from, or include in, optimization
- statistics to display or print
- optimization techniques and features to use when optimizing data streams

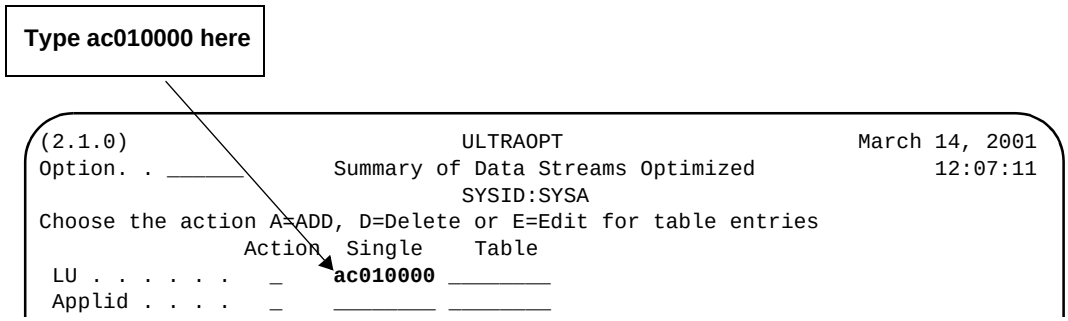
Use the **Single** fields to perform the following actions:

- specify a single LU, Applid, or valid Applid.Transid or Applid.LU
- create or edit a table of LUs, Applids, Applid.Transid pairs or Applid.LU pairs
- add or delete entries to a table without displaying the Table Build panel

When you use the **Single** field to include or exclude a single entry, do not type an action in the **Action** field.

The example in Figure 3-1 shows an entry of **ac010000** in the **Single LU** field.

Figure 3-1 Example Specifying a Single LU



If you type a new entry in the **Single** field, the old entry is replaced by the new one. The old entry is no longer active. If you require more than a single entry, build a table as described in "Creating a New Table" on page 3-13.

Wildcard Characters

Wherever you can type a single entry name, you can use an asterisk (*) as a wildcard character to include all the items whose names match. An entry with an asterisk is also called a *generic* entry.

The following rules apply to the use of wildcard characters:

- The asterisk can appear anywhere in the name.
- One asterisk matches one character.

  Exception: If the asterisk is at the end, the system pads the entry with asterisks to fill the eight-character field.
- An asterisk alone is allowed to match all names.

  For example, suppose you have a list of Applid names as follows:

  ABC01 ABC04 XYZ03 ABND365
  ABC02 XYZ01 ALT02
  ABC03 XYZ02 ALT01

  — Entry **A*** matches everything except *XYZ01*, *XYZ02*, and *XYZ03*. (The entry is padded to **A*******.)

  — Entry **XYZ*** matches *XYZ01*, *XYZ02*, and *XYZ03*. (The entry is padded to **XYZ*****.)

  — Entry ***** matches everything. (The entry is padded to ********.)

  — Entry **AB*** matches *ABC01*, *ABC02*, *ABC03*, *ABC04*, and *ABND365*. (The entry is padded to **AB******.)

  — Entry **A***1 does not match anything in the preceding list. (The entry is not padded.)

  — Entry **A***1** matches *ABC01* and *ALT01*. (The entry is not padded.)

Inclusion/Exclusion of Transactions

If you have IMS transactions that cannot be optimized, you must exclude them through the ULTRAOPT Monitor component. If you do not exclude transactions by IMS Transid, all IMS Transids are included by default.

The CICS exit program (SOPCUS*xx*) lets you include/exclude CICS transactions with the ULTRAOPT Monitor component. The SOPCINIT program calls the SOPCUS*xx* program. *xx* is the CICS release. Attempting to include or exclude CICS transactions without the CICS exit SOPCINIT in the program list table for program initialization (PLTPI) table is not possible. For more information about installing the CICS exit program, see the ULTRAOPT Customization Guide.

Inclusion/Exclusion by Applid.LU

ULTRAOPT lets you include or exclude based on the Applid.LU pair. You can specify LUs by Applid to include for, or exclude from, optimization. To use this function, include a plus sign (+) before the LUname when you add an entry to the application transaction by LU (Appl.Tran/LU) table.

For example, to exclude LUs *ABC** from application APPL1, you would code the following entry in the ApplTran exclude table:

```
APPL1+ABC*
```

You can use the application ID transaction Applid.Tran table to add, update, or delete entries for the Applid.LU pair. You must use the + character to distinguish the Applid.LU from Applid.Transid.

VTAM Applids

To optimize an application's data streams, you must specify the Applid on the appropriate Monitor component panel. The Applid for each application is in a member of SYS1.VTAMLST. The member is referred to as the application's major node. SYS1.VTAMLST is the default name for this VTAM data set. You might need to ask your VTAM system programmer for the name of this data set and each application's major node name at your site. In each member, search for a statement of the following form:

```
label  APPL  [other parameters]
```

label is the Applid. This statement is known as the application's minor node. More than one minor node might exist for each major node, depending on how your system is configured.

Tables

You can create a table if the SOPOPT options file has been created and its name is placed in the file definition table (FDT), as described in the *ULTRAOPT Customization Guide*.

You can create a table of LUs, Applids, Applid.Transid pairs, or Applid.LU pairs starting from any panel that has a field for entering a table name. To see a list of existing tables, rename a table, or delete a table, access the User Installation Tables panel (4.1.0), as described in Chapter 8, “Status Information.”

Creating a New Table

Summary: In this task, you will create a new table.

Before You Begin

Before you create a table, you must create the SOPOPT options file and place its name in the FDT, as described in the *ULTRAOPT Customization Guide*.

To Create a New Table

To create a table of LUs, Applids, Applid.Transid pairs, or Applid.LU pairs, you can start from any panel that has a field for entering a table name.

To see a list of existing tables, rename a table, or delete a table, access panel 4.1.0, User Installation Tables, as described in Chapter 8, “Status Information.”

To create a new table, perform the following steps:

Step 1 From the Primary Menu panel, select one of the following options:

- 1
- 2
- 4

Step 2 From the subsequent menus, select any option *except* 1.5.1, 2.9, 4.1, or 4.9 to access a panel on which a **Table** field exists.

Step 3 Type **E** in the **Action** field next to the type of table that you want to create (LU, Applid, or ApplTran).

Step 4 Type the name that you want to use for the new table in the **Table** field.

Step 5 Press **Enter**.

The User Installation Tables (Table Build) panel (Figure 3-2 or Figure 3-3) is displayed. If you typed an existing table's name, this panel displays the entries for the existing table.

Figure 3-2 Table Build Panel for LUs

```
(Table Build)                    ULTRAOPT                    December 29, 2001
Option. . ______           User Installation Tables                 21:55:20
                                 SYSID:SYSA

Table Name:  CONTROL1       Description:
Table Type:  LU             Active For Option:   ** NOT ACTIVE **
** commands are; R=Repeat  D=Delete  I=Insert
** LU            ** LU           ** LU            ** LU          ** LU
__ LU000001         LU000002         LU000003         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________
   ________         ________         ________         ________       ________


F1=Help  F2=Keys  F3=End  F7=Scroll Up  F8=Scroll Down  F12=Cancel Changes
```

Figure 3-3 Table Build Panel for Applid.Transid or Applid.LU Pairs

```
(ApplTran Table)                 ULTRAOPT                    December 29, 2001
Option. . ______          User Applid.Transaction Tables             16:56:31
SYSID:SYSH
Table Name:  SYSAAT1        Description:
Table Type:  ApplTran       Active For Option:   ** NOT AVAILABLE **
**   Applid . Transid     **   Applid . Transid     **   Applid . Transid
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________
   ________ . ________       ________ . ________       ________ . ________


F1=Help  F2=Keys  F3=End  F7=Scroll Up  F8=Scroll Down  F12=Cancel Changes
```

Table 3-6 describes the fields in the Table Build panels.

Table 3-6 Table Build Panel Fields

Field	Definition
Table Name	name of the table
Table Type	type of table (valid types are LU, Applid, and ApplTran)
Description	describes the contents of the table or the reason it was created
Active For Option	the option the table is associated with For example, if the table is included for Imaging optimization, it displays ****IMAGING INCLUDE****. ****NOT ACTIVE**** indicates that the table is active for neither includes nor excludes anywhere.
**	action field Type an action to perform on an entry in the table. Valid actions are as follows: • **R** to repeat an entry • **D** to delete an entry • **I** to insert a blank entry You can follow the action code with a digit from 1 to 9 to indicate the number of times to repeat the action.
LU/Applid	names of the LUs or Applids that make up this table (This column heading varies according to the type of table: LU, Applid, or ApplTran.)
Transid	names of the transactions associated with the given Applid **Note:** This field appears only when the table type is ApplTran, as shown in Figure 3-3 on page 3-14.
Applid.LU	names of the Applids and associated LUnames that make up this table

Where to Go from Here

When you have created a new table, you can begin typing table entries. For instructions on typing table entries, see the example task “Typing Table Entries” on page 3-16.

Typing Table Entries

Summary: This task is an example for typing table entries.

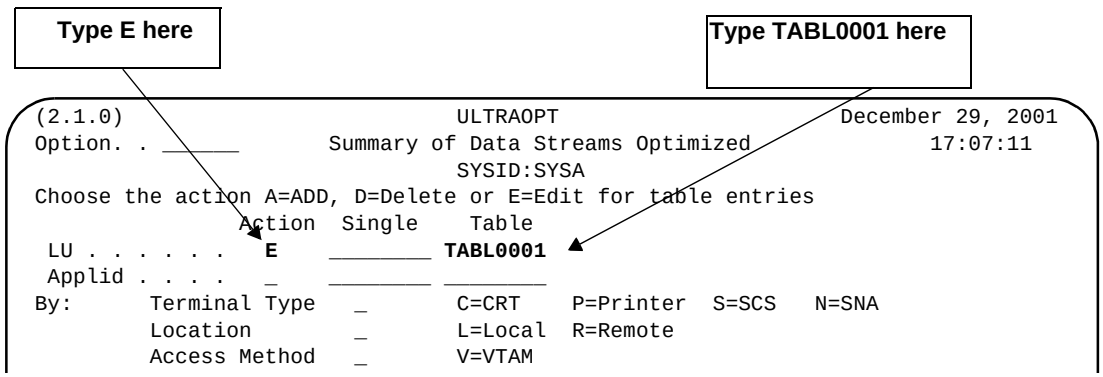
To create a table (using the name TABL0001) from the Summary of Data Streams Optimized panel (2.1.0) that has three LUs (LU000001, LU000002, and LU000003), perform the following steps:

Step 1 From the Primary Menu panel, select item **2**, Data Stream Statistics.

Step 2 From the Data Stream Statistics Menu, select item **2**, Summary of Data Streams Optimized.

Step 3 Type **E** in the **Action** field of the Summary of Data Streams Optimized panel (Figure 3-4).

Figure 3-4 Example Using the Action Field to Create a Table



Step 4 Type **TABL0001** in the **Table** field.

Step 5 Press **Enter**.

The User Installation Tables (Table Build) panel is displayed.

Step 6 On the User Installation Tables (Table Build) panel, type the LUs in the **LU** fields as shown in Figure 3-5.

Figure 3-5 Sample Table Build Panel for LUs

```
(Table Build)                    ULTRAOPT                        December 29, 2001
Option. . ______              User Installation Tables           17:07:20
                                    SYSID:SYSA

Table Name:  TABL0001        Description:
Table Type:  LU             Active For Option:   ** NOT AVAILABLE **
** commands are; R=Repeat  D=Delete  I=Insert
** LU            ** LU            ** LU            ** LU           ** LU
__ LU000001         LU000002         LU000003         ________        ________
   ________         ________         ________         ________        ________
```

Step 7 Press **F3** to save your entries.

Table TABL0001 has been created and is now listed on the Summary of Data Streams Optimized panel. Because this table is new, all statistics are zero.

Table Entries

From the User Installation Tables (Table Build) panel, you can add, repeat, insert, and delete an entry. You can also save or cancel changes to a table or scroll through the entries.

To add a table entry, see “Tips for Creating Table Entries” on page 3-19 and “Adding a Table Entry” on page 3-20.

Note: For information about adding Applid.LU table entries, see “Inclusion/Exclusion by Applid.LU” on page 3-11.

To repeat a table entry once (for example, when adding an entry similar to an existing entry), type **R** in the ****** field next to the desired entry. To repeat an entry more than once, type **R*n*** (*n* is a number 1 to 9). For example, **R3** repeats an entry three times.

Warning! As with all table edits, take care not to press **D** or the entries are deleted when you press **F3**.

To insert a blank entry between two existing entries, type **I** in the ****** field next to the first entry. To insert more than one blank entry, you can type **I*n***, (*n* is a number 1 to 9). For example, **I2** inserts two blank entries.

To delete a table entry, see “Deleting a Table Entry” on page 3-22.

To save a table, press **F3** (or **F13**) or use the **Option** field to access another Monitor option. A table is saved automatically when you transfer to another panel. Table entries are not used for inclusion/exclusion until the table is saved.

To cancel any changes that you have made to a table, press **F12** (or **F24**).

To scroll down through the table, use **F8** (or **F20**). To scroll up through the table, use **F7** (or **F19**).

Tips for Creating Table Entries

The following tips may be useful for creating table entries:

Tip: Because each entry is a single item, not a table, you are allowed to use the wildcard character (*).

Tip: An LU table can contain the LOCADDR1 LU name of a controller. You can use this method to include LFS controllers for LFS optimization. Unless specifically excluded, each LU that is connected to such an included controller receives LFS optimization.

Tip: If you have an application-to-application session, you can include one Applid in an Applid table and the other Applid in an LU table. The Applid in the Applid table is intercepted; the Applid in the LU table is not (and does not need to be intercepted for its data streams to be optimized).

Tip: To use Bypass Send and Receive (BSR), you must have an application-to-application session, include both Applids in an Applid table, and intercept both Applids.

Tip: Because table entries that do not exist on the system are ignored, you can share a table between systems whether or not its entries exist on both systems.

Adding a Table Entry

Summary: In this task, you will add a single entry to a table.

To add a table entry, use **Tab** to move the cursor to the first entry field, where you can type your first entry. If the entry is eight characters, the cursor moves from left to right to the next entry field. If an entry is fewer than eight characters, use **Tab** to move to the next field. The Monitor component removes duplicate entries when you save the table.

If you are on the User Installation Tables (Table Build) panel, you can add entries as just described. To add entries to a table *without* displaying the User Installation Tables (Table Build) panel, perform the following steps:

Step 1 From the Primary Menu panel, select one of the following options:

- 1
- 2
- 4

Step 2 From the subsequent menus, select any option *except* 1.5.1, 2.9, 4.1, or 4.9 to access a panel on which a **Table** field exists.

Step 3 In the **Action** field to the right of the type of table you for which you want to add an entry (LU or Applid), type **A**.

Step 4 In the **Single** field, type the name of the entry that you want to add.

Step 5 In the **Table** field, type the name of the table to which you want to add the entry.

Step 6 Press **Enter** to add the entry to the table.

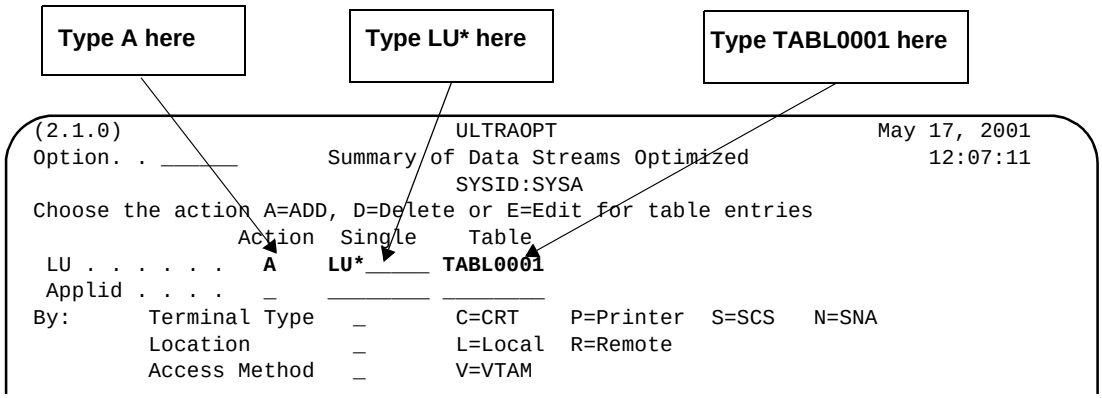
When you press **Enter** or transfer to another panel, the entry is added to the table. The entry is used immediately wherever the table is used. You can use the wildcard character (*) for entries in a table.

Example

Add the generic entry, LU*, to the LU table, TABL0001. Type **A** in the **Action** field, the entry (**LU***) in the **Single LU** field, and the table name (**TABL0001**) in the **LU Table** field. Press **Enter**.

The entry is added to the table as shown in Figure 3-6.

Figure 3-6 Example Adding a Single Entry to a Table



Deleting a Table Entry

Summary: In this task, you will delete a table entry.

To delete an entry, type **D** in the ****** field next to the entry. To delete more than one entry, type **D*n*** (*n* is a number from 1 to 9). For example, **D9** deletes nine entries.

To delete entries from a table without displaying the User Installation Tables (Table Build) panel, perform the following steps:

Step 1 From the Primary Menu panel, select one of the following options:

- 1
- 2
- 4

Step 2 From the subsequent menus, select any option *except* 1.5.1, 2.9, 4.1, or 4.9 to access a panel on which a **Table** field exists.

Step 3 Type **D** in the **Action** field next to the type of table from which you want to delete an entry (LU, Applid, or Applid.Transid).

Step 4 In the **Single** field, type the name of the entry that you want to delete.

Step 5 In the **Table** field, type the name of the table from which you want to delete the entry.

Step 6 Press **Enter** to delete the entry from the table.

When you press **Enter** or transfer to another panel, the entry is deleted from the table. The inclusion/exclusion restriction for that entry is removed immediately; however, if it is an Applid that has already been intercepted, it remains intercepted until the application is restarted.

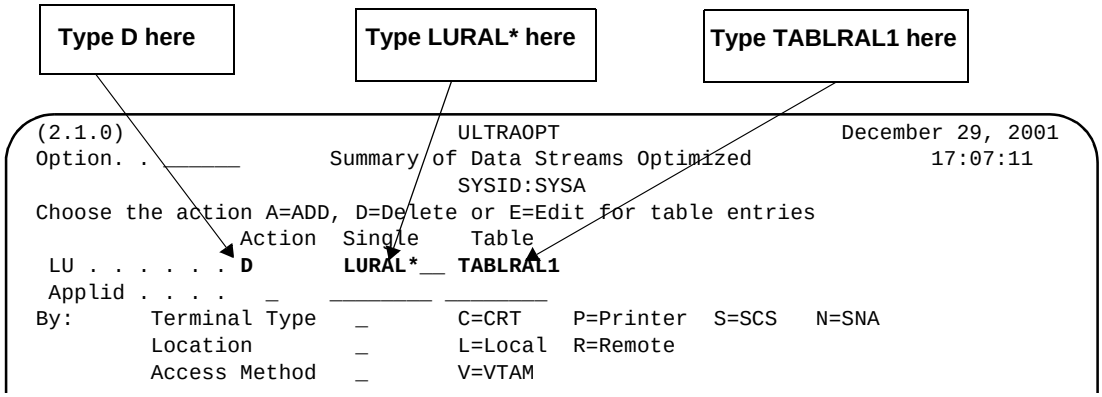
Warning! No confirmation is given for deletions. If you delete an entry by mistake, press **F12** to cancel the operation and return to the previous panel.

Example

Delete the generic entry, LURAL*, in the LU table, TABLRAL1. Type **D** in the **Action** field, **LURAL*** in the **SINGLE LU** field, and the table name (**TABLRAL1**) in the **LU Table** field; then press **Enter**.

The entry is deleted from the table as shown in Figure 3-7.

Figure 3-7 Example Deleting a Single Entry from a Table



Chapter 4 Optimization Control

This chapter describes how you can achieve the highest optimization possible by selecting the options that are displayed on the Optimization Control Menu panel (1.0.0).

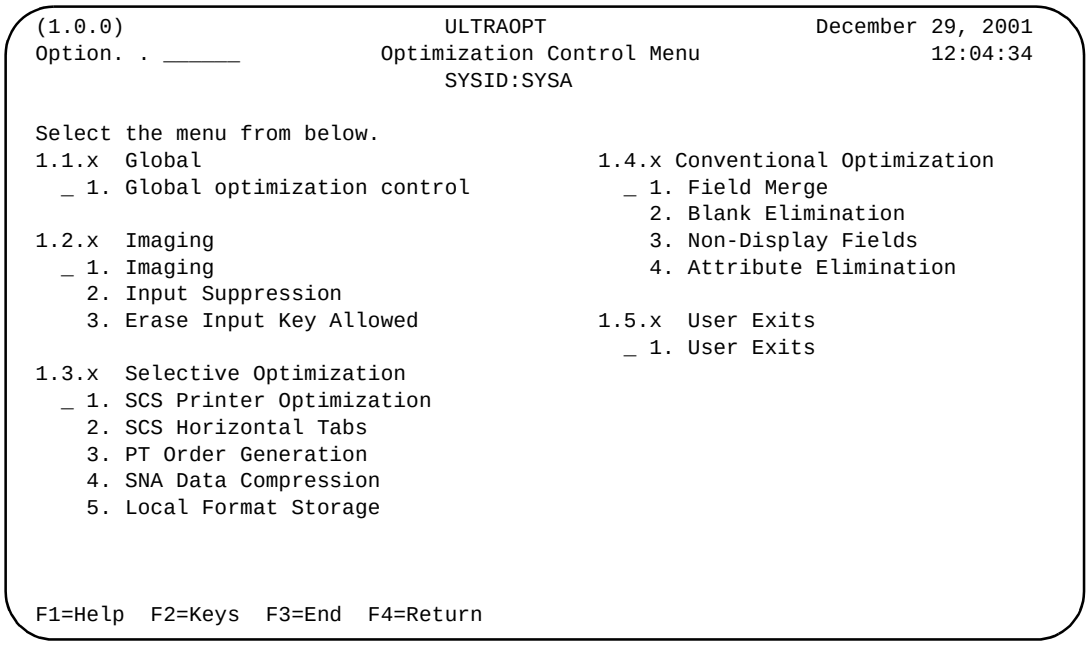
This chapter contains the following sections:

Overview

You can fine-tune the way your data streams are optimized to achieve the highest optimization possible by selecting the options that are displayed on the Optimization Control Menu panel (1.0.0).

To display the Optimization Control Menu (Figure 4-1), type **1** on the ULTRAOPT Monitor Primary Menu, and press **Enter**.

Figure 4-1 Optimization Control Menu (1.0.0)



Types of Optimization

Optimization control is divided into the following areas:

- Global
- Imaging
- Selective
- Conventional
- User Exits

Global optimization control (option 1.1.*x*) lets you control whether to optimize a device's data stream.

Imaging optimization control (option 1.2.*x*) lets you control the use of the following optimization techniques:

- Imaging
- Input Suppression
- Erase Input Key Allowed

Selective optimization control (option 1.3.*x*) lets you control the use of the following optimization techniques:

- SCS Printer
- SCS Horizontal Tabs
- Program Tab (PT) Order Generation
- SNA Data Compression
- Local Format Storage

Conventional optimization control (option 1.4.*x*) lets you control the use of the following optimization features:

- Field Merge
- Blank Elimination
- Non-Display Fields
- Attribute Elimination

User Exits (option 1.5.*x*) lets you process inbound and outbound data streams using a user-written program. You can process data streams before and after optimization. This panel is described in detail in Chapter 5, "User Exits." For information about installing the CICS exit program, see the *ULTRAOPT Customization Guide*.

Optimization Controls

These options let you control optimization for all devices, a single LU, Applid, or Applid.Transid pair, or a list of LUs, Applids, or Applid.Transids (in a table). You can also add, delete, or edit entries in a table.

All optimization controls have default values. You are not required to change any of the values to use ULTRAOPT, but you can change these values to get the best optimization possible for your data center.

If you change any of the optimization controls, your changes will not be saved when the Optimizer is shut down unless the SOPOPT VSAM options file was present and its name placed in the file definition table (FDT), as described in the *ULTRAOPT Customization Guide.*

If changes are made to the optimization controls and features, the Monitor records the following information:

- date that the last change was made
- time that the last change was made
- terminal ID (LU) from which the change was made
- ID of the operator who made the last change

The Monitor keeps this information only for the last time the optimization controls were changed. You can display this information by using option 4.2. See “Optimizer and Monitor Usage Panel” on page 8-11.

If the SOPOPT file is present, at shutdown the Monitor updates the file with the changes that you made to the optimization controls.

When the Optimizer is started, the Monitor looks for this file before setting the values used by the Optimizer to control optimization. These values can be set by using the batch program (SOPBSET). See “Set Options Program (SOPBSET)” on page 12-2.

If the SOPOPT file is not present at ULTRAOPT initialization, default optimization settings will be used. These values can be changed through the Monitor, but all settings will be lost at ULTRAOPT shutdown.

Optimization Changes

When you change the optimization that is being performed on a session, the new types of optimization do not take effect immediately. You must press the **CLEAR** key or otherwise clear the buffer before the new optimization methods take effect.

Maximum Optimization

For tips about configuring ULTRAOPT to maximize optimization, see the *ULTRAOPT Customization Guide*.

Global Optimization Control

The Global Optimization Control panel (1.1.1) lets you control whether the data streams of the following devices undergo any type of optimization:

- all CRTs
- all printers
- a single LU, Applid, Applid.Transid, or Applid.LU pair
- a list of LUs, Applids, Applid.Transid, or Applid.LU pairs in a table

This panel also lets you add, delete, or edit LU, Applid, Applid.Transid, or Applid.LU entries in a new or existing table. For more information about adding, deleting, or editing entries in a table, see Chapter 3, “Include/Exclude Tables.”

Displaying the Global Optimization Control Panel

Summary: In this task, you will display the Global Optimization Control panel.

To display the Global Optimization Control panel, perform the following steps:

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **1** in the **Global** field.

Step 4 Press **Enter**.

The Global Optimization Control panel (Figure 4-2) is displayed.

Figure 4-2 Global Optimization Control Panel

```
(1.1.1)                          ULTRAOPT                  February 09, 2001
Option. . ______           Global Optimization Control              14:08:59
                                 SYSID:SYSP

CRTs . . . . . _  *. On      Status. . . : On
                  2. Off
Printers . . . _  *. On      Status. . . : On
                  2. Off

For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

 Exclude by:             Action   Single                 Table
  LU . . . . . . . . . .   _     ________               SYSPTAB1
  Applid . . . . . . . .   _     ________               SYSPAPL
  Applid.Tran|Lu . . . .   _     ________ . _________   ________
 Include by:
  LU . . . . . . . . . .   _     ********               ________
  Applid . . . . . . . .   _     ********               ________
  Applid.Tran|Lu . . . .   _     ________ . _________   ________

F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F10=Table List
```

Table 4-1 describes the fields that are displayed on the Global Optimization Control panel. All fields are optional.

Table 4-1 Global Optimization Control Panel Fields

Field	Description	Default
CRTs	controls the optimization of all data streams sent to CRTs Type **1** to include data streams for all CRTs in Global optimization. Type **2** to exclude data streams for all CRTs from Global optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized. When CRTs Status is **Off**, data streams sent to CRTs are not optimized.	On
Printers	controls the optimization of all printers Type **1** to include data streams for all printers in Global optimization. Type **2** to exclude data streams for all printers from Global optimization.	On
Printers Status	current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized. When Printers Status is **Off**, data streams sent to printers are not optimized.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, Applid.Transids, Applid.LUs) Valid actions are as follows: • **A** to add LU, Applid, Applid.Transid, or Applid.LU entries to a table • **D** to delete LU, Applid, Applid.Transid, or Applid.LU entries from a table • **E** to edit a table or create a new table by typing **E** and entering the new table name in the **Table** field.	blank
Exclude by: Single – LU, Applid, Applid.Transid, or Applid.LU	name of a single or generic LU, Applid, Applid.Transid, or Applid.LU pair to exclude from Global optimization	blank
Exclude by: Table – LU, Applid, Applid.Transid, or Applid.LU	name of a table (list of LUs, Applids, Applid.Transid, or Applid.LU pairs) to exclude from Global optimization	blank
Include by: Single – LU, Applid, Applid.Transid, or Applid.LU	name of a single or generic LU, Applid, Applid.Transid, or Applid.LU pair to include in Global optimization	blank
Include by: Table – LU, Applid, Applid.Transid, or Applid.LU	name of a table (list of LUs, Applid, Applid.Transid, Applid.LU pairs) to include in Global optimization	blank

Including All CRTs and Printers for Global Optimization

Summary: In this task, you will include data streams for all CRTs and printers in Global optimization.

You can control whether CRTs, printers, LUs, Applids, Applid.Transid pairs, or Applid.LU pairs are included in Global optimization. To include data streams for all CRTs and printers in Global optimization, perform the following steps:

Step 1 Type **1** in the **CRTs** or **Printers** field.

Tip: To exclude all CRTs and printers from Global optimization, type **2** in the **CRTs** or **Printers** field.

Step 2 Press **Enter**.

If CRTs and printers status is already on, all CRTs and printers are already included in Global optimization.

Step 3 Perform one of the following steps:

- Press **Enter** to save the changes and remain on the Global Optimization Control panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Including LUs, Applids, Applid.Transids, or Tran/LUs in Global Optimization

Summary: In this task, you will include data streams in Global optimization.

You can include data streams in Global optimization by specifying the name of the LU, Applid, Applid.Transid, Applid.LU, or a table name (list of LUs, Applids, Applid.Transid, or Applid.LU pairs).

Because CRTs and printers are also LUs, they can be included by setting the **CRTs** or **Printers Status** to on or off *or* by specifying their LU name. If a CRT or printer is inadvertently *included* by one method and *excluded* by another, its data streams are always *excluded*.

For information about the order in which the Optimizer component processes includes and excludes, see “Rules of Optimization” on page 3-3.

To include a single LU, Applid, Applid.Transid, or Tran/LU, or to include a table of LUs, Applids, Applid.Transid, or Tran/LU pairs, perform the following steps:

Step 1 Perform one of the following steps:

- To include a single LU, Applid, Applid.Transid, or Tran/LU, type the name in the **Include by: LU**, **Applid, Applid.Transid**, or **Applid.LU** field under **Single**.
- To include a table of LUs, Applids, Applid.Transid, or Tran/LU pairs, type the table name in the **Include by: LU, Applid**, **Applid.Transid**, or **Applid.LU** field under **Table**.

Tip: To exclude LUs, Applids, Applid.Transid, or Tran/LU pairs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When the preceding field contains the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the Global Optimization Control panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Imaging Optimization Control

Use Imaging optimization to control data streams by using Imaging, Input Suppression, or Erase Input Key Allowed techniques. You can perform the following actions:

- turn Imaging optimization on and off for all CRTs and printers
- turn Input Suppression optimization on and off for all CRTs
- turn Erase Input Key Allowed optimization on and off for all CRTs
- include or exclude individual LUs or Applids from Imaging, Input Suppression, or Erase Input Key Allowed optimization

The Imaging panel (1.2.1) provides statistics about the number of data streams that are not optimized for the following reasons:

- They were excluded from Imaging optimization.
- They were not included in Imaging optimization.
- Storage was insufficient.

Local Copy Print

Local Copy is a GEN option available on 3270 control units or a hardware feature on the IBM 3276. It is invoked with the **Print** key.

Print from a Local Copy is not sent to the operating system for routing; therefore, ULTRAOPT does not recognize what was last printed. For Imaging to work correctly, the Optimizer component must recognize exactly what is in the print buffer. You can use option 1.2.1 in the Monitor to exclude these printers from Imaging optimization.

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If you have any applications that alter the printer device buffer, these applications should be excluded from Imaging optimization. For example, a printer device buffer can be altered by an operator performing a local print copy function (shared printer mode).

CLEAR AID Key Suppression

If you have control units that support CLEAR AID key suppression, you must disable that feature or exclude those devices from Imaging (panel 1.2.1).

Imaging Screen-Flashing Effect

A flashing effect can appear in some fields under certain circumstances when Imaging is turned on. This effect is normal. It occurs when longer fields get overwritten by smaller fields.

As the attribute of each of the smaller fields is written, the larger field momentarily takes on that attribute. If the shorter field is designated as highlighted or reverse video, the larger field changes to highlighted or reverse video just until the next short field attribute is written. Because the entire screen is rewritten quickly, the apparent flashing lasts only a short time. To stop this effect, you can turn off Imaging by Applid or LU. If you use Local Format Storage, however, Imaging must be on.

Displaying the Imaging Panel

Summary: In this task, you will display the Imaging panel.

In some cases when authorization for the product is interrupted, Imaging is disabled. For example, a bypass password expires before you add your permanent password. You can activate Imaging optimization by correctly authorizing the ULTRAOPT subsystem, starting the Monitor, and activating Imaging. To display the Imaging panel, perform the following steps:

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **1** in the **Imaging** field.

Step 4 Press **Enter**.

The Imaging panel (Figure 4-3) is displayed.

Figure 4-3 Imaging Panel

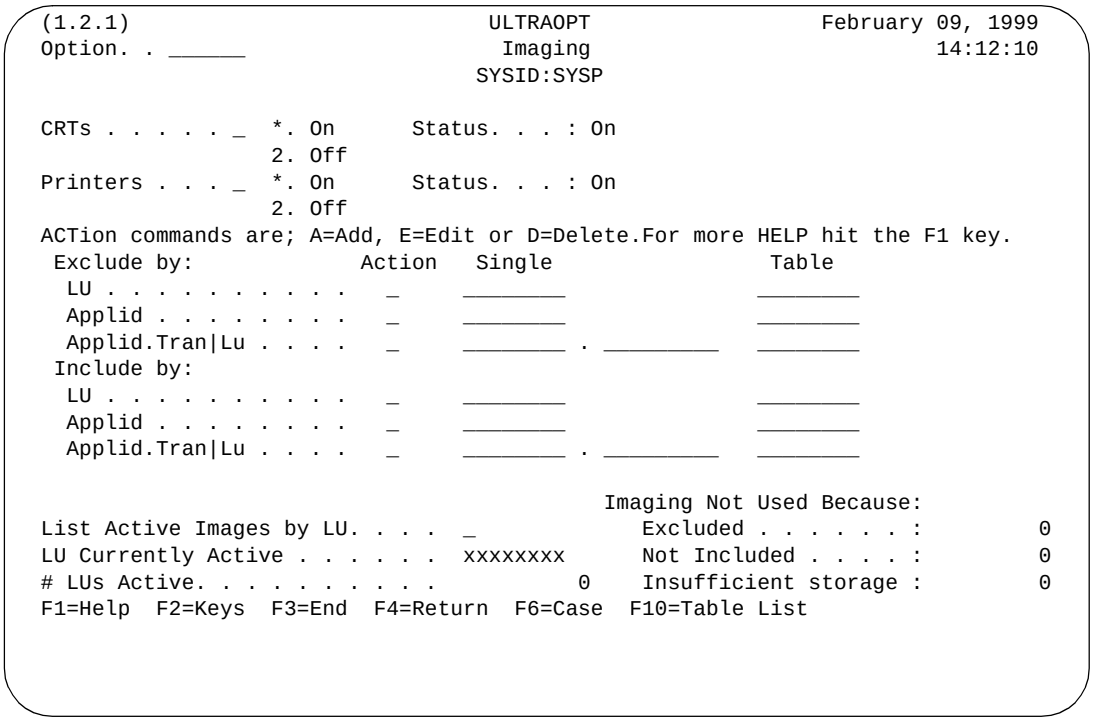


Table 4-2 describes the fields that are displayed on the Imaging panel.

Table 4-2 Imaging Panel Fields

Field	Description	Default
CRTs	controls the optimization of all data streams sent to CRTs Type **1** to include data streams for all CRTs in Imaging optimization. Type **2** to exclude data streams for all CRTs from Imaging optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized using Imaging optimization. When CRTs Status is **Off**, data streams sent to CRTs are not optimized using Imaging optimization.	On
Printers	controlS the optimization of all printers Type **1** to include data streams for all printers in Imaging optimization. Type **2** to exclude data streams for all printers from Imaging optimization.	On
Printers Status	Current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized. When Printers Status is **Off**, data streams sent to printers are not optimized using Imaging optimization. Data streams are optimized using Conventional optimization.	
Action	Lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to exclude from Imaging optimization	blank
Exclude by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LUs) to exclude from Imaging optimization	blank
Include by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to include in Imaging optimization	blank
Include by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LUs) to include in Imaging optimization	blank
List Active Images by LU	displays a list of active images by LU To display the list of active images by LU, type a non-blank character in this field and press **Enter**. The Active Images List panel is displayed (Figure 4-4 on page 4-15).	

To display the list of active images by LU, type a non-blank character in the **List Active Images by LU** field, and press **Enter**. The Active Image List (Active Images) panel (Figure 4-4) is displayed.

Figure 4-4 Active Image List Panel (Active Images)

```
(Active Images)                    ULTRAOPT                      December 29, 2001
Option. . ______                Active Image List                        12:05:14
                                   SYSID:SYSA

LU             LU             LU             LU             LU             LU
L3ABR1         L3A2B1         L319K1         L3A6P2         L3AAU1         L3A5E2
L3A1P2         DEN6656        L3A0G2         L3A1A1         ELALU0         AUS152
IRABLU0        L3A5I4         L3A4H3         L3A1X1         L3A0T2         L3ADJ1
L3A1L2         L3A1G1         L3A6M2         DEN115         L3A5J3         L3A5I3
L3A5V2         L31DJ          L3A4K2         L3A4F1         L3A5T1         AUS233
L3A5R1         L3A6T1         L3A5P1         AUS5506        DZLLU3         L31DA
L3A9C2         L314B          DEN137         L3A0L1         L317Y2         L31DG
L318I1         AUS7707        L3A0N2         L3A0I1         L3ADI1         L3ADH1
L313V1         L313P2         L3A1B2         AUS5557        EXSLU0         CT0035
L3ADC4         L3A1P1         L3A8X1         L317B2         L317C2         L3A4J1
AUS7741        L3A4C1         L3A7H3         DEN6715        L3A3I1         DEN6716
DEN6714        L3A3S2         AUS106         AUS225         L300D1         AUS406
IRKSLU1        IRKSLU0        L3A7U1         DEN6645        L3A3D3         L300A2
DEN6643        L3A1T2         L3A5H1         L3A1U1         DEN6669        DEN6616
L300Z2         L300A5         L3A9G2         L3A9B1         L3A9K2         L3A2L2
DEN6705        L3A6F1         L314K          AUS242         L3A0I3         MTJLU0

F1=Help  F2=Keys  F3=End  F7=Scroll Up  F8=Scroll Down
```

Including LUs, Applids, or Applid.Tran/LUs in Imaging Optimization

Summary: In this task, you will include data streams in Imaging optimization.

You can include data streams in Imaging optimization by specifying the LU, Applid, Applid.Tran/LU, or a table name (list of LUs, Applids, or Applid.Tran/LUs).

Because CRTs and printers are also LUs, they can be included or excluded by setting the CRTs or printers status to on or off and by specifying their LU name. If a CRT or printer is *included* by one method and *excluded* by another, its data streams are always *excluded*.

For information about the order in which the Optimizer component processes includes and excludes, see “Rules of Optimization” on page 3-3.

To include a single LU, Applid, or Applid.Tran/LU, or to include a table of LUs, Applids, or Applid.Tran/LUs, perform the following steps:

Step 1 Perform one of the following steps:

- To include a single LU, Applid, or Applid.Tran/LU, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Single**.
- To include a table of LUs, Applids, or Applid.Tran/LUs, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Table**.

Tip: To exclude LUs, Applids, or Applid.Tran/LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the Imaging panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Displaying the Input Suppression Panel

Summary: In this task, you will display the Input Suppression panel.

Input Suppression optimization removes unnecessary data and control characters from the data stream that is transmitted to a terminal and restores the data stream on the inbound side before passing it to your host application. To display the Input Suppression optimization panel, perform the following steps:

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu is displayed (Figure 4-1 on page 4-3).

Step 3 Type **2** in the **Imaging** field.

Step 4 Press **Enter**.

The Input Suppression panel is displayed (Figure 4-5).

Figure 4-5 Input Suppression Panel

```
(1.2.2)                          ULTRAOPT                  February 09, 1999
Option. . ______               Input Suppression                     14:14:41
                                  SYSID:SYSP

CRTs . . . . . _  *. On      Status. . . : On
                  2. Off

For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

 Exclude by:             Action   Single                 Table
  LU . . . . . .  . . .   _     ________                ________
  Applid . . . . . . . .  _     ________                ________
  Applid.Tran|Lu . . . .  _     ________ . _________    ________

 Include by:
  LU . . . . . .  . . .   _     ________                ________
  Applid . . . . . . . .  _     ________                ________
  Applid.Tran|Lu . . . .  _     ________ . _________    ________


F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F10=Table List
```

Figure 4-5 describes the fields that are displayed on the Input Suppression panel.

Table 4-3 Input Suppression Panel Fields

Field	Description	Default
CRTs	controls optimization of all data streams sent to CRTs Type **1** to include data streams for all CRTs in Input Suppression optimization. Type **2** to exclude data streams for all CRTs from Input Suppression optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized using Input Suppression optimization. When CRTs Status is **Off**, data streams sent to CRTs are not optimized using Input Suppression optimization.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, Applid.Tran/LU to exclude from Input Suppression optimization	blank
Exclude by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, Applid.Tran/LUs) to exclude from Input Suppression optimization	blank
Include by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to include in Input Suppression optimization	blank
Include by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LUs) to include in Input Suppression optimization	blank

Including LUs and Applids in Input Suppression Optimization

Summary: In this task, you will include data streams in Input Suppression optimization.

You can include data streams in Input Suppression optimization by specifying the name of the LU or Applid or a table name (list of LUs, Applids, or Applid.Tran/Lus).

Because CRTs and printers are also LUs, they can be included or excluded by setting the CRTs or printers status to on or off and by specifying their LU name. If a CRT or printer is *included* by one method and *excluded* by another, its data streams are always *excluded*.

For information about the order in which the Optimizer component processes includes and excludes, see “Rules of Optimization” on page 3-3.

Note: In some cases when authorization for the product is interrupted, Input Suppression is disabled. For example, a bypass password expires before you add your permanent password. You can activate Input Suppression by correctly authorizing the ULTRAOPT subsystem, starting the Monitor, and activating Input Suppression.

To include LUs and Applids in Input Suppression optimization, perform the following steps:

Step 1 Perform one of the following steps:

- To include a single LU, Applid, or Applid.Tran/LU, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Single**.
- To include a table of LUs, Applids, or Applid.Tran/LUs, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Table**.

Tip: To exclude LUs, Applids, or Applid.Tran/LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the Input Suppression panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Displaying the Erase Input Key Allowed Panel

Summary: In this task, you will display the Erase Input Key Allowed panel.

Before You Begin

If your terminal operators use the **Erase Input** key, use Erase Input Key Allowed optimization. This optimization technique allows as much Input Suppression optimization as possible under those conditions. If Input Suppression is inactivated, Erase Input Key Allowed optimization is not relevant.

If only certain Applids require the use of the **Erase Input** key, include only Applids in Erase Input Key Allowed optimization and exclude all other Applids.

Warning! If Erase Input Key Allowed optimization is set to No, using the **Erase Input** key can adversely affect your screens and the database which contains information that is updated by these screens.

Do not confuse the **Erase Input** key with **Erase EOF** key:

- **Erase Input** clears all unprotected fields to nulls and resets the corresponding MDT bit Off. This key is labeled as **ErInp**, **Erase Input**, or something similar, depending on the brand and model of terminal keyboard used.

- **Erase EOF** clears all the characters in one unprotected field to nulls from the location of the cursor to the end of the field and sets the corresponding MDT bits On. This key might be labeled as **Erase EOF** or something similar. **Erase EOF** can be used with Input Suppression.

To Display the Erase Input Key Allowed Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **3** in the **Imaging** field.

Step 4 Press **Enter**.

The Erase Input Key Allowed panel (Figure 4-6) is displayed.

Figure 4-6 Erase Input Key Allowed Panel

```
(1.2.3)                              ULTRAOPT                    February 09, 2001
Option. . _______                Erase Input Key Allowed                  14:16:00
                                      SYSID:SYSP

Erase Input Key Allowed . . . _  1. Yes     Status. . . : No
                                 *. No

For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

 Exclude by:              Action   Single                   Table
  LU . . . . . . . . . . .   _     _________                _________
  Applid . . . . . . . . .   _     _________                _________
  Applid.Tran|Lu . . . . .   _     _________ . _________    _________

 Include by:
  LU . . . . . . . . . . .   _     _________                _________
  Applid . . . . . . . . .   _     _________                _________
  Applid.Tran|Lu . . . . .   _     _________ . _________    _________


F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F9=Print  F10=Table List
```

Table 4-4 describes the fields that are displayed on the Erase Input Key Allowed panel.

Table 4-4 Erase Input Key Allowed Panel Fields

Field	Definition	Default
Erase Input Key Allowed	controls the optimization of all data streams sent to CRTs Type **1** to let your terminal operators use the Erase Input Key. Type **2** if your terminal operators do not use the Erase Input Key.	No
Erase Input Key Allowed Status	current status of optimization for all data streams sent to CRTs When Erase Input Key Allowed Status is **Yes**, your terminal operators can use the Erase Input Key. Usually less Input Suppression optimization occurs with this value, but it allows as much Input Suppression optimization as possible when using the Erase Input Key. When Erase Input Key Allowed Status is **No**, your terminal operators cannot use the Erase Input Key. This value allows full Input Suppression optimization. **Warning!** If terminal operators use the Erase Input Key when the value is **No**, the data stream for which they press Erase Input will not reflect that the data was erased.	No
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LU) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to exclude from Erase Input Key Allowed	blank
Exclude by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LU) to exclude from Erase Input Key Allowed	blank
Include by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to include in Erase Input Key Allowed	blank
Include by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LU) to include in Erase Input Key Allowed	blank

Including LUs, Applids, or Applid.Tran/LUs in Erase Input Key Allowed Optimization

Summary: In this task, you will include data streams in Erase Input Key Allowed optimization.

For information about the order in which the Optimizer processes includes and excludes, see "Rules of Optimization" on page 3-3.

You can include data streams in Erase Input Key Allowed optimization by specifying the name of the LU, Applid, Applid.Tran/LU, or a table name (list of LUs, Applids, or Applid.Tran/LUs). To include a single LU, Applid, or Applid.Tran/LU, or to include a table of LUs, Applids, Applid.Tran/LUs, perform the following steps:

Step 1 Perform one of the following steps:

- To include a single LU, Applid, or Applid.Tran/LU, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Single**.
- To include a table of LUs, Applids, Applid.Tran/LUs, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Table**.

Tip: To exclude LUs, Applids, or Applid.Tran/LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the Erase Input Key Allowed panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Selective Optimization Control

Selective optimization controls the optimization of data streams using SCS Printer optimization, SCS Horizontal Tabs, PT Order Generation, SNA Data Compression, and Local Format Storage techniques. These options let you perform the following actions:

- turn SCS Printer optimization on and off
- turn SCS Horizontal Tabs optimization on and off
- specify the default print line length for SCS Printers
- specify an alternate print line length for certain LUs, Applids, and Applid.Tran/LUs
- turn PT Order Generation on and off
- turn SNA Data Compression on and off
- include/exclude individual LUs, Applids, or Applid.Tran/LUs from each optimization type

Displaying the SCS Printer Optimization Panel

Summary: In this task, you will display the SCS Printer Optimization panel.

The SCS Printer optimization and SCS Horizontal Tabs options apply only to SCS printers. To display the SCS Printer Optimization panel, perform the following steps:

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **1** in the **Selective Optimization** field.

Step 4 Press **Enter**.

The SCS Printer Optimization panel (Figure 4-7) is displayed.

Figure 4-7 SCS Printer Optimization Panel

```
(1.3.1)                          ULTRAOPT                    February 09, 2001
Option. . ______           SCS Printer Optimization                    14:31:10
                                 SYSID:SYSP

SCS Printer Optimization . . . . . _   *. On   Status . . . : On
                                       2. Off

Default Print Line Length . . . . . .   132    maximum value 255
Alternate Print Line Length . . . . .   ___    maximum value 255

Specify LU  and/or Applid  that will use the alternate print line length.
For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

                        Action   Single                  Table
  LU . . . . . .   _     ________                  ________
  Applid . . . . . .   _     ________                  ________
  Applid.Tran|Lu . . . .   _     ________ . _________   ________


F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F9=Print  F10=Table List
```

Table 4-5 describes the fields that are displayed on the SCS Printer Optimization panel.

Table 4-5 SCS Printer Optimization Panel Fields

Field	Definition	Default
SCS Printer Optimization	controls the optimization of data streams sent to SCS printers Type **1** to include data streams in SCS Printer optimization. Type **2** to exclude data streams from SCS Printer optimization.	On
SCS Printer Optimization Status	current status of optimization for all data streams sent to SCS printers When SCS Printer optimization Status is **On**, all data streams sent to SCS printers are optimized using SCS Printer optimization. When SCS Printer optimization Status is **Off**, data streams sent to SCS printers are not optimized using SCS Printer optimization.	On
Default Print Line Length	the default print line length used by all SCS printers The default print line length can consist of 1 to 255 characters.	132
Alternate Print Line Length	the alternate print line length used by user-specified SCS printers The alternate print line length can consist of 1 to 255 characters.	blank
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
LU, Applid, or Applid.Tran/Lu – Single	name of a single or generic LU, Applid, or Applid.Tran/LU that should use the alternate print line length	blank
LU, Applid, or Applid.Tran/Lu – Table	name of a table (list of LUs, Applids, or Applid.Tran/LUs) that should use the alternate print line length	blank

Changing the Default Print Line Length

Summary: In this task, you will change the default print line length for SCS printers.

Note: The default print line length is used for all LUs and Applids that do not have an alternate print line length specified for their use.

The default print line length that is used for SCS printers is 132 characters. You can specify a default print line length of 1 to 255. To change the default print line length, perform the following steps:

Step 1 In the **Default Print Line Length** field, type a number 1 to 255.

Step 2 Perform one of the following steps:

- Press **Enter** to save the change and remain on the SCS Printer Optimization panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Specifying an Alternate Print Line Length

Summary: In this task, you will specify an alternate print line length for SCS printers.

Note: The alternate print line length overrides the default print line length for the specified LUs, Applids, and Applid.Tran/LUs.

You can specify that certain SCS printer LUs, Applids, and Applid.Tran/LUs that print to SCS printers use an alternate print line length. To specify the name of a single SCS printer LU, Applid, Applid.Tran/LU, or a table name (list of LUs, Applids, or Applid.Tran/LUs), perform the following steps:

Step 1 In the **Alternate Print Line Length** field, type a number 1 to 255.

Step 2 Perform one of the following steps:

- If you are including a single SCS printer LU, type the LU name in the **Single LU** field.
- If you are including a single Applid, type the Applid name in the **Single Applid** field.
- If you are including a single Applid.Tran/LU, type the Applid.Tran/LU name in the **Single Applid.Tran/Lu** field.
- If you are including a list of SCS printer LUs, type the LU table name in the **Table LU** field.
- If you are including a list of Applids, type the Applid table name in the **Table Applid** field.
- If you are including a list of Applid.Tran/LUs, type the Applid.Tran/LU table name in the **Table Applid.Tran/Lu** field.

Step 3 Press **Enter**.

Displaying the SCS Horizontal Tabs Panel

Summary: In this task, you will display the SCS Horizontal Tabs panel.

Before You Begin

The SCS Printer optimization and SCS Horizontal Tabs options apply only to SCS printers. The SCS Horizontal Tabs option lets you specify whether the Optimizer uses SCS Horizontal Tabs to reduce the size of output data streams for SCS printers. By default, this optimization is off.

If your SCS printers support the horizontal formatting control codes (Set Horizontal Format and Set Horizontal Tab), use SCS Horizontal Tabs to achieve maximum optimization.

To determine whether horizontal tabbing is supported, consider the following information:

- Most IBM 3287 printers with a serial number beginning with 5 or lower do not support Horizontal Tabs.
- If your 3287 IBM printer has the Change Space Feature, it does not support tabbing. The Change Space Feature is indicated in the test pattern by an X'80' bit at Offset 52.
- You may be able to modify a SCS printer to allow it to support tabbing. Contact the manufacturer to determine whether this option is possible with your printer.
- Some non-IBM printers have a problem when the horizontal tab data is split across RUs.
- Most PC ASCII printers do not support tabbing.

If horizontal tabs are not supported (your SCS printers experience terminated sessions or sense code 1005), exclude SCS printers from horizontal tabs by performing the following actions:

- Turn off Horizontal Tabs.
- Exclude or include a specific or generic LU.
- Exclude or include a list of SCS printer LUs by creating a table.

If your SCS printers support SCS Horizontal Tabs, include the printers in SCS Horizontal Tabs optimization by including the following information:

- single or generic LU, Applid, or Applid.Tran/LU
- list of LUs, Applids, or Applid.Tran/LUs

To Display the SCS Horizontal Tabs Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **2** in the **Selective Optimization** field.

Step 4 Press **Enter**.

The SCS Horizontal Tabs panel (Figure 4-8) is displayed.

Figure 4-8 SCS Horizontal Tabs Panel

```
(1.3.2)                          ULTRAOPT                  February 09, 2001
Option. . ______              SCS Horizontal Tabs                   14:32:59
                                  SYSID:SYSP

SCS Horizontal Tabs . .  _  1. On              Status. . . : Off
                            *. Off

For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

 Exclude by:            Action   Single                Table
  LU . . . . . . . . . .   _     ________              ________
  Applid . . . . . . . .   _     ________              ________
  Applid.Tran|Lu . . . .   _     ________ . _________  ________

 Include by:
  LU . . . . . . . . . .   _     ________              ________
  Applid . . . . . . . .   _     ________              ________
  Applid.Tran|Lu . . . .   _     ________ . _________  ________


F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F10=Table List
```

Table 4-6 describes the fields that are displayed on the SCS Horizontal Tabs panel.

Table 4-6 SCS Horizontal Tabs Panel Fields

Field	Definition	Default
SCS Horizontal Tabs	controls the optimization of all data streams sent to SCS printers Type **1** to include data streams in SCS Horizontal Tabs optimization. Type **2** to exclude data streams from SCS Horizontal Tabs optimization.	Off
SCS Horizontal Tabs Status	current status of optimization for all data streams sent to SCS printers When SCS Horizontal Tabs Status is On, all data streams sent to SCS printers are optimized using SCS Horizontal Tabs optimization. When SCS Horizontal Tabs Status is Off, data streams sent to SCS printers are not optimized using SCS Horizontal Tabs optimization.	Off
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by: Single – LU, Applid, or Applid.Tran/LU	name of a single or generic LU, Applid, or Applid.Tran/LU to exclude from SCS Horizontal Tabs optimization	blank
Exclude by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LU) to exclude from SCS Horizontal Tabs optimization	blank
Include by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to include in SCS Horizontal Tabs optimization	blank
Include by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LU) to include in SCS Horizontal Tabs optimization	blank

Including LUs, Applids, or Applid.Tran/LUs in SCS Horizontal Tabs Optimization

Summary: In this task, you will include data streams in SCS Horizontal Tabs optimization.

You can include data streams in SCS Horizontal Tabs optimization by specifying the name of the LU, Applid, Applid.Tran/LU, or a table name (list of LUs, Applids, or Applid.Tran/LUs).

Step 1 Perform one of the following steps:

- To include a single LU, Applid, or Applid.Tran/LU, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by Applid.Tran/LU** field under **Single**.
- To include a table of LUs, Applids, or Applid.Tran/LUs, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Table**.

Tip: To exclude LUs, Applids, or Applid.Tran/LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the SCS Horizontal Tabs panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Displaying the PT Order Generation Panel

Summary: In this task, you will display the PT Order Generation panel.

Before You Begin

Program Tab (PT) Order Generation optimization lets you specify whether the Optimizer component uses PT orders to reduce the size of output data streams. The PT Order Generation options apply only to 3270 terminals and non-SCS printers.

If your 3270 terminals and non-SCS printers support PT orders, use PT Order Generation to achieve maximum optimization.

If PT orders are not supported or not implemented correctly (fields are not cleared correctly), exclude devices from PT Order Generation optimization by performing one of the following actions:

- turning PT Order Generation optimization off
- excluding or including a single or generic LU, Applid, or Applid.Tran/LU
- excluding or including a list of LUs, Applids, or Applid.Tran/LUs

To Display the PT Order Generation Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **3** in the **Selective Optimization** selection field.

Step 4 Press **Enter**.

The PT Order Generation panel (Figure 4-9) is displayed.

Figure 4-9 PT Order Generation Panel

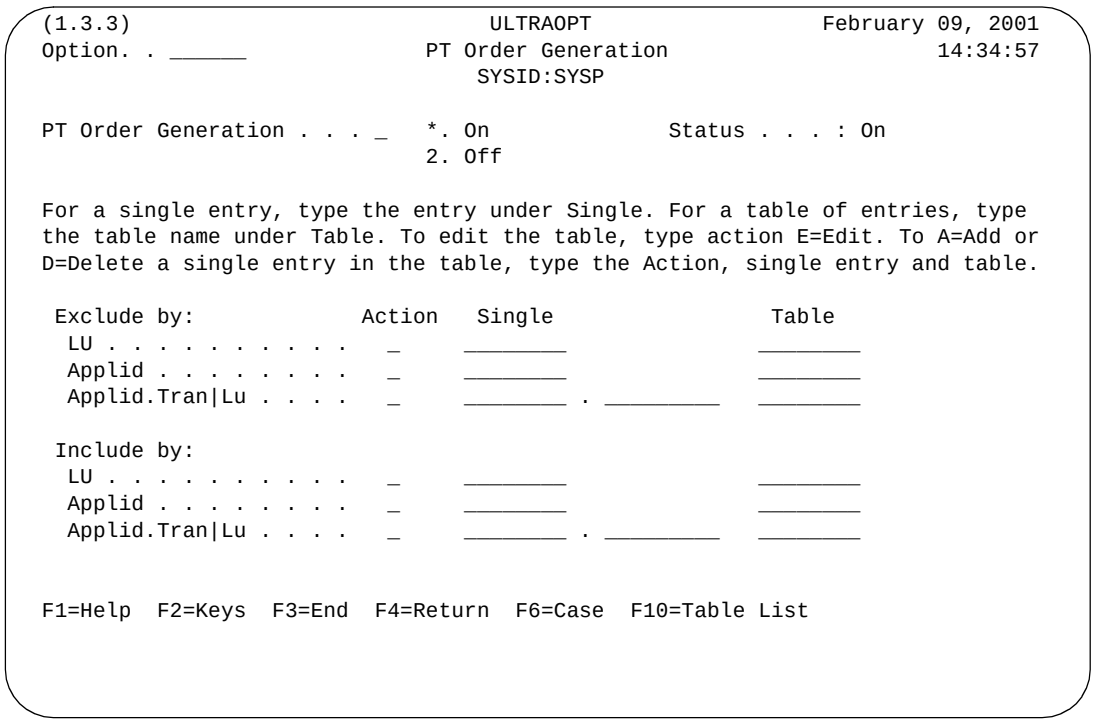


Table 4-7 describes the fields that are displayed on the PT Order Generation panel.

Table 4-7 PT Order Generation Panel Fields

Field	Definition	Default
PT Order Generation	controls the optimization of all data streams sent to 3270 terminals and non-SCS printers Type **1** to include data streams in PT Order Generation optimization. Type **2** to exclude data streams from PT Order Generation optimization.	On
PT Order Generation Status	current status of optimization for all data streams sent to 3270 terminals and non-SCS printers When PT Order Generation Status is **On**, all data streams sent to 3270 terminals and non-SCS printers are optimized using PT Order Generation optimization.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to exclude from PT Order Generation optimization	blank
Exclude by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LUs) to exclude from PT Order Generation optimization	blank
Include by: Single – LU, Applid, or Applid.Tran/Lu	name of a single or generic LU, Applid, or Applid.Tran/LU to include in PT Order Generation optimization	blank
Include by: Table – LU, Applid, or Applid.Tran/Lu	name of a table (list of LUs, Applids, or Applid.Tran/LUs) to include in PT Order Generation optimization	blank

Including LUs, Applids, or Applid.Tran/LUs in PT Order Generation Optimization

Summary: In this task, you will include data streams for 3270 terminals and non-SCS printers in PT Order Generation optimization.

You can include data streams for 3270 terminals and non-SCS printers in PT Order Generation optimization by specifying the name of the LU, Applid, Applid.Tran/LU, or a table name (list of LUs, Applids, or Applid.Tran/LU).

Step 1 Perform one of the following steps:

- To include a single LU, Applid, or Applid.Tran/LU, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/LU** field under **Single**.
- To include a table of LUs, Applids, or Applid.Tran/LUs, type its name in the **Include by: LU**, **Include by: Applid**, or **Include by: Applid.Tran/Lu** field under **Table**.

Tip: To exclude LUs, Applids, or Applid.Tran/LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the PT Order Generation panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Displaying the SNA Data Compression Panel

Summary: In this task, you will display the SNA Data Compression panel.

Before You Begin

SNA Data Compression optimization lets you specify whether the Optimizer component uses SNA Data Compression to reduce the size of output data streams for 3600, 4700, and 3790 User Program devices. The SNA Data Compression options apply only to 3600 and 4700 controllers and to 3790 devices with decompression capability.

If SNA Data Compression is not supported, you can exclude 3600, 4700, and 3790 User Program devices from SNA Data Compression optimization by performing one of the following actions:

- turning SNA Data Compression off
- excluding or including a single or generic LU
- excluding or including a list of LUs

To implement SNA Data Compression optimization, the following conditions must exist:

- The session partners must be included for SNA Data Compression.
- ULTRAOPT must be started with the SNA4 startup parameter (or issue the *subsysid* SNA4 command).
- The session must be bound by using session parameters LUTYPE=0, FMPROF=04, and TSPROF=04.

The first two conditions can be controlled easily by using startup parameters and the Monitor component. The third condition may be more difficult to control. If the third condition is not satisfied, you can write a user exit to achieve the same result by altering the ULTRAOPT internal representation for the session to LUTYPE4.

See the sample exit provided in member '*hilevel*.BBSAMP(SOPUSERC).'

To Display the SNA Data Compression Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **4** in the Selective Optimization selection field.

Step 4 Press **Enter**.

The SNA Data Compression panel (Figure 4-10) is displayed.

Figure 4-10 SNA Data Compression Panel

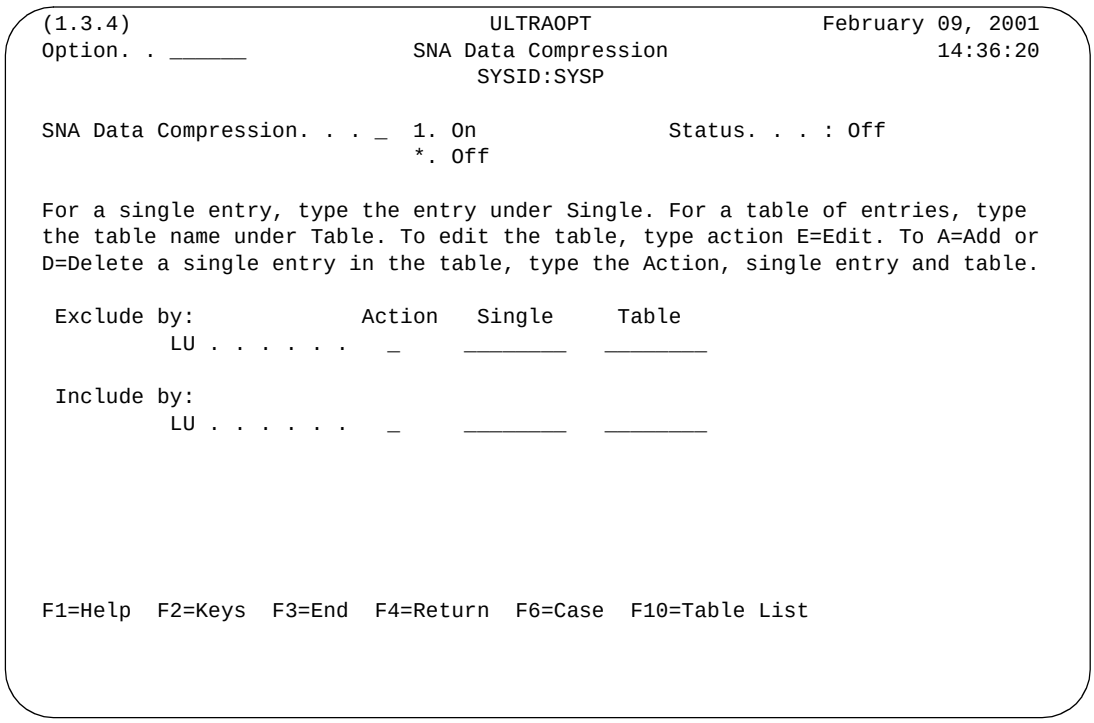


Table 4-8 describes the fields that are displayed on the SNA Data Compression panel.

Table 4-8 SNA Data Compression Panel Fields

Field	Definition	Default
SNA Data Compression	controls the optimization of all data streams sent to 3600, 4700, and 3790 User Program devices Type **1** to include data streams in SNA Data Compression. Type **2** to exclude data streams from SNA Data Compression.	On
SNA Data Compression Status	current status of optimization for all data streams sent to 3600, 4700, and 3790 User Program devices When SNA Data Compression Status is **On**, all data streams sent to these devices are optimized using SNA Data Compression. When SNA Data Compression Status is **Off**, data streams to these devices are not optimized using SNA Data Compression.	On
Action	lets you specify an action to perform on a table (list of LUs or Applids) Valid actions are as follows: • **A** to add a single or generic LU or Applid to a table • **D** to delete a single or generic LU or Applid from a table • **E** to edit a table	blank
Exclude by LU – Single	name of a single or generic LU to exclude from SNA Data Compression	blank
Exclude by LU – Table	name of a table (list of LUs) to exclude from SNA Data Compression	blank
Include by LU – Single	name of a single or generic LU to include in SNA Data Compression	blank
Include by LU – Table	name of a table (list of LUs) to include in SNA Data Compression	blank

Including LUs in SNA Data Compression Optimization

Summary: In this task, you will include LUs in SNA Data Compression optimization.

You can include data streams in SNA Data Compression optimization by specifying the name of the LU or an LU table.

Because the 3600, 4700, and 3790 devices are also LUs, they can be included or excluded by setting the SNA Data Compression to on or off and by specifying their LU name. If one of these devices is *included* by one method and *excluded* by another, its data streams are always *excluded*.

Note: Including an LU for SNA Data Compression optimization is only one requirement for implementing SNA Data Compression. For more information, see the description of the SNA4 startup parameter in the *ULTRAOPT Customization Guide*.

Step 1 Perform one of the following steps:

- To include a single LU, type its name in the **Include by: LU** field under **Single**.
- To include a table of LUs, type its name in the **Include by: LU** field under **Table**.

Tip: To exclude LUs, type the name in the appropriate **Exclude by** field under **Single** or **Table**.

Step 2 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on the SNA Data Compression panel.
- Press **F3** to save the changes and return to the Optimization Control Menu.

Displaying the Local Format Storage Panel

Summary: In this task, you will display the Local Format Storage panel.

Before You Begin

Local Format Storage (LFS) optimization lets you specify whether the Optimizer component uses LFS to reduce the size of output data streams. LFS optimization applies only to IBM 3174 controllers.

If LFS is used, the Optimizer component can perform LFS optimization only under the following conditions:

- The IBM 3174 controllers are configured for LFS use (for CUT mode terminals), as described in the *ULTRAOPT Customization Guide*.
- ULTRAOPT was installed for LFS; the following conditions apply:
  - — Imaging optimization is on.
  - — Input Suppression is on.
  - — The LAPPLID parameter was specified in the startup procedure.
  - — A VTAM Applid is defined for LFS.
  - — The control unit LUs are defined.
  - — The LFS user exit interface program is created and assembled.
  - — The LFS user exit interface program name is entered in the Exit program ID field on panel 1.5.1.

    Note: The exit is unnecessary if you installed RPQ 8Q0929.
  - — The SOPOPT VSAM file was created and its name placed in the File Definition Table (FDT) during installation (if you are using the user exit).

For more information about LFS, see the *ULTRAOPT Customization Guide*.

To Display the Local Format Storage Panel

Step 1 Type **1** on the Monitor Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **5** in the **Selective Optimization** field.

Step 4 Press **Enter**.

The Local Format Storage panel (Figure 4-11) is displayed.

Figure 4-11 Local Format Storage Panel

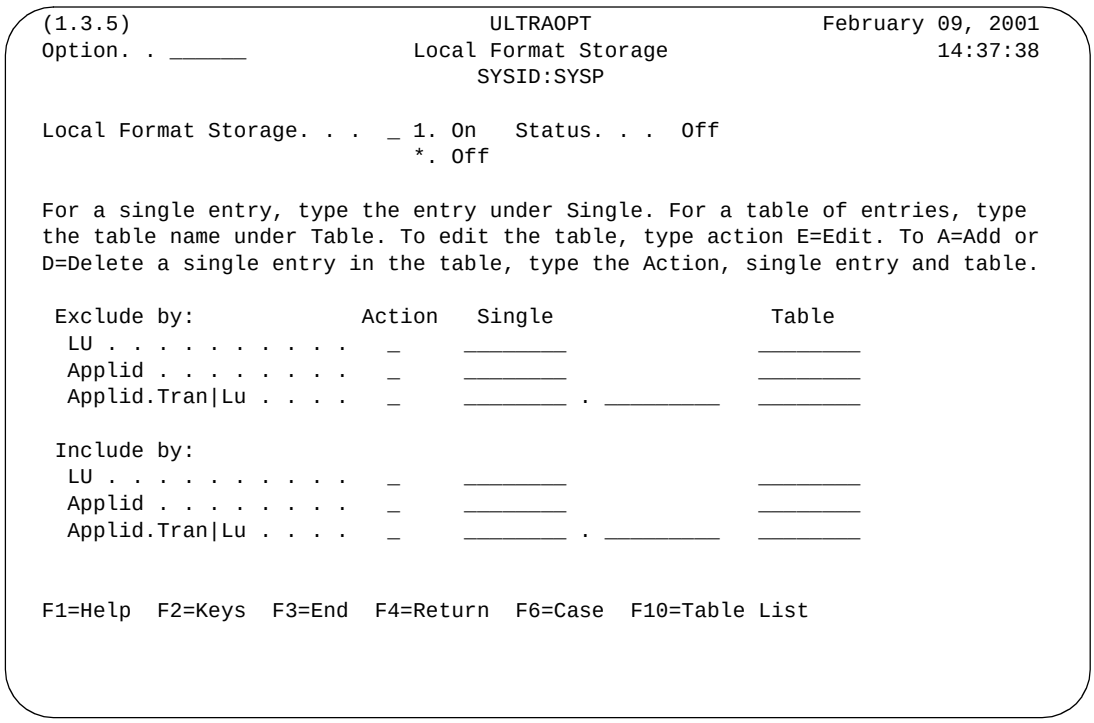


Table 4-9 describes the fields that are displayed on the Local Format Storage panel.

Table 4-9 Local Format Storage Panel Fields

Field	Definition	Default
Local Format Storage	controls the optimization of all outbound data streams Type **1** to include outbound data streams in LFS optimization. Type **2** to exclude outbound data streams from LFS optimization.	On
Local Format Storage Status	current status of optimization for all outbound data streams When Local Format Storage Status is **On**, all outbound data streams are optimized using LFS optimization. When Local Format Storage Status is **Off**, outbound data streams are not optimized using LFS optimization.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by LU - Single	name of a single or generic LU to exclude from LFS optimization	blank
Exclude by LU - Table	name of a table (list of LUs) to exclude from LFS optimization	blank
Include by LU - Single	name of a single or generic LU to include in LFS optimization	blank
Include by LU - Table	name of a table (list of LUs) to include in LFS optimization	blank
Exclude by Applid - Single	name of a single or generic LU to exclude from LFS optimization	blank
Exclude by Applid - Table	name of a table (list of LUs) to exclude from LFS optimization	blank
Include by Applid - Single	name of a single or generic LU to include in LFS optimization	blank
Include by Applid - Table	name of a table (list of LUs) to include in LFS optimization	blank
Exclude by Applid.Tran/Lu - Single	name of a single or generic Applid.Tran/LU to exclude from LFS optimization	blank
Exclude by Applid.Tran/Lu - Table	name of a table (list of Applid.Tran/LUs) to exclude from LFS optimization	blank
Include by Applid.Tran/Lu - Single	name of a single or generic Applid.Tran/LU to include in LFS optimization	blank
Include by Applid.Tran/Lu - Table	name of a table (list of Applid.Tran/LUs) to include in LFS optimization	blank

Note: Any LU included for LFS optimization is queried unless you use the QUERYP startup parameter and the LU's PSERVIC query bit is off or if the NOQLFS startup parameter is used and the LU is not attached to an LFS controller.

Conventional Optimization Control

Conventional optimization features affect the way that the Optimizer component optimizes output data streams when Conventional optimization techniques are used. None of the features completely excludes a data stream from optimization by the Conventional optimization techniques.

If you have software that scans the contents of the device buffer, but does not function correctly with ULTRAOPT, exclude that software from the Conventional optimization features and test those devices.

Displaying the Field Merge Panel

Summary: In this task, you will display the Field Merge panel.

Before You Begin

Field Merge optimization lets you eliminate start field (SF) orders from consecutive protected fields when the field attributes are the same. When the Field Merge feature is inactivated, normal start field processing is used.

Note: The fields that are affected by Field Merge appear and function the same as before.

Although this feature lets you maximize optimization, do not use it if one of the following conditions exists:

- Imaging optimization is On *and* your terminal operators use a *terminal hardware* feature to perform String and Block Copy functions. For example, a 3290 lets you copy a string or block of data from one partition to another.
- Imaging optimization is off (Conventional optimization is being used), and one of the following actions occurs:
  - — A VTAM application program uses program tab (PT) orders to clear a field eligible for Field Merge.
  - — A VTAM application program modifies existing attributes on the CRT for fields eligible for Field Merge.
  - — A VTAM application issues a READB (Read Buffer) and expects the resulting inbound data stream to contain all the original attributes that were sent out.

To Display the Field Merge Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **1** in the **Conventional Optimization** field.

Step 4 Press **Enter**.

The Field Merge panel (Figure 4-12) is displayed.

Figure 4-12 Field Merge Panel

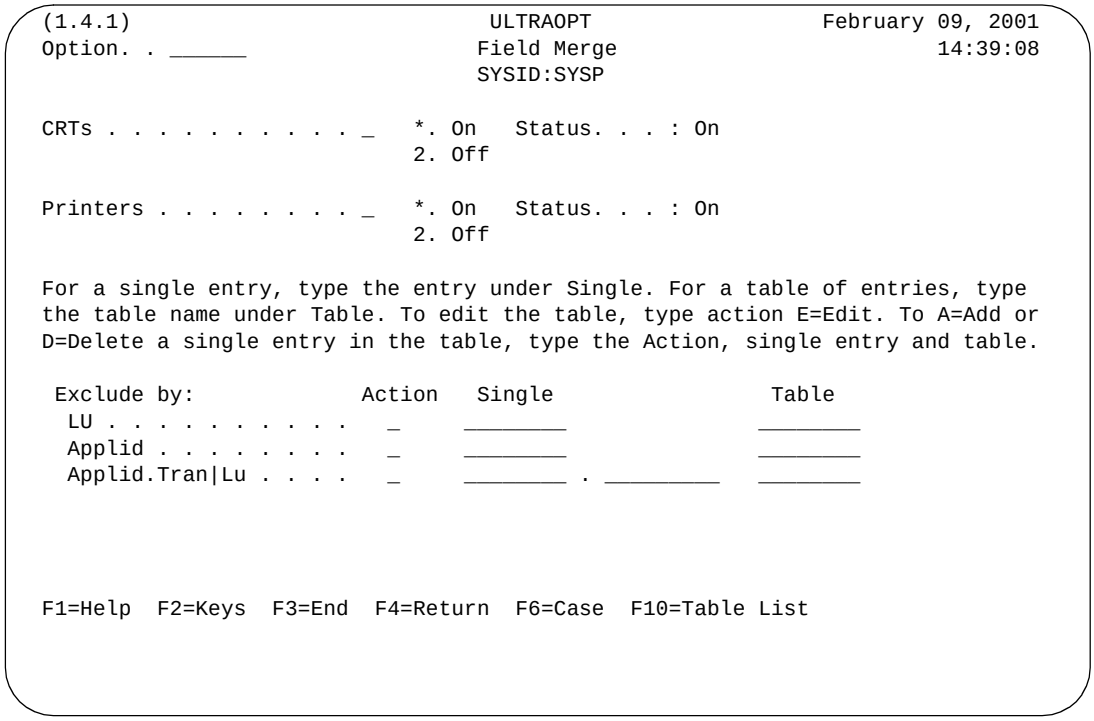


Table 4-10 describes the fields that are displayed on the Field Merge panel.

Table 4-10 Field Merge Panel Fields

Field	Definition	Default
CRTs	controls the optimization of all data streams sent to CRTs Type **1** to include data streams in Field Merge optimization. Type **2** to exclude data streams from Field Merge optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized using the Field Merge feature. When CRTs Status is **Off**, data streams sent to CRTs are not optimized using the Field Merge feature.	On
Printers	controls the optimization of all data streams sent to printers Type **1** to include data streams in Field Merge optimization. Type **2** to exclude data streams from Field Merge optimization.	
Printers Status	current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized using the Field Merge feature. When Printers Status is **Off**, data streams sent to printers are not optimized using the Field Merge feature.	
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by LU - Single	name of a single or generic LU to exclude from Field Merge feature optimization	blank
Exclude by LU - Table	name of a table (list of LUs) to exclude from Field Merge feature optimization	blank
Exclude by Applid - Single	name of a single or generic Applid to exclude from Field Merge feature optimization	blank
Exclude by Applid - Table	name of a table (list of Applids) to exclude from Field Merge feature optimization	blank
Exclude by Applid.Tran/Lu - Single	name of a single or generic Applid.Tran/LU to exclude from Field Merge feature optimization	blank
Exclude by Applid.Tran/Lu - Table	name of a table (list of Applid.Tran/LUs) to exclude from Field Merge feature optimization	blank

Displaying the Blank Elimination Panel

Summary: In this task, you will display the Blank Elimination panel.

Before You Begin

Blank Elimination optimization removes blanks from outbound data steams that are sent to CRTs and printers. For CRTs, blanks are only removed from protected fields. When this feature is off, the Optimizer component uses repeat-to-address (RA) orders to optimize the blanks.

Note: In the fields that are affected by the Blank Elimination feature, the data remains in its proper relative positions.

Although Blank Elimination optimization lets you maximize optimization, do not use it if one of the following conditions exists:

- Imaging optimization is on *and* your terminal operators use a *terminal hardware* feature to perform String and Block Copy functions. For example, a 3290 lets you copy a string or block of data from one partition to another.

- Imaging optimization is off (Conventional optimization is being used), and one of the following occurs:

  — A VTAM application changes protected fields to unprotected.
  — A VTAM application issues a READB (Read Buffer) and expects the resulting inbound data stream to contain all the original attributes that were sent out.

To Display the Blank Elimination Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **2** in the **Conventional Optimization** field.

Step 4 Press **Enter**.

The Blank Elimination panel (Figure 4-13) is displayed.

Figure 4-13 Blank Elimination Panel

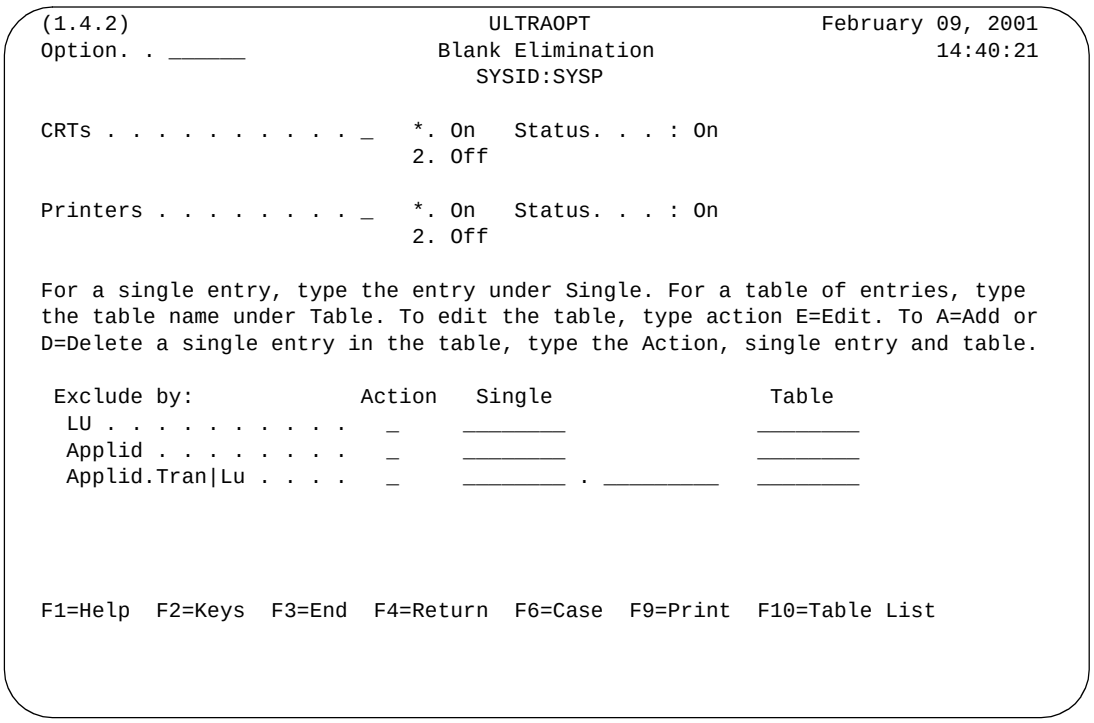


Table 4-11 describes the fields that are displayed on the Blank Elimination panel.

Table 4-11 Blank Elimination Panel Fields

Field	Definition	Default
CRTs	controls the optimization of data streams sent to CRTs Type **1** to include data streams in Blank Elimination optimization. Type **2** to exclude data streams from Blank Elimination optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized using the Blank Elimination feature. When CRTs Status is **Off**, data streams sent to CRTs are not optimized using the Blank Elimination feature.	On
Printers	controls the optimization of data streams sent to printers Type **1** to include data streams in Blank Elimination optimization. Type **2** to exclude data streams from Blank Elimination optimization.	On
Printers Status	current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized using the Blank Elimination feature. When Printers Status is **Off**, data streams sent to printers are not optimized using the Blank Elimination feature.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by LU - Single or Table	name of a single/generic LU or table (list of LUs) to exclude from Blank Elimination optimization	blank
Exclude by Applid - Single or Table	name of a single/generic Applid or table (list of Applids) to exclude from Blank Elimination optimization	blank
Exclude by Applid.Tran/Lu - Single or Table	name of a single/generic Applid.Tran/LU or table (list of Applid.Tran/LUs) to exclude from Blank Elimination optimization	blank

Displaying the Non-Display Fields Panel

Summary: In this task, you will display the Non-Display Fields panel.

Before You Begin

Non-display Fields optimization eliminates non-display fields from outbound data streams that are sent to CRTs and printers. For CRTs, only protected non-display fields will be eliminated. When this feature is off, the Optimizer component uses other optimization techniques on the non-display fields.

Although this feature lets you maximize optimization, do not use it if one of the following conditions exists:

- Imaging optimization is on *and* your terminal operators use a *terminal hardware* feature to perform String and Block Copy functions. For example, a 3290 lets you copy a string or block of data from one partition to another.
- Imaging is off (Conventional optimization is being used) and a VTAM application program modifies any CRT field with existing attributes of protected, non-premodified, and not detectable by a light pen.
- Imaging is off (Conventional optimization is being used) and an application issues a READB (Read Buffer) and expects the inbound data stream to contain all of the original attributes that were sent out.

To Display the Non-Display Fields Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **3** in the **Conventional Optimization** field.

Step 4 Press **Enter**.

The Non-Display Fields panel (Figure 4-14) is displayed.

Figure 4-14 Non-Display Fields Panel

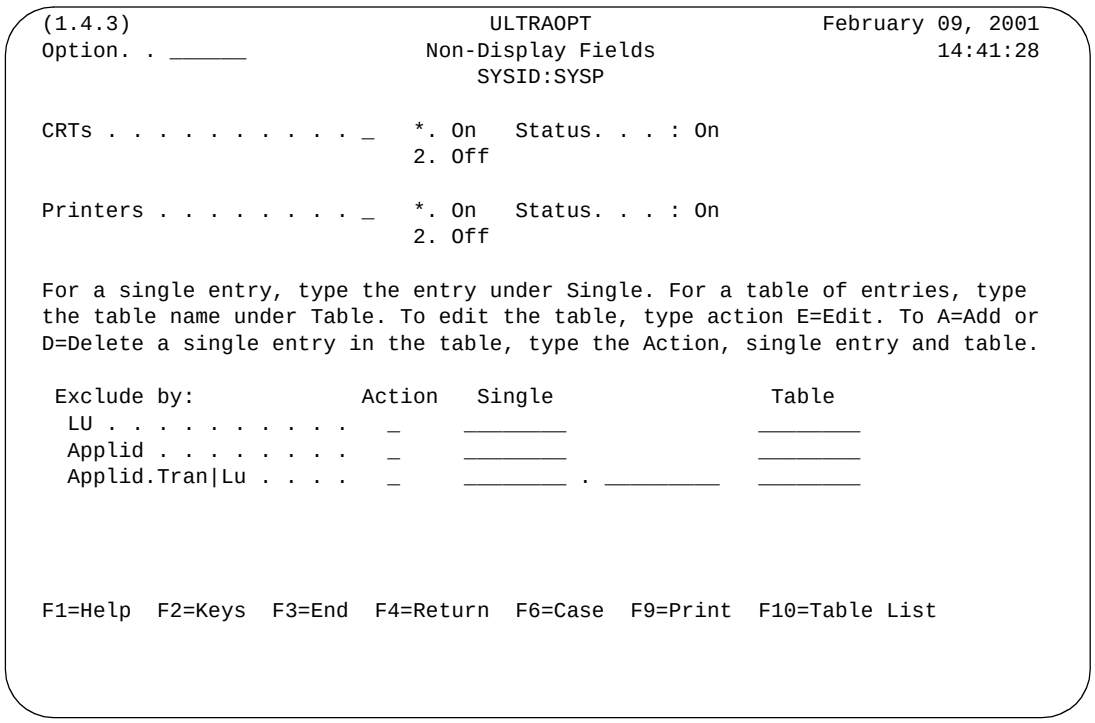


Table 4-12 describes the fields that are displayed on the Non-Display Fields panel.

Table 4-12 Non-Display Fields Panel Fields

Field	Definition	Default
CRTs	controls optimization of all data streams sent to CRTs Type **1** to include data streams in Non-Display Fields optimization. Type **2** to exclude data streams from Non-Display Fields optimization.	On
CRTs Status	current status of optimization for all data streams sent to CRTs When CRTs Status is **On**, all data streams sent to CRTs are optimized using the Non-Display Fields feature. When CRTs Status is **Off**, data streams sent to CRTs are not optimized using the Non-Display Fields feature.	On
Printers	controls optimization of all data streams sent to printers Type **1** to include data streams in Non-Display Fields optimization. Type **2** to exclude data streams from Non-Display Fields optimization.	On
Printers Status	current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized using the Non-Display Fields feature. When Printers Status is **Off**, data streams sent to printers are not optimized using the Non-Display Fields feature.	On
Action	lets you specify an action to perform on a table (list of LUs, Applids, or Applid.Tran/LUs) Valid actions are as follows: • **A** to add a single or generic LU, Applid, or Applid.Tran/LU to a table • **D** to delete a single or generic LU, Applid, or Applid.Tran/LU from a table • **E** to edit a table	blank
Exclude by LU - Single	name of a single or generic LU to exclude from Non-Display Fields feature optimization	blank
Exclude by LU - Table	name of a table (list of LUs) to exclude from Non-Display Fields feature optimization	blank
Exclude by Applid - Single	name of a single or generic Applid to exclude from Non-Display Fields feature optimization	blank
Exclude by Applid - Table	name of a table (list of Applids) to exclude from Non-Display Fields feature optimization	blank
Exclude by Applid.Tran/LU - Single	name of a single or generic Applid.Tran/LU to exclude from Non-Display Fields feature optimization	blank
Exclude by Applid.Tran/Lu - Table	name of a table (list of Applid.Tran/LUs) to exclude from Non-Display Fields feature optimization	blank

Displaying the Attribute Elimination Panel

Summary: In this task, you will display the Attribute Elimination panel.

Before You Begin

Attribute Elimination optimization eliminates all attributes that are embedded in outbound data streams which are sent to printers. Although this feature lets you maximize the optimization streams sent to printers, do not use it if one of the following conditions exists:

- The printer is a color printer, and colors are used.
- A VTAM application program sends an erase/write data stream to a printer, followed by a non-erase/write data stream that depends on the attributes which are included in the first data stream. In this case, do not use this feature with Conventional optimization (when Imaging is off).

To Display the Attribute Elimination Panel

Step 1 Type **1** on the ULTRAOPT Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **4** in the **Conventional Optimization** field.

Step 4 Press **Enter**.

The Attribute Elimination panel (Figure 4-15) is displayed.

Figure 4-15 Attribute Elimination Panel

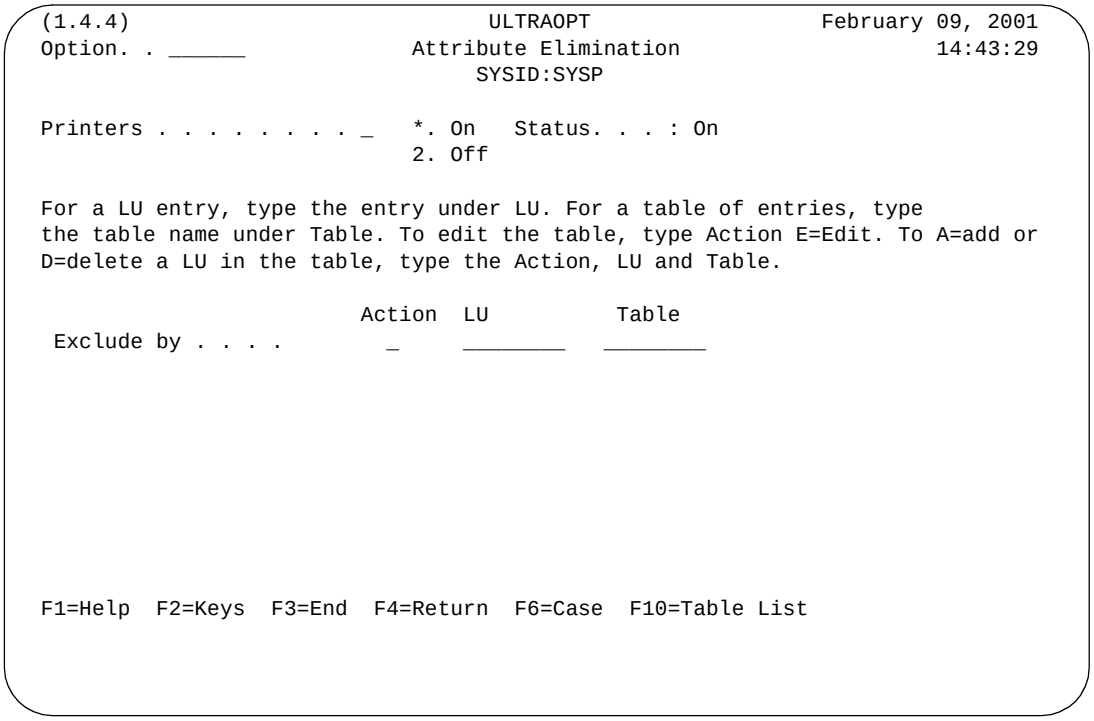


Table 4-13 describes the fields that are displayed on the Attribute Elimination panel.

Table 4-13 Attribute Elimination Panel Fields

Field	Definition	Default
Printers	controls optimization of all data streams sent to printers Type **1** to include data streams in Attribute Elimination optimization. Type **2** to exclude data streams from Attribute Elimination.	On
Printers Status	current status of optimization for all data streams sent to printers When Printers Status is **On**, all data streams sent to printers are optimized using the Attribute Elimination feature. When Printers Status is **Off**, data streams sent to printers are not optimized using the Attribute Elimination feature.	On
Action	lets you specify an action to perform on a table (list of LUs) Valid actions are as follows: • **A** to add a single or generic LU to a table • **D** to delete a single or generic LU from a table • **E** to edit a table	blank
Exclude by LU - Single	name of a single or generic LU to exclude from Attribute Elimination feature optimization	blank
Exclude by LU - Table	name of a table (list of LUs) to exclude from Attribute Elimination feature optimization	blank

Chapter 5 User Exits

ULTRAOPT has several exit points. This chapter includes information that you need to edit the supplied user exit (or write your own) so that it can handle one or more of these exit points.

This chapter contains the following sections:

Overview

The sample user exit (*hilevel*.BBSAMP(SOPUSER)) is designed to manage the exit points that are described in this chapter. You need only to edit the user exit for it to function in your data center. This section describes each exit point and explains how the user exit must function at each point.

Inbound before Optimization Exit Point

At this exit point, the program lets you perform the following activities:

- remove any non-3270 data stream data inserted by the hardware
- correct data stream errors before the Optimizer component processes the data stream

Inbound after Optimization Exit Point

At this exit point, the program lets you translate inbound data streams. Fields can be inserted or removed as long as *the data stream length does not exceed the size of the storage area that is provided*.

Outbound before Optimization Exit Point

At this exit point, the program lets you further preprocess output data streams or exclude/include any output data stream from optimization. Any directions received from the user exit program override any other existing options as follows:

- If the program excludes a data stream, the Optimizer component bypasses the data stream.

- If the program includes a data stream, all other selection criteria are bypassed and the data stream is optimized.

This exit point lets you change which optimization techniques are used or exclude a portion of the data stream from optimization.

When the user exit returns control to the Optimizer component, Register 15 should contain one of the return codes that are described in Table 5-1.

Table 5-1 Return Codes

Return Code	Description
zero	indicates that the Optimizer should honor the normal include/exclude options
negative number	indicates that the data stream should be included for optimization, disregarding all other include/exclude options
positive number	indicates that the data stream should be completely excluded from optimization

Outbound after Optimization Exit Point

At this exit point, the program lets you insert or change data in the data stream that is actually being transmitted to the device. This exit is generally not recommended for data stream processing because the optimized data stream will be much more complex than the original data stream and because data stream errors that are generated in the exit will not be detected by the Optimizer component.

Local Format Storage Exit Point

For LFS optimization to be in effect, the Optimizer component must know which terminal (Display LU) is connected to which IBM 3174 (Load LU). If the Optimizer component cannot determine this information automatically, you must write a user exit to supply the information. The user exit is not called when establishing a session with a Display LU when the query reply indicates that a Load LU is already associated with it.

For IBM 3174 controllers, you do not need a user exit if the 3174 Load LU is automatically associated with the terminal (Display LU). This statement is true when the controllers have the following characteristics:

- IBM 3174 controller with Configuration Support B
- microcode level 4.2
- RPQ 8Q0929
- multiple-host LFS support (RPQ 8Q1008) is *not* being used

With these characteristics, the controller will respond to ULTRAOPT queries with the correct LOCADDR1 LU name, and a user exit is not needed. Otherwise, you must supply a user exit to determine the correct LOCADDR1 name. For each LU name that the Optimizer passes to this exit program, the exit must return the name of the IBM 3174 LOCADDR=1 LU.

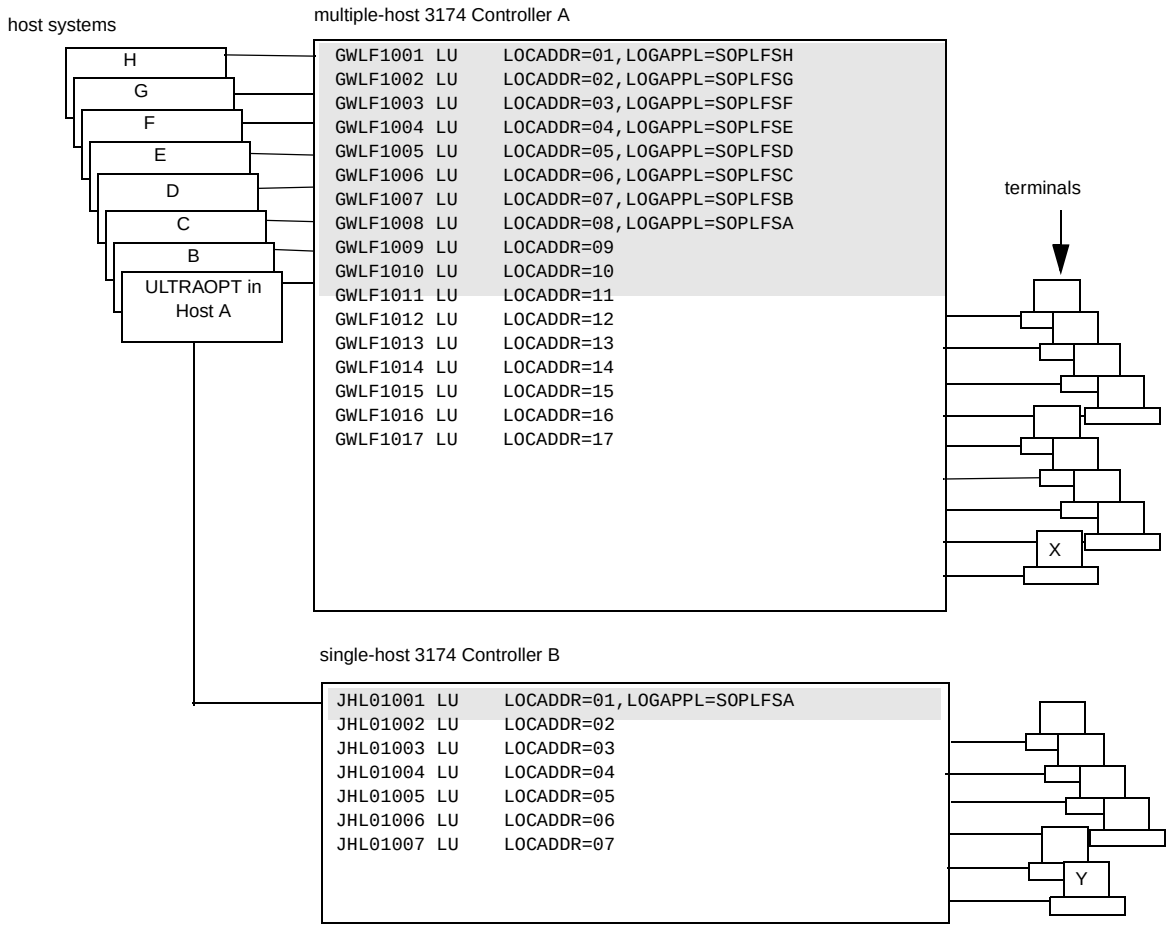
If you are using a controller that supports LFS on multiple hosts (RPQ 8Q1008 is installed), the user exit program has additional decisions to make:

- It must always return the LU name of the LOCADDR=1 LU for sessions using single-host controllers.

- It must return the LU name of the LOCADDR that this host uses when the controller is a multiple-host controller.

Figure 5-1 shows an example of LOCADDR LU names in a 3174 controller. The ULTRAOPT user exit program in Host A must return the LU name for Controller B's LOCADDR 1 if the session is logged on from terminal Y. It must return the LU name for Controller A's LOCADDR 8 if the session is logged on from terminal *X*. Presumably, this requires a terminal LU naming convention so that the user exit can determine which controller is being used and a table of LU names and LOCADDR LUs to use for each controller.

Figure 5-1 LOCADDR LU Names in 3174 Controllers



The *ULTRAOPT Customization Guide* describes how to set up a 3174 controller for multiple-host LFS support and how to set up a single-host controller to eliminate the need for a user exit.

Creating User Exit Programs

The User Exit program must be written as follows:

- as re-entrant in Assembler language, using standard OS/VS linkage
- to be link-edited as AMODE(31),RMODE(ANY),RENT
- to return to the Optimizer in AMODE(31)
- to receive control from the Optimizer in AMODE(31)
  - — supervisor state
  - — protect key 6
  - — SRB mode
  - — reside in ECSA
  - — protected by FRR
  - — running enabled
  - — in non-cross memory mode
  - — with local or CMS locks that cannot be released

No restrictions exists on the name of the program. The same program can be used for all exit points, as is the case with the sample user exit (*hilevel*.SOP.BBSAMP(SOPUSER)).

No operating system services should be requested by a user exit program.

When entering an exit program, the registers are passed from the Optimizer as described in Table 5-2.

Table 5-2 Registers Passed by the Optimizer to a User Exit (Part 1 of 2)

Register	Contents	
1	A parameter list of full words that contains the addresses of the following items:	
	Word	Description
	1	Exit Identifier - A full word that identifies the exit for which a program was called: 0—Local Format Storage 4—Inbound before Optimization 8—Inbound after Optimization 12—Outbound before Optimization 16—Outbound after Optimization
	2	LU

Table 5-2 Registers Passed by the Optimizer to a User Exit (Part 2 of 2)

Register	Contents	
	A parameter list of full words that contains the addresses of the following:	
	Word	Description
	3	Applid
	4	Data Stream
	5	Length—A full word that identifies the length of data stream for the four inbound and outbound user exits. This data stream length is the length of the entire data stream. For outbound exits, this includes the lengths of the Command Code (if present) and the Write Control Character (if present). For inbound exits, the length includes the AID and cursor address (if present).
	6	Optimization Options—Applies only to the Outbound Before Optimization exit.
	7	Full word - For the Outbound Before Optimization exit, the full word is a number that indicates the number of bytes following the WCC that are to be retained in the optimized data stream. For the Outbound After Optimization exit, the full word is an address that points to a skip reason code byte. If this byte contains X'FF', the data stream has not been skipped.
	8	reserved
	9	reserved
	10	reserved
	11	reserved
	12	RPL Copy Address—address of the copy of the user's RPL
13	Address of an 18 full word save area	
14	Return address	
15	Entry point address	

Displaying the User Exits Panel

Summary: In this task, you will display the User Exits panel.

ULTRAOPT has the following user exit points:

- Inbound before Optimization
- Inbound after Optimization
- Outbound before Optimization
- Outbound after Optimization
- Local Format Storage

All user exits are controlled from the User Exits panel. To display the User Exits panel, perform the following steps:

Step 1 Type **1** on the Monitor Primary Menu (Figure 2-1 on page 2-5).

Step 2 Press **Enter**.

The Optimization Control Menu (Figure 4-1 on page 4-3) is displayed.

Step 3 Type **1** in the **User Exits** field.

Step 4 Press **Enter**.

The User Exits panel (Figure 5-2) is displayed.

Figure 5-2 User Exits Panel

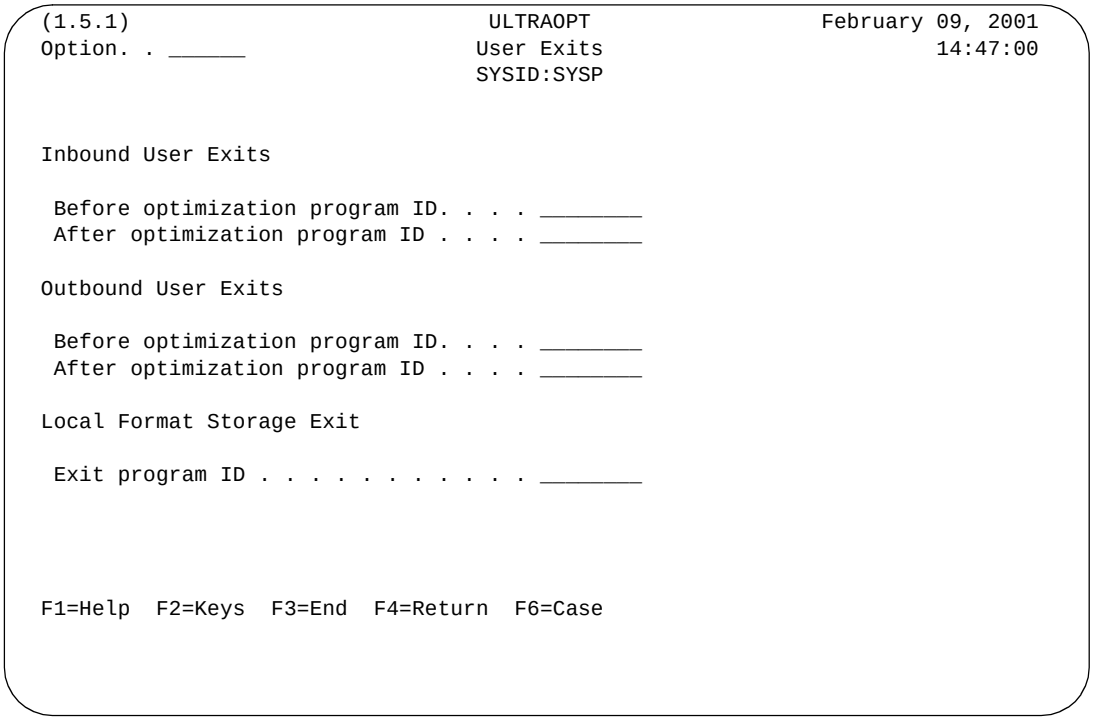


Table 5-3 describes the fields that are on the User Exits panel.

Table 5-3 User Exits Panel Fields

Field		Description
Inbound User Exits	Before optimization program ID	name of an inbound before optimization user exit program
	After optimization program ID	name of an inbound after optimization user exit program
Outbound User Exits	Before optimization program ID	name of an outbound before optimization user exit program
	After optimization program ID	name of an outbound after optimization user exit program
Local Format Storage Exit	Exit program ID	name of a Local Format Storage user exit program

Step 5 Choose one of the following options:

- To activate your user exit program, type its name in the appropriate program ID fields. (The program must reside in an APF-authorized library.)

- To stop a user exit program, use the spacebar to space through the name of the program in the appropriate program ID field on the User Exits panel.

Chapter 6 Optimization Statistics

This chapter describes statistics that you can display or print. This chapter also explains how you can write statistics to system management facilities (SMF).

This chapter contains the following sections:

Overview

The Monitor component lets you select which statistics to display or print. You can select statistics for the following items:

- all Applids, all CRTs, and all printers
- a single LU or Applid
- a table of LUs or Applids
- all TN3270 sessions

You can also write statistics to SMF.

Data Stream Statistics Menu

The Monitor Data Stream Statistics Menu (Figure 6-1) is used to display the data stream statistics panels by selecting an appropriate option.

Figure 6-1 Data Stream Statistics Menu

```
(2.0.0)                          ULTRAOPT                    December 29, 2001
Option. . ______           Data Stream Statistics Menu                12:07:06
                                 SYSID:SYSA

Select a choice from below.
_ 1 . Summary of Data Streams Optimized
  2 . Data Streams Optimized by LU/Applid
  3 . Data Streams Excluded by Installation
  4 . Data Streams Excluded by Optimizer
  5 . Local Format Storage Summary

  9 . Print or Reset Statistics
                                          Optimizer status . . . :  Active
                                          Imaging. . . . . . . . :  On
                                          Input Suppression. . . :  On
                                          Erase Input Key Allowed:  No
                                          SCS Printer. . . . . . :  On
                                          Local Format Storage . :  On



F1=Help  F2=Keys  F3=End  F4=Return
```

The Data Stream Statistics panels are as follows:

- Summary of Data Streams Optimized

  Using option 1, you can display data stream statistics by LU, Applid, or terminal type.

- Data Streams Optimized by LU/Applid

  Using option 2, you can display data stream statistics for all Applids, CRTs, and printers.

- Data Streams Excluded by Installation

  Using option 3, you can display statistics for all data streams that were excluded by your installation from optimization.

- Data Streams Excluded by Optimizer

  Using option 4, you can display statistics for all data streams that were excluded by the Optimizer from optimization.

- Local Format Storage Summary

  Using option 5, you can display the Local Format Storage optimization statistics for your IBM 3174 controllers.

The statistics are reset when the Optimizer is shut down and when the user specifies a time.

Displaying the Summary of Data Streams Optimized Panel

To display the Summary of Data Streams Optimized panel, perform the following steps:

Step 1 Type **2** on the ULTRAOPT Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **1** on the Data Stream Statistics Menu.

Step 4 Press **Enter**.

The Summary of Data Streams Optimized panel is displayed (Figure 6-2).

Figure 6-2 Summary of Data Streams Optimized Panel

```
(2.1.0)                          ULTRAOPT                  February 09, 2001
Option. . ______       Summary of Data Streams Optimized             14:50:13
                                SYSID:SYSP
Choose the Action A=Add, D=Delete or E=Edit to modify table entries.
               Action  Single    Table
 LU . . . . . .   _    ________ ________
 Applid . . . .   _    ________ ________
By:      Terminal Type   _       C=CRT    P=Printer  S=SCS   N=SNA


-------------------------------------------------------------------------------
          Data Streams    Bytes Before     Bytes After   Bytes Reduced  Percent
In  Total      239,628      29,519,734      29,509,442          10,292     0.1%
      Avg                         123             123               0
Out Total      296,399     260,119,860     165,612,375      94,507,485    36.4%
      Avg                         877             558             319
All Total      536,027     289,639,594     195,121,817      94,517,777    32.7%
      Avg                         540             364             176
-------------------------------------------------------------------------------
Data Stream:         Before     After   Reduced    Percent    Applid   LU
  Last                   19        17         2      10.5%    TSO3126  SYSP0002
  Largest Reduced     4,618         3     4,615      99.9%    TSO3311  C5E5
        % Reduced     2,253         2     2,251      99.9%    TSO3339  L3A8X1
```

The statistics on this panel are displayed for data streams that were optimized since the statistics were last reset. The statistics that are shown on the Summary of Data Streams Optimized panel are reset when the Optimizer is shut down and when the user specifies a time. You can reset these statistics by using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

Data Stream statistics can be retained by turning off the startup parameter RSCBE as described in the *ULTRAOPT Customization Guide*.

Step 5 Press **Enter** to update the summary of statistics with any data streams that were optimized since the last time you pressed **Enter**.

None of the selections that you make are retained by the Monitor after you end the current Monitor session.

Table 6-1 describes the data stream options and information that is displayed on the Summary of Data Streams Optimized panel.

Table 6-1 Summary of Data Streams Optimized Panel Fields (Part 1 of 3)

Field	Description
Action	Lets you specify an action to perform on a table (list of LUs or Applids). Valid actions are • **A** to add a single or generic LU or Applid to a table • **D** to delete a single or generic LU or Applid from a table • **E** to edit a table
LU or Applid – Single	Name of a single or generic LU or Applid
LU or Applid – Table	Name of a table (list of LUs or Applids)
Terminal Type	Lets you display a subset of the summary statistics by terminal type. Valid types are • blank for all terminal types • **C** for all CRTs • **P** for all printers • **S** for all SCS printers • **N** for all SNA Data Compression devices
Data Streams – In Total	Total optimized inbound data streams selected for summary statistics
Data Streams – Out Total	Total optimized outbound data streams selected for summary statistics
Data Streams – All Total	Total of all optimized data streams selected for summary statistics
Bytes Before – In Total	Lengths of all inbound data streams before optimization
Bytes Before – Total – Avg	Average length of all inbound data streams before optimization
Bytes Before – Out Total	Lengths of all outbound data streams before optimization
Bytes Before – Total – Avg	Average length of all outbound data streams before optimization
Bytes Before – All Total	Lengths of all inbound and outbound data streams before optimization
Bytes Before – All Total – Avg	Average length of all inbound and outbound data streams before optimization
Bytes After – In Total	Lengths of all inbound data streams after optimization
Bytes After – In Total – Avg	Average length of all inbound data streams after optimization
Bytes After – Out Total	Lengths of all outbound data streams after optimization
Bytes After – Out Total – Avg	Average length of all outbound data streams after optimization
Bytes After – All Total	Lengths of all inbound and outbound data streams after optimization

Table 6-1 Summary of Data Streams Optimized Panel Fields (Part 2 of 3)

Field	Description
Bytes After – All Total – Avg	Average length of all inbound and outbound data streams after optimization
Bytes Reduced – In Total	Total bytes by which all optimized inbound data streams were reduced
Bytes Reduced – In Total – Avg	Average bytes by which all optimized inbound data streams were reduced
Bytes Reduced – Out Total	Total bytes by which all optimized outbound data streams were reduced
Bytes Reduced – Out Total – Avg	Average bytes by which all optimized outbound data streams were reduced
Bytes Reduced – All Total	Total bytes by which all optimized data streams were reduced
Bytes Reduced – All Total – Avg	Average bytes by which all optimized data streams were reduced
Percent – In Total	Percentage of reduction in all optimized inbound data streams
Percent – Total	Percentage of reduction in all optimized outbound data streams
Percent – Total	Percentage of reduction in all optimized inbound and outbound data streams
Data Streams: Before – Last	Length of the last data stream before optimization
Data Streams: Before – Largest Reduced	Length of the largest reduced data stream before optimization
Data Streams: Before – Largest % Reduced	Length of the largest percentage of reduced data stream before optimization
Data Streams: Before – Last	Length of the last data stream after optimization
Data Streams: Before – Largest Reduced	Length of the largest reduced data stream after optimization
Data Streams: Before – Largest % Reduced	Length of the largest percentage of reduced data stream after optimization
Data Streams: Reduced – Last	Number of bytes the last data stream was reduced in length after optimization
Data Streams: Reduced – Largest Reduced	Number of bytes the largest reduced data stream was reduced in length after optimization
Data Streams: Reduced – Largest % Reduced	Number of bytes the largest percentage of reduced data stream was reduced in length after optimization
Data Streams: Percent – Last	Percentage of reduction in the length of the last data stream optimized
Data Streams: Percent – Largest Reduced	Percentage of reduction in the length of the largest reduced data stream optimized
Data Streams: Percent – Largest % Reduced	Percentage of reduction in the length of the largest percentage of reduced data stream optimized
Data Streams: LU – Last	LU of the last data stream optimized
Data Streams: LU – Largest Reduced	LU of the largest reduced data stream optimized
Data Streams: LU – Largest % Reduced	LU of the largest percentage of reduced data stream optimized
Data Streams: Applid – Last	Applid of the last data stream optimized

Table 6-1 Summary of Data Streams Optimized Panel Fields (Part 3 of 3)

Field	Description
Data Streams: Applid – Largest Reduced	Applid of the largest reduced data stream optimized
Data Streams: Applid – Largest % Reduced	Applid of the largest percentage of reduced data stream optimized

Specifying Summary of Data Streams Optimized Statistics

Summary: In this task, you will specify how you want statistics displayed for the Summary of Data Streams Optimized panel.

To select how statistics are displayed, perform the following steps:

Step 1 Choose one of the following options:

- To use a single LU, a generic LU, or a table (list of LUs), type the name in the appropriate field. Summary statistics are displayed for the criteria you specified on the panel.
- Continue to Step 2.

Step 2 Choose one of the following options:

- To use a single Applid, a generic Applid, or a table (list of Applids), type the name in the appropriate field.
- Continue to Step 3.

Step 3 Choose one of the following options:

- To use one of the terminal types listed, type the appropriate letter in the **Terminal Type** field.
- Continue to Step 4.

Step 4 Press **Enter**.

Displaying the Data Streams Optimized by LU/Applid Panel

Summary: In this task, you will display the Data Streams Optimized by LU/Applid panel.

To display the Data Streams Optimized by LU/Applid panel, perform the following steps:

Step 1 Type **2** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **2** on the Data Stream Statistics Menu.

Step 4 Press **Enter**.

The Data Streams Optimized by LU/Applid panel is displayed (Figure 6-3).

Figure 6-3 Data Streams Optimized by LU/Applid Panel

```
(2.2.0)                          ULTRAOPT                    December 29, 2001
Option. . ______     Data Streams Optimized by LU/Applid            12:07:19
                                 SYSID:SYSA

 Select:  All Applids  _    All CRTs _    All Printers _
     Or -             Action Single    Table
          LU. . . . .  _   ________  ________              1 LUs Selected
          Applid. . .  _   ________  ________
 Type of statistics to display. . .   X Input   X Output  X Total
 ------------------------------------------------------------------------------
 LU           Data Streams   Bytes Before    Bytes After  Bytes Reduced Percent
 ABL2     In            40          1,474            204          1,270   86.2%
          Out           40         41,060         29,037         12,023   29.3%
          Tot           80         42,534         29,241         13,293   31.3%









 F1=Help  F2=Keys  F3=End  F6=Case  F7=Scroll Up  F8=Scroll Down
```

If no options are selected, the default statistics that are displayed represent statistics for all LUs (input, output, and total), except those that were reset or have no statistics.

The statistics for this panel are for data streams that are optimized since the statistics were last reset. The statistics shown on this panel are reset whenever the Optimizer is shut down and at user-specified times. You can reset these statistics by using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

Data Stream statistics can be retained by turning off the startup parameter RSCBE as described in the *ULTRAOPT Customization Guide*.

You can log these statistics to SMF records, as described in “Writing Applid Statistics to SMF” on page 6-21. If you do, these values are reset each time they are written to an SMF record.

None of the selections that you make on this panel are retained by the Monitor after you end the current Monitor session.

Table 6-2 describes the data stream options and information displayed on the Summary of Data Streams Optimized panel.

Table 6-2 Data Streams Optimized by LU/Applid Panel Fields (Part 1 of 2)

Fields	Description
All Applids	lets you display statistics for all data streams optimized for all Applids by typing a non-blank character in this field
All CRTs	lets you display statistics for all data streams optimized for all CRTs by typing a non-blank character in this field
All Printers	lets you display statistics for all data streams optimized for all printers by typing a non-blank character in this field
Action	lets you specify an action to perform on a table (list of LUs or Applids) Valid actions are • **A** to add a single or generic LU or Applid to a table • **D** to delete a single or generic LU or Applid from a table • **E** to edit a table
LU or Applid – Single	name of a single or generic LU or Applid
LU or Applid – Table	name of a table (list of LUs or Applids)
Type of statistics to display – Input	lets you display statistics for inbound data streams only
Type of statistics to display – Output	lets you display statistics for outbound data streams only
Type of statistics to display – Total	lets you display statistics for both inbound and outbound data streams
LU	LU name associated with the statistics displayed on the panel
Data Streams – In	number of inbound data streams optimized that meet your selection criteria for statistics
Data Streams – Out	number of outbound data streams optimized that meet your selection criteria for statistics

Table 6-2 Data Streams Optimized by LU/Applid Panel Fields (Part 2 of 2)

Fields	Description
Data Streams – Total	number of inbound and outbound data streams optimized that meet your selection criteria for statistics
Bytes Before – In	lengths of all inbound data streams before optimization
Bytes Before – Out	lengths of all outbound data streams before optimization
Bytes Before – Total	lengths of all inbound and outbound data streams before optimization
Bytes After – In	lengths of all inbound data streams after optimization
Bytes After – Out	lengths of all outbound data streams after optimization
Bytes After – Total	lengths of all inbound and outbound data streams after optimization
Bytes Reduced – In	number of bytes all inbound data streams were reduced in length after optimization
Bytes Reduced – Out	number of bytes all outbound data streams were reduced in length after optimization
Bytes Reduced – Total	number of bytes all inbound and outbound data streams were reduced in length after optimization
Percent In	percentage of reduction in the lengths of all inbound data streams after optimization
Percent Out	percentage of reduction in the lengths of all outbound data streams after optimization
Percent Total	percentage of reduction in the lengths of all inbound and outbound data streams after optimization

Specifying Data Streams Optimized by LU/Applid Statistics

Summary: In this task, you will specify how you want statistics displayed for the Data Streams Optimized by LU/Applid panel.

To select how statistics are displayed, perform the following steps:

Step 1 Choose one of the following options:

- To select one of the following fields, type a non-blank character in the appropriate field.

  Data Streams Optimized by LU/Applid statistics are displayed for the criteria that you specified on the panel.

  — All Applids
  — All CRTs
  — All Printers

- Continue to Step 2.

Step 2 Choose one of the following options:

- To use a single Applid, a generic Applid, or a table (list of Applids), type the name in the appropriate field.

- Continue to Step 3.

Step 3 Choose one of the following options:

- To select the **Input**, **Output**, or **Total** fields, type a non-blank character in the appropriate field.

- Continue to Step 4.

Step 4 Press **Enter**.

When data streams optimized by LU are displayed, LFS LUs are highlighted.

Displaying the Data Streams Excluded by Installation Panel

Summary: In this task, you will display the Data Streams Excluded by Installation panel.

To display the Data Streams Excluded By Installation panel, perform the following steps:

Step 1 Type **2** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **3** on the Data Stream Statistics Menu.

Step 4 Press **Enter**.

The Data Streams Excluded by Installation panel is displayed (Figure 6-4).

Figure 6-4 Data Streams Excluded by Installation Panel

```
(2.3.0)                          ULTRAOPT                  February 09, 2001
Option. . ______     Data Streams Excluded by Installation          14:52:37
                                 SYSID:SYSP
                                        Last        Last
                                        LU        Applid    Miscellaneous
Global Exclude - Applid . :          0
       - LU . . . . . . . :          5    L300E1
Global Include - Applid . :          0
       - LU . . . . . . . :          0
Input Suppression Off . . :          0

Short of Storage. . . . . :          0

User Exits. . . . . . . . :          0

SCS Printer Off . . . . . :          0
SNA Data Compression Off. :          0

Total . . . . . . . . . . :          5
Totals for all Data Streams:
  Revd:     599,389       Excl:      63,362       Optd:     536,027

F1=Help  F2=Keys  F3=End  F4=Return
```

The statistics that are displayed on this panel are reset when the Optimizer component is shut down and at user-specified times. You can reset statistics by using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

Table 6-3 describes the data stream information that is displayed on the Data Streams Excluded by Installation panel.

Table 6-3 Data Streams Excluded by Installation Panel Fields (Part 1 of 2)

Field	Description
Global Exclude – Applid	number of data streams excluded from optimization because you excluded a single Applid or a list of Applids using Option 1.1
Global Exclude – LU	number of data streams excluded from optimization because you used Option 1.1 to exclude • a single LU or a list of LUs (table) • all CRTs • all printers
Global Include – Applid	number of data streams excluded from optimization because you used Option 1.1 to include only • a single Applid • a list of Applids (table)
Global Include – LU	number of data streams excluded from optimization because you used Option 1.1 to include only • a single LU • a list of LUs (table)
Input Suppression Off	number of data streams excluded from optimization because you used Option 1.2 to exclude • a single Applid or a list of Applids (table) • a single LU or a list of LUs (table) • all LUs or Applids
Short of Storage	number of data streams excluded from optimization because not enough storage was available to the Optimizer
User Exits	number of data streams excluded from optimization, using the Outbound Before Optimization user exit interface program
SCS Printer Off	number of data streams excluded from optimization because you used Option 1.3.1 to exclude • a single Applid or a list of Applids (table) • a single LU or a list of LUs (table) • all SCS printers
SNA Data Compression Off	number of data streams excluded from optimization because you used Option 1.3.4 to exclude • a single Applid or a list of Applids (table) • a single LU or a list of LUs (table) • all data streams
Last LU	LU of the last data stream excluded from optimization
Last Applid	Applid of the last data stream excluded from optimization
Miscellaneous	other information about the category of data stream excluded from optimization is displayed; for example, the low order byte of the return code from an active user exit

Table 6-3 Data Streams Excluded by Installation Panel Fields (Part 2 of 2)

Field	Description
Total	total number of data streams excluded from optimization by your facility
Total for All Data Streams Reviewed	total number of data streams reviewed by the Optimizer, including those that were optimized and those that were excluded from optimization
Total for All Data Streams Excluded	total number of data streams excluded from optimization, including those excluded by your facility and by the Optimizer
Total for All Data Streams Optimized	total number of data streams optimized

Displaying the Data Streams Excluded by Optimizer Panel

Summary: In this task, you will display the Data Streams Excluded by Optimizer panel.

To display the Data Streams Excluded By Optimizer panel, perform the following steps:

Step 1 Type **2** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **4** on the Data Stream Statistics menu.

Step 4 Press **Enter**.

The Data Streams Excluded by Optimizer panel is displayed (Figure 6-5).

Figure 6-5 Data Streams Excluded by Optimizer Panel

```
(2.4.0)                          ULTRAOPT                 December 29, 2001
Option. . ______      Data Streams Excluded by Optimizer            12:10:35
                                 SYSID:SYSP
                                         Last      Last
                                         LU        Applid    Miscellaneous
Unsupported Device Type . :          0
Error in Data Stream. . . :         13    L3AEK2    TSO3274   Error Code =A05

Other . . . . . . . . . . :     15,029    DESL7017  NODMSCP   Reason Code = C

Total . . . . . . . . . . :     15,042









Totals for all Data Streams:
  Reviewed: 1,314,858     Excluded:    28,581     Optimized: 1,286,277
F1=Help  F2=Keys  F3=End  F4=Return
```

The statistics shown on this panel are reset whenever the Optimizer is shut down and at user-specified times. You can reset statistics using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

Table 6-4 describes the data stream information displayed on the Data Streams Excluded by Optimizer panel.

Table 6-4 Data Streams Excluded by Optimizer Panel Fields

Field	Description
Unsupported Device Type	Number of data streams excluded from optimization because they were sent to a terminal that is defined to VTAM as other than a • 3270 terminal • 3600/4700 device • 3790 user program
Error in Data Stream	Number of data streams excluded from optimization for • application outbound data stream errors (Last Applid) • hardware inbound data stream errors (Last LU) The possible error codes are shown in Table 7-2 on page 7-6.
Other	Number of data streams excluded from optimization for other reasons. The last LU and Applid excluded are listed along with the reason code: **A** - The last data stream was not optimized because the Optimizer is quiescing. **B** - The last data stream was not optimized because the data stream was in Explicit Partition State and only Conventional optimization was being used. Only the Imaging technology has the ability to optimize partitioned data streams. **C** - The last data stream was not optimized because the data stream was identified as a PC File Transfer. **E** - The last inbound data stream was not optimized because the corresponding outbound data stream was excluded from optimization. **G** - The last data stream was not optimized because not enough storage is available in ECSA for the Optimizer. **H** - The data stream was excluded from optimization because only the ULTRAOPT Monitoring support is active. **S** - The last outbound data stream for a CRT was not optimized because the default screen size is zero.
Total	Total number of data streams excluded from optimization by the Optimizer
Totals for All Data Streams: Reviewed	Total number of data streams reviewed by the Optimizer, including those that were optimized and those that were excluded from optimization
Totals for All Data Streams: Excluded	Total number of data streams excluded from optimization, including those excluded by your data center and by the Optimizer
Totals for All Data Streams: Optimized	Total number of data streams optimized

Displaying the Local Format Storage Summary Panel

Summary: In this task, you will display the Local Format Storage panel.

To display the Local Format Storage panel, perform the following steps:

Step 1 Type **2** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **5** on the Data Stream Statistics menu.

Step 4 Press **Enter**.

The Local Format Storage Summary panel is displayed (Figure 6-6).

Figure 6-6 Local Format Storage Summary Panel

```
(2.5.0)                          ULTRAOPT                 December 29, 2001
Option. . ______          Local Format Storage Summary              12:10:55
                                 SYSID:SYSP

Select all controllers. . . _
Or choose the Action to either, A=ADD or D=Delete an entry in a table.
Use the Action E=Edit to edit the table entry(s)
               Action   Single   Table
 Controller. . .   _     ________  ________              Selected:           5
--------------------------------------------------------------------------------
              Multi-Host   ----   Storage  ----     --  Formats --   Terminals
Controller      Support    Available    Used       Loaded  Purged   Using LFS
DESL7001          No          65,536     10,904        19       0        1
DESL8001          No          65,536        324         1       0        7
DESLB001          No          65,536      1,424         1       0        4
DESL3001          No          65,536        228         0       0        0
DESL4001          No          65,536        228         0       0        1




F1=Help  F2=Keys  F3=End  F7=Scroll Up  F8=Scroll Down  F10=Table List
```

If no options are selected, the default statistics displayed represent statistics for all controllers. The statistics shown on this panel are reset whenever the Optimizer is shut down and at user-specified times. You can reset statistics using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

All selections are retained by the Monitor after the Optimizer is shut down *only* if the SOPOPT options file exists and its name is in the File Definition Table, as described in the *ULTRAOPT Customization Guide*. The Monitor updates this file when any fields on this panel are changed.

Table 6-5 describes the options and information displayed on the Local Format Storage Summary panel.

Table 6-5 Local Format Storage Summary Panel Fields

Field	Description
Select all controllers	lets you display statistics for all controllers
Action	lets you specify an action to perform on a table (list of controllers): • **A** to add a single (or generic) controller to a table • **D** to delete a single (or generic) controller from a table • **E** to edit a table
Selected	number of controllers that meet the selection criteria you specified
Controller	LOCADDR=1 LU name of the controller associated with the statistics displayed on the panel
Multi-Host Support	indicates whether the controller provides multi-host support
Storage Available	amount of storage, in KB, available for Local Format Storage
Storage Used	amount of storage, in KB, used for Local Format Storage
Formats Loaded	number of unique formats loaded into the controller during the current session with ULTRAOPT If LFSLRU is not used, ULTRAOPT cannot remove an old version of a format as it reloads a newly refined version of the same format. The previous copies of a format are not reflected in the number loaded, but their storage is reflected in the storage used (above). To avoid accumulating previous copies of formats, use LFSLRU. If you cannot use LFSLRU, then the DEFER= startup parameter will reduce the accumulation of old formats.
Formats Purged	number of single formats that have been purged from controller storage if LFSLRU is used If LFSLRU is not used, it is the number of times the entire controller storage has been reset. After three resets, controller storage cannot be reset again, and existing loaded formats remain loaded.
Terminals Using LFS	Number of terminals using Local Format Storage. If a terminal logs on to an application that is in the same host as ULTRAOPT and ULTRAOPT is in session with the controller, the **Terminals Using LFS** field increases by one.

Specifying Local Format Storage Summary Statistics

Summary: In this task, you will specify how you want statistics displayed for the Local Format Storage Summary panel.

To specify how you want statistics displayed for the Local Format Storage Summary panel, perform the following steps:

Step 1 Choose one of the following options:

- To select all controllers, type a non-blank character in the appropriate field.
- Continue to Step 2.

  Local Format Storage Summary statistics are displayed for the criteria that you specified on the panel.

Step 2 Choose one of the following options:

- To use a single controller, a generic controller name, or a table (list of controllers), type the name in the appropriate field.
- Continue to Step 3.

Step 3 Press **Enter**.

Writing Applid Statistics to SMF

Summary: In this task, you will write Applid statistics to SMF.

Note: SMF records are taken from Monitor component statistics Data Streams Optimized by LU/Applid panel (2.2.0), which is then reset. You should not be logging SMF records while printing or resetting statistics. If you are, statistics are being reset by both functions; neither the Data Streams Optimized by LU/Applid panel statistics nor the SMF records will accurately reflect the activity on your system. To write accurate SMF records, disable any Print/Reset function on the Print/Reset Statistics panel.

In addition to using the statistics panels, ULTRAOPT can generate SMF records for application statistics. You can use the ULTRAOPT SMF records to keep historical log of data stream optimization for each application (Applid). To write these SMF records, perform the following steps:

Step 1 Use the SMFINT and SMFREC startup parameters, as described in the *ULTRAOPT Customization Guide*.

Step 2 Ensure that the SMF record type is specified in the SMF parameter SYS1.PARMLIB(SMFPRM*xx*), as described in the IBM *System Management Facilities* document. Records begin to accumulate as soon as ULTRAOPT starts.

Step 3 To format the records that you collected, edit and run the sample job that was provided by BMC Software. This job is in *hilevel*.BBSAMP(SMF251). *hilevel* is the high-level qualifier that you specified when you unloaded the tape.

The formatted output provides the following information within each record:

- SMF record type number
- time that the information was recorded
- SMF system ID
- product name (ULTRAOPT/CICS or ULTRAOPT/IMS)
- Applid name
- ACB name
- total number of inbound data streams for this Applid for this interval
- number of bytes in inbound data streams before optimization
- number of bytes in inbound data streams after optimization
- total number of outbound data streams for this Applid for this interval
- number of bytes in outbound data streams before optimization
- number of bytes in outbound data streams after optimization

Each number represents the totals for the interval only; the numbers are not cumulative.

Chapter 7 Data Stream Analysis

This chapter describes how to perform data stream traces. The traces let you examine the flow of data between a logical unit (LU) and an application before and after optimization.

This chapter contains the following sections:

Overview

Data stream analysis includes keeping track of the number and type of data stream errors and performing traces. The traces let you examine the flow of data between an LU and an application before and after optimization.

The Monitor component Data Stream Analysis Menu is used to access the data stream analysis panels.

The Data Stream Analysis panel options are as follows:

- Application Outbound Data Stream Errors
- Hardware Inbound Data Stream Errors
- Wraparound Data Stream Trace

Using the Monitor component's Data Stream Analysis options 1 and 2, you can determine the frequency and types of errors for the following data streams:

- application outbound
- hardware inbound

You can capture and examine your VTAM data streams by using option 4.

Accessing the Data Stream Analysis Menu

Summary: In this task, you will access the Data Stream Analysis Menu.

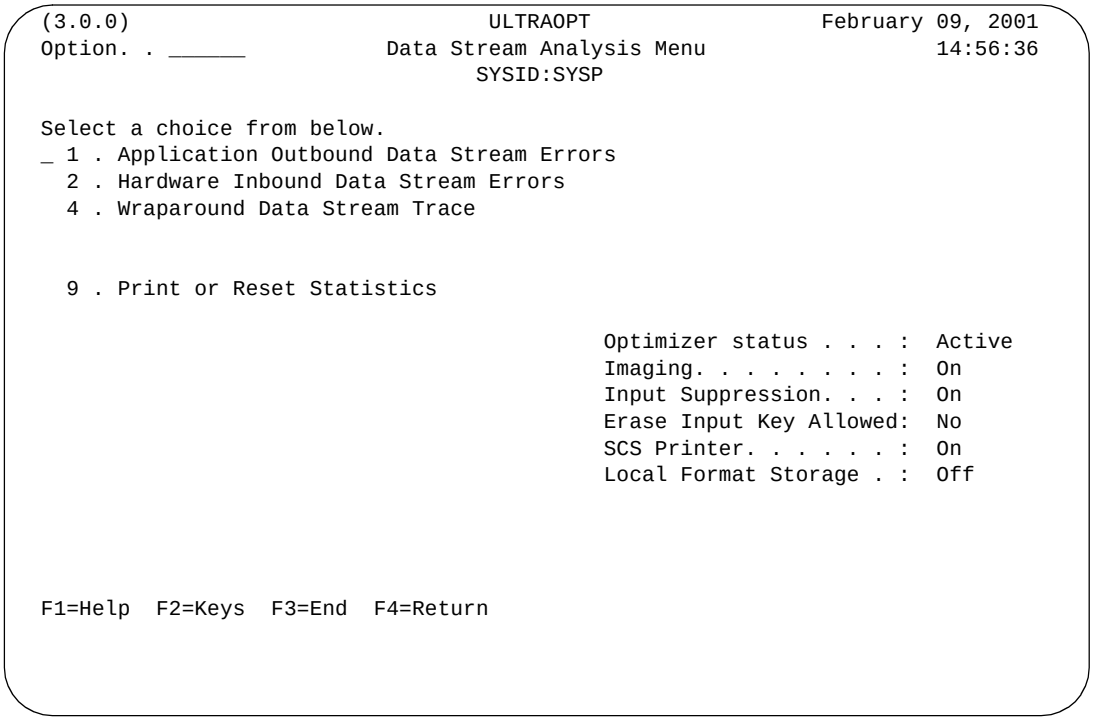
To access the Data Stream Analysis Menu, perform the following steps:

Step 1 Type **3** on the Primary Menu.

Step 2 Press **Enter**.

The Data Stream Analysis Menu (Figure 7-1) is displayed.

Figure 7-1 Data Stream Analysis Menu



Displaying the Application Outbound Data Stream Errors Panel

Summary: In this task, you will display the Application Outbound Data Stream Errors panel.

To display the Application Outbound Data Stream Errors panel, perform the following steps:

Step 1 Type **3** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **1** on the Data Stream Analysis Menu.

Step 4 Press **Enter**.

The Application Outbound Data Stream Errors panel is displayed. Figure 7-2 shows a typical example of the information provided by the Optimizer component for any data stream errors it finds in your VTAM data streams. Table 7-2 on page 7-6 describes all possible error codes.

For more information about outbound data stream errors, see the *IBM 3270 Information Display System Data Stream Programmer's Reference*.

Figure 7-2 Application Outbound Data Stream Errors Panel

```
(3.1.0)                          ULTRAOPT                  December 29, 2001
Option. . ______    Application Outbound Data Stream Errors          12:08:10
                                 SYSID:SYSP

------Error------       -------------Data Stream Error Information-------------
Code  Description       Frequency LU       Applid   SF PI  PS  Dspl OR/COM TV/A
A05   Invalid data stream order
                               10 L3AEK2   TSO3274  40 00 0780 01A3 10     018C
A06   Invalid address
                                3 AUS10040 TSO3146  40 00 0780 0002 11 SBA 0CE3









Total Outbound Errors . . . . . :        13
Total Errors. . . . . . . . . . :        13
F1=Help  F2=Keys  F3=End  F4=Return
```

The statistics that are displayed on the Outbound Data Stream Errors panel are reset when the Optimizer component is shut down and at user-specified times. You can reset statistics by using Option 9, as described in Chapter 11, “Printing or Resetting of Statistics.”

Table 7-1 describes the data stream error information that is displayed on the Application Outbound Data Stream Errors panel and the Hardware Inbound Data Stream Errors panel.

Table 7-1 Data Stream Error Information Fields

Field	Description
Code	error code for each error detected (Table 7-2 on page 7-6 lists all possible Application Outbound data stream error codes)
Description	description of the error code in the previous column
Frequency	number of data streams in which the Optimizer has detected the error
LU	VTAM logical unit identification
Applid	VTAM application identification
SF	structured field code (for a list of valid structured field codes, see the Glossary)
PI	partition ID or the Local Character Set Identifier (LCID) for programmed symbols
PS	buffer size or partition size, depending on the state of the device (for programmed symbols, this field contains the structured field length)
Dspl	displacement of the error in the data stream or the buffer address (for codes A17 through A20)
OR/COM	3270 order or command code depending on the error type For programmed symbols, this field contains the flag byte with the data format type. For a list of valid command codes and 3270 orders, see the Glossary.
TV/A	Type-Value pair or 3270 address, depending on the error type For programmed symbols, this field contains other information relevant to the error code.
Total Outbound Errors	total number of application outbound data stream errors found by the Optimizer
Total Errors	total number of errors that are found by the Optimizer

Table 7-2 describes all possible application outbound data stream error codes. The Monitor component displays only errors that are found by the Optimizer component. If the Optimizer component determines that a data stream contains an error, the data stream is excluded from optimization.

Table 7-2 Application Outbound Data Stream Error Codes (Part 1 of 2)

Error Code	Description
A01	Truncated parameter list—An outbound data stream ended with an incomplete 3270 order. This message might be issued incorrectly if you are not using chain accumulation and the rest of the order is in another chain.
A02	Unknown character set attribute—A Set Attribute (SA), Start Field Extended (SFE), or Modify Field (MF) order contains an unknown Local Character Set Identifier (LCID). The LCID should have been loaded by a previous Load Programmed Symbol (LPS) structured field. A02 is usually an application program error. If the data stream containing the LPS was excluded from optimization, the Optimizer may have detected this error incorrectly.
A03	Partition ID unknown or invalid—The partition ID specified in the structured field was either unknown or invalid for the device. A03 is usually an application program error. If the data stream containing the Create Partition (CP) was excluded from optimization, the Optimizer may have detected this error incorrectly.
A04	Invalid structured field—An unknown or invalid structured field was detected
A05	Invalid data stream order—An invalid 3270 data stream order was detected. If this was an SCS printer data stream, an invalid set function, Maximum Print Position (MPP), or left and right margins were specified. For a list of valid 3270 orders, see the Glossary. If an invalid SCS data stream is detected, all subsequent SCS data streams sent to the associated SCS printer will not be optimized.
A06	Invalid address—An invalid buffer address was detected in an Erase All Unprotected (EAU), Repeat-to-Address (RA), or Set Buffer Address (SBA) order. One of the following conditions was found: • The address is unknown. • The address is larger than the current device buffer size. • The addressing mode was not synchronized with the data stream (12-, 14-, or 16-bit addressing mode). The addressing mode is set in the CP structured field.
A07	Invalid attribute type—An invalid attribute type was detected in an MF, SA, or SFE order. Valid attribute types are as follows: • 3270 Field Attributes • Extended Highlighting • Extended Color • Character Set • Field Outlining • Background Transparency • Field Validation
A08	Invalid attribute value—An invalid attribute value was found for an attribute type other than Character Set in an MF, SA, or SFE order.
A09	Invalid character set—An invalid LCID was found in the attribute value field of an attribute type Character Set (programmed symbols) in an MF, SA, or SFE order. This value must be X'00' or X'40' to X'F7'.
A10	Invalid graphic escape character—An invalid Graphic Escape (GE) order was detected. Valid values are X'40' to X'FE'.

Table 7-2 Application Outbound Data Stream Error Codes (Part 2 of 2)

Error Code	Description
A11	Invalid command code—An invalid Command Code in a 3270 outbound data stream was detected. For a list of valid command codes, see the Glossary.
A12	Invalid repeat character—An invalid repeat character was specified for an RA order. The valid repeat characters are X'00' and, X'40' to X'FE'.
A13	Invalid LCID in a Load Programmed Symbols structured field—An invalid LCID was detected in an LPS structured field. Valid values for the LCID are X'40' to X'EF'.
A14	Invalid RWS in a Load Programmed Symbols structured field—An invalid Read/Write Store (RWS) was detected in an LPS structured field. Valid values for the RWS are X'02' to X'0B'.
A15	Invalid reply mode in a Set Reply Mode structured field— An invalid Reply Mode (RM) was detected in the Set Reply Mode (SRM) structured field. Valid Reply Modes are • Field • Extended Field • Character
A16	Target of a modify field is not an attribute—The target of an MF order must be an attribute byte. In this case, the target was not an attribute byte.
A17	Invalid character set in DBCS field—Character set character attributes were detected in a double-byte character set (DBCS) field. The character set character attributes were set by an SA order.
A18	Invalid Shift Out/Shift In pairing—An invalid or incomplete Shift Out/Shift In (SO/SI) pair was detected. SO/SI orders must appear as pairs in the terminal buffer.
A19	Invalid DBCS character—An invalid DBCS character was detected. Valid DBCS characters are X'4040' to X'FEFE'.
A20	Invalid DBCS field—A DBCS field was detected that has an odd number of bytes, and the next byte is not an attribute. A20 is usually found with an SA order.
A21	Invalid structured field length—A structured field was present in the outbound data stream that was longer than the remaining length of the data stream.
A22	Load Programmed Symbols beginning code point invalid—The beginning code point of an LPS must be in the range X'41' to X'FE'.
A23	Load Programmed Symbols data exceeds RWS limit—The programmed symbol (PS) data that started at the specified beginning code point in the PS set RWS has overflowed. It exceeds the maximum code point allowed for that RWS.

Displaying the Hardware Inbound Data Stream Errors Panel

Summary: In this task, you will display the Hardware Inbound Data Stream Errors panel.

Before You Begin

The Hardware Inbound Data Stream Errors panel shows information about any hardware inbound data stream errors that are found by the Optimizer. These errors can be caused by the following items:

- incorrect microcode in the device controller
- incorrect 3270 emulation
- Applids acting as secondary LUs that generate incorrect data streams or incorrect scripts that are used in such an Applid

To Display the Hardware Inbound Data Stream Errors Panel

Step 1 Type **3** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **2** on the Data Stream Analysis Menu.

Step 4 Press **Enter**.

The Hardware Inbound Data Stream Errors panel is displayed. Figure 7-3 shows a typical example of the information provided by the Optimizer for any data stream errors it finds in your VTAM data streams. Table 7-3 on page 7-10 describes all possible error codes.

For more information about inbound data stream errors, see the *IBM 3270 Information Display System Data Stream Programmer's Reference*.

Figure 7-3 Hardware Inbound Data Stream Errors Panel

```
 (3.2.0)                          ULTRAOPT                    December 29, 2001
Option. . ______       Hardware Inbound Data Stream Errors              12:08:44
                                   SYSID:SYSP

------Error------       -------------Data Stream Error Information ------------
Code  Description       Frequency LU       Applid   SF PI  PS  Dspl OR/COM TV/A
H13   Data stream field longer than image field
                                1 DEN20099 TSO3022  80 00 0053 0476 11 SBA D7F8









Total Inbound Errors. . . . :         1
Total Errors. . . . . . . . :        14
F1=Help  F2=Keys  F3=End  F4=Return
```

The statistics that are shown on the Hardware Inbound Data Stream Errors panel are reset to zero when the Optimizer component is shut down and at user-specified times. You can reset statistics by using Option 9, as described in Chapter 11, "Printing or Resetting of Statistics."

Table 7-1 on page 7-5 describes the data stream error information that is displayed on the Application Outbound Data Stream Errors panel and the Hardware Inbound Data Stream Errors panel.

Table 7-3 describes all possible hardware inbound data stream error codes. If the Optimizer component determines that a data stream contains an error, the data stream is not optimized.

Table 7-3 Hardware Inbound Data Stream Error Codes (Part 1 of 2)

Error Code	Description
H01	Truncated parameter list—An inbound data stream ended with an incomplete 3270 order
H02	Unknown character set attribute— An SA, SFE, or MF order contains an unknown LCID. The LCID should have been loaded by a previous LPS structured field. H02 is usually a hardware error. If the data stream containing the LPS was excluded from optimization, the Optimizer may have detected this error incorrectly.
H03	Partition ID unknown or invalid—The partition ID specified in the structured field was either unknown or invalid for the device. H03 is usually a hardware error. If the data stream containing the CP was excluded from optimization, the Optimizer may have detected this error incorrectly.
H04	Invalid structured field—An unknown or invalid structured field was detected.
H05	Invalid data stream order—An invalid 3270 data stream order was detected. For example, an SBA occurs in an unformatted read-modified or READDB data stream. A protected non-light-pen-detectable field is modified by a terminal operator. For a list of valid 3270 orders, see the Glossary.
H06	Invalid address—An invalid buffer address was detected in an EAU, RA, or SBA order. One of the following conditions was found: • The address is unknown. • The address is larger than the current device buffer size. • The addressing mode was not in sync with the data stream (12-, 14-, or 16-bit addressing mode). The addressing mode is set in the CP structured field. • An SBA order's non-zero address was not greater than the previous SBA order's address. • An SBA order does not correspond to a field on the panel.
H07	Invalid attribute type—An invalid attribute type was detected in an MF, SA, or SFE order. Valid attribute types are as follows: • 3270 Field Attributes • Extended Highlighting • Extended Color • Character Set • Field Outlining • Background Transparency • Field Validation
H08	Invalid attribute value—An invalid attribute value was found for an attribute type other than Character Set in an MF, SA, or SFE order.
H09	Invalid character set—An invalid LCID was found in the attribute value field of an attribute type Character Set (programmed symbols) in an MF, SA, or SFE order. This value must be X'00' or X'40' to X'F7'.
H10	Invalid graphic escape character—An invalid Graphic Escape (GE) order was detected. Valid values are X'40' to X'FE'.
H11	Invalid command code—An invalid command code in a 3270 inbound data stream was detected. For a list of valid command codes, see the Glossary.

Table 7-3 Hardware Inbound Data Stream Error Codes (Part 2 of 2)

Error Code	Description
H12	Data stream SBA out of sequence—An SBA was encountered in the inbound data stream whose address was less than the address of the preceding SBA. This error is not valid for inbound data streams unless the address is zero (X'4040').
H13	Data stream field longer than image field—A field was present in the inbound data stream that was longer than the field that was last sent to the screen at that location.
H14	Data stream contains both SF and SBA—An inbound data stream contains SF *and* SBA orders. This error is not valid for inbound data streams.
H15	SBA found but not at start of data—An SBA at the beginning of the inbound data stream indicates a formatted RM data stream. If no SBA is present at the beginning of the data stream, the data stream is unformatted and cannot contain other SBA orders.
H16	Unmodifiable field in Read Modified—A field that is protected and not pre-modified or Select Pen Detectable was found in the inbound data stream. This error cannot occur with a valid 3270 device.
H17	Structured field longer than data stream—A structured field length is larger than the remaining length of the data stream.
H18	Incomplete Read Buffer—An RB data stream was too short (not all data was read from the buffer) or too long (more data was read than the buffer could contain).
H19	Data stream protected field differs from image field—An inbound field that is protected was changed since the data was last sent to the screen. This error is not possible with a valid 3270 device.
H20	Data stream protected field shorter than image field—A field was found in the inbound data stream that is shorter than the field last sent to the device. This error is not valid if the field is protected.
H21	Query reply descriptor length invalid—The Descriptor Length in the Character Sets or Graphic Symbol Sets query reply was zero.

Displaying the Wraparound Data Stream Trace Panel

Summary: In this task, you will display the Wraparound Data Stream Trace panel.

Before You Begin

A wraparound trace continues capturing data streams by wrapping around to the top of the storage you have allocated. This trace lets you continue capturing data streams until your target data stream is captured.

To capture a large number of data streams or to leave the trace active for a long period of time to capture an error, use a wraparound trace.

To Display the Wraparound Data Stream Trace Panel

Step 1 Type **3** on the Monitor Primary Menu.

Step 2 Press **Enter**.

Step 3 Type **4** on the Data Stream Analysis Menu.

Step 4 Press **Enter**.

The Wraparound Data Stream Trace panel (Figure 7-4) is displayed.

Figure 7-4 Wraparound Data Stream Trace Panel

```
(3.4.0)                          ULTRAOPT                    February 09, 2001
Option. . ______          Wraparound Data Stream Trace                  14:59:32
                                SYSID:SYSP

Trace action. . . . . . . . . . . . . _    1. Start  Status. . :  Inactive
                                           *. Stop
                                           *. List
                                           *. Delete
                                           5. Start diagnostic trace
 Trace buffer allocation size . . . .  3000 K
 LU . . . . . . . . . . . . . . . . .  ________
 Applid.Tran|Lu . . . . . . . . . . .  ________ . _________
 Data Stream Error Code . . . . . . .  ___
 Stop when data stream error code . .  ___   or At Buffer Wrap  _ Y=Yes
```

From the Wraparound Data Stream Trace panel, you can perform the following actions:

- start a trace
- stop a trace
- display a condensed list of traced data streams
- print the captured information
- delete a wraparound data stream trace
- start a diagnostic trace for BMC Software Product Support

Even data streams that were not optimized can be captured for analysis. Table 7-5 shows a sample of a wraparound data stream trace.

Note: If you created a SOPOPT options file, as described in the *ULTRAOPT Customization Guide*, all entries (except the **Trace header** field) that are made on this panel are retained by the Monitor component when the Optimizer component is shut down.

Figure 7-5 Sample Wraparound Data Stream Trace

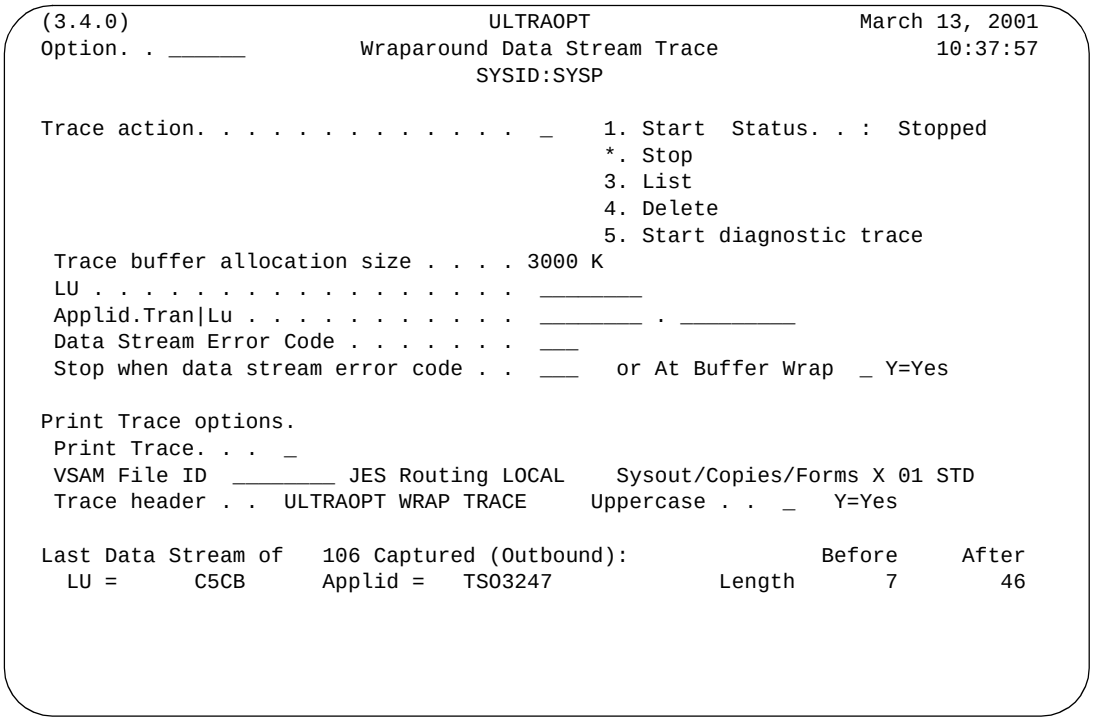


Table 7-4 describes the fields that are on the Wraparound Data Stream Trace panel.

Table 7-4 Wraparound Data Stream Trace Fields (Part 1 of 2)

Field	Description
Trace Action Section	
Trace action	You can choose to start, stop, list, or delete a wrap trace. Options that are not currently available have asterisks next to them. In the sample panel in Figure 7-4 on page 7-13, a trace has just stopped. Data is available to examine before you can start another trace.
Status	The trace status is retained between Optimizer shutdown and startup. The possible statuses are as follows: Inactive—The trace is not running, and there is no trace data to be examined. Only the start option is active. Started—The trace is started, and data streams are being captured. Only the Stop option is active. Stopped—The trace is stopped, and there may be trace data to examine. You change the status to inactive when you delete the trace.
Trace buffer allocation size	Type the size of the wrap trace buffer in kilobytes. This area is obtained above the 16 MB line. Use any amount from 1 through 9999, but it should be at least twice the size of your largest data stream. The default is 100 KB. The trace storage area is not released until the trace is stopped and no trace has been captured or the captured trace is deleted. If there is not enough storage area to store the trace, the trace is not started.
LU	Data streams that belong to the specified LU are traced. To create generic entries, you can use the wildcard character (*). The default is blank, which means trace data streams for all LUs.
Applid.Tran/Lu	Data streams that belong to the specified Applid, Applid.Transid, or Applid.Formatid are traced. To create generic entries, you can use the wildcard character (*). The default is blank, which means trace data streams for all Applids, Applid.Transid pairs, and Applid.Formatid pairs. If you specify an Applid without a Transid or Formatid, the default Applid.********* is assumed and all data streams for that application are traced. You cannot specify ********.Transid.
Data Stream Error Code	Only data streams that belong to the specified error code are traced. The error code can be any application outbound error code from A01 through A23 or any hardware inbound error code from H01 through H21. To create generic entries, you can use the wildcard character (*). The default is blank, which means trace data streams containing any error. The application outbound error codes are listed in Table 7-2 on page 7-6. The hardware inbound error codes are listed in Table 7-3 on page 7-10.
Stop when data stream error code	If you want the trace to stop when an error code is encountered, specify that error code here. If this field and the **At Buffer Wrap field** are both blank, the trace continues until you stop it.
at Buffer Wrap	To stop the trace when it wraps, type **Y** in this field. If this field and the **Stop when data stream error code** field are both blank, the trace continues until you stop it.

Table 7-4 Wraparound Data Stream Trace Fields (Part 2 of 2)

Field	Description
Print Section	
Print Trace	After the trace is stopped, you can print it by typing any character in this field, filling in the rest of this section, and pressing **Enter**.
VSAM File ID	To print to a VSAM file, use any VSAM DDNAME. The DDNAME must already have been specified in the File Definition Table (FDT) as described in the *ULTRAOPT Customization Guide*. The default is blank.
JES Routing	To print, use the JES Routing ID assigned to your local or remote JES printer, or use the keyword **LOCAL** for your local printer. The default is blank.
Sysout	A character that indicates your Sysout Class. The default is blank.
Copies	The number of copies you want to print (from **1** to **99**). If this field is left blank, the default value of **1** is used.
Forms	The four-character form name. If this field is left blank, your data center's default form name is used.
Trace header	You can type any 20 characters in this field. When the trace is printed, the Monitor uses these characters to create a header for the trace.
Uppercase	To print the trace in uppercase only, type **Y** (for yes).
Last Data Stream Pair	
Last Data Stream of _ Captured	As the trace runs, this number indicates how many of the requested data streams have been captured so far. You must press **Enter** again to get the latest number captured.
LU	This is the LU of the last (most recent) data stream pair traced. Press **Enter** to update this field.
Applid	This is the Applid of the most recent data stream traced. Press **Enter** to update this field.
Length	These fields show the lengths of the most recent data stream (inbound or outbound) before and after optimization. Press **Enter** to update this field.

How Wraparound Data Stream Traces Work

An outbound or inbound data stream is captured only if it matches the selection criteria you established with the trace. If no criteria are specified, all data streams are captured.

One set of environment statistics and options is captured for each inbound and outbound data stream (before and after optimization).

Trace status is retained between Optimizer shutdown and startup. If the trace was started before shutdown, it will continue tracing data streams after startup, but any data streams that are captured before shutdown are not retained.

Wildcard Entries

The Applid, LU, and Data Stream Error Code can be generic. To indicate a generic entry, use the asterisk wildcard character (*); for example, A*, CDC*, A0*, or VTAM0*.

Example 1

```
Applid=FMT1
LU=FC01
```

These entries tell the Optimizer component to capture the first output data stream with an Applid of FMT1 and an LU of FC0. The next input data stream with an LU of FC01 is captured.

Example 2

```
Applid=STAT
LU=TS11
Data Stream Error Code = *
```

These entries tell the Optimizer component to capture the first input or output data stream between an Applid of STAT and an LU of TS11 and containing any error. If an output data stream is captured, the next input data stream with an LU of TS11 is captured.

Starting a Wraparound Data Stream Trace

Summary: In this task, you will start a wraparound data stream trace.

To start a wrap trace, perform the following steps:

Step 1 Access the Wraparound Data Stream Trace panel (3.4.0).

Step 2 To restrict the trace to specific data streams, complete the fields that control which data streams are captured, as described in “Trace Action Section” in Table 7-4 on page 7-15.

Step 3 Type **1** in the **Trace Action** field.

Step 4 Press **Enter**.

This action starts a trace of the specified data streams. The **Trace** status changes to **Started** when the trace is started.

Step 5 After starting a trace, press **Enter** to display information for the most recently captured data stream.

This information is displayed at the bottom of the panel.

Starting a DIAGNOSTIC Wraparound Data Stream Trace

Summary: In this task, you will start a DIAGNOSTIC wraparound data stream trace.

Note: This trace is encrypted. Run this trace when you instructed by BMC Software Product Support, and send it in.

To start a DIAGNOSTIC wraparound data stream trace, perform the following steps:

Step 1 Access the Wraparound Data Stream Trace panel (3.4.0).

Step 2 To restrict the trace to specific data streams, complete the fields that control which data streams are captured, as described in “Trace Action Section” in Table 7-4 on page 7-15.

Step 3 Type **5** in the **Trace Action** field.

Step 4 Press **Enter**.

This action starts a trace of the specified data streams. The **Trace** status changes to **Started** when the trace is started.

Stopping a Wraparound Data Stream Trace

Summary: In this task, you will stop a wraparound data stream trace.

To stop a wraparound data stream trace, perform the following step:

To stop a wraparound trace or a DIAGNOSTIC wraparound trace from the Wraparound Data Stream Trace panel (3.4.0), choose one of the following methods:

- Before starting the trace, type an error code in the **Stop when data stream error code** field. (The trace stops only if it encounters the specified error in a captured data stream.)
- Before starting the trace, type **Y** in the **At Buffer Wrap** field. The trace stops when the buffer is full and does not wrap.
- While a trace is running, type **2** in the **Trace Action** field and press **Enter**.

Trace status changes to Stopped when the trace has stopped.

Note: If you restart a stopped trace, the trace starts writing to the buffer where the previous one left off. Because you do not have to delete or print the trace before restarting it, ensure that you do not inadvertently wrap and write over previous trace information that you still need.

Printing a Wraparound Data Stream Trace

Summary: In this task, you will print a wraparound data stream trace.

Before You Begin

Note: A diagnostic trace must be printed to the VSAM print file (SOPRINT) for shipment to BMC Software for analysis. The file contains encrypted information that only BMC Software product support representatives can process. When the trace has been printed to the VSAM print file, use the JCL in *hilevel*.BBSAMP(SOPREPRO) to copy the records to tape.

You can print the wraparound data stream trace only after the trace stops. If the trace has not been stopped, see “Stopping a Wraparound Data Stream Trace” on page 7-20.

Print the trace before shutting down the Optimizer component. If you shut down the Optimizer component before the trace is printed, the trace is deleted.

To Print a Wraparound Data Stream Trace

Step 1 Access the Wraparound Data Stream Trace panel (3.4.0).

Step 2 Type a non-blank character in the **Print Trace** field.

If you type a non-blank character in the **Print Trace** field, an entry is required in the following fields:

- **VSAM File ID**
- **JES Routing**
- **Sysout**
- **Trace Header**

Note: The **Sysout** and **Forms** fields are not edited. Verify that any entries made in these fields are correct.

Step 3 Enter the appropriate print options, as described in “Print Section” in Table 7-4 on page 7-16.

Step 4 Select uppercase character printing (**Y**) or mixed-case character printing (**N**).

Step 5 Press **Enter**.

If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name you started ULTRAOPT with, based on the print options you selected. If you specify a file, it should be the VSAM print file name that you specified during installation.

You can also print individual data streams from the trace by using the Wraparound Data Stream Trace List panel as described in “Printing a Portion of the Wraparound Data Stream Trace” on page 7-23.

The printed trace contains the following information for the outbound *and* inbound data streams:

- Wraparound Data Stream Trace panel (3.4.0)
- Environment panel (see Figure 7-8 on page 7-29)
- Options panel (see Figure 7-9 on page 7-30)
- Data Stream panel (see Figure 7-7 on page 7-27):
  - — data stream before optimization
  - — data stream after optimization (only if no errors were found and the data stream was not excluded from optimization)

Printing a Portion of the Wraparound Data Stream Trace

Summary: In this task, you will print a portion of the wraparound data stream trace.

To print a portion of the wraparound data stream trace, perform the following steps:

Step 1 Type **3** in the **Trace Action** field to display the Wraparound Data Stream Trace List panel.

Step 2 Type the appropriate print options, as described in “Print Section” in Table 7-4 on page 7-16.

Step 3 Select uppercase character printing (**Y**) or mixed-case character printing (**N**).

Step 4 Press **Enter** to display the List.

Step 5 Select a data stream by performing one of the following steps:

- Type the number of the trace that you want to print in the **Num** field and press **Enter.**
- Scroll through the list of data streams by using **F8** (or **F20**).

  The cursor is in the **Act** field of the data stream that you want to print.

Step 6 Type **P** in the **Act** field of the data stream that you selected in the Step 5.

Step 7 Press **Enter**.

If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name that was used to start ULTRAOPT, based on the print options you selected. Otherwise, the print job is stored in the VSAM file.

Listing Individual Wrap-Trace Data Streams

Summary: In this task, you will display a list of data streams that have been captured.

When a wraparound data stream trace has been started, you can display a condensed list of the data streams that have been captured.

To display a list of data streams that have been captured, perform the following steps:

Step 1 Access the Wraparound Data Stream Trace panel (3.4.0) by typing **3** in the **Trace Action** field.

Step 2 Press **Enter**.

The Wraparound Data Stream Trace (List) panel (Figure 7-6) is displayed.

Figure 7-6 Wraparound Data Stream Trace Panel (List)

```
(List)                              ULTRAOPT                  December 29, 2001
Option. . ______          Wraparound Data Stream Trace                12:15:13
                                  SYSID:SYSP

Start Trace. . . _             Status. . . : Stopped
Actions are; B=Before, A=After, E=Environment, O=Option, or P=Print

Act   Num   Dir    Before     After  LU       Applid     Time    Data
 _   01490  Out        94        86  AUSL3111 TSO3183  08:53:13  7EC111F56F1D
 _   01491  In         19        19  L3A2B1   TSO3081  08:53:13  7D4FE5114FD8
 _   01492  Out         6         6  L3AAS2   TSOP33   08:53:13  C3D3E2C4E2E3
 _   01493  In          3         3  L3A3A2   TSO3151  08:53:13  F7C15E
 _   01494  Out       874       697  L3A3A2   TSO3151  08:53:13  F1C311407F60
 _   01495  Out        57        57  L316D4   TSO3178  08:53:13  F14011C2601D
 _   01496  Out        70        70  AUSL3111 TSO3183  08:53:13  F14011C1501D
 _   01497  Out        36        36  L3AAS2   TSO3185  08:53:13  010303B19030
 _   01498  Out     2,648     1,911  AUSL4010 TSO3110  08:53:13  F1C31100A5D7
 _   01499  Out        54        54  L316D4   TSO3178  08:53:13  F14011C3F01D
 _   01500  In          7        46  L31BN3   TSO3158  08:53:13  7D4DC811C5E8
 _   01501  In          3         3  L3A3A2   TSO3151  08:53:13  F7C15E
 _   01502  In         83        83  AUSL7002 TSO3070  08:53:13  7CC16011C15E

F1=Help  F2=Keys  F3=End  F4=Return  F7=Scroll Up  F8=Scroll Down
```

For each data stream that is captured, the Wraparound Data Stream Trace (List) panel displays the following information:

- number assigned to each data stream
- data stream direction (In for inbound and Out for outbound)
- length of the *before* data stream
- length of the *after* data stream
- LU of the data stream
- Applid of the data stream
- time that the data stream was captured
- first six hexadecimal characters of the data stream

Step 3 The most recent data stream that is captured is displayed at the bottom of the list. If new data streams are captured, you can update the list by pressing **Enter**.

The data streams are numbered from 1 to 99,999. If an application or hardware error has been found in any of data stream, it is highlighted.

Note: For inbound data streams, the *After* data stream may be larger than the *Before*, which is normal when Input Suppression has occurred. Input Suppression optimized the data stream before it went out to the terminal, then restored the information during inbound processing before passing it on to the application.

For devices receiving LFS optimization there are two Out entries for the device. If you are also tracing the LFS controller/server Locaddr, there are three. The last of these entries shows bytes before and after all optimization. The other entries appear to show no optimization because the trace points occur before any optimization has occurred.

Step 4 When the list is first displayed, you are at the bottom of the list. To scroll the list, perform one of the following tasks:

- Modify the **Num** field on the first data stream line. Type the number of any data stream to which you would like to scroll in the **Num** field, and press **Enter**.

- Use **F8** (or **F20**) to scroll down through the data and **F7** (or **F19**) to scroll up through the data.

Scrolling can be performed only after the trace has been stopped. When the trace is active, the most recently captured data stream is displayed.

Wraparound Data Stream Trace List Actions

Table 7-5 describes the actions that can be typed in the **Act** field on each data stream line.

Table 7-5 Wraparound Data Stream Trace Start Options

Action	Description
B	The *before* data stream is displayed using the Wraparound Data Stream Trace Data Display panel. See Figure 7-7 on page 7-27.
A	The *after* data stream is displayed using the Wraparound Data Stream Trace Data Display panel. See Figure 7-7 on page 7-27.
E	The Wraparound Data Stream Trace Environment panel is displayed. See Figure 7-8 on page 7-29.
O	The Wraparound Data Stream Trace Options panel is displayed. See Figure 7-9 on page 7-30.
P	The data stream selected will be printed. The destination must already have been specified by using Option 3.4.

To return to the Wraparound Data Stream Trace (List) panel from any of the above panels, press **F3** (or **F15**).

To perform one of the Wraparound Data Stream Trace (List) actions on a specific data stream, perform the following steps:

Step 1 Select a data stream by performing one of the following steps:

- Scroll through the list of data streams by using **F8** (or **F20**).
- Type the number of the trace that you want to print in the **Num** field and press **Enter**.

  The cursor is placed in the **Act** field of the data stream that you selected.

Step 2 Type one of the following actions in the **Act** field of the data stream that you selected in the previous step:

- **B** (before)
- **A** (after)
- **E** (environment)
- **O** (option)
- **P** (print)

Step 3 Press **Enter** to perform the indicated action.

Wraparound Data Stream Trace (Data Display) Panel

The Wraparound Data Stream Trace (Data Display) panel (Figure 7-7) shows the inbound and outbound data streams. Each line of the Wraparound Data Stream Trace (Data Display) panel shows the following information:

- hexadecimal displacement of the line
- trace in hexadecimal
- trace line translated into character display

Note: The data stream is displayed in the same format that is sent to the device.

Figure 7-7 Wraparound Data Stream Trace (Data Display) Panel

```
(Data Display)                    ULTRAOPT                    December 29, 2001
Option. . ______          Wraparound Data Stream Trace                 12:18:39
                                  SYSID:SYSP

       Offset : 0000                 Output Before Data Stream # 01498
       Length : 0A58         Captured at 12:15:01 on  December 29, 2001
       0000    F1C31100 A5D7D6F0 F11100A9 2902C0E8    1C..vPO01..z...Y
       0010    42F7D9C4 C1C7C3E6 4BD1C3D3 4BC3D5E3    .7RDAGCW.JCL.CNT
       0020    D3403C00 DA601100 DA2902C0 E842F7D4    L ...-......Y.7M
       0030    C5D4C2C5 D940C9C5 C2C3D6D7 E840E2C1    EMBER IEBCOPY SA
       0040    E5C5C411 00EF2902 C06042F1 11013F29    VED......-.1....
       0050    02C06042 F1404040 40D5C1D4 C53C0158    ..-.1    NAME...
       0060    40E5E54B D4D44040 C3D9C5C1 E3C5C43C     VV.MM  CREATED.
       0070    016B40C3 C8C1D5C7 C5C43C01 7740E2C9    ., CHANGED... SI
       0080    E9C54040 C9D5C9E3 404040D4 D6C44040    ZE  INIT   MOD
       0090    40C9C440 40404011 01902902 C0C842F2     ID    ......H.2
       00A0    40110192 2902C060 42F1C9C5 C2C3D6D7     ..k...-.1IEBCOP
       00B0    E8401101 9B2902C0 6042F13C 01A44011    Y ......-.1..u .
       00C0    01A42902 C06042F1 404040F0 F14BF1F2    .u...-.1   01.12
       00D0    40F9F361 F1F261F1 F540F9F4 61F0F261     01/12/15 94/02/
       00E0    F0F940F0 F87AF5F3 40404040 F1F14040    09 08:53    11
       00F0    4040F1F1 3C01D640 F040D9C4 C1C7C3E6      11..O 0 RDAGCW
F1=Help  F2=Keys  F3=End  F7=Scroll Up  F8=Scroll Down
```

Displaying a Specific Displacement

To display a specific hexadecimal displacement, modify the **Offset** field. Any hexadecimal characters from 0 to F can be used. The length of the data stream is displayed for your information.

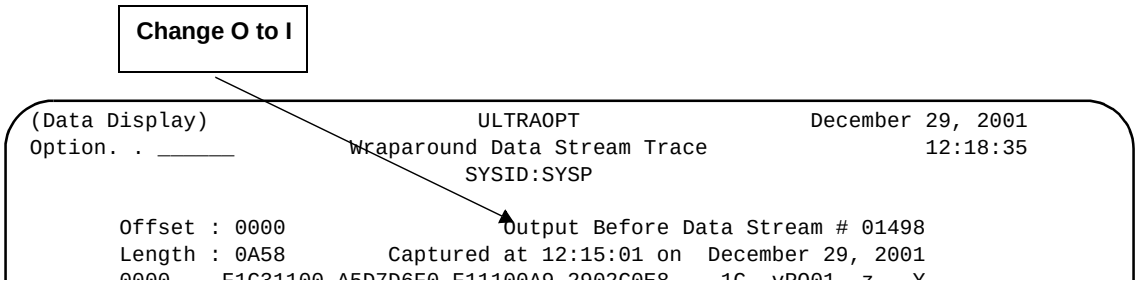
Scrolling Through the Data

You can use **F8** (or **F20**) to scroll down through the trace and **F7** (or **F19**) to scroll up through the trace. The default scroll is one screen at a time.

Displaying an Input or Output Data Stream

If the Data Display panel is displaying an *Output* data stream, you can switch to an Input data stream by changing the *O* in the word *Output* to *I*.

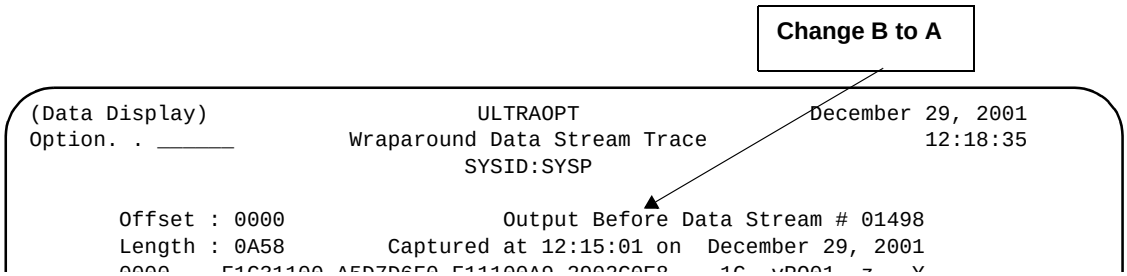
If the Data Display panel is displaying an *Input* data stream, you can switch to an output data stream by changing the *I* in the word *Input* to *O*.



Displaying a Before or After Data Stream

If the Data Display panel is displaying a *Before* data stream, you can switch to an After data stream by changing the *B* in the word *Before*, to *A*.

If the Data Display panel is displaying an *After* data stream, you can switch to a Before data stream by changing the *A* in the word *After* to *B*.



Wraparound Data Stream Trace (Environment) Panel

The Wraparound Data Stream Trace (Environment) panel (Figure 7-8) shows information about the environment of the data stream that was captured. This panel lists the operating system, the VTAM environment, the lengths of the captured data streams, and information about any errors that were found.

Figure 7-8 Wraparound Data Stream Trace Panel (Environment)

```
(Environment)                    ULTRAOPT                    December 29, 2001
Option. . ______          Wraparound Data Stream Trace                12:19:21
                                  SYSID:SYSA

                                       Output Data Stream # 00003
Operating System . . : ESA/(R)         LU  :      CPP00002  Applid  :  TSO16002

                                       Outbound Length Before . :          2
Terminal Type. . . . : NON3270  (SNA)  Outbound Length After. . :          2
                                       Time captured. . . . . . :  12:19:21
                                       Date captured :    December 29, 2001



Addressing Mode. . . : 12 Bit
Inbound Reply Mode . : FM
Query. . . . . . . . :  No
Controller . . . . . :



Tape Date and Time :  December 29, 2001 / 08.02  Version: 4.1.02 2001
```

Wraparound Data Stream Trace (Options) Panel

The Wraparound Data Stream Trace (Options) panel (Figure 7-9) shows information about the captured data stream and the status of the Optimization Control options and features at the time of the trace.

Figure 7-9 Wraparound Data Stream Trace Panel (Options)

```
(Options)                        ULTRAOPT                    December 29, 2001
Option. . ______          Wraparound Data Stream Trace                12:20:01
                                 SYSID:SYSA

Imaging . . . . . . . . . . . : Off      Input  Data Stream # 00004
Input Suppression . . . . . . : Off      LU :      CPP00002   Applid :  TSO16002
Erase Input Key Allowed . . : No
SCS Printer Optimization. . : On
SCS Horizontal Tabs . . . . : On
PT Order Generation . . . . : On
SNA Data Compression. . . . : Off

Field Merge . . . . . . . . : Off
Blank Elimination . . . . . : Off
Non-Display Fields. . . . . : Off
Attribute Elimination . . . : On

Global optimization status.
 CRTS . . . . . . . . . . . : On
 Printers . . . . . . . . . : On
                                     Tape date . . . . : December 29, 2001
                                     Tape time . . . . : 08.02
```

Deleting a Wraparound Data Stream Trace

The Monitor component does not delete a trace unless directed to do so. If you do not delete the trace, it is deleted when the Optimizer component is shut down.

You must stop a wraparound data stream trace before you can delete it. If the trace is not stopped, see “Stopping a Wraparound Data Stream Trace” on page 7-20.

To delete a wraparound data stream trace, type **4** in the **Trace Action** field and press **Enter**. The trace status changes to Inactive.

Wraparound Data Stream Trace Statistics

When a wraparound data stream trace starts and at least one data stream has been captured, the lower portion of Wraparound Data Stream Trace panel shows the following information about the most recent data stream that was captured:

- number that is assigned to the data stream from 1 to 99,999
- LU
- Applid
- outbound or inbound length:
  - before optimization
  - after optimization

For outbound data streams, if the data stream was excluded from optimization, the *before* and *after* lengths will be the same.

Table 7-6 describes the panels that are available after a data stream has been captured.

Table 7-6 Wraparound Data Stream Trace Display Panels

Panel Type	Description
Data Display	displays the data stream
Environment	lists the following information: • operating system • VTAM environment • lengths of captured data streams • information about errors
Options	lists the following information at time of trace: • information about the data stream being traced • status of the Optimizer control options and features
List	displays summary information for any captured data streams

Chapter 8 Status Information

This chapter describes the status panels that are used to display status information about include and exclude tables, data streams optimized, and Monitor component usage.

This chapter contains the following sections:

Overview

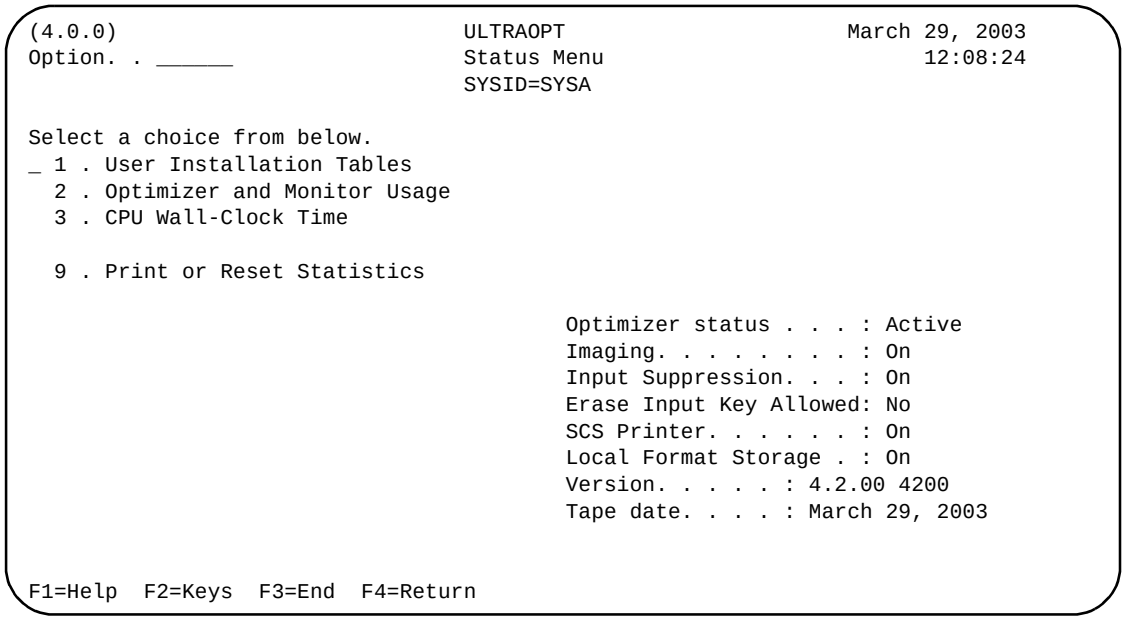
This chapter describes the status panels that are used to display status information about include and exclude tables, data streams optimized, and Monitor component usage.

Status Menu

The Status Menu (Figure 8-1) is used to display the following status panels:

- User Installation Tables
- Optimizer and Monitor Usage
- CPU Wall-Clock Time

Figure 8-1 Status Menu



User Installation Tables Panel

The User Installation Tables Panel lists the names of all include and exclude tables that you have created. You can use this panel to verify that the Optimizer component is using the correct tables. You can also use this panel to edit, rename, delete, browse, copy, or create a table.

Displaying the User Installation Tables Panel

Summary: In this task, you will display the User Installation Tables panel.

To display the User Installation Tables panel, perform the following steps:

Step 1 Type **4** on the Monitor Primary Menu.

Step 2 Press **Enter** to display the Status Menu.

Step 3 Type **1** on the Status Menu.

Step 4 Press **Enter** to display the User Installation Tables panel (Figure 8-2).

You can use **F8** (or **F20**) to scroll down through the list of tables or **F7** (or **F19**) to scroll up through the list of tables.

Figure 8-2 User Installation Tables Panel

```
(4.1.0)                          ULTRAOPT                    December 29, 2001
Option. . ______           User Installation Tables                    12:08:29
                                 SYSID:SYSH

 * = E=Edit  R=Rename  D=Delete  B=Browse  C=Copy
 * --Name-- --Type-- -Active For Option-   ------------Description------------
 _ SYSHEXCL LU        ** Not Active **
 _ SYSHTAB1 Applid    ** Not Active **
 _ SYSHLU1  LU        ** Not Active **
 _ KWMTABLU LU        ** Not Active **
 _ SYSHTAB2 Applid    ** Not Active **
 _ SNERDLY  ApplTran  ** Not Active **
 _ CONTROL2 LU        ** Not Active **
 _ SYSHTAB3 Applid    ** Not Active **
 _ DTSTAB1  Applid    ** Not Active **
 _ SYSHJEF1 LU        ** Not Active **
 _ SYSHJEF2 Applid    ** Not Active **
 _ LFSTEST1 LU        ** Not Active **
 _ KWMTAB   Applid    ** Not Active **
 _ DWRINC   Applid    ** Not Active **
Enter new name to copy, rename or create a new  table. .  ________

F1=Help  F2=Keys  F3=End  F6=Case F7=Scroll Up F8=Scroll Down
```

Table 8-1 describes the fields displayed on the User Installation Tables panel.

Table 8-1 User Installation Tables Panel Fields

Field	Description
*	Actions that you want to perform on a table: • **B** (browse) • **C** (copy) • **E** (edit) • **D** (delete) • **R** (rename)
Name	name of the table
Type	type of table The table must be a list of LUs, Applids, or controllers.
Active For Option	option or feature that is associated with the table If this field is blank, the table is not being used.
Description	user-supplied description that was typed when the table was created or when the table is updated
Enter new name to copy, remove or create a new table	table name that you want assigned to a table that you are creating, renaming, or copying

If creating a new table, the User Installation Tables (Table Build) panel (Figure 8-3) is displayed, requesting that you enter the table type. Valid table types are LU, Applid, or ApplTran.

Figure 8-3 User Installation Tables Panel (Table Build)

```
(Table Build)                    ULTRAOPT                   December 29, 2001
Option. . ______           User Installation Tables                   12:08:29
                                 SYSID:SYSH

Table Name:    EWS          Description:
Table Type:    ApplTran     Active for Option:   **NOT AVAILABLE**









F1=Help  F2=Keys  F3=End  F6=Case F7=Scroll Up F8=Scroll Down
```

Tables can be created and edited from several panels. For more information, see “Creating a New Table” on page 3-13 and “Table Entries” on page 3-18.

Renaming a Table

Summary: In this task, you will rename a table.

From the User Installation Tables panel you can use the Rename action (**R**) to change the name of a table. To rename a table, perform the following steps:

Step 1 Move the cursor into the action field next to the table whose name you want to change.

Step 2 Type **R** in the ***** (action) field.

Step 3 Type the new table name in the **Enter New Name** field at the bottom of the panel.

Step 4 Press **Enter** to assign the new name to the selected table.

Inactivating a Table

Summary: In this task, you will inactivate a table so that it can be deleted.

A table can be deleted only if the status `*Not Active*` is displayed in the **Active For Option** field.

If the table is active, the optimization type for which this table is included or excluded (for example, Global Include) is displayed in the **Active for Option** field. To inactivate a table so that it can be deleted, perform the following actions:

Step 1 Access the Optimization Control Menu (panel 1.0.0) and select the optimization type for which the table is included or excluded.

Step 2 Move the cursor onto the table name and type spaces to erase the table.

The table is inactivated.

Step 3 Access the User Installation Tables (panel 4.1.0) to delete the inactive table.

To delete the inactive table, see “Deleting a Table” on page 8-8.

Deleting a Table

Summary: In this task, you will delete a table.

Before You Begin

From the User Installation Tables panel you can use the Delete action (**D**) to delete a table that is no longer required.

The table can be deleted only if the **Active For Option** field displays *Not Active*. If the table is active, the optimization type for which this table is included or excluded (for example, Global Include) is displayed in the **Active for Option** field. To inactivate a table so that it can be deleted, see “Inactivating a Table” on page 8-7.

To Delete an Inactive Table

Step 1 Move the cursor into the action field next to the table that you want to delete.

Step 2 Type **D** in the ***** (action) field.

Step 3 Press **Enter** to delete the table.

Browsing a Table

Summary: In this task, you will browse a table.

You can browse the contents of a table by using the Browse action. The User Installation Tables (Table Build) panel is displayed for the table that you selected. From the User Installation Tables (Table Build) panel, you can browse the table entries. No updates are allowed. To browse a table, perform the following steps:

Step 1 Move the cursor into the action field next to the table that you want to browse.

Step 2 Type **B** in the ***** (action) field.

Step 3 Press **Enter** to access the User Installation Tables (Table Build) panel.

Note: The action field is not active during browsing.

Copying a Table

Summary: In this task, you will copy a table.

To create several tables that have only minor differences between them, you can use the Copy action to make a copy of a table, then change it by using the Edit action. To copy a table, perform the following steps:

Step 1 Move the cursor into the action field next to the table that you want to copy.

Step 2 Type **C** in the ***** (action) field.

Step 3 Type the new table name in the **Enter New Name** field.

Step 4 Press **Enter** to make a copy of the selected table and assign it the new name.

Optimizer and Monitor Usage Panel

This panel shows how many inbound and outbound data streams have been optimized and when certain options were last changed or reset. You can use the Optimizer and Monitor Usage panel to track the following information:

- use of the Optimizer or the Monitor
- when and by whom the Optimizer was last started or stopped
- when and by whom the Optimizer control options were last changed

Displaying the Optimizer and Monitor Usage Panel

Summary: In this task, you will display the Optimizer and Monitor Usage panel.

To display the Optimizer and Monitor Usage panel, perform the following steps:

Step 1 Type **4** on the Monitor Primary Menu.

Step 2 Press **Enter** to display the Status Menu.

Step 3 Type **2** on the Status Menu.

Step 4 Press **Enter** to display the Optimizer and Monitor Usage panel (Figure 8-4).

Figure 8-4 Optimizer and Monitor Usage Panel

```
(4.2.0)                          ULTRAOPT                   December 29, 2001
Option. . ______           Optimizer and Monitor Usage               12:26:06
                                 SYSID:SYSH

Optimizer:
  Number of Times Entered From -          Last Started -
  Input  VTAM . . . . :         0           On    Tuesday, December 26, 2001
                                            At 17:29:35
                                            Automatically at startup
  Output VTAM . . . . :         0
                                          Last Stopped -
                                            On     Monday, December 25, 2001
                                            At 20:34:46
  Total . . . :                 0           Automatically at shutdown

Monitor:    Total Times Entered -         77

Optimization Control Options              Print Screens/Reset Statistics
Last Changed:                             Last Changed:
  On    Monday, December 29, 2001           On  Thursday, December 21, 2001
  At 10:19:40                               At 12:42:52
  From LU     L3AAL1    Userid HPM4         From LU     L3ACC1    Userid HPM
F1=Help  F2=Keys  F3=End  F4=Return
```

Table 8-2 describes the fields that are displayed on the Optimizer and Monitor Usage panel.

Table 8-2 Optimizer and Monitor Usage Panel Fields

Field	Description
Optimizer: Number of Times Entered From	number of times that the Optimizer was used for inbound and outbound data stream processing since the statistics were last reset
Optimizer: Last Started	date and time that the Optimizer was last started
Optimizer: Last Stopped	date and time that the Optimizer was last stopped
Monitor: Total Times Entered	number of times that **Enter** was pressed since the last time statistics were reset
Optimization Control Options: Last Changed	the following information is displayed for the last time that the Optimizer Control options 1.1 through 1.5 were changed: • date and time • LU from which the change was made and the Userid
Print Screens/Reset Statistics: Last Changed	the following information is displayed for the last time the Optimizer Print/Reset options were changed: • date and time • LU from which the change was made and the Userid

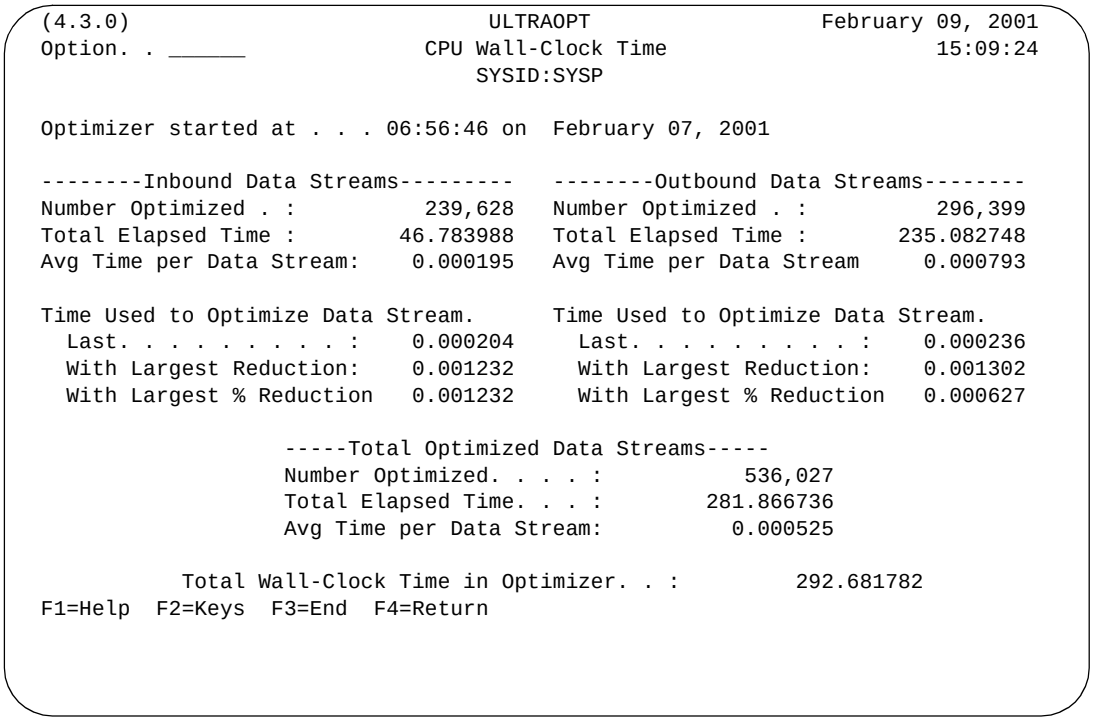
The following statements are true for the **Optimization Control Options Last Changed** field:

- If you use the defaults for the Optimization Control options, no information is displayed.
- If the options are changed, the Optimizer is shut down and the SOPOPT file is not being used (or is not available), no information is retained.
- When the SOPOPT file is available, if you change any options then shut the Optimizer down, the information is retained for later display.
- This information is not reset when the other statistics are reset.

CPU Wall-Clock Time Panel

You can use the CPU Wall-Clock Time panel (Figure 8-5) to display information about the amount of time that was used by the Optimizer component to optimize your data streams.

Figure 8-5 CPU Wall-Clock Time Panel



```
(4.3.0)                          ULTRAOPT                  February 09, 2001
Option. . ______              CPU Wall-Clock Time                    15:09:24
                                  SYSID:SYSP

Optimizer started at . . . 06:56:46 on  February 07, 2001

--------Inbound Data Streams---------   --------Outbound Data Streams--------
Number Optimized . :          239,628   Number Optimized . :          296,399
Total Elapsed Time :        46.783988   Total Elapsed Time :       235.082748
Avg Time per Data Stream:    0.000195   Avg Time per Data Stream     0.000793

Time Used to Optimize Data Stream.      Time Used to Optimize Data Stream.
  Last. . . . . . . . . . :    0.000204     Last. . . . . . . . . . :    0.000236
  With Largest Reduction:    0.001232     With Largest Reduction:    0.001302
  With Largest % Reduction   0.001232     With Largest % Reduction   0.000627

                  -----Total Optimized Data Streams-----
                  Number Optimized. . . . :           536,027
                  Total Elapsed Time. . . :        281.866736
                  Avg Time per Data Stream:          0.000525

           Total Wall-Clock Time in Optimizer. . :         292.681782
F1=Help  F2=Keys  F3=End  F4=Return
```

Table 8-2 describes the fields that are displayed on the CPU Wall-Clock Time panel.

Table 8-3 CPU Wall-Clock Time Panel Fields (Part 1 of 2)

Field	Description
Optimizer started at	date and time that the Optimizer was last started
Inbound Data Streams	
Number Optimized	total number of inbound data streams that were optimized
Total Elapsed Time	total CPU wall-clock time that was used by the Optimizer to optimize inbound data streams
Avg Time per Data Stream	average amount of time that was used by the Optimizer to optimize one inbound data stream
Time Used to Optimize Data Stream	elapsed time that was used by the Optimizer to process the last inbound data stream

Table 8-3 CPU Wall-Clock Time Panel Fields (Part 2 of 2)

Field	Description
Time Used to Optimize Data Stream with Largest Reduction	elapsed time that was used by the Optimizer to process the inbound data stream with the largest reduction in length
Time Used to Optimize Data Stream with Largest % Reduction	elapsed time that was used by the Optimizer to process the inbound data stream with the largest percentage of reduction in length
Outbound Data Streams	
Number Optimized	total number of outbound data streams that have been optimized
Total Elapsed Time	total CPU wall-clock time that was used by the Optimizer to optimize outbound data streams
Avg Time per Data Stream	average amount of time that was used by the Optimizer to optimize one outbound data stream
Time Used to Optimize Data Stream	elapsed time that was used by the Optimizer to process the last outbound data stream
Time Used to Optimize Data Stream with Largest Reduction	elapsed time that was used by the Optimizer to process the outbound data stream with the largest reduction in length
Time Used to Optimize Data Stream with Largest % Reduction	elapsed time that was used by the Optimizer to process the outbound data stream with the largest percentage of reduction in length
Number Optimized	total number of inbound and outbound data streams that were optimized by the Optimizer
Total Elapsed Time	CPU wall-clock time that was used by the Optimizer to optimize all data streams
Avg Time per Data Stream	average amount of time that was used by the Optimizer to optimize one data stream
Total Wall-Clock Time in Optimizer	elapsed (wall-clock) time since the Optimizer was last started, including time spent performing the following activities: • optimizing data streams • processing data streams excluded from optimization • monitoring VTAM for LOGON/LOGOFF activity, terminal errors, and other data stream events

Chapter 9 Response Time Monitor

This chapter describes the ULTRAOPT response time monitor (RTM) feature for monitoring host and network response times by application or by terminal. Response time monitoring can be performed for applications included for interception. Response time statistics are displayed for applications and terminals that are included for response time monitoring.

This chapter contains the following sections:

Overview

Response time monitoring lets you evaluate the host and network response times of intercepted applications. These statistics can be used to monitor your system's performance and help keep track of service level agreements.

Response Time Monitor Summary

Table 9-1 summarizes the steps for setting up the response time monitor feature and displaying response time statistics.

Table 9-1 Response Time Monitor Summary

Step	Action	Reference
1	Use the following startup parameters or operator commands to turn on and set up the response time monitor feature: RESPTM and TSORSP to turn on response time monitoring. RTMINT= to set the time interval for statistics to be collected before being reset. RTMSMG to specify whether you want statistics for virtual sessions to be displayed with the "virtual" LU name or the "real" LU name.	"Startup Parameters" chapter in the *ULTRAOPT Customization Guide* and Appendix A, "Operator Commands"
2	Ensure the applications to be monitored are included for interception.	Chapter 3, "Include/Exclude Tables"
3	Use the Global RTM Control menu to specify whether applications and LUs are to be tracked and monitored.	"Global Response Time Monitoring Control" on page 9-6
4	Use the Application Response Time Statistics panel or the Terminal Response Time Statistics panel to display statistics for host and network response times by application.	"Application Response Time Statistics" on page 9-10
5	Use the Terminal Response Time Statistics panel to display statistics for host and network response times by terminal.	"Terminal Response Time Statistics" on page 9-14

Calculating Network Response Times

Response time monitoring calculates host and network response times. Host response time is the time that is taken by the application to process a transaction. To calculate response times, ULTRAOPT invokes definite response for the application. (Definite response is a VTAM function which specifies that traffic sent to the terminal be acknowledged.)

Network response time represents the time that is required for the output of a transaction to travel through the network to the terminal, plus the time that is required for the definite response to return to the VTAM application. Response times can only be monitored for LU2 sessions and optimized LU0 and LU1 sessions. A definite response cannot be forced on sessions that use LU 6.2 protocol, nor can it be used for bisynchronous and 4700/3600 (SNA financial) terminals.

Consider the following variables:

- *Time A*: Transaction flows from the terminal through the network to the host.
- *Time B*: Transaction is processed in the host.
- *Time C*: Transaction output flows from the host through the network to the terminal.
- *Time D*: Definite response is sent from the terminal (PU) to acknowledge receipt of output.

An application user typically perceives response time to be host response time added to the network response time. Users typically define response time as *`Time A + Time B + Time C`*.

Response time, as calculated by the subsystem RTM function, is *`Time B + Time C + Time D`*.

The subsystem assumes that *Time A* is equivalent to *Time D*. The size of transaction input and line speed are determining factors in response time calculations.

Forcing Definite Response

Definite response is activated (forced) for the following conditions for intercepted applications which are included for RTM:

- Request Parameter Lists (RPLs) with CONTROL=DATA, Only In Chain (OIC) or Last In Chain (LIC) data streams, LU2 or LU3, and reset keyboard contained in the Write Control Character (WCC).

- RPLs with CONTROL=DATA, Only In Chain (OIC) or Last In Chain (LIC) data streams, and optimized LU0 or LU1 sessions.

Definite response is not forced in the following conditions:

- LU6 sessions
- LU0 or LU1 sessions which are not being optimized
- RPLs which are not CONTROL=DATA
- Middle In Chain (MIC) or First in Chain (FIC) RUs
- Sessions which are using Bypass Send and Receive (BSR)

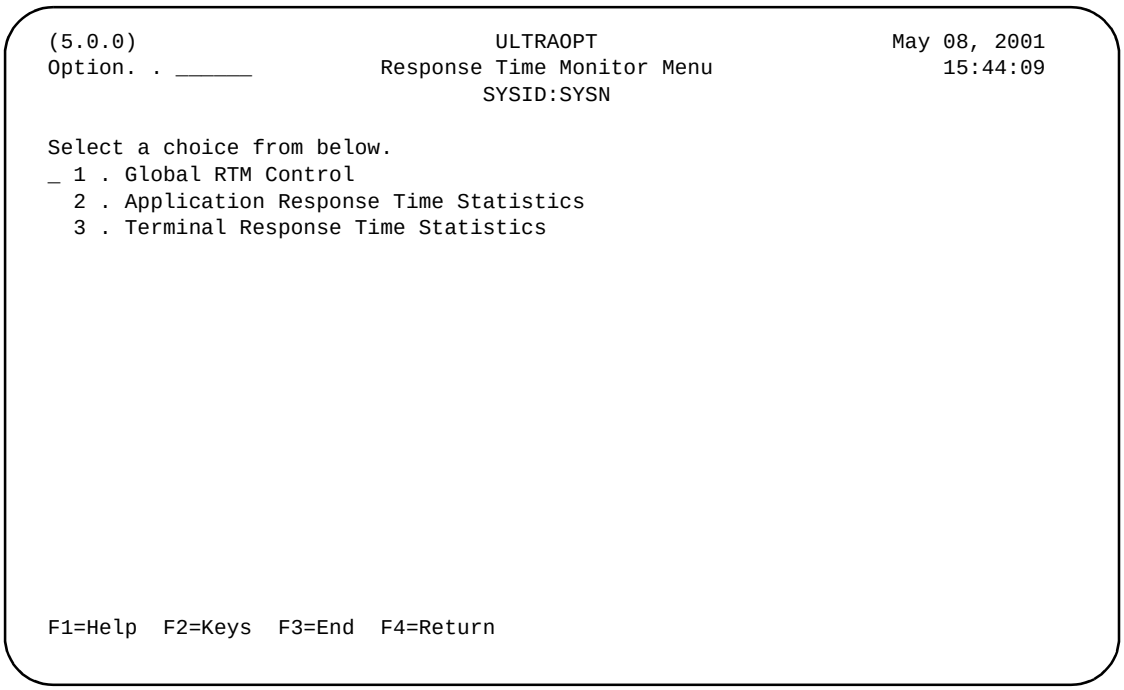
If definite response is already activated for an RU, the subsystem does not further alter these bit settings.

Response Time Monitor Menu

The Response Time Monitor Menu (shown in Figure 9-1) displays the following panels for controlling and monitoring the RTM feature:

- Global RTM Control
- Application Response Time Statistics
- Terminal Response Time Statistics

Figure 9-1 Response Time Monitor Menu



Global Response Time Monitoring Control

The Global RTM Control panel lets you specify whether the response times of applications and LUs are to be tracked and monitored. To measure response times, applications must first be intercepted then included in the RTM.

The Global RTM Control Panel (5.1.0) lets you control whether any of the following devices' data streams are included in, or excluded from, any type of response time monitoring:

- single LU or Applid
- list of LUs or Applids in a table

This panel is used to add, delete, or edit LU or Applid entries in a new or existing table. For information about how to update entries in a table, see Chapter 3, "Include/Exclude Tables."

Response time is monitored by turning on the definite response bit for applications included in the Global RTM Monitor panel. Applications which do not support this VTAM functionality or have problems with this should be excluded from response time monitoring. Devices which support definite responses (such as LU2 sessions, optimized LU0 sessions, terminals, and session managers acting as secondary LUs) are eligible for monitoring. LU 6.2 sessions cannot be monitored through RTM because these devices do not support definite responses.

Displaying the Global RTM Control Panel

Summary: In this task, you will display the Global RTM Control panel.

To display the Global RTM Control panel, perform the following steps:

Step 1 Type **5** on the ULTRAOPT Primary Menu.

Step 2 Press **Enter** to display the Response Time Monitor Menu.

Step 3 Type **1** on the Response Time Monitor Menu.

Step 4 Press **Enter** to display the Global RTM Control panel (Figure 9-2).

Figure 9-2 Global RTM Control Panel

```
(5.1.0)                          ULTRAOPT                        May 08, 2001
Option. . ______               Global RTM Control                    15:46:51
                                 SYSID:SYSN




For a single entry, type the entry under Single. For a table of entries, type
the table name under Table. To edit the table, type action E=Edit. To A=Add or
D=Delete a single entry in the table, type the Action, single entry and table.

 Exclude by:             Action   Single     Table
          LU . . . . . .   _     _________   _________
          Applid . . . .   _     _________   _________

 Include by:
          LU . . . . . .   _     _________   _________
          Applid . . . .   _     ********    _________



F1=Help  F2=Keys  F3=End  F4=Return  F6=Case  F10=Table List
```

Table 9-2 describes the fields that are displayed on the Global RTM Control panel.

Table 9-2 Global RTM Control Panel Fields

Field	Description
Action	specifies an action to perform on a single entry or table (list of Applids): • **A** to add a single or generic LU or Applid to a table • **D** to delete a single or generic LU or Applid from a table • **E** to edit a table or create a new table by typing *E* and typing the new table name in the **Table** field
Exclude by: Single - LU or Applid	name of a single or generic LU or Applid to exclude from response time monitoring
Exclude by: Table - LU or Applid	name of a table (list of LUs or Applids) to exclude from response time monitoring
Include by: Single - LU or Applid	name of a single or generic LU or Applid to include in response time monitoring
Include by: Table - LU or Applid	name of a table (list of LUs or Applids) to include in response time monitoring

Including/Excluding Applications and Devices

Summary: In this task, you will include or exclude applications and devices in global response time monitoring.

Note: If an LU or Applid is inadvertently included *and* excluded, it is always excluded. For information about the sequence in which the product processes excludes and includes, see "Rules of Optimization" on page 3-3.

To control whether LUs and Applids are included in, or excluded from, global response time monitoring, perform the following steps:

Step 1 Ensure that the application to be monitored is included for interception.

For more details, see "Entries" on page 3-9.

Note: Response time monitoring can be accomplished only for applications that are intercepted; including an LU or Applid for RTM does not cause it to be intercepted.

Step 2 Choose one of the following options:

- To include a single LU or Applid, type its name in the **Include by: LU** or **Include by: Applid** field under **Single**.
- To include a table of LUs or Applids, type the table name in the **Include by: LU** or **Include by: Applid** field under **Table**.
- To exclude a single LU or Applid, type its name in the **Exclude by: LU** or **Exclude by: Applid** field under **Single**.
- To exclude a table of LUs or Applids, type the table name in the **Exclude by: LU** or **Exclude by: Applid** field under **Table**.

Step 3 When these fields contain the correct entries, perform one of the following steps:

- Press **Enter** to save the changes and remain on this panel.
- Press **F3** to save the changes and return to the Response Time Monitor Menu.

Application Response Time Statistics

The Application Response Time Statistics panel (5.2.0) lets you display statistics for applications monitored since the statistics were last reset. The interval at which these statistics are reset is specified with the RTMINT startup parameter (or operator command).

Displaying the Application Response Time Statistics Panel

Summary: In this task, you will display the Application Response Time Statistics panel.

To display the Application Response Time Statistics panel, perform the following steps:

Step 1 Type **5** on the ULTRAOPT Primary Menu.

Step 2 Press **Enter** to display the Response Time Monitor Menu.

Step 3 Type **2** on the Response Time Monitor Menu.

Step 4 Press **Enter** to display the Application Response Time Statistics panel (Figure 9-3).

Figure 9-3 Application Response Time Statistics Panel

```
(5.2.0)                          ULTRAOPT                  February 09, 2001
Option. . ______     Application Response Time Statistics            15:16:00
                                SYSID:SYSP

Select:  All Applids   _                                  Interval: 00:18:42 H

    Or -            Action  Single    Table
         Applid. . .  _    ________  ________            0  Appls Selected

------------------------------------------------------------------------------
 Appl      Avg-Rsp      Worst               Input    Output    Avg       Avg
 Name     Host   Net    Host    Sessions    PIUs      PIUs   In-Size   Out-Size
------------------------------------------------------------------------------









F1=Help  F3=Exit  F4=Return  F7=Backward  F8=Forward  F10=Table  PF12=Cancel
```

Table 9-3 describes the fields that are displayed on the Application Response Time Statistics panel.

Table 9-3 Application Response Time Statistics Panel Fields

Field	Description
Action	specifies an action to perform on a single entry or table (list of Applids): • **A** to add a single or generic Applid to a table • **D** to delete a single or generic Applid from a table • **E** to edit a table or create a new table by typing *E* and typing the new table name in the **Table** field
Interval	time remaining in the current RTMINT interval before the statistics are reset
All Applids	option for displaying summary statistics for all Applids
Applid - Single	name of a generic Applid for which RTM statistics will be displayed
Applid - Table	name of a table (list of Applids) for which RTM statistics will be displayed
Appl Name	name of application monitored
Avg-Rsp-Host	average host response time for this interval
Avg-Rsp-Net	average network response time for this interval
Worst host	worst host response time recorded during this interval
Sessions	number of sessions to this application during this interval
Input PIUs	number of Path Information Units inbound to this application during this interval
Output PIUs	number of Path Information Units outbound from this application during this interval
Avg In-Size	average length of inbound data streams to this application during this interval
Avg Out-Size	average length of outbound data streams to this application during this interval

Specifying Applications to Be Displayed

Summary: In this task, you will specify how you want statistics displayed for the Application Response Time Statistics panel.

To specify how you want statistics displayed for the Application Response Time Statistics panel, perform the following steps:

Step 1 Type the name of a single Applid or table (list of Applids) in the appropriate field for which you want statistics displayed.

Step 2 Press **Enter**.

Step 3 Press **F3** to return to the Response Time Monitor Menu panel.

Terminal Response Time Statistics

The Terminal Response Time Statistics panel (5.3.0) lets you display statistics for terminals that were monitored since the statistics were last reset. The interval at which these statistics are reset is specified with the RTMINT startup parameter (or operator command).

Displaying the Terminal Response Time Statistics Panel

Summary: In this task, you will display the Terminal Response Time Statistics panel.

To display the Terminal Response Time Statistics panel, follow the following steps:

Step 1 Type **5** on the ULTRAOPT Primary Menu.

Step 2 Press **Enter** to display the Response Time Monitor Menu.

Step 3 Type **3** on the Response Time Monitor Menu.

Step 4 Press **Enter** to display the Terminal Response Time Statistics panel (Figure 9-4).

Figure 9-4 Terminal Response Time Statistics Panel

```
(5.3.0)                          ULTRAOPT                          May 08, 2001
Option. . ______       Terminal Response Time Statistics              15:54:40
                                SYSID:SYSN

Select:  All Terminals _                                  Interval: 00:01:53 H

    Or -            Action  Single    Table
         Terminal. .  _    ________  ________            1 Terms Selected

--------------------------------------------------------------------------------
  Term       Avg-Rsp        Worst-Rsp    Input   Output    Avg      Avg     V
  Name     Host    Net     Host   Net    PIUs     PIUs   In-Size  Out-Size  L
-------------------------------APPL = TSO0007---------------------------------
L31BR2     00.29  00.15    01.40  00.22      29      41       15       902
```

Table 9-4 describes the fields that are displayed on the Terminal Response Time Statistics panel.

Table 9-4 Terminal Response Time Statistics Fields

Field	Description
Action	specifies an action to perform on a single entry or table (list of Applids): • **A** to add a single or generic Applid to a table • **D** to delete a single or generic Applid from a table • **E** to edit a table or create a new table by typing *E* and typing the new table name in the **Table** field
Interval	time remaining in the current RTMINT interval before the statistics are reset
All Terminals	option to display summary statistics for all terminals
Terminal - Single	name of a terminal for which RTM statistics will be displayed
Terminal - Table	name of a table (list of terminals) for which RTM statistics will be displayed
Term Name	name of the terminal monitored
Avg-Rsp-Host	average host response time for this interval
Avg-Rsp-Net	average network response time for this interval
Worst-Rsp-Host	worst host response time recorded during this interval
Worst-Rsp-Net	worst network response time recorded during this interval
Input PIUs	number of path information units inbound to this application during this interval
Output PIUs	number of path information units outbound from this application during this interval
Avg In-Size	average length of inbound data streams to this application during this interval
Avg Out-Size	average length of outbound data streams to this applications during this interval
VL	virtual LU—indicates whether the session is a background session

Specifying Terminals to Be Displayed

Summary: In this task, you will specify how you want statistics displayed for the Terminal Response Time Statistics panel.

To specify how you want statistics displayed for the Terminal Response Time Statistics panel, perform the following steps:

Step 1 Type the name of a single terminal or table (list of terminals) in the appropriate field for which you want statistics displayed.

Step 2 Press **Enter**.

Step 3 Press **F3** to return to the Response Time Monitor Menu panel.

Chapter 10 TN3270 Application Monitor

This chapter describes the TN3270 Application Monitor and the panels that are used to map TN3270 IP addresses to VTAM LUs, correlate TN3270 LUs to VTAM applications running on an MVS system, and display response time and optimization statistics.

This chapter contains the following sections:

Overview

The TN3270 Application Monitor lets end users who use display terminals (connected to IP networks) access and display data on hosts. TN3270 bridges Internet Protocol (IP) and Systems Network Architecture (SNA) protocol.

TN3270 provides the following information:

- correlation of TN3270 LUs (IP addresses) to VTAM applications running on an MVS system
- mapping of TN3270 IP addresses to VTAM logical units (LUs) and resolution of IP addresses to specific domain names
- response time statistics for TN3270 LUs
- optimization statistics for TN3270 LUs or Applids

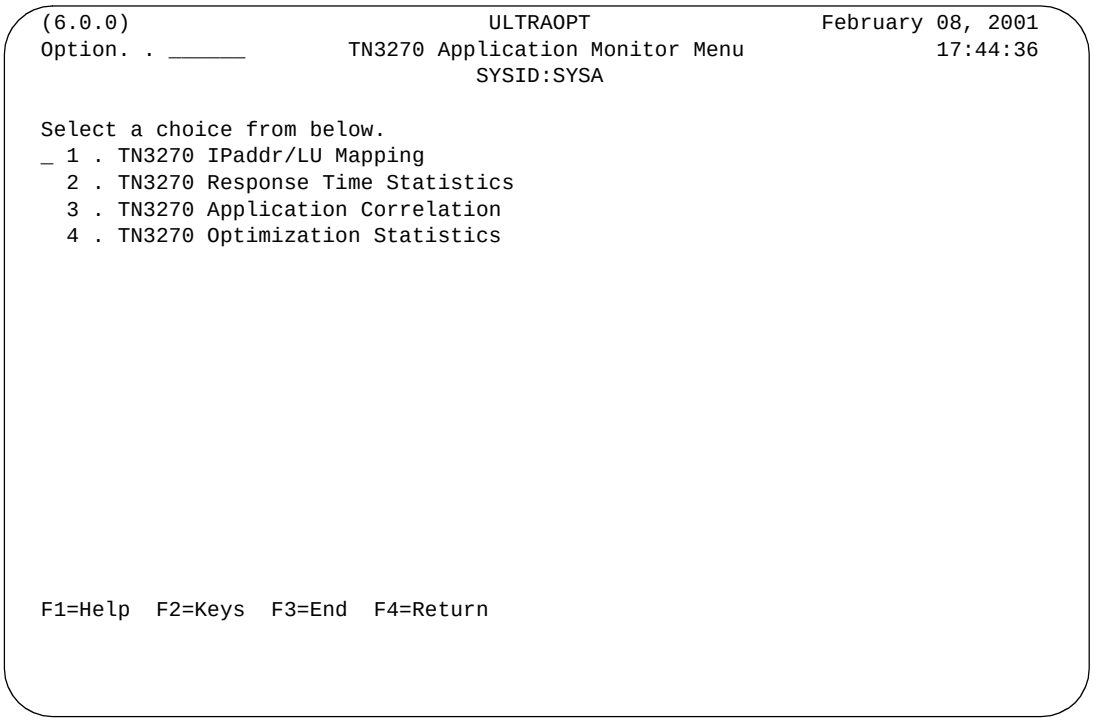
Note: For information about IP environments, see the *ULTRAOPT Customization Guide*.

TN3270 Application Monitor Menu

The TN3270 Application Monitor Menu (Figure 10-1) is used to display the following panels:

- TN3270 IPaddr/LU Mapping
- TN3270 Response Time Statistics
- TN3270 Application Correlation
- TN3270 Optimization Statistics

Figure 10-1 TN3270 Application Monitor Menu



TN3270 IPaddr/LU Mapping Panel

You can use the TN3270 IPaddr/LU Mapping panel to map TN3270 IP addresses to VTAM LUs. You can also resolve IP addresses with specific domain names. You may select TN3270 LUs in the following ways:

- single (or generic) TN3270 LUs
- table of TN3270 LUs

For each preceding category, the VTAM LU that TCP/IP has selected for the TN3270 client at the specified IP address will be displayed. The resolved domain name (if DNS server is available) will also be displayed.

If you enter nothing on the screen, all known TN3270 LUs that have been intercepted by ULTRAOPT are displayed.

Displaying the TN3270 IPaddr/LU Mapping Panel

Summary: In this task, you will display the TN3270 IPaddr/LU Mapping panel.

To display the TN3270 IPaddr/LU Mapping panel, perform the following steps:

Step 1 Type **6** on the Monitor Primary Menu.

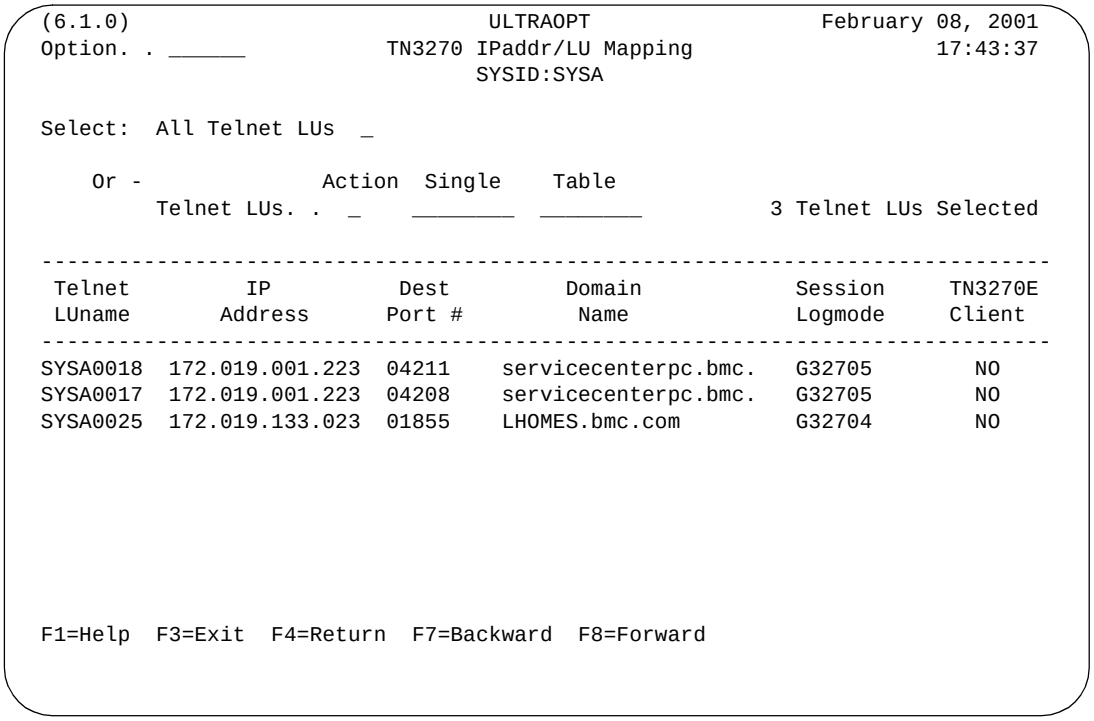
Step 2 Press **Enter** to display the TN3270 Application Monitor Menu.

Step 3 Type **1** on the TN3270 Application Monitor Menu.

Step 4 Press **Enter** to display the TN3270 IPaddr/LU Mapping panel (Figure 10-2).

You can use **F8** to scroll down through the list of Telnet LUs or **F7** to scroll up through the list of Telnet LUs.

Figure 10-2 TN3270 IPaddr/LU Mapping Panel



```
(6.1.0)                          ULTRAOPT                  February 08, 2001
Option. . ______           TN3270 IPaddr/LU Mapping                  17:43:37
                                 SYSID:SYSA

Select:  All Telnet LUs  _

    Or -              Action  Single    Table
         Telnet LUs. .  _    ________  ________          3 Telnet LUs Selected

-------------------------------------------------------------------------------
 Telnet         IP          Dest         Domain            Session     TN3270E
 LUname       Address      Port #         Name              Logmode     Client
-------------------------------------------------------------------------------
SYSA0018  172.019.001.223  04211    servicecenterpc.bmc.   G32705        NO
SYSA0017  172.019.001.223  04208    servicecenterpc.bmc.   G32705        NO
SYSA0025  172.019.133.023  01855    LHOMES.bmc.com         G32704        NO









F1=Help  F3=Exit  F4=Return  F7=Backward  F8=Forward
```

Table 10-1 describes the fields displayed on the TN3270 IPaddr/LU Mapping panel.

Table 10-1 TN3270 IPaddr/LU Mapping Fields

Field	Description
All Telnet LUs	lets you display IP addresses and domain names for all Telnet LUs
Action	lets you specify an action that you want to perform on a single Telnet LU or table (list of Telnet LUs) Valid actions are as follows: • **A** to add a single or generic TN3270 LU to a table • **D** to delete a single or generic TN3270 LU from a table • **E** to edit a table
Telnet LUs – Single	name of a single or generic Telnet LU
Telnet LUs – Table	name of a table (list of Telnet LUs)
Telnet LUs Selected	number of Telnet LUs that were selected for mapping
Telnet LUname	name of the Telnet LU
IP Address	IP address for a selected Telnet LU
Dest Port#	access point number for data entry and exit
Domain Name	name of host system associated with specific IP address
Session Logmode	log operation number for specified session
TN3270E Client	indicates whether the client is TN3270E TN3270E clients support RFC 1646 or RFC 1647

TN3270 Response Time Statistics

You can use the TN3270 Response Time Statistics panel to display response time statistics for each TN3270 LU that you select. You can select TN3270 LUs in the following ways:

- all TN3270 LUs
- single TN3270 LU
- table of TN3270 LUs

If you do not enter anything on the screen, the default statistics displayed will represent statistics for all TN3270 LUs.

Displaying the TN3270 Response Time Statistics Panel

Summary: In this task, you will display the TN3270 Response Time Statistics panel.

To display the TN3270 Response Time Statistics panel, perform the following steps:

Step 1 Type **6** on the Monitor Primary Menu and press **Enter** to display the TN3270 Application Monitor Menu.

Step 2 Type **2** on the TN3270 Application Monitor Menu and press **Enter** to display the TN3270 Response Time Statistics panel (Figure 10-3).

You can use **F8** to scroll down through the list of Telnet LUs or **F7** to scroll up through the list of Telnet LUs.

Figure 10-3 TN3270 Response Time Statistics Panel

```
(6.2.0)                          ULTRAOPT                    October 10, 2002
Option. . ______        TN3270 Response Time Statistics              13:14:31
                                SYSID:ESAM

Select:  All Telnet LUs  _

    Or -            Action  Single    Table
         Telnet LUs.  _    ________  ________          6     Telnet LU Selected

-------------------------------------------------------------------------------
    Telnet        Avg-Rsp     Worst-Rsp     Input    Output    Avg       Avg
 Lu/Ip/Domain    Host  Net    Host  Net     PIUs      PIUs   In-Size   Out-Size
-------------------------------------------------------------------------------
172.031.014.005 00.00 00.05  00.00 00.05        1         3      304         17
172.031.012.035 00.05 00.08  02.54 00.24      430       455       14      1,352
172.031.012.035 00.00 00.04  00.00 00.04        1         3      285         17
172.025.121.166 00.23 00.94  02.08 05.27       18        24       29        867
172.025.121.166 00.23 00.30  02.79 05.64       60        73       13        530
172.031.012.066 00.25 00.00  20.03 00.00      477       562       27        676



F1=Help  F3=Exit  F4=Return  F7=Backward  F8=Forward  F11=Show Lu/Ip/Domain
```

Table 10-2 describes the fields that are displayed on the TN3270 Response Time Statistics panel.

Table 10-2 TN3270 Response Time Statistics Panel Fields

Field	Description
All Telnet LUs	lets you display response time statistics for all Telnet LUs
Action	lets you specify an action that you want to perform on a table (list of Telnet LUs) Valid actions are as follows: • **A** to add a single or generic TN3270 LU to a table • **D** to delete a single or generic TN3270 LU from a table • **E** to edit a table
Telnet LUs – Single	name of single or generic Telnet LU
Telnet LUs – Table	name of table (list of Telnet LUs)
Telnet LU Selected	number of Telnet LUs that were selected for response time statistics
Telnet Lu/Ip/Domain	identifies the LU, IP, or Domain for a selected Telnet
Avg-Rsp – Host	average host response time for this interval
Avg-Rsp – Net	Average network response time for this interval
Worst-Rsp – Host	Worst host response time for this interval
Worst-Rsp – Net	Worst network response time for this interval
Input PIUs	number of Path Information Units inbound to this application during this interval
Output PIUs	number of Path Information Units outbound from this application during this interval
Avg In – Size	average length of inbound data streams to this application during this interval
Avg Out – Size	average length of outbound data streams to this application during this interval

Specifying TN3270 Response Time Statistics

Summary: In this task, you will specify how you want to display statistics for the TN3270 Response Time panel.

To specify how you want statistics displayed for the TN3270 Response Time Statistics panel, perform the following steps:

Step 1 Type the name of a single Telnet LU or table (list of Telnet LUs) in the appropriate field for which you want statistics displayed.

Step 2 Press **Enter**.

Step 3 Press **F3** to return to the TN3270 Application Monitor Menu panel.

TN3270 Application Correlation

You can use the TN3270 Application Correlation panel to correlate TN3270 LUs (IP addresses) to VTAM applications running on an MVS system. You can select TN3270 LUs in the following ways:

- single (or generic) TN3270 LUs
- table of TN3270 LUs

For each category, the TN3270 LU that is in session with a particular VTAM application on the same MVS system will be displayed.

If you enter nothing on the screen, all known TN3270 LUs that have been intercepted by ULTRAOPT are displayed.

Displaying the TN3270 Application Correlation Panel

Summary: In this task, you will display the TN3270 Application Correlation panel.

To display the TN3270 Application Correlation panel, perform the following steps:

Step 1 Type **6** on the Monitor Primary Menu.

Step 2 Press **Enter** to display the TN3270 Application Monitor Menu.

Step 3 Type **3** on the TN3270 Application Monitor Menu.

Step 4 Press **Enter** to display the TN3270 Application Correlation panel (Figure 10-4).

You can use **F8** to scroll down through the list of Telnet LUs or **F7** to scroll up through the list of Telnet LUs.

Figure 10-4 TN3270 Application Correlation Panel

```
(6.3.0)                          ULTRAOPT                  February 08, 2001
Option. . ______        TN3270 Application Correlation              17:45:50
                                SYSID:SYSA

Select:  All Telnet LUs  _

    Or -              Action  Single    Table
         Telnet LUs. .  _    ________  ________          3 Telnet LUs Selected

-------------------------------------------------------------------------------
 Telnet         IP         Application   Session   Session    Session  Session
 LUname       Address       Correlator   Partner    Start     Jobname   LUtype
-------------------------------------------------------------------------------
SYSA0018  172.019.001.223      TSO      TSO12005  039/17.32   *UNKNOWN    00
SYSA0017  172.019.001.223      TSO      TSO12004  039/17.32   *UNKNOWN    00
SYSA0025  172.019.133.023      TSO      TSO12003  039/16.35   *UNKNOWN    00









F1=Help  F3=Exit  F4=Return  F7=Backward  F8=Forward
```

Table 10-3 describes the fields that are displayed on the TN3270 Application Correlation panel.

Table 10-3 TN3270 Application Correlation Panel Fields

Field	Description
All Telnet LUs	lets you correlate TN3270 LUs (IP addresses) to VTAM applications running on an MVS system for all Telnet LUs
Action	lets you specify an action that you want to perform on a table (list of Telnet LUs) Valid actions are as follows: • **A** to add a single or generic TN3270 LU to a table • **D** to delete a single or generic TN3270 LU from a table • **E** to edit a table
Telnet LUs - Single	name of single or generic Telnet LU
Telnet LUs - Table	name of table (list of Telnet LUs)
Telnet LUs Selected	number of Telnet LUs that were selected for application correlation
Telnet LUname	name of the Telnet LU
IP Address	Internet Protocol (IP) address for a selected Telnet session
Application Correlator	application associated with a specified IP address
Session Partner	one of two network addressable units (NAUs) having an active session
Session Start	time the application correlation process was started for a session
Session Jobname	jobname of the active session
Session LUtype	indicates the type of session between an application program and a single display terminal in an interactive environment, using the SNA 3270 data stream

TN3270 Optimization Statistics

You can use the TN3270 Optimization Statistics panel to display optimization statistics for TN3270 LUs or Applids that you select. You can select TN3270 LUs in the following ways:

- group: all Applids, all CRTs, or all printers
- single (or generic) LU or Applid
- table of LUs or Applids

For each category, you may also indicate whether you want Input, Output, and/or Total Data Stream Statistics.

If you enter nothing on the screen, the default statistics that are displayed represent statistics for all TN3270 LUs with Input, Output, and Total.

Displaying the TN3270 Optimization Statistics Panel

Summary: In this task, you will display the TN3270 Optimization Statistics panel.

To display the TN3270 Optimization Statistics panel, perform the following steps:

Step 1 Type **6** on the Monitor Primary Menu.

Step 2 Press **Enter** to display the TN3270 Application Monitor Menu.

Step 3 Type **4** on the TN3270 Application Monitor Menu.

Step 4 Press **Enter** to display the TN3270 Optimization Statistics panel (Figure 10-5).

You can use **F8** to scroll down through the list of optimization statistics or to scroll up through the list of optimization statistics use **F7**.

Figure 10-5 TN3270 Optimization Statistics Panel

```
(6.4.0)                          ULTRAOPT                  February 08, 2001
Option. . ______         TN3270 Optimization Statistics              17:46:24
                                 SYSID:SYSA

Select:  All Applids   _    All LUs  _    All Printers _
    Or -            Action  Single    Table
         LU. . . . .  _    ________  ________              3 LUs Selected
         Applid. . .  _    ________  ________
Type of statistics to display. . .   X Input   X Output  X Total
--------------------------------------------------------------------------------
LU          Data Streams   Bytes Before    Bytes After  Bytes Reduced Percent
SYSA0018 In             5            156            156              0    0.0%
         Out           19          4,467          3,451          1,016   22.8%
         Tot           24          4,623          3,607          1,016   22.0%
SYSA0025 In             2             23             23              0    0.0%
         Out           10          1,460          1,015            445   30.5%
         Tot           12          1,483          1,038            445   30.1%
SYSA0017 In            25            702            265            437   62.3%
         Out           51         26,726         15,794         10,932   41.0%
         Tot           76         27,428         16,059         11,369   41.5%


F1=Help  F2=Keys  F3=End  F6=Case  F7=Scroll Up  F8=Scroll Down
```

Table 10-4 contains information about the fields that are displayed on the TN3270 Optimization Statistics panel.

Table 10-4 TN3270 Optimization Statistics Panel Fields (Part 1 of 2)

Field	Description
All Applids	lets you display statistics for all data streams optimized for all Applids by typing a non-blank character in this field
All LUs	lets you display statistics for all data streams optimized for all LUs by typing a non-blank character in this field
All Printers	lets you display statistics for all data streams optimized for all printers by typing a non-blank character in this field
Action	lets you specify an action that you want to perform on a table (list of LUs or Applids) Valid actions are as follows: • **A** to add a single or generic LU or Applid to a table • **D** to delete a single or generic LU or Applid from a table • **E** to edit a table
LU or Applid – Single	name of single or generic LU or Applid
LU or Applid – Table	name of table (list of LUs or Applids)
LUs Selected	number of LUs that were selected for optimization
Type of statistics to display – Input	lets you display statistics for inbound data streams only
Type of statistics to display - Output	lets you display statistics for outbound data streams only
Type of statistics to display – Total	lets you display statistics for both inbound and outbound data streams
LU	LU name associated with the statistics displayed on the panel
Data Streams – In	number of inbound data streams optimized that meet your selection criteria for statistics
Data Streams – Out	number of outbound data streams optimized that meet your selection criteria for statistics
Data Streams – Total	number of inbound and outbound data streams optimized that meet your selection criteria for statistics
Bytes Before – In	lengths of all inbound data streams before optimization
Bytes Before – Out	lengths of all outbound data streams before optimization
Bytes Before – Total	lengths of all inbound and outbound data streams before optimization
Bytes After – In	lengths of all inbound data streams after optimization
Bytes After – Out	lengths of all outbound data streams after optimization
Bytes After – Total	lengths of all inbound and outbound data streams after optimization
Bytes Reduced – In	total bytes by which all optimized inbound data streams were reduced
Bytes Reduced – Out	total bytes by which all optimized outbound data streams were reduced
Bytes Reduced – Total	total bytes by which all optimized data streams were reduced
Percent – In	percentage of reduction in the lengths of all inbound data streams after optimization

Table 10-4 TN3270 Optimization Statistics Panel Fields (Part 2 of 2)

Field	Description
Percent – Out	percentage of reduction in the lengths of all outbound data streams after optimization
Percent – Total	percentage of reduction in the lengths of all inbound and outbound data streams after optimization

Specifying the TN3270 Optimization Statistics Panel

Summary: In this task, you will specify how you want the statistics displayed for the TN3270 Optimization Statistics panel.

To select how statistics are displayed, perform the following steps:

Step 1 Perform one of the following steps:

- To select one of the following fields, type a non-blank character in the appropriate field. TN3270 Optimization statistics are displayed for the criteria that you specified on the panel.

  — **All LUs**
  — **All Applids**
  — **All Printers**

- Continue to Step 2.

Step 2 Perform one of the following steps:

- To use a single (or generic) LU or Applid, or a table (list of LUs or Applids), type the name in the appropriate field.

- Continue to Step 3.

Step 3 Perform one of the following steps:

- To select the **Input**, **Output**, or **Total** fields, type a non-blank character in the appropriate field.

- Continue to Step 4.

Step 4 Press **Enter**.

Chapter 11 Printing or Resetting of Statistics

This chapter describes how to print statistics displays and certain other panels and how to reset the accumulated values to zero. This chapter includes the following sections:

Overview

ULTRAOPT provides the following ways of printing the Monitor component panels or resetting the statistics:

- print statistics now
- print and reset statistics now
- print statistics at a user-specified interval
- print and reset statistics at a user-specified interval
- print statistics at Optimizer shutdown
- print and reset statistics at Optimizer shutdown

Note: The statistics print job appears in the JES output queue with the same name as the ULTRAOPT started task.

Panels That You Can Print

You can print the information that is displayed in the panels which are listed in Table 11-1.

Table 11-1 Panels That You Can Print (Part 1 of 2)

Panel	Option
ULTRAOPT Primary Menu	0
Optimization Control Menu	1.0.0
Global Optimization Control	1.1.1
Imaging	1.2.1
Input Suppression	1.2.2
Erase Input Key Allowed	1.2.3
SCS Printer Optimization	1.3.1
SCS Horizontal Tabs	1.3.2
PT Order Generation	1.3.3
SNA Data Compression	1.3.4
Local Format Storage	1.3.5
Field Merge	1.4.1
Blank Elimination	1.4.2
Non-Display Fields	1.4.3
Attribute Elimination	1.4.4
User Exits	1.5.1

Table 11-1 Panels That You Can Print (Part 2 of 2)

Panel	Option
Data Stream Statistics Menu	2.0.0
Summary of Data Streams Optimized	2.1.0
Data Streams Optimized by LU/Applid	2.2.0
Data Streams Excluded by Installation	2.3.0
Data Streams Excluded by Optimizer	2.4.0
Local Format Storage Summary	2.5.0
Data Streams Analysis Menu	3.0.0
Application Outbound Data Stream Errors	3.1.0
Hardware Inbound Data Stream Errors	3.2.0
User Installation Tables	4.1.0
Optimizer and Monitor Usage	4.2.0
CPU Wall-Clock Time	4.3.0
Response Time Monitor Menu	5.0.0
Global RTM Control	5.1.0
Application Response Time Statistics	5.2.0
Terminal Response Time Statistics	5.3.0
TN3270 Application Monitor Menu	6.0.0
TN3270 IPaddr/LU Mapping	6.1.0
TN3270 Response Time Statistics	6.2.0
TN3270 Application Correlation	6.3.0
TN3270 Optimization Statistics	6.4.0
User Installation Tables (Table Build)	n/a
Print or Reset Statistics (Print/Reset)	n/a

Statistics That You Can Reset

You can reset statistics that are displayed on the panels which are listed in Table 11-2.

Table 11-2 Statistics That You Can Reset

Panel	Option
Imaging	1.2.1
Summary of Data Streams Optimized	2.1.0
Data Streams Optimized by LU/Applid	2.2.0
Data Streams Excluded by Installation	2.3.0
Data Streams Excluded by Optimizer	2.4.0
Local Format Storage Summary	2.5.0
Application Outbound Data Stream Errors	3.1.0
Hardware Inbound Data Stream Errors	3.2.0
Optimizer and Monitor Usage	4.2.0
CPU Wall-Clock Time	4.3.0

Displaying the Print or Reset Statistics Panel

Summary: In this task, you will display the Print or Reset Statistics panel.

To display the Print or Reset Statistics panel, perform the following steps:

Step 1 Type **9** on the Primary Menu panel.

Step 2 Press **Enter** to display the Print or Reset Statistics (Print/Reset) panel (Figure 11-1).

Figure 11-1 Print or Reset Statistics Panel (Print/Reset)

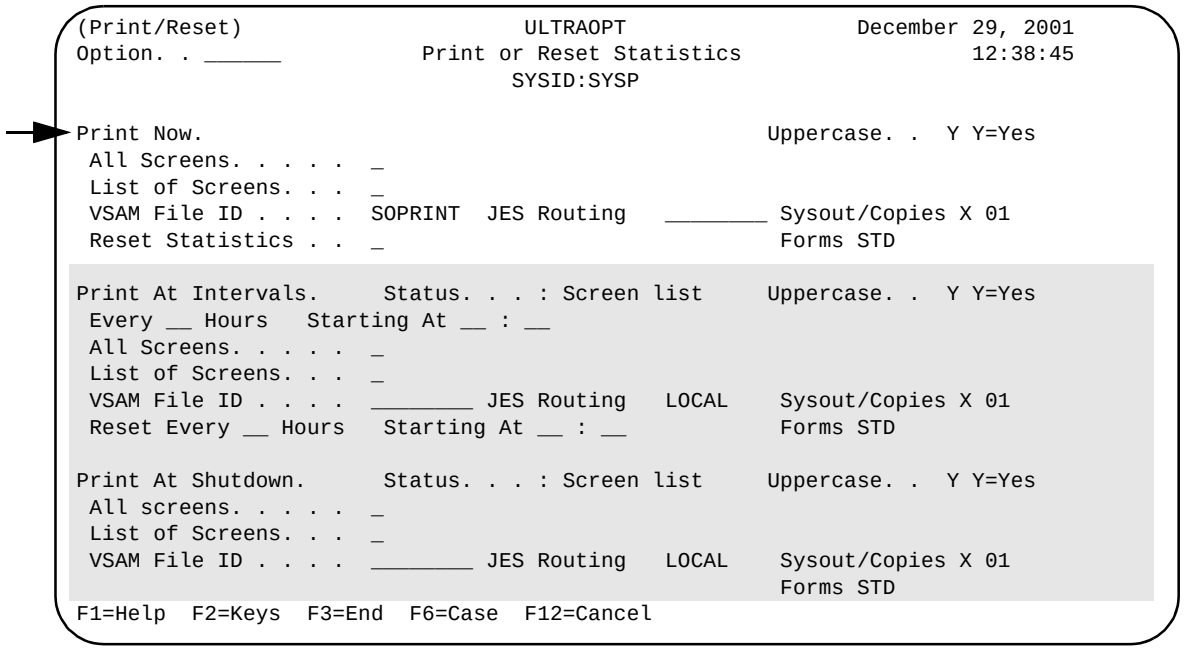


Table 11-3 describes the options that are provided by the Monitor to print and reset statistics immediately.

Table 11-3 Print Now Options

Field	Description
Uppercase	*Optional*. To print panels in uppercase only, type **Y** (for yes). The default in **N**.
All Screens	If you type any non-blank character in this field, all Monitor panels are printed as soon as you press **Enter** or transfer to another Monitor panel. The default is blank.
List of Screens	If you type any non-blank character in this field the List for Now panel (Figure 11-1 on page 11-5) is displayed. You can scroll through the list of Monitor panel titles and select only those panels that you want to print. The panels are printed when you return to the Print or Reset Statistics panel or select another Monitor panel. The default is blank.
VSAM File ID	If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name you started ULTRAOPT with, based on the print options you selected. If you specify a file, it should be the VSAM print file name you specified during installation.
JES Routing	The JES Routing ID assigned to your local or remote JES printer. If you use the keyword LOCAL, the output is sent to your local printer. The default is blank.
Sysout	A character that indicates your Sysout Class. The default is blank.
Copies	The number of copies you want to print (from 1 to 99). If this field is left blank, the default value of 1 is used.
Forms	The four-character form name. The default is your data center's default form name.
Reset Statistics	Lets you reset the statistics displayed on the Monitor panels immediately. If you have also requested that the Monitor panels be printed at this time, the statistics are reset after the printing is completed. The default is **N**.

Printing or Resetting Statistics Immediately

Summary: In this task, you will print or reset statistics immediately.

To print the Monitor panels and reset the statistics immediately, use the options shown in Table 11-3 on page 11-6 and perform the following steps:

Step 1 In the Print Now portion of the panel, type a non-blank character in the **All Screens** field or the **List of Screens** field.

Step 2 Choose one of the following options:

- Type **Y** to select uppercase character printing.
- Type **N** for mixed-case character printing.

Step 3 Type an appropriate value in each of the following fields:

- **VSAM File ID** (name of the VSAM print file)
- **JES Routing** (for your system)
- **Sysout** (for your system)
- **Copies** (number of copies to print)
- **Forms** (as appropriate for your system)

Step 4 To reset the statistics that are displayed by the Monitor component panels after you have printed them, type a non-blank character in the **Reset Statistics** field.

Step 5 Press **Enter**.

If you selected List of Screens, the List for Now panel (Figure 11-2 on page 11-8) is displayed.

Step 6 Type a non-blank character in the **Select the Screens to Print** field for each panel that you want to print.

You can press **F8** (or **F20**) to scroll down through the list and **F7** (or **F19**) to scroll up.

Step 7 To reset the statistics that are displayed by the Monitor panels after you have printed them, type a non-blank character in the **Reset Statistics** field.

Step 8 Press **F3** (or **F15**) or use the **Option** field to leave the List panel.

If no VSAM File ID is specified, the print job is sent to the JES output queue under the task name that you started ULTRAOPT with, based on the print options you selected. If you specify a file, it should be the VSAM print file name you specified during installation.

If you also elected to reset statistics, they are reset after the panels are printed. The panels are printed when you return to the Print/Reset panel or select another Monitor panel, using the **Option** field.

Figure 11-2 Print or Reset Statistics Panel (List for Now)

```
(List for Now)                    ULTRAOPT                    December 29, 2001
 Option. . ______           Print or Reset Statistics                12:39:04
                                   SYSID:SYSA

Select the screens to print.
  _    Primary Menu
  _    1.0  Optimization Control Menu
  _         1.1.1  Global Optimization
  _         1.2.1  Imaging
  _         1.2.2  Input Suppression
  _         1.2.3  Erase Input Key Allowed
  _         1.3.1  SCS Printer Optimization
  _         1.3.2  SCS Horizontal Tabs
  _         1.3.3  PT Order Generation
  _         1.3.4  SNA Data Compression
  _         1.3.5  Local Format Storage
  _         1.4.1  Field Merge
  _         1.4.2  Blank Elimination
  _         1.4.3  Non-Display Fields
  _         1.4.4  Attribute Elimination


F1=Help  F2=Keys  F3=End  F6=Case  F8=Scroll Down  F12=Cancel
```

You can log these statistics to SMF records, as described in “Writing Applid Statistics to SMF” on page 6-21. If you do, these values are reset each time they are written to an SMF record. Similarly, if you reset them here, the totals read for the next SMF record interval may not represent the entire interval.

Printing or Resetting Statistics at Intervals

Summary: In this task, you will print or reset statistics at intervals.

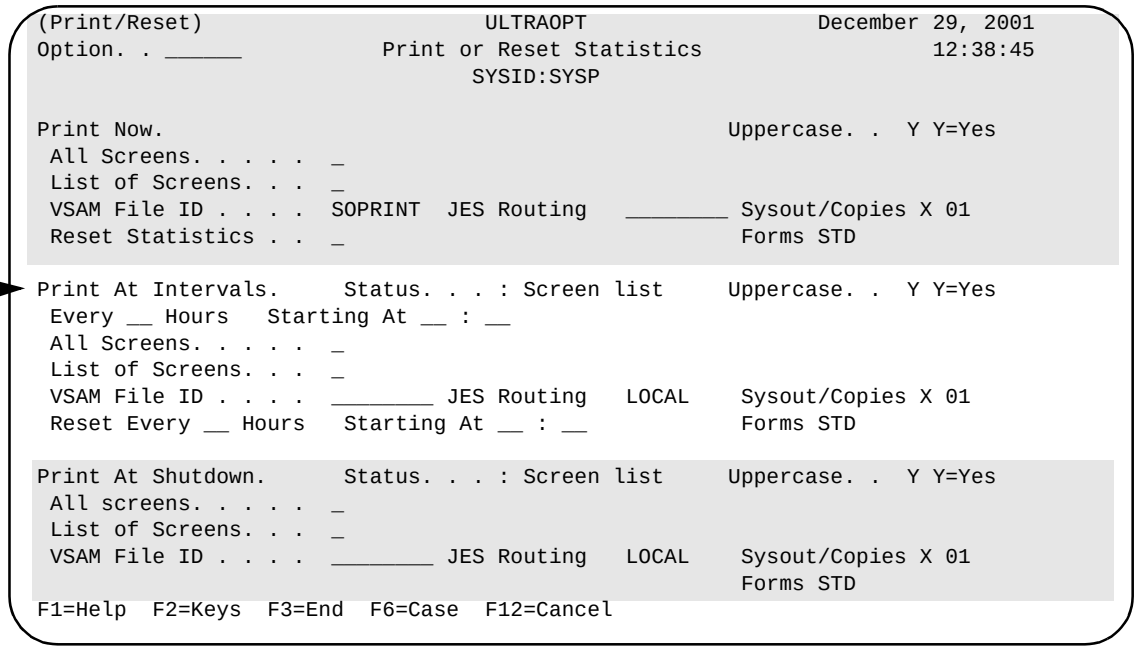
Before You Begin

This option lets you print all or selected statistics panels at specified time intervals. Access the Print or Reset Statistics Panel (Print/Reset) by performing the following steps:

Step 1 Type **9** on the Primary Menu panel.

Step 2 Press **Enter** to display the Print or Reset Statistics panel (Figure 11-3).

Figure 11-3 Print or Reset Statistics Panel (Print/Reset)



```
(Print/Reset)                      ULTRAOPT                  December 29, 2001
Option. . ______           Print or Reset Statistics                  12:38:45
                                  SYSID:SYSP

Print Now.                                              Uppercase. .  Y Y=Yes
 All Screens. . . . .  _
 List of Screens. . .  _
 VSAM File ID . . . .  SOPRINT  JES Routing   ________ Sysout/Copies X 01
 Reset Statistics . .  _                               Forms STD

Print At Intervals.     Status. . . : Screen list     Uppercase. .  Y Y=Yes
 Every __ Hours   Starting At __ : __
 All Screens. . . . .  _
 List of Screens. . .  _
 VSAM File ID . . . .  ________ JES Routing   LOCAL    Sysout/Copies X 01
 Reset Every __ Hours   Starting At __ : __            Forms STD

Print At Shutdown.      Status. . . : Screen list     Uppercase. .  Y Y=Yes
 All screens. . . . .  _
 List of Screens. . .  _
 VSAM File ID . . . .  ________ JES Routing   LOCAL    Sysout/Copies X 01
                                                       Forms STD
F1=Help  F2=Keys  F3=End  F6=Case  F12=Cancel
```

The options that are provided by the Monitor to print and reset statistics at a user-specified interval are shown in Table 11-4.

Table 11-4 Print At Intervals Options

Field	Description
Status	This field indicates whether this function is currently set to print/reset All screens. • **All Screens** (This function is currently set to print/reset all statistics screens.) • **Screen List** (This function is currently set to print/reset selected screens.)
Uppercase	*Optional*. To print panels in uppercase only, type **Y** (for yes). The default in **N**.
Print Every __ Hours	Lets you set the time interval for printing the Monitor panels. You can use any number from 1 to 99. The default is blank.
Print Starting At	Lets you specify when to start printing the Monitor panels and when to reset the statistics displayed on the Monitor panels. You can specify both the hour (0 to 23) and the minute (0 to 59). The default is blank.
All Screens	If you type any non-blank character in this field, all Monitor panels are printed as soon as you press **Enter** or transfer to another Monitor panel. The default is blank.
List of Screens	If you type any non-blank character in this field, the List for Now panel (Figure 11-1 on page 11-5) is displayed. You can scroll through the list of Monitor panel titles and select only those panels that you want to print. The panels are printed when you return to the Print or Reset Statistics panel or select another Monitor panel. The default is blank.
VSAM File ID	If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name you started ULTRAOPT with, based on the print options you selected. If you specify a file, it should be the VSAM print file name you specified during installation.
JES Routing	The JES Routing ID assigned to your local or remote JES printer. If you use the keyword **LOCAL**, the output is sent to your local printer. The default is blank.
Sysout	A character that indicates your Sysout Class. The default is blank.
Copies	The number of copies you want to print (from 1 to 99). If this field is left blank, the default value of one is used. The default is 1.
Forms	The four-character form name. If this field is left blank, your data center's default form name is used.
Reset Every __ Hours	Lets you set the time interval for resetting the statistics displayed on Monitor panels. You can use any number from 1 to 99. The default is N.
Reset Starting At	Lets you specify when to reset the statistics displayed on the Monitor panels.You can specify both the hour (0 to 23) and the minute (0 to 59). The default is blank.

To Print or Reset Statistics At Intervals

Step 1 In the Print At Interval portion of the panel, type a non-blank character in the **All Screens** field or the **List of Screens** field.

Step 2 Choose one of the following options:

- Type **Y** to select uppercase character printing.
- Type **N** for mixed-case character printing.

Step 3 Specify the interval you want to use for printing the panels. Type a number from 1 to 99 in the **Print Every __ Hours** field.

Step 4 Specify the time you want to start printing the panels. Type the hour (0 to 23) and the minutes (0 to 59) in the **Print Starting At** field.

Step 5 Type an appropriate value in each of the following fields:

- **VSAM File ID** (name of the VSAM print file)
- **JES Routing** (for your system)
- **Sysout** (for your system)
- **Copies** (number of copies to print)
- **Forms** (as appropriate for your system)

Step 6 To reset the statistics displayed by the Monitor component panels after you have printed them, type a non-blank character in the **Reset Statistics** field.

Step 7 Specify the interval you want to use for resetting the panels. Type a number from 1 to 99 in the **Reset Every __ Hours** field.

Step 8 Specify the time you want to start resetting the panels. Type the hour (0 to 23) and the minutes (0 to 59) in the **Reset Starting At** field.

Step 9 Press **Enter**.

If you selected List of Screens, the Print or Reset Statistics (List for At Intervals) panel is displayed (Figure 11-4).

Step 10 Type a non-blank character in the **Select the Screens to Print** field for each panel you want to print.

You can press **F8** or **F20** to scroll down and **F7** or **F19** to scroll up.

Step 11 Press **F3** (or **F15**) or use the **Option** field to leave the List panel.

Figure 11-4 Print or Reset Statistics Panel (List for At Intervals)

```
(List for At Intervals)          ULTRAOPT                    December 29, 2001
Option. . ______           Print or Reset Statistics                12:39:04
                                 SYSID:SYSA

Select the screens to print.
  _    Primary Menu
  _    1.0  Optimization Control Menu
  _         1.1.1  Global Optimization
  _         1.2.1  Imaging
  _         1.2.2  Input Suppression
  _         1.2.3  Erase Input Key Allowed
  _         1.3.1  SCS Printer Optimization
  _         1.3.2  SCS Horizontal Tabs
  _         1.3.3  PT Order Generation
  _         1.3.4  SNA Data Compression
  _         1.3.5  Local Format Storage
  _         1.4.1  Field Merge
  _         1.4.2  Blank Elimination
  _         1.4.3  Non-Display Fields
  _         1.4.4  Attribute Elimination


F1=Help  F2=Keys  F3=End  F6=Case  F8=Scroll Down  F12=Cancel
```

If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name that you started ULTRAOPT with, based on the print options that you selected. If you specify a file, it should be the VSAM print file name you specified during installation.

If you also elected to reset statistics, they are reset when the panels are printed. The panels are printed when you return to the Print/Reset panel or select another Monitor panel, using the **Option** field.

Note: Print at Interval produces output only if the statistics have changed since the product was started or the most recent interval, whichever came later.

You can log these statistics to SMF records, as described in “Writing Applid Statistics to SMF” on page 6-21. However, you should not be logging SMF records while printing or resetting statistics. If you are, statistics are being reset by both functions, and neither this panel nor the SMF records will accurately reflect activity on your system.

Printing Statistics at Shutdown

Summary: In this task, you will print all or selected statistics panels when you shut down the ULTRAOPT subsystem.

Before You Begin

To print all or selected statistics panels when you shut down the ULTRAOPT subsystem, access the Print or Reset Statistics Panel (Print/Reset) by performing the following steps:

Step 1 Type **9** on the Primary Menu panel.

Step 2 Press **Enter** to display the Print or Reset Statistics panel (Figure 11-5).

Figure 11-5 Print or Reset Statistics Panel (Print/Reset)

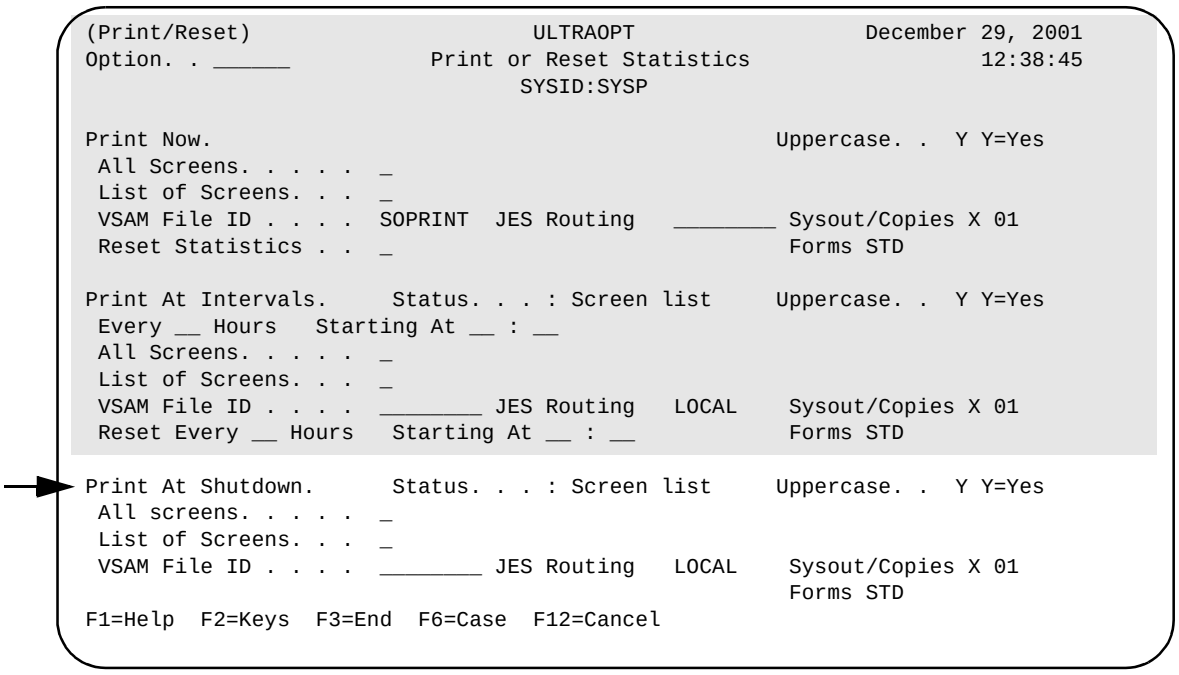


Table 11-5 describes the options that are provided by the Monitor to print statistics at Optimizer shutdown.

Table 11-5 Print At Shutdown Options

Field	Description
Status	This field indicates whether this function is currently set to print/reset all screens. • **All Screens** means this function is set to print/reset all statistics screens. • **Screen List** means this function is set to print/reset selected screens.
Uppercase	*Optional*. To print panels in uppercase only, type **Y** (for yes). The default in **N** (for no).
All Screens	If you type any non-blank character in this field, all Monitor panels are printed as soon as you press **Enter** or transfer to another Monitor panel. The default is blank.
List of Screens	If you type any non-blank character in this field, the List for Now panel (Figure 11-1 on page 11-5) is displayed. You can scroll through the list of Monitor panel titles and select only those panels that you want to print. The panels are printed when you return to the Print or Reset Statistics panel or select another Monitor panel. The default is blank.
VSAM File ID	If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name you started ULTRAOPT with, based on the print options you selected. If you specify a file, it should be the VSAM print file name you specified during installation.
JES Routing	The JES Routing ID assigned to your local or remote JES printer. If you use the keyword LOCAL, the output is sent to your local printer. The default is blank.
Sysout	A character that indicates your Sysout Class. The default is blank.
Copies	The number of copies you want to print (from 1 to 99). If this field is left blank, the default value of 1 is used.
Forms	The four-character form name. The default is your data center's default form name.

To Print At Shutdown

To print Monitor panels when the Optimizer is shut down (statistics are *always* reset at shutdown), perform the following steps:

Step 1 In the Print At Shutdown portion of the panel, type a non-blank character in the **All Screens** field or the **List of Screens** field.

Step 2 Choose one of the following options:

- Type **Y** to select uppercase character printing.
- Type **N** for mixed-case character printing.

Step 3 Type an appropriate value in each of the following fields:

- **VSAM File ID** (name of the VSAM print file)
- **JES Routing** (for your system)
- **Sysout** (for your system)
- **Copies** (number of copies to print)
- **Forms** (as appropriate for your system)

Step 4 Press **Enter**.

If you selected List of Screens, the Print or Reset Statistics (List for At Shutdown) panel is displayed (Figure 11-6).

Figure 11-6 Print or Reset Statistics Panel (List for At Shutdown)

```
 (List for At Shutdown)            ULTRAOPT                    December 29, 2001
 Option. . ______           Print or Reset Statistics                  12:39:04
                                   SYSID:SYSA

Select the screens to print.
  _    Primary Menu
  _    1.0  Optimization Control Menu
  _         1.1.1  Global Optimization
  _         1.2.1  Imaging
  _         1.2.2  Input Suppression
  _         1.2.3  Erase Input Key Allowed
  _         1.3.1  SCS Printer Optimization
  _         1.3.2  SCS Horizontal Tabs
  _         1.3.3  PT Order Generation
  _         1.3.4  SNA Data Compression
  _         1.3.5  Local Format Storage
  _         1.4.1  Field Merge
  _         1.4.2  Blank Elimination
  _         1.4.3  Non-Display Fields
  _         1.4.4  Attribute Elimination


F1=Help  F2=Keys  F3=End  F6=Case  F8=Scroll Down  F12=Cancel
BMC7100I Print/Reset Statistics options set/changed
```

Step 5 Type a non-blank character in the **Select the Screens to Print** field for each panel you want to print.

Tip: You can press **F8** (or **F20**) to scroll down and **F7** (or **F19**) to scroll up.

Statistics are reset when the panels are printed.

Step 6 To leave the List panel, press **F3** (or **F15**) or use the **Option** field.

The panels are printed when you return to the Print/Reset panel or select another Monitor component panel, using the **Option** field.

Note: Statistics are reset automatically when the Optimizer component is shut down.

If the **VSAM File ID** field is blank, the print job is sent to the JES output queue under the task name that you started ULTRAOPT with, based on the print options that you selected. If you specify a file, it should be the VSAM print file name you specified during installation.

If you also elected to reset statistics, they are reset when the panels are printed. The panels are printed when you return to the Print/Reset panel or select another Monitor component panel, using the **Option** field.

General Notes for Print or Reset Statistics

The following items apply to the printing and resetting of statistics:

- Panels are not printed if your terminal screen is cleared.
- To print the VSAM print file, perform one of the following tasks:
  - — Use IDCAMS to PRINT directly or REPRO to a sequential data set for formatting. The LRECL is 3440 bytes.
  - — Use the batch program, SOPBPRT, as described in Chapter 12, “Batch Utilities.”
- The Print/Reset request is not effective until you press **Enter**, **F3**, or **F20**.
- If you do not want to print the panels that you selected, press **F12** (or **F24**). Your selections will be canceled.
- If you selected the Print at Shutdown option, statistics are reset automatically when the Optimizer component is shut down.

Chapter 12 Batch Utilities

This chapter describes the batch programs that you can use for setting options in your ULTRAOPT options files and for printing the print file.

The sections in this chapter are as follows:

Overview

BMC Software provides batch programs to set options in your ULTRAOPT options files and to print the print file.

Set Options Program (SOPBSET)

To change the Monitor options *before* the Optimizer component is started, use the batch Set Options (SOPBSET) program. This program changes the options in the SOPOPT options file according to the parameters specified in your batch JCL. To review an enhanced version of the Set Options program, see “Enhanced Set Options Program (SOPMSET)” on page 12-5.

Note: The Optimizer component must be shut down when you execute the Set Options program. The Optimizer component only reads the options file when it starts and writes that information back (overwriting any Set Options program changes) at shutdown.

Table 12-1 lists the Set Options that can be changed.

Table 12-1 Set Options That You Can Change

Option	Description
1.1	Global Optimization for CRTs (on or off)
	Global Optimization for printers (on or off)
1.2	Imaging for CRTs (on or off)
	Imaging for printers (on or off)
	Input Suppression (on or off)
	Erase Input Key Allowed (on or off)
1.3	SCS Printer Optimization (on or off)
not available from Monitor component	display the Monitor panels in uppercase characters or in mixed-case characters This instruction does not apply to the CAPS ON/OFF F key, which affects the data that a terminal operator enters.

JCL to Execute SOPBSET

Sample JCL to execute the Set Options program is shown in Figure 12-1 on page 12-4. To set the options use the parameters that are listed in Table 12-2 as the SYSIN input. For information about creating an options file, see the *ULTRAOPT Customization Guide*.

Table 12-2 SOPBSET Parameters

Parameter Name	Description
PASSWORD=*password*	If the Monitor uses password checking, supply that password here to authorize any updates by this job.
BUFFER WRAP *on/off*	**BUFFER WRAP ON** means that the device must handle data streams that wrap past the end of the buffer back to the beginning of the buffer. This is the default and improves optimization slightly over Buffer Wrap **OFF**. The default is **ON**. **BUFFER WRAP OFF** forces the screen to paint from the origin of the buffer and reduces optimization slightly. Buffer Wrap **OFF** assumes the device will not handle data streams that wrap back to the origin; so when necessary, an additional set buffer address (SBA) is generated.
DISPLAY *case*	The Display option controls how panels are displayed. **DISPLAY UPPERCASE** folds all characters on the panel to uppercase. **DISPLAY UPPER/LOWER** leaves all characters as uppercase or lowercase. This option does not affect text as it is typed (for that, use **F6** in the Monitor). The default is **DISPLAY UPPER/LOWER**.
ENHANCE READB *on/off*	When this option is **ENHANCE READB ON**, it provides better optimization. The result of Read Buffer operations may not be exactly correct if there is doubt about whether something has been changed. Doubt can be introduced by things such as short read AIDs (PA1, PA3, light-pen AID) or embedded nulls in inbound fields. When this option is **ENHANCE READB OFF** (the default), there is slightly less optimization; but the Read Buffer operation is exact. The default is **ENHANCE READB OFF**.
ERASE INPUT *yes/no*	If this option is **ERASE INPUT YES,** it allows as much Input Suppression optimization as possible. If input suppression is turned off, Erase Input Key Allowed optimization cannot be used. The default is **ERASE INPUT NO**.
IMAGING *on/off* CRTS	This option is used to control the optimization of all data streams sent to CRTs. The default is **IMAGING ON CRTS**.
IMAGING *on/off* PRTS	This option is used to control the optimization of all data streams sent to printers. The default is **IMAGING ON PRTS**.
INPUT *on/off*	Input Suppression optimization removes unnecessary data and control characters from the data stream transmitted from a terminal to your host application. The default is **INPUT ON**.
PRINT INIT=*ddname*	This option simply sets the DD name for the SOPRINT VSAM print options file. The default is the SOPPRINT DDNAME.
OPTIMIZER *on/off* CRTS	This option controls global optimization for all CRTs. The default is **OPTIMIZER ON CRTS**.
OPTIMIZER *on/off* PRTS	This option controls global optimization for all printers. The default is **OPTIMIZER ON PRTS**.
SCS *on/off*	This option specifies whether to optimize SCS printers. The default is **SCS ON**.

If you have set a password, you must use the PASSWORD parameter for the options to be changed. Figure 12-1 shows sample JCL to execute the Set Options program.

Figure 12-1 Sample JCL to Execute SOPBSET

```
//SETOPT   EXEC PGM=SOPBSET
//*
//STEPLIB   DD DSN=hilevel.BBLINK,DISP=SHR
//*
//SOPOPT    DD DSN=hilevel.SOPOPT,DISP=SHR   <==== SOPOPT VSAM FILE
//*SOPPRINT DD DSN=hilevel.SOPRINT,DISP=SHR  <==== Uncomment this statement
//*                                            if you are using the
//*                                            PRINT INIT=xxxxxxxx option.
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
PASSWORD=xxxxxxxx      <==== Current password.
PRINT INIT=SOPPRINT
SCS OFF
//*
```

Default Options

If you previously changed the options and you would like to set the options back to the defaults, run the Set Options program with the DEFAULT OPTIONS parameter as the SYSIN input.

Figure 12-2 shows sample JCL.

Figure 12-2 Sample JCL to Set SOPBSET Default Options

```
//SETOPT   EXEC PGM=SOPBSET
//*
//STEPLIB   DD DSN=hilevel.BBLINK,DISP=SHR
//*
//SOPOPT    DD DSN=hilevel.SOPOPT,DISP=SHR   <==== SOPOPT VSAM FILE
//*SOPPRINT DD DSN=hilevel.SOPRINT,DISP=SHR  <==== Uncomment this statement
//*                                            if you are using the
//*                                            PRINT INIT=xxxxxxxx option.
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
PASSWORD=xxxxxxxx      <==== Current password.
DEFAULT OPTIONS
//*
```

Note: If you are starting ULTRAOPT for the first time, the Monitor component displays the default options automatically. It is *not necessary* to run this program with the DEFAULT OPTIONS parameter before startup.

Enhanced Set Options Program (SOPMSET)

To add tables in batch mode, connect a table to an optimization option, or set optimization options which were previously set with the Monitor component, you can use the enhanced Set Options program, SOPMSET. This program is an enhanced version of the batch Set Options program, SOPBSET.

Note: Shut down the Optimizer component before executing any Set Options program. The Optimizer component reads the options file only when it starts and writes that information back (overwriting any Set Options program changes) at shutdown.

The following tasks can be performed in batch mode with SOPMSET:

- adding an Applid or LU table
- connecting a table to an optimization option
- setting optimization options

Section Header Keywords

Valid section headers for this program are described in Table 12-3.

Table 12-3 SOPMSET Section Header Keywords

Section Header	Description
<OPTION>	Manipulates most options available through Monitor panels
<APPL_TABLE>	Adds an application table
<LUNAME_TABLE>	Adds an LU table
<CONNECT>	Activates a table for an optimization option

Tables

The syntax for adding tables is as follows:

```
<APPL_TABLE | LUNAME_TABLE>
tablename=(xxxxxxxx,xxxxxxxx,xxxxxxxx,...)
      - or -
tablename=*ddname
```

To designate a table, you *must* specify the section header <APPL_TABLE> or <LUNAME_TABLE>. The next statement, tablename=(*xxxxxxxx*,*xxxxxxxx*,*xxxxxxx*,...) defines the table to be added. The entries for the table are enclosed in parentheses.

You can also specify table entries with a DDNAME. An asterisk (*) must precede the DDNAME. Each entry in the file for DDNAME must be separated by commas.

To continue a line of input data for table entries, use a comma at the end of the line, followed by a null or a blank, as in the following example:

```
<APPL_TABLE>
BMCTAB2=(A001,
         A002,
         A003,
         .... )
```

SOPMSET loads the table entries exactly as specified. If the entry contains a blank, it is loaded with the blank character intact. For example, in the entries, 1234, 5678, the second entry contains a leading blank.

Tables Connected to an Optimization Option

The <CONNECT> section connects a table to an optimization option. The CONNECT statements must include the table name. The table name can be a table just created in the batch job or one that already exists in the options file. Valid syntax for this section is as follows:

```
function option table=xxxxxxxx
```

function is INCLUDE|EXCLUDE. *option* is one of the following options:

- GLOBAL
- IMAGING
- INPUT SUPPRESSION
- ERASE INPUT ALLOWED
- SNA COMPRESSION
- SCS HORIZ TAB
- FIELD MERGE (use with EXCLUDE only)
- BLANK ELIMINATION (use with EXCLUDE only)
- NON DISPLAY (use with EXCLUDE only)
- ATTRIBUTE ELIMINATION (use with EXCLUDE only)
- PT ORDER GENERATION
- SCS ALT LINE LENGTH (use with INCLUDE only)

table is APPL|LUNAME. *xxxxxxxx* is the name of the table.

Following are some examples of valid syntax in the CONNECT statement:

```
<CONNECT>
INCLUDE GLOBAL APPL=xxxxxxxx
EXCLUDE GLOBAL LUNAME=xxxxxxxx
INCLUDE ERASE INPUT ALLOWED LUNAME=xxxxxxxx
EXCLUDE PT ORDER GENERATION APPL=xxxxxxxx
```

Optimization Options

SOPMSET lets you set optimization options that formerly had to be set through the Monitor. Table 12-4 lists the existing Monitor panel options and the corresponding batch options that are available. Use the section header <OPTION> to specify any of the options in Table 12-4.

Note: If you do not specify an option on a control card, it remains unchanged.

Table 12-4 SOPMSET Control Statement Syntax

Monitor Panel	Batch Control Statement Syntax
Initialization Options	NETnamE=ON|OFF
1.1.1	GLOBAL CRTS=ON|OFF GLOBAL PRTS=ON|OFF
1.2.1, 1.2.2, 1.2.3	IMAGING CRTS=ON|OFF IMAGING PRTS=ON|OFF INPUT SUPPRESSION=ON|OFF ERASE INPUT KEY ALLOWED=YES|NO
1.3.1, 1.3.2, 1.3.3, 1.3.4	GLOBAL SCS=ON|OFF SCS HORIZONTAL TABS=ON|OFF PT ORDER GENERATION=ON|OFF SNA DATA COMPRESSION=ON|OFF
1.4.1, 1.4.2, 1.4.3, 1.4.4	FIELD MERGE CRTS=ON|OFF FIELD MERGE PRTS=ON|OFF BLANK ELIMINATION CRTS=ON|OFF BLANK ELIMINATION PRTS=ON|OFF NON DISPLAY CRTS=ON|OFF NON DISPLAY PRTS=ON|OFF ATTRIBUTE ELIMINATION=ON|OFF
1.5.1	INBOUND USER EXIT BEFORE=*xxxxxxxx* INBOUND USER EXIT AFTER=*xxxxxxxx* OUTBOUND USER EXIT BEFORE=*xxxxxxxx* OUTBOUND USER EXIT AFTER=*xxxxxxxx*

JCL to Execute SOPMSET

Figure 12-3 shows sample JCL to execute the enhanced Set Options program. For information about creating an options file, see the *ULTRAOPT Customization Guide*.

Figure 12-3 Sample JCL to Execute SOPMSET

```
//BMCJOB  JOB (ACCT),'NAME',MSGCLASS=X,CLASS=Q,REGION=1M,NOTIFY=USERID
//*
//This is a batch job to update or list current options of the
//Ultraopt options file indicated on the SOPOPT DD card below.
//Input can come from inline SYSIN cards or from an external file
//Output can be written to SYSOUT or to an external file.
//*
//The DD names below are required.  Customize the data set names as
//necessary, choosing either to use inline SYSIN and writing to
//SYSOUT (as is the case below), or to input from and output to
//external files (currently commented out).
//*
//STEP1     EXEC PGM=SOPMSET
//STEPLIB   DD DSN=hilevel.BBLINK,DISP=SHR              <<< your loadlib
//SOPOPT    DD DSN=hilevel.SOPOPT,DISP=SHR            <<< your opt'n file
//SYSPRINT  DD SYSOUT=*
//SYSTERM   DD SYSOUT=*
//SYSUDUMP  DD SYSOUT=*
//*DIRLIST  DD DSN=YOUR.PDS(OUTPUT1),DISP=SHR     <<< output to file
//DIRLIST   DD SYSOUT=*                           <<< output to sysout
//*SYSIN    DD DSN=YOUR.PDS(INPUT1),DISP=SHR      <<< input from file
//SYSIN DD *                                      <<< input from job
<OPTION>                                          <<< required
LIST TABLE=*ALL*                                  <<< customize
//
```

Batch Print Program (SOPBPRT)

To print the panel data and single data stream trace entries that are routed to the SOPRINT VSAM file, use the batch Print (SOPBPRT) program.

Data is routed to this file by the print options that are displayed on the following panels:

- panel 3.4 - Wraparound Data Stream Trace
- panel 9 - Print or Reset Statistics

This program prints one Monitor component panel per page by adding ASCII carriage-control characters to the records. The DD card for the SYSOUT file must reflect the ASCII character format (RECFM) for your printer.

Figure 12-4 shows sample JCL to execute SOPBPRT.

Figure 12-4 Sample JCL to Execute SOPBPRT

```
//BPRT    EXEC PGM=SOPBPRT
//STEPLIB  DD DSN=HILEVEL.BBLINK,DISP=SHR
//SOPRINT  DD DSN=HILEVEL.SOPRINT,DISP=SHR
//PRINTER  DD SYSOUT=A,DCB=RECFM=FA
```

You can reset the SOPRINT file if it was allocated with the REUSE attribute instead of UNIQUE. You reset it by submitting sample JCL member SOPBPRT and adding PARM=RESET to the SOPBPRT program call.

When you use the RESET parameter with SOPBPRT, the file is cleared instead of printed. If you attempt a RESET and the VSAM file was not allocated with the REUSE attribute, the RESET does not occur and produces return code 04.

You can perform a RESET while ULTRAOPT is active.

Rename and Switch VSAM Options Files Program (SOPJOPTN)

Changing the name of an options file involves creating a new file, copying the information from the old one to the new one, then deleting the old one. To build the File Definition Table (FDT), these files must always be created by using BMC Software batch programs; *do not use* IDCAMS alone. If you have the Storage Management Subsystem (SMS), you may need to edit these jobs to satisfy certain SMS requirements.

Switching options files is done by creating a new FDT.

New Options File

The JCL to create a VSAM file and its associated FDT is shown in Figure 12-5 on page 12-12. This JCL is in *hilevel*.BBSAMP(SOPJOPTN). The DDNAME of this file (shown in bold type) *must* be SOPOPT, but the cluster name can be anything you want.

Before you run this job, change the following JCL statements:

- job card information
- SMF system ID
- APF authorized library where this option file will reside
- disk unit name
- volume serial
- VSAM cluster, data file, and catalog names

Make the appropriate changes, and submit the job.

Figure 12-5 shows the JCL required to create a VSAM file and its associated FDT.

Figure 12-5 JCL to Create an Options File

```
//SOPOPT  JOB ,'CREATE VSAM FILE'
//*
//*
//*  NOTE:  SYSA IS THE SMFID PARAMETER FOR YOUR MVS SYSTEM
//*           IT IS SPECIFIED VIA SYS1.PARMLIB(SMFPRMXX)
//*           TYPICALLY, IT IS SET TO SYSA|SYSB|SYSC ... ETC.
//*
//*           THIS IS USED TO IDENTIFY THE OPTIONS FILE FOR EACH
//*           MVS HOST THAT ULTRAOPT RUNS ON.
//*
//*
//VOPT   EXEC PGM=SOPBAMS,PARM='SYSID=SYSA'      <== SMF SYSID
//*
//STEPLIB  DD DSN=hilevel.BBLINK,                 <== SYSTEM APF LIB
//            DISP=SHR
//AUTHLIB  DD DSN=hilevel.BBLINK,                 <== SYSTEM APF LIB
//            DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SOPOPT   DD DISP=SHR,
//            UNIT=UNIT,                          <== ENTER UNIT
//            VOL=SER=VVVVVV                      <== ENTER VOL SER
//*-------------------------------------------------------------------*
//*    SPECIFY THE VOL SER AND THE USER CATALOG.                      *
//*    THE DATA SET NAMES MAY BE CHANGED.                             *
//*-------------------------------------------------------------------*
//SYSIN    DD *
       DELETE hilevel.SOPOPT CLUSTER -            <== OPTIONS FILE NAME
              CAT(USERCATALOGNAME)            <== USER CATALOG NAME
       DEFINE CLUSTER (NAME(hilevel.SOPOPT) -     <== OPTIONS FILE NAME
              VOLUMES(VVVVVV) -                   <== ENTER VOL SER
              FILE(SOPOPT) -
              RECORDS(10,5) -
              NUMBERED -
              UNIQUE-
              RECORDSIZE(4084,4084)) -
              CAT(USERCATALOGNAME) -           <== USER CATALOG NAME
              DATA (NAME(hilevel.OPTDATA))        <== DATA FILE NAME
```

Old Options File

Copy your old VSAM file into the new one by using the sample JCL that is provided in member SOPREPRO in the *hilevel*.BBSAMP data set. Figure 12-6 shows sample JCL for copying an options file.

Figure 12-6 Sample JCL to Copy an Options File

```
//* THIS JOB CAN BE USED TO RENAME THE ULTRAOPT VSAM
//* FILE (SOPOPT OR SOPRINT).
//JOBNAME  JOB (9999),'ULTRAOPT REPRO',MSGCLASS=A,CLASS=A
//COPY1    EXEC PGM=IDCAMS
//FROM1    DD DSN=hilevel.from.dataset,DISP=SHR
//TO1      DD DSN=hilevel.to.dataset,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
REPRO INFILE(FROM1) OUTFILE(TO1) REPLACE
DELETE **OLDFILENAME** CLUSTER -
       CAT (USERCATALOGNAME)
```

The DELETE statement is optional; you do not need to use it unless you want to delete the old options file.

Change *hilevel.from.dataset* and *hilevel.to.dataset* to the correct high-level qualifier for your source and destination options files, respectively.

Different Options File

Switching to a different options file is useful if you must create a number of FDTs at a central location, for example, and ship them to remote sites where personnel are not permitted to update the ULTRAOPT load library.

The JCL to specify a different VSAM file (without creating it) and its associated FDT is shown in Figure 12-7 on page 12-14. The base JCL is in *hilevel*.BBSAMP(SOPJOPTN). The DDNAME of this file (shown in bold type) *must* be SOPOPT, but the cluster name can be anything you want.

This is the same job as shown in Figure 12-5 on page 12-12, except that you must add the NOIDCAMS startup parameter so that the VSAM file name is specified in the FDT but the file is not created. When using NOIDCAMS, the SMF specified must be four characters.

Before you run this job, change the following JCL statements:

- job card information
- SMF system ID
- APF authorized library where this option file will reside
- disk unit name
- volume serial
- VSAM cluster, data file, and catalog names
- add NOIDCAMS parameter

Make the appropriate changes, and submit the job.

Note: You must restart ULTRAOPT for the new FDT to take effect.

The JCL to specify a different VSAM file (without creating it) and its associated FDT is shown in Figure 12-7.

Figure 12-7 JCL to Create an FDT

```
//SOPOPT  JOB ,'CREATE VSAM FILE'
//*
//*
//*  NOTE:  SYSA IS THE SMFID PARAMETER FOR YOUR MVS SYSTEM
//*           IT IS SPECIFIED VIA SYS1.PARMLIB(SMFPRMXX)
//*           TYPICALLY, IT IS SET TO SYSA|SYSB|SYSC ... ETC.
//*
//*           THIS IS USED TO IDENTIFY THE OPTIONS FILE FOR EACH
//*           MVS HOST THAT ULTRAOPT RUNS ON.
//*
//*
//VOPT   EXEC PGM=SOPBAMS,PARM='SYSID=SYSA,NOIDCAMS' <== SMF SYSID
//*
//STEPLIB  DD DSN=hilevel.BBLINK,                 <== SYSTEM APF LIB
//            DISP=SHR
//AUTHLIB  DD DSN=hilevel.BBLINK,                 <== SYSTEM APF LIB
//            DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SOPOPT   DD DISP=SHR,
//            UNIT=UNIT,                         <== ENTER UNIT
//            VOL=SER=VVVVVV                     <== ENTER VOL SER
//*-------------------------------------------------------------------*
//*    SPECIFY THE VOL SER AND THE USER CATALOG.                      *
//*    THE DATA SET NAMES MAY BE CHANGED.                             *
//*-------------------------------------------------------------------*
//SYSIN    DD *
       DELETE hilevel.SOPOPT CLUSTER -            <== OPTIONS FILE NAME
              CAT(USERCATALOGNAME)             <== USER CATALOG NAME
       DEFINE CLUSTER (NAME(hilevel.SOPOPT) -     <== OPTIONS FILE NAME
              VOLUMES(VVVVVV) -                   <== ENTER VOL SER
              FILE(SOPOPT) -
              RECORDS(10,5) -
              NUMBERED -
              UNIQUE-
              RECORDSIZE(4084,4084)) -
              CAT(USERCATALOGNAME) -           <== USER CATALOG NAME
              DATA (NAME(hilevel.OPTDATA))        <== DATA FILE NAME
```

Check ULTRAOPT Status Program (SOPISUP)

If you need a batch step to determine whether ULTRAOPT is active and ready to intercept applications, use the SOPISUP utility. You can ensure that ULTRAOPT is ready to intercept the ACB by adding this program to the jobstream of applications to be optimized.

SOPISUP returns the following condition codes:

0 ULTRAOPT is ready to intercept (corresponds to ACT/Ready to int or ACT/Intercepting in the Monitor).

non-zero
ULTRAOPT is not ready to intercept.

By coding jobsteps to execute conditionally based on the condition code, you can prevent an application's complete initialization if ULTRAOPT is not active. These operations can correct the situation at application startup rather than discovering this condition after users have begun logging on to the application.

Note: SOPISUP will return a condition code of zero if ULTRAOPT has fully initialized, even if the NOINT startup parameter has been coded.

JCL to execute this utility may be found in *hilevel*.BBSAMP (SOPISUP). Figure 12-8 shows sample JCL for executing SOPISUP.

Figure 12-8 Sample JCL to Execute SOPISUP

```
//SOPISUP JOB (xxxx),'your name',CLASS=A,MSGCLASS=X
//*
//THIS JOB WILL RETURN A RETURN CODE = 0 IF ULTRAOPT IS ACTIVE AND
//READY TO INTERCEPT OTHERWISE IT WILL RETURN A NON-ZERO RETURN CODE.
//*
//STEP1 EXEC PGM=SOPISUP
//*
//STEPLIB DD DSN=hilevel.BBLINK,DISP=SHR
//*
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//
```

Count VTAM Sessions Program (SOPSESCT)

The Session Counter Utility (SOPSESCT) is a batch utility that helps ensure you are using ULTRAOPT to its fullest potential at your data center. At specified intervals, SOPSESCT reports the following information:

- number of concurrent VTAM applications and sessions to assist you with an appropriate session/tier licensing decision, whether you are a first-time customer or considering an upgrading
- number of optimized, unoptimized, and total intercepted sessions to assist you with include/exclude decisions for optimization
- amount of used and free ECSA to assist you with resource planning for ECSA (common storage) and XPVT (private storage)

SOPSESCT periodically scans VTAM to provide a snapshot of that moment's activity. After the last iteration, SOPSESCT outputs a summary of the active applications and sessions.

Note: ULTRAOPT does not have to be installed on your system to run this utility. If ULTRAOPT is not installed, the utility reports everything except the number of optimized, unoptimized, and intercepted sessions.

When running VTAM 4.3 or later, the maximum number of Applids that are used in the SOPSESCT count is 8000.

Before You Begin

Before you run the utility, perform the following steps:

Step 1 Create a VTAM APPLID definition for use by the utility. A sample is provided in the following places:

- SOPAPPL member that you copied to SYS1.VTAMLST while installing the product
- comments section of the SOPSESCT JCL

Step 2 Determine the timer interval in minutes and number of snapshots for which you would like to collect data. The interval and number of snapshots determine the length of the run.

Note: You can unload the SOPSESCT utility from the product tape without unloading the entire ULTRAOPT product. For more information, see "JCL for the Session Counter Utility."

JCL for the Session Counter Utility

When you have created the APPLID definition, customize the sample JCL that is provided in *hilevel*.BBSAMP(SOPSESCT). Figure 12-9 shows the sample JCL.

Figure 12-9 Sample JCL to Execute SOPSESCT

```
//SOPSESCT JOB (xxxx),'your name',CLASS=A,MSGCLASS=X,NOTIFY=USERID
//*************************************************************
//*
//THIS SAMPLE JCL MAY BE USED TO START THE BMC SESSION COUNTER
//*
//*************************************************************
//*
//ACTIVATE VTAM APPL DEFINITION
//*
//VTAMACT EXEC PGM=IEFBR14,ACCT=(xxxx)
// V NET,ID=BMCAPPL,ACT,SCOPE=ALL
//*
//*
//* RUN PROGRAM
//*
//STEP1 EXEC PGM=SOPSESCT,PARM='A=BMCAP,I=30,N=48'
//STEPLIB DD DSN=hilevel.BBLINK,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//
```

Submit the JCL for processing by executing the following TSO command from an APF-authorized library:

```
SUBMIT 'hilevel.BBSAMP(SOPSESCT)'
```

Table 12-5 describes the Session Counter Utility parameters.

Table 12-5 Session Counter Utility Parameters

Parameter Name	Description
ID=*APPLID*	*APPLID* is the ACB name defined for this job
I=*mm*	*mm* is the interval (number of minutes) between snapshots from 1 to 99
N=*nn*	*nn* is the number of snapshots to be taken from 1 to 99

Note: BMC Software recommends that this utility be run for a complete processing day to illustrate peak and slack usage periods.

When the Utility Is Complete

Data from all snapshots is reported to the SYSPRINT data set. Each snapshot is marked with a time-stamp. The data summary is output at job termination (see Figure 12-10). This output lists the following information:

- total optimized and unoptimized sessions if you are running ULTRAOPT
- current ECSA defined, in use, and free
- list of each APPLID and the number of active and pending sessions
- total APPLIDs with total active and pending sessions

Figure 12-10 SOPSESCT Sample Output

```
************************************************************************
************************  ITERATION 001 *************************
************************************************************************
************************************************************************

*******************************************
*         ULTRAOPT SESSION COUNTS           *
* ----------------------------------------- *
* ACTIVE/OPTIMIZED SESSIONS........ 00000272 *
* ACTIVE/NON-OPTIMIZED SESSIONS.... 00000043 *
* TOTAL SESSIONS (ACT OR INACT) ... 00000359 *
*******************************************
-----------------------------------------------
CURRENT ECSA STATISTICS:

ECSA DEFINED =  200036K /  195M
ECSA IN USE  =   69660K /   68M   (34.9%)
ECSA FREE    =  130376K /  127M   (65.2%)

-------------------------------------------
TIMESTAMP ===>  16:57:00.275987

 ACTIVE    PENDING
 APPLID    SESSIONS   SESSIONS
--------   --------   --------
SOP1             0          0
SOPLFSP          0          0
TSOP33           0          0
TSO3001          1          0
TSO3002          1          0
TSO3003          1          0
.......        ...        ...
.......        ...        ...
.......        ...        ...

===============================================
========= TOTALS FOR THIS ITERATION ===========
===============================================

 ACTIVE    PENDING
 APPLID    SESSIONS   SESSIONS
--------   --------   --------
 322        348          0
```

Appendix A Operator Commands

This appendix provides the default settings and information about commands that you can use to control operation of the ULTRAOPT subsystem.

This appendix contains the following sections:

Conventions

You would typically issue these operator commands from the MVS system console. The command syntax uses the following conventions:

- Items in italics are variables for which you must supply a value. For example, in HALT *subsysid*, you must supply the correct ULTRAOPT subsystem ID name.
- When two or more items are separated by a vertical line, you must select only one item. For example, in Z|HALT *subsysid*,CANCEL, you would use Z *or* HALT but not both.

Commands

This section lists descriptions of the operator commands alphabetically to help you find them more easily. In most cases, the default setting is listed.

ACB31—Obtain Private ACB Storage

The ACB31 command causes storage for ACBs to be obtained in the application's private area above the 16 MB line. This command may be useful for an environment containing an application that opens thousands of ACBs (such as a session manager) under its address space. The command uses the format *subsysid* ACB31 | NOACB31. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

The default action is to obtain storage in the Applid's private area above the 16 MB line. Use NOACB31 to cause the *subsysid* to obtain private storage below the 16 MB line for the application.

Note: Ensure you install the VTAM PTF from APAR OY52785.

ADVLFS—LFS with Extended Attribute Terminals

The ADVLFS command invokes an algorithm that determines the best technique for handling optimization of extended attribute terminals when using LFS. Through the new algorithm, ULTRAOPT/CICS determines whether to use format presentation from the controller (LFS) or Imaging optimization.

If you are using LFS on your extended attribute terminals (such as color graphic terminals), BMC Software suggests that you include ADVLFS and EXTLFS in your startup parameters. ADVLFS lets ULTRAOPT analyze and determine the best optimization technique, which results in improved optimization on these terminals.

ADVLFS can be entered as an operator command from the MVS console in the format *subsysid* ADVLFS | NOADVLFS. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

ALLMSG—Print Interception Messages

When ALLMSG is in effect, message BMC13134I is issued when a VTAM application opens an ACB that is intercepted by ULTRAOPT. Message BMC13129I is issued when a VTAM application opens an ACB that is not intercepted.

When ALLMSG is off, the two messages are not issued unless the INTMSG operator command is in effect. (INTMSG prints BMC13129I.) Enter ALLMSG as an operator command from the MVS console in the format *subsysid* ALLMSG | NOALLMSG. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

APSTAT—Turn Application Status On or Off

This command lets ULTRAOPT issue an INQUIRE OPTCD=APPSTAT to determine whether a session partner is an application. This lets you optimize certain LU0, local, bisynchronous 3270, and non-SNA 3270 devices.

To turn the APPLICATION STATUS option on or off, enter the operator command from the MVS console in the format
subsysid APSTAT | NOAPSTAT. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

BUFWRP—Turn Buffer Wrap On or Off

When this command is off, it causes the panel to be printed from the origin of the buffer and may reduce optimization slightly.

ULTRAOPT lets you turn the buffer wrap option on or off dynamically with an operator command. To turn the buffer wrap option on or off, enter the operator command from the MVS console in the format *subsysid* BUFWRP | NOBUFWRP. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

BWAD—Write Additional Diagnostic Information

The BWAD operator command should be used only when advised by Product Support. This command results in the execution of a significant amount of additional diagnostic code, resulting in significant CPU time increases. A product support representative may recommend using this command only if necessary for obtaining special problem documentation. When this command is active, it writes additional trace entries to an internal wraparound trace buffer (which can be seen in an SVC dump). If the BSOP TRACE is in effect and GTF is active, it also causes the trace entries to be written to GTF.

When advised by Product Support, enter the command in the format *subsysid* BWAD | NOBWAD. where *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

If advised to activate this command, start the system GTF task with options that let GTF collect all USR records or specific USR records of type 0C0. Start the ULTRAOPT internal GTF trace using the operator command *subsysid* TRACE. You can activate the special diagnostics using the startup parameter BWAD or by using this operator command. NOBWAD turns the extra tracing off again.

CHACC—Chain Accumulation for LU1 Devices

This command enables accumulation of LU1 data stream chains in a buffer until the entire data stream is received before sending it on to the device. The default is to not accumulate LU1 chains (which may not have sufficient buffer space) and is to send each one on as soon as it is received.

To turn the CHACC command on or off, enter the operator command from the MVS console in the format *subsysid* CHACC | NOCHACC. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

CSALIMIT—Limit the Use of CSA

The value of CSALIMIT limits the total amount of ECSA storage used by the product subsystem. If the subsystem was started with a non-zero CSALIMIT parameter, the CSALIMIT command may be used to change the setting. The CSALIMIT command can be defined using kilobytes or megabytes. For example, 6000, 6000 KB, or 6 MB all mean 6 megabytes. Use up to eight characters with no non-numeric characters except *K* (for KB) or *M* (for MB).

To set the CSA limit, issue the command
subsysid CSALIMIT=*xxxxxxx*[*x* | K | M] from the MVS console. *subsysid* is the four-character name established for the subsystem, and the *x*'s are digits.

Setting CSALIMIT to zero has the following effects:

- Zero means there is no CSA limit.
- The product subsystem monitors the ECSA used by the entire system.
- The CSALIMIT operator command is ignored from then on.
- You must set a non-zero CSALIMIT startup parameter and restart the product to let the CSALIMIT operator command function again.

This value affects the ECSA utilization thresholds by defining what amount of memory the thresholds are a percentage of.

If the subsystem was started without a non-zero CSALIMIT parameter and the CSALIMIT command is used, message BMC13014E is displayed to indicated the command is ignored.

CSALVLS—Set the ECSA Utilization Thresholds

Use the CSALVLS command to set the ECSA utilization thresholds. When overall system ECSA use reaches each level percentage of the total ECSA defined for the system, ULTRAOPT limits its activities as follows:

- level 1 or higher—the product stops intercepting newly opened ACBs
- level 2 or higher—optimization stops
- level 3 or higher—the product stops accepting new sessions (new logons are rejected)

To set ECSA thresholds, issue the command *subsysid* CSALVLS=(*xx*,*yy*,*zz*) from the MVS console. *subsysid* is the four-character name established for the subsystem, *xx* is level 1, *yy* is level 2, and *zz* is level 3. Level 1 can be 1 to 97 percent. Level 2 can be 2 to 98 percent. Level 3 can be 3 to 99 percent. Level 1 must be less than level 2, which must be less than level 3.

You can omit values by leaving them out, but you must still include the comma delimiter, such as in the example (,,*zz*). In this case, the existing values are used for the values that are not supplied but the $x < y < z$ rule still holds.

D—Display Information

You can add options to the DISPLAY command to display different information.

Active Applids (D *subsysid*, ACTIVE)

If you use the Z|HALT *subsysid* command, the subsystem does not shut down until all VTAM applications being intercepted are shut down.

Display active (intercepted) Applids by issuing the command D|DISPLAY *subsysid*,ACTIVE from the MVS console. *subsysid* is the four-character name established for the subsystem. Figure A-1 shows an example of the resulting display for subsystem BSOP.

Figure A-1 Active Applids Display

```
40000210  D BSOP,ACTIVE
40000010  BMC097I DISPLAY ACCEPTED  BSOP
40000010  BMC006I FOLLOWING APPLIDS ARE ACTIVE  BSOP
40000010  BMC007I   JHLUP006 JHLUP005  JHLUP004  JHLUP003  BSOP
40000010  BMC007I   JHLUP002 JHLUP001  JHLAP006  JHLAP005  BSOP
40000010  BMC007I   JHLAP004 JHLAP003  JHLAP002  JHLAP001  BSOP
40000010  BMC007I   JHLNM  BSOP
40000010  BMC314I END  BSOP
```

ACBs and Sessions (D *subsysid*,ACTIVE,[DETAIL | SUM])

To display all intercepted ACBs, the number of optimized sessions to each ACB, and the total sessions to each intercepted ACB, issue the command D|DISPLAY *subsysid*,ACTIVE,DETAIL from the MVS console. The total sessions to each intercepted ACB includes sessions that are excluded from optimization.

Note: The display can be lengthy for environments with a large number of intercepted ACBs.

To display the total number of optimized sessions to all intercepted ACBs and the total of all sessions (includes sessions that are excluded from optimization and optimized sessions) to all intercepted ACBs, issue the command D|DISPLAY *subsysid*,ACTIVE,SUM from the MVS console.

Status of ECSA (D *subsysid*, ECSA)

To determine the status of total system ECSA storage used and free, issue the command D|DISPLAY *subsysid*,ECSA from the MVS console. *subsysid* is the four-character name established for the subsystem. Figure A-2 shows an example of the resulting display for subsystem BSOP.

Figure A-2 ECSA Display

```
16:03:47.53 TSU08847 40000210  D BSOP,ECSA
16:03:47.62 STC08745 40000010  BMC619I ECSA DISPLAY REQUESTED  BSOP
16:03:50.79 STC08745 40000010 *BMC13501I MVS ECSA USED     9696 K/     9 M     4.9%
16:03:50.79 STC08745 40000010 *BMC13502I MVS ECSA FREE   190900 K/   186 M    95.1%
```

Applid Status (D *subsysid*, ID)

To determine whether an Applid is being intercepted by the subsystem, issue the command D|DISPLAY *subsysid*,ID=*Applid* from the MVS console. *subsysid* is the four-character name established for the subsystem, and *Applid* is the VTAM Applid name. Figure A-3 shows an example of the resulting display for subsystem BSOP and Applid JHLUP006.

Figure A-3 Applid Status Display

```
15:21:31.03 TSU08847 40000210  D BSOP,ID=JHLUP006
15:21:31.09 STC08745 40000010  BMC097I DISPLAY ACCEPTED  BSOP
15:21:31.10 STC08745 40000010  BMC075I NAME = JHLUP006, TYPE = LCL APPL  BSOP
15:21:31.11 STC08745 40000010  BMC486I INTERCEPTED = Y  BSOP
15:21:31.12 STC08745 40000010  BMC487I OPTIMIZATION = Y  BSOP
15:21:31.12 STC08745 40000010  BMC213I ACBNAME FOR ID = JHLUP006  BSOP
15:21:31.13 STC08745 40000010  BMC654I BUFFER TRACE = OFF  BSOP
15:21:31.13 STC08745 40000010  BMC314I END  BSOP
```

LU Status (D *subsysid*, ID)

To determine whether an LU is part of a session with an Applid being intercepted by the subsystem, issue the command D|DISPLAY *subsysid*,ID=*LUname* from the MVS console. *subsysid* is the four-character name established for the subsystem, and *LUname* is the VTAM LU name. Figure A-4 shows an example of the resulting display for subsystem BSOP and LU L31BQ2.

Figure A-4 LU Status Display

```
40000210  D BSOP,ID=L31BQ2
40000010  BMC097I DISPLAY ACCEPTED  BSOP
40000010  BMC075I NAME = L31BQ2  , TYPE = SESSION  BSOP
40000010  BMC206I SESSIONS:  BSOP
40000010  BMC634I NAME      STATUS     CID       VCID    LU  OPT  BSR  BSOP
40000010  BMC635I TSO0030   ACTIV-P  010000EB  0F0F701B  02  YES  NO   BSOP
40000010  BMC490I -------------  OPTIMIZATION STATISTICS  ------------ BSOP
40000010  BMC491I  DIRECTION     BYTES BEFORE    BYTES AFTER   %% OPT  BSOP
40000010  BMC492I   INBOUND                3              3     0.0%  BSOP
40000010  BMC492I  OUTBOUND            2,241          1,386    38.1%  BSOP
40000010  BMC314I END  BSOP
```

LFS Summary (D *subsysid*, LFS)

To display an LFS summary, issue the command D|DISPLAY *subsysid*,LFS from the MVS console. *subsysid* is the four-character name established for the subsystem. Figure A-5 shows an example of the resulting display.

Figure A-5 LFS Summary Display

```
40000210  D BSOP,LFS
40000010  BMC097I DISPLAY ACCEPTED
40000010  BMC637I CONTROLLER  ----  STORAGE ----   --  FORMATS --   TERMINALS
40000010  BMC638I LU  NAME    AVAILABLE     USED   LOADED   PURGED  USING LFS
40000010  BMC639I L3F001  -N    65,536    61,980      142       58        4
40000010  BMC314I END
```

LFS Formats (D *subsysid*, LFS,FORMATS)

To display a list of all the LFS formats that ULTRAOPT has in ECSA, issue the command D|DISPLAY *subsysid*,LFS,FORMATS from the MVS console. *subsysid* is the four-character name established for the subsystem. Figure A-6 shows an example of the resulting display.

Figure A-6 LFS Formats Display

```
 40000210  D BSOP,LFS,CNTR L3F001
40000010  BMC097I DISPLAY ACCEPTED
40000010  BMC645I LFS CONTROLLER - L3F001
40000010  BMC640I FMT NAME   SIZE    # USED    IMAGE LEN   IMAGE ADDR   EXT ATT
40000010  BMC641I   41A9      225         3       1,920     19E57050       NO
40000010  BMC641I   41AA      199         3       1,920     19E5D050       NO
40000010  BMC641I   41AC      647         1       1,920     19E5C838       NO
40000010  BMC641I   41B2      200         2       1,920     19E4F838       NO
40000010  BMC641I   41B3      208         1       1,920     19E54050       NO
40000010  BMC641I   41B5      224         2       1,920     19E53838       NO
40000010  BMC641I   41B7      248         2       1,920     19E50050       NO
40000010  BMC641I   41B8      256         1       1,920     19E4A050       NO
40000010  BMC641I   41B9      230         1       1,920     19E49050       NO
```

LFS Formats by Controller (D *subsysid*, LFS,CNTR *cname*)

To display a list of LFS formats that ULTRAOPT has in ECSA for the specified controller, issue the command D|DISPLAY *subsysid*,LFS,CNTR *cname* from the MVS console. *subsysid* is the four-character name established for the subsystem, and *cname* is the controller name as shown on the LFS Formats display. Figure A-7 shows an example of the resulting display.

Figure A-7 LFS Formats by Controller Display

```
 40000210  D BSOP,LFS,FORMATS
40000010  BMC097I DISPLAY ACCEPTED
40000010  BMC640I FMT NAME   SIZE     #USED    IMAGE LEN   IMAGE ADDR   EXT ATT
40000010  BMC641I   4102       76       37       1,920     1A7F6838       NO
40000010  BMC641I   4103    1,341        2       1,920     1A7F5838       NO
40000010  BMC641I   4104    1,342        2       1,920     1B09E838       NO
40000010  BMC641I   4105      420        2       1,920     1B09E050       NO
40000010  BMC641I   4106      454        2       1,920     1B09D838       NO
40000010  BMC641I   4107      867        3       1,920     1B09B838       NO
40000010  BMC641I   4108      879        1       1,920     1B039050       NO
40000010  BMC641I   4109    1,177        3       1,920     1B038050       NO
40000010  BMC641I   410A    1,185        1       1,920     1AF60050       NO
40000010  BMC641I   410B      625        3       1,920     1B038838       NO
```

LFS Format Dump (D *subsysid*, LFS,DUMP *formid*)

To display the contents of an LFS format in hex and character form, issue the command D|DISPLAY *subsysid*,LFS,DUMP *formid* from the MVS console. *subsysid* is the four-character name established for the subsystem, and *formid* is the format identifier, as shown in Figure A-7 on page A-11. Figure A-8 shows an example of the resulting display for a small format.

Figure A-8 LFS Format Dump Display

```
40000210  D BSOP,LFS,DUMP 4102
40000010  BMC097I DISPLAY ACCEPTED
40000010  BMC648I LFS FORMAT NAME - 4102  LENGTH(0000004C)
40000010  BMC649I  + 0000 F300080F 02400000 0000430F 24C00001  *3  >       >    *
40000010  BMC649I  + 0010 C3E34040 40404040 E2D6D7D8 C1F64040  *CT      SOPQA6  *
40000010  BMC649I  + 0020 40404040 40404040 41024040 40404040  *                *
40000010  BMC649I  + 0030 40404040 40404040 11001013 1100003C  *                *
40000010  BMC649I  + 0040 0779001D F8000000 00D91D40           *    8    R      *
```

Product Options (D *subsysid*, OPTIONS)

To determine the status of the ULTRAOPT options, issue the command D|DISPLAY *subsysid*,OPTIONS from the MVS console. *subsysid* is the four-character name established for the subsystem.

Figure A-9 shows an example of the resulting display for subsystem BSOP. The term *OPTIONS* refers to startup parameters or operator commands. For a description of the startup parameters, see the *ULTRAOPT Customization Guide*.

Figure A-9 Options Display

```
0210 D BSOP,OPTIONS
0010 BMC13048I BSOP SUBSYSTEM OPTIONS IN EFFECT
0010 BMC13049I  CPU MODEL = 9021           CPUID = 010523
0010 BMC13050I SUBSYSTEM LEVEL = 2.0.02
0010 BMC13055I ULTRAOPT/VTAM - INACT    PSWD STATUS= NOT AVAILABLE
0010 BMC13055I ULTRAOPT/CICS - ACTIVE   PSWD STATUS= PERMANENT
0010 BMC13055I ULTRAOPT/IMS - ACTIVE    PSWD STATUS= PERMANENT
0010 BMC13051I VTAM LEVEL = 3.4.2
0010 BMC13052I SSCT ADDRESS  = 00F439E0   CSVT ADDRESS = 0F523008
0010 BMC13053I TRACE ADDRESS = 0F4A6000   CSVX ADDRESS = 0F522000
0010 BMC13060I DSPNAME = 00000IAS
0010 BMC13054I APPLID    = SOP1
0010 BMC13054I LFSAPPL   = SOPLFSP
0010 BMC13054I CSALIMIT  = *NONE*
0010 BMC13054I ACB31     = NO
0010 BMC13054I ADVLFS    = NO
0010 BMC13054I ALLOPENS  = NO
0010 BMC13054I ALLMSG    = NO
0010 BMC13054I APSTAT    = YES
0010 BMC13054I BSR       = YES
0010 BMC13054I BSR%      = N/A
0010 BMC13054I FUFFWRAP  = NO
0010 BMC13054I CVALVLS   = (80,90,95)
```

Product Status (D *subsysid*, STATUS)

To display a status summary of each product tower (such as ULTRAOPT/CICS or ULTRAOPT/IMS), issue the command D *subsysid*,STATUS from the console. *subsysid* is the four-character name established for the subsystem. Figure A-10 shows an example of the resulting display.

Figure A-10 Product Summary Status Display

```
D BSOP,STATUS
BMC097I DISPLAY ACCEPTED
BMC13267I    SUBSYSTEM       STATUS    LIC TERMS    CURR TERMS
BMC13268I  -------------    --------   ---------    ----------
BMC13269I  ULTRAOPT/CICS     INACT
BMC13269I  ULTRAOPT/IMS      ACTIVE     999,999         1,539
BMC13269I   *  OTHER                                       0
BMC13269I      TOTALS                   999,999         1,539
BMC314I END
```

Product Storage (D *subsysid*, STORAGE)

Use this command to list ULTRAOPT control block types in the ECSA (such as SCBE and BWA). The list includes control block types, the number of control blocks of each type, the number of blocks available, and the number of bytes available.

If you use the STOR=XPVT startup parameter, only common storage control blocks are listed; control blocks in the extended private area are not listed.

To see the control block storage display, issue the command D|DISPLAY *subsysid*,STORAGE from the MVS console. *subsysid* is the four-character name established for the subsystem. Figure A-11 shows an example of the resulting display.

Figure A-11 Storage Display

```
BMC13241I CB-NAME  NUMBER   FREE      K
BMC13242I -------  ------  ------  ------
BMC13243I CJB         333       0   22525
BMC13243I CASL        328       0       1
BMC13243I CAB         372       0   10812
BMC13243I VDB         362       0   21500
BMC13243I BWA56        77       6       5
BMC13243I BWA168      166      83      28
BMC13243I BWA256       38      15      10
BMC13243I BWA512      493      25     243
BMC13243I BWA1024    1717      12    1691
BMC13243I BWA2048     245      35     485
BMC13243I BWA4096     216      19     864
BMC13243I CFG         401       1     204
BMC13243I EWA          30      27      37
BMC13243I OWA           4       4      38
BMC13243I RAQ         398      35     492
BMC13243I RWA          14      14      12
BMC13243I SCBE        601      18     475
BMC13243I VWA         686      73    1941
BMC13243I MISC                       1362
BMC13243I -TOTAL-    6481     367   62725
BMC13017I MAX CSALIMIT = * NONE * , CURR ALLOCATED = N/A
```

DEFER—Defer Storage of Formats

The start option DEFER=*nnnnn* for LFS lets ULTRAOPT defer loading a particular format until it has seen that panel n + 1 times and refined its format. Deferred loading ensures that only the refined version of the format gets loaded and also prevents loading of formats that are referenced fewer than n + 1 times. The default value of n is zero. DEFER is highly recommended for controllers that cannot support LFSLRU.

To turn the DEFER option on or off, enter the operator command from the MVS console in the format *subsysid* DEFER=*nnnnn*. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed. *nnnnn* is any value from 0 to 99,999.

DSERR—Set Data Stream Error Recording

This command enables or disables the DSERR recording option and indicates where to store the data stream errors.

To turn the DSERR option on or off, enter the operator command *subsysid* DSERR=*xxxx* from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed. *xxxx* is one of the following values:

NO disables DSERR recording

LOG activates DSERR recording to syslog

SMF activates DSERR recording to SMF

BOTH activates DSERR recording to syslog and SMF

Note: When running a wraparound data stream trace, ULTRAOPT cannot write to SMF to record data stream errors. You may always write to the log, regardless of traces being run.

DUMP—Dump the Subsystem Address Space

This command lets you create a dump of the subsystem's address space, associated data spaces, and user address spaces. To create a dump from the MVS console, issue one of the following commands:

subsysid DUMP
subsysid DUMP,JOBNAME=*job1*
subsysid DUMP,JOBNAME=(*job1*,*job2*)

subsysid is the name of the ULTRAOPT subsystem that was established when the product was installed. *job1* and *job2* are the optional names of up to two additional tasks that you can dump along with this subsystem.

If you are creating a dump to track down a problem with the ULTRAOPT API, specify the job name or address space of the application in which the problem occurs or use the DUMP COMM MVS command.

After taking a dump, look for message IEA911 in the log to verify that a *complete* dump was captured.

ENHRDB—Turn Enhanced Read Buffer On or Off

This command increases the potential for inbound data stream optimization. You can turn the enhanced read buffer option on or off dynamically with an operator command. To turn the enhanced read buffer on or off, enter the operator command *subsysid* ENHRDB | NOENHRDB from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

EXTLFS—LFS with Extended Attribute Terminals

If you are using LFS on extended attribute terminals (such as color graphic terminals), you should include ADVLFS and EXTLFS in your startup parameters. EXTLFS lets ULTRAOPT download formats for extended attribute terminals with primary *and* extended attributes.

EXTLFS can be entered as the operator command
subsysid EXTLFS | NOEXTLFS from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

F NET,TRACE—Start/Stop VTAM GTF Traces

Before a VTAM GTF trace can be started, the MVS Generalized Trace Facility (GTF) must be started and GTF initialization must be completed (as explained in the IBM *MVS/ESA Service Aids)*. For more information about starting a VTAM GTF trace, see the IBM *VTAM Reference Summary* and IBM *VTAM Diagnosis*.

To start a VTAM BUF trace from the MVS console, type F NET,TRACE,TYPE=BUF,ID=*Applid|LU*. An Applid name must be entered to trace a specific VTAM Applid. An LU name must be entered to trace a specific VTAM LU.

To start a VTAM API trace from the MVS console, type F NET,TRACE,TYPE=VTAM,OPT=API,MODE=EXT.

When you have captured the necessary information, stop the VTAM GTF trace and stop the MVS GTF. To stop a VTAM BUF trace from the MVS console, type F NET,NOTRACE,TYPE=BUF,ID=*Applid|LU*. To stop a VTAM API trace from the MVS console, type F NET,NOTRACE,TYPE=VTAM,OPT=END.

FORCEACB—Close the Application ACB

The FORCEACB command forces the deletion of ULTRAOPT control blocks for the indicated ACB. Rather than issuing a Z *subsysid*,CANCEL, which affects all intercepted applications, the FORCEACB command can be used to force a selected application to close its ACB. This command may be helpful in the event that communications must be stopped for the application and the normal means of doing so have not been successful.

Issue the command *subsysid* FORCEACB=*aaaaaaaa*. *subsysid* is the subsystem name, and *aaaaaaaa* is the ACB to be cleaned up.

FORCESLU—Complete Session Termination

The FORCESLU command forces the completion of an ULTRAOPT SCBE session termination for sessions hung in a pending quiesce state. This command may be helpful in completing the shutdown of an application that is waiting for the session to terminate. *D subsysid,ID=llllllll* displays the ULTRAOPT status for the session. A pending quiesce state is reflected by a USECOUNT=4000000*x*.

Issue the command *subsysid* FORCESLU=*llllllll*. *subsysid* is the subsystem name, and *llllllll* is the LU to be cleaned up.

FRBWA—Free Buffer Work Areas

When the FRBWA command is specified, buffer work areas are freed to MVS when their number exceeds the threshold limit. The threshold for 2 KB BWAs is 512, and for 4 KB BWAs, it is 256. This limit prevents too many BWAs from accumulating. To turn the FRBWA option on or off, enter the operator command *subsysid* FRBWA| NOFRBWA from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

INT—Intercept Application ACBs

The INT command specifies whether ACBs are to be intercepted. The startup default is INT. If you specify NOINT, no new applications are intercepted when they open their ACBs with VTAM, so their sessions are not optimized. Applications that have already been intercepted remain intercepted.

Use INT if you started ULTRAOPT with the NOINT startup parameter to build the initial include and exclude tables and are now ready to intercept applications. Applications that have already started must be restarted to be intercepted.

To turn this command on or off, enter the operator command *subsysid* INT | NOINT from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

INTMSG—Turn Intercept Message On or Off

The INTMSG command lets you turn on or off a message telling you when an application that just started is not being intercepted. Message BMC13129I is described in the *ULTRAOPT Messages Manual*.

To turn this command on or off, enter the operator command *subsysid* INTMSG | NOINTMSG from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

LFSLRU—Delete Least Recently Used Formats

The LFSLRU command lets you delete the least recently used formats when storage is exhausted from LFS storage in the IBM 3174 controller. If you do not use the LFSLRU command, the controller Load LU LFS storage space is reset when storage is exhausted, and multiple copies of unrefined formats may consume controller storage (unless you use DEFER).

For information about the minimum microcode level required, see the *ULTRAOPT Customization Guide*.

To turn this command on or off, enter the operator command *subsysid* LFSLRU | NOLFSLRU from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

MAXOPT—Set Maximum Sessions to Optimize

The MAXOPT command controls the number of sessions that ULTRAOPT optimizes. Every time a user logs on to a new session, the MAXOPT value is checked against the number of sessions currently being optimized. If the maximum has not been reached, the session is allowed to be optimized, although the include and exclude rules might still prevent it from being optimized. MAXOPT is supported in environments where the product is permanently authorized.

MAXOPT can be entered as an operator command from the MVS console in the format *subsysid* MAXOPT=*xxxxx*. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed and *xxxxx* is the maximum number of sessions that can be optimized from 0 to 99999. A pound sign (#) means unlimited sessions may be optimized. When set to zero, no new sessions will be optimized. The default is ##### (unlimited sessions).

Optimization of sessions is dynamic while MAXOPT is in effect. As optimized sessions terminate, existing sessions (which have not been optimized because MAXOPT was exceeded) begin to be optimized.

Note: Reducing your MAXOPT setting or changing it to zero does not cause ULTRAOPT to stop optimizing current sessions until the session ends.

MINFMT—Only Load Formats of Minimum Size

If you are using ULTRAOPT with LFS, this command lets you specify that formats smaller than approximately 256 bytes are not to be loaded into LFS-capable controllers. Data streams are examined *before* optimization for their size.

This command is useful if you are using the LFSLRU command to reuse format storage. The small formats are less likely to be reused and can eventually clog up the format storage area. The default is NOMINFMT, which loads all formats. To change the minimum size from 256 bytes, see the "MINFMTSZ — Set Small Format Size" section in the *ULTRAOPT Customization Guide*.

To turn this command on or off, enter the operator command from the MVS console in the following format:

```
subsysid MINFMT | NOMINFMT
```

subsysid is the name of the ULTRAOPT subsystem that was established when the product was installed.

MINFMTSZ—Set Minimum Size of Formats

If you are using ULTRAOPT with LFS, the MINFMTSZ command works with MINFMT to change the minimum size format from 256 bytes to an approximate value between 1 and 9999 bytes. Data streams are examined *before* optimization for their size. Any data stream that is less than the MINFMTSZ setting is not loaded into the LFS-capable controller. When selecting a minimize size format, you may want to consider the overall optimization percentage typical at your data center.

To specify a minimum LFS format, enter the operator command *subsysid* MINFMTSZ=*xxxx* from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed and *xxxx* is a number 0 to 9999. MINFMTSZ=0 is the same as MINFMTSZ=256 (which is the default). If MINFMT is off, MINFMTSZ is ignored.

MLFS—Support Multiple-Host LFS Controllers

The MLFS command lets ULTRAOPT take advantage of RPQ 8Q1008, which enables IBM 3174 Controllers to support multiple hosts for LFS optimization. If you have an IBM 3174 Controller with this RPQ installed, you must use the MLFS command (or start ULTRAOPT with the MLFS startup parameter). Use the command format *subsysid* MLFS | NOMLFS. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

This command changes the way ULTRAOPT with LFS resets the controller and is required for multiple-host LFS support. For more information about configuring your 3174 controller for multiple-host LFS support, see the *ULTRAOPT Customization Guide*.

MODEL2—Use Default Model 2 Screen Size

The MODEL2 command provides a default model 2 screen size (24 by 80 characters) for sessions (LU type 0, 2, or 3) that should be optimized but otherwise cannot since no screen size information is available in the PSERVIC area of the session's BIND request.

If ULTRAOPT receives a QUERY REPLY for a device indicating the screen size, the MODEL2 command is ignored and ULTRAOPT optimizes data streams for the device, using the size in the QUERY REPLY command instead of the model 2 size. With NOMODEL2, 3270 sessions established without a presentation space defined in the BIND or QUERY REPLY are not optimized.

To turn this command on or off, enter the operator command *subsysid* MODEL2 | NOMODEL2 from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

NEWDAY—Issue Message on New Day

The NEWDAY command issues a date message at the beginning of each day, so that the time stamps in the job log can be correlated easily to the current date. The message is "BMC13039 THE SUBSYSTEM HAS DETECTED A NEW DAY ******."

To turn this command on or off, enter the operator command *subsysid* NEWDAY | NONEWDAY from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

NOACB31—Obtain Private ACB Storage Below the 16 MB Line

Beginning with ULTRAOPT 3.0.00, default action is to obtain storage for ACBs in the Applid's private area above the 16 MB line. The operator commands *subsysid* ACB31 | NOACB31 can be used to toggle this setting. The use of private storage is discussed in more detail in the *ULTRAOPT Customization Guide*. This command should be used for systems prior to MVS/ESA and MVS/DFP 2.3. See VTAM APAR OY52785 regarding this issue.

NOBSR—Do Not Bypass SENDs and RECEIVEs

ULTRAOPT lets you turn off Bypass Send and Receive (BSR) for all new sessions (the default is on). To turn BSR off or on for all new sessions, issue the command *subsysid* NOBSR | BSR from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed.

NOLU0—Do Not Optimize LU0 Data Streams

Use the NOLU0 command to prevent the Optimizer from optimizing data streams for LU0 sessions. The command format is *subsysid* NOLU0 | LU0. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

This command is valid for ULTRAOPT/CICS *and* ULTRAOPT/IMS; however, it is often not required for ULTRAOPT/IMS. ULTRAOPT/IMS already suppresses optimization for the LU0 sessions that were established with the FMPROF=04 and TSPROF=04 session characteristics ("SLUP" sessions).

By default, ULTRAOPT/CICS optimizes eligible SLUP sessions and other eligible LU0 sessions as long as NOLU0 is not in effect. The LU0 command returns to the default setting.

NOQLFS—Do Not Query LFS Devices

NOQLFS prevents devices on non-LFS controllers from getting queried. NOQLFS ensures that a device is queried only for LFS support if it is attached to a controller that supports LFS. ULTRAOPT uses the following criteria to decide whether a controller supports LFS:

- An LFS user exit exists.
- The exit must return an LFS management LU (LOCADDR=01).
- The LFS management LU must be in session with the LFS Applid.

QLFS is the default setting since some controllers may contain microcode that returns the LOCADDR=01 LU in the query reply, and devices on such controllers must be queried. If you have any such controllers, do not use NOQLFS. This operator command format is *subsysid* NOQLFS | QLFS. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

OPENLACB—Reopen the LFS ACB

If you inactivate the LFS ACB (V NET,INACT), you can reopen it again with the OPENLACB operator command. The command uses the format *subsysid* OPENLACB. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

OPT—Optimize Data Streams

If optimization has been turned off, use the OPT command to resume optimizing data streams for included applications.

To turn optimization on or off, enter the operator command from the MVS console in the format *subsysid* OPT | NOOPT. *subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed. The NOOPT command has the same effect as the NOOPT startup parameter.

OPTAPP—Optimize Application-to-Application Data Streams

The OPTAPP command enables optimization of certain application-to-application session data streams. Use this command only for virtual terminals whose sessions are not optimized, such as TPNS applications and unoptimized session manager virtual terminals. This feature is enabled by default in ULTRAOPT.

To turn the application-to-application command on or off, enter the operator command from the MVS console in the format *subsysid* OPTAPP | NOOPTAPP. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed. This command has the same effect as the OPTAPPLS startup parameter.

OPTPS—Optimize Programmed Symbols

The OPTPS command (and startup parameter) activates optimization for Programmed Symbols. If OPTPS is omitted, optimization is not performed for Programmed Symbol data streams.

BMC Software recommends OPTPS if you have applications that use complex graphics data streams (such as GDDM) because those data streams tend to be very large and have significant potential for optimization.

To turn the optimization of programmed symbols on or off, enter the operator command *subsysid* OPTPS | NOOPTPS from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

Note: Activating this form of optimization results in additional ECSA storage use of 76 KB for each optimized session using Programmed Symbol data streams.

QUERYP—Control Terminal Queries

The QUERYP command controls the issuing of a query to a terminal. When using QUERYP, a terminal is queried only if it is included for LFS optimization and if the *query bit* is on in the LOGMODE PSERVIC area. If QUERYP is omitted, all terminals included for LFS optimization are queried unless NOQLFS is used and the controller is not an LFS controller.

The default is NOQUERYP. Do not use QUERYP if you have LFS terminals without the query bit on. If all LFS terminals have the query bit on, then QUERYP is recommended because it can prevent issuing queries to devices whose controller or microcode does not support queries.

To turn this command on or off, enter the operator command *subsysid* QUERYP | NOQUERYP from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

RECANY—Receive Any

The RECANY command (and startup parameter) changes the size of the request parameter list (RPL) Receive Any buffer. The RECANY command value is defined in kilobytes (KB). This command lets you specify 1 KB to 4 KB RPL buffer size for Receive Any data. The default value is 1 KB.

To issue this command from the MVS console, type *subsysid* RECANY=*nn*. *Subsysid* is the name of the ULTRAOPT subsystem that was established when ULTRAOPT was installed. *nn* is the size of the RPL Receive Any buffer (1k to 4k).

The buffer size change is dynamic. The change takes effect on the next inbound data stream.

BMC Software recommends using the default value of 1 KB. IMS and CICS LU 6.1/6.2 sessions sometimes require larger RECANY buffers. Using a 1 KB buffer in these situations may cause a performance degradation if these sessions are bound with a larger SEND/RECEIVE request unit (RU) size. You may want to use a larger buffer size, such as 4 KB.

Note: Larger buffers require more storage. ECSA or EPVT (if STOR=XPVT is used) may need to be adjusted to accommodate the larger buffer size.

RESPTM—Collect Response Time Statistics

The RESPTM command invokes host and network response time monitoring for all applications and sessions except TSO. (The TSORSP command turns on response time monitoring for TSO.) To turn this command on and off, issue the command *subsysid* RESPTM | NORESPTM from the MVS console.

Statistics collected may be viewed through the ULTRAOPT Monitor Response Time Monitor Menu (panel 5.0). This menu includes a control panel to specify whether applications and LUs are included in response time monitoring.

By default, ULTRAOPT does not collect response time statistics. The NORESPTM operator command turns off response time monitoring. RESPTM must be in effect to use any other RTM commands (TSORSP, RTMINT, and RTMSMG). For more information, see Chapter 9, “Response Time Monitor.”

RSCBE—Reuse Session Control Blocks

RSCBE frees session control blocks (SCBEs) that are only being used to retain statistics for LUs whose optimized sessions have terminated. The statistics for those individual LUs are no longer displayed on panel 2.2.0 when the RSCBE operator command is used; only LUs with active optimized sessions appear on panel 2.2.0. Almost 1 KB of ECSA per re-used SCBE is saved, and the number of SCBEs is kept from exceeding the highest total number of concurrent active primary and secondary half sessions to intercepted applications.

To reuse session control blocks, issue the *subsysid* RSCBE | NORSCBE command from the MVS console.

RTMINT—Response Time Monitor Interval

The RTMINT command specifies the interval for which response time statistics are collected before being reset. To use this command, RESPTM must be in effect.

The command *subsysid* RTMINT=*mmmm* is issued from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed and *mmmm* is the number of minutes from 0 to 1440 (24 hours). By default, ULTRAOPT resets response time statistics every 15 minutes.

RTMSMG—Response Time Monitor Session Manager LU Display

The RTMSMG command causes statistics for virtual sessions (from a session manager to a background application) to be displayed with the “real” LU name, not the “virtual” LU name. (The “real” LU name is the name of the device logged onto the session manager. The “virtual” LU name is the name of the secondary LU of the session between the session manager and the background application.) When this command is in effect, the statistics viewed in the monitor can toggle between the “real” and “virtual” LU names by pressing **F11**. By default, ULTRAOPT displays statistics using the “virtual” LU name. RESPTM must be in effect in order to use this command.

To issue this command from the MVS console, type *subsysid* RTMSMG | NORTMSMG.

SHUTDOWN—Shut Down the BMC Software Primary Subsystem

To shut down the BMC Software Primary Subsystem (BMCP), issue the command *BMCP* SHUTDOWN from the MVS console. *BMCP* is the name of the BMCP *SUBSYSID* that was established when the ULTRAOPT or a previous BMC Software product was installed.

SHUTMSG—Shutdown Verification Message

The SHUTMSG command provide a verification message when you shut down the ULTRAOPT subsystem. To turn this command on or off, enter the operator command *subsysid* SHUTMSG | NSHUTMSG from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed. The default is NSHUTMSG (no message is provided at shutdown).

SNA4—Use SNA4 Data Compression

When SNA4 is in effect, data streams are compressed using SNA Data Compression (3600/4700) if the following conditions are true:

- The session was bound using session parameters LUTYPE=0, FMPROF=04, and TSPROF=04 (“SLUP” sessions).
- The session partners are included for SNA Data Compression.

To turn SNA4 compression on or off, use the command *subsysid* SNA4 | NOSNA4. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

Note: If you do not use this command, or if you need to use SNA Data Compression on any data streams that do not adhere to the first condition, write a user exit as documented in sample user exit SOPUSERC.

SRBTIM—Set SRB Timer

SRBs are MVS units of dispatch that can enter infinite loops. If no time-out is set for these SRBs, you may lose the CPU. By default, ULTRAOPT sets a two-second timer for each SRB.

If your data center has been running for an extended period and you are confident that you will not encounter any SRB looping situations, you can increase performance by specifying the NOSRBTIM command to disable the SRB timer. With NOSRBTIM, SRB loops are detected and result in system-completion code S05B.

To turn this command on or off, enter the operator command *subsysid* SRBTIME | NOSRBTIM from the MVS console. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

START—Start the Subsystem

This command is used to start the BMCP or the product subsystem. For instructions on how to start the BMCP, see “How to Start the BMC Software Primary Subsystem” on page 2-14. For instructions on how to start the product subsystem, see “How to Start the Product Subsystem” on page 2-15.

TRACE—Start an ULTRAOPT GTF Trace

Before you can start an ULTRAOPT subsystem GTF trace, you must start the MVS GTF (using TRACE=USR,RNIO) and complete GTF initialization (as explained in the IBM *MVS/ESA Service Aids*). If you use TRACE=USRP, reply to subsequent prompts with USR=ALL or USR=0C0 to collect the subsystem's trace records.

To start a product subsystem GTF trace or to stop the product subsystem from writing to GTF, enter the command *subsysid* TRACE | NOTRACE from the MVS console. *subsysid* is the four-character name established for the ULTRAOPT subsystem during installation.

All intercepted Applids and LUs are traced. The GTF event identifier (EID) for the ULTRAOPT subsystem trace records is 0C0. Ensure that your GTF trace data set is very large (such as 100 cylinders) and is not dynamically allocated; do not use RLSE.

TRAP—Set Up a SLIP Command

You can set up a SLIP command for the ULTRAOPT subsystem address space by using the correct options, not the system defaults. To perform the TRAP command, issue the command *subsysid* TRAP,ID=*xxxx*,(JOB=*jobname*|ASID=*asid*) from the MVS console. *xxxx* is any four-character name that you want to use to identify the trap. If *xxxx* is not specified, it defaults to BSOP. *asid* is the address space ID. *subsysid* is the four-character name established for the ULTRAOPT subsystem during installation.

TSORSP—Collect Response Time Statistics for TSO

The TSORSP command invokes host and network response time monitoring for TSO sessions. Statistics collected may be viewed through the ULTRAOPT Monitor Response Time Monitor Menu (panel 5.0). To use this command, RESPTM must be in effect. For more information, see Chapter 9, "Response Time Monitor."

By default, ULTRAOPT does not collect TSO response time statistics. To invoke response time monitoring or to turn it off, issue the command *subsysid* TSORSP | NOTSORSP from the MVS console.

USIM—Allocate SCBE for SIMLOGON Sessions

The startup parameter USIM (Unique SIMlogon) and the equivalent operator command force ULTRAOPT to allocate a new SCBE for each new session initiated with SIMLOGON, even if an SCBE already exists for that LU from a previous, terminated session. The command uses the format *subsysid* USIM | NOUSIM. *subsysid* is the name of the ULTRAOPT subsystem that was established when the product was installed.

Use the USIM command in environments where an application requires that each new session use a new CID. The NOSIM operator command sets the function back to the default (to reuse the SCBEs when possible) if there is no existing session with that LU.

Note: USIM results in 0.7 KB of additional ECSA storage used per additional SCBE.

VTIMEINT—Set VTAM Storage-Checking Timer

The VTIMEINT command determines the length of the VTAM storage-checking timer in the ULTRAOPT module SOPMUXIT. Setting VTIMEINT=SHORT causes ULTRAOPT to check the VTAM storage levels every 1/2 second. This interval is recommended since a VTAM buffer expansion can lead to performance and timing-related problems in the SNA network.

Specifying VTIMEINT=LONG indicates that the VTAM storage levels are checked at 30-second intervals. While this interval uses less CPU time, it causes ULTRAOPT to wait the full interval before retrying an operation that initially failed because of a VTAM storage shortage. This lull can “hang” the application for the duration of the 30-second interval. The default is SHORT.

To initiate the VTIMEINT command, issue the command *subsysid* VTIMEINT=SHORT|LONG from the MVS console.

Z | HALT—Shut Down ULTRAOPT

For instructions on how to shut down the ULTRAOPT subsystem. see “How to Shut Down the Product Subsystem” on page 2-21.

To shut down the product subsystem, perform one of the following tasks:

- (Recommended) Perform an orderly shutdown sequence for a system with VTAM applications and the ULTRAOPT subsystem by performing the startup actions in reverse order. The applications should be shut down first, followed by this subsystem, then VTAM (if a total network shutdown is desired).

- (Not recommended) You can shut down the subsystem at any time from the MVS console by entering one of the following commands:

  Z *subsysid*
  HALT *subsysid*
  Z *subsysid*,QUICK
  HALT *subsysid*,QUICK
  Z *subsysid*,CANCEL
  HALT *subsysid*,CANCEL

  subsysid is the four-character name established for the ULTRAOPT subsystem.

  Warning! If you shut down the product subsystem while any application is being intercepted, the application will lose communications with VTAM and may abend. You should first stop any such applications normally. To help prevent shutdown when applications are being intercepted, turn on the SHUTMSG startup parameter.

Glossary

For definitions of terms not in this Glossary, refer to the following resources:

- *IBM Dictionary of Computing*
- *OS/VS Access Method Services*
- *IBM 3270 Information Display System Data Stream Programmer's Reference*

3270 address An address in a 3270 terminal buffer. Buffer addresses are numbered sequentially, starting at zero. For a terminal with alternate screen sizes, certain addresses may be valid or invalid depending on the mode of the terminal.

3270 field attribute An attribute in a 3270 terminal buffer. Field attributes are created by either an SF or SFE order in the data stream.

3270 order When sent to a 3270, a 3270 order causes the terminal to perform certain functions such as defining the start of a field or defining where to place the cursor. Valid 3270 orders are as follows:

- **EUA** (Erase Unprotected-to-Address)
- **GE** (Graphic Escape)
- **IC** (Insert Cursor)
- **MF** (Modify Field)
- **PT** (Program Tab)
- **RA** (Repeat-to-Address)
- **SA** (Set Attribute)
- **SBA** (Set Buffer Address)
- **SF** (Start Field)
- **SFE** (Start Field Extended)
- **SO/SI** (Shift Out/Shift In)

AID

Attention Identifier. The AID appears as the first byte in an inbound 3270 data stream. It indicates the source or type of data which follows. If the inbound data stream consists of structured fields, an additional AID byte can be embedded in the inbound 3270 data stream structured field. Valid AID bytes are as follows:

- **60** (No AID generated)
- **E8** (No AID generated)
- **88** (Structured field)
- **61** (Read partition)
- **7F** (Trigger action)
- **F1** (F1 key)
- **F2** (F2 key)
- **F3** (F3 key)
- **F4** (F4 key)
- **F5** (F5 key)
- **F6** (F6 key)
- **F7** (F7 key)
- **F8** (F8 key)
- **F9** (F9 key)
- **7A** (F10 key)
- **7B** (F11 key)
- **7C** (F12 key)
- **C1** (F13 key)
- **C2** (F14 key)
- **C3** (F15 key)
- **C4** (F16 key)
- **C5** (F17 key)
- **C6** (F18 key)
- **C7** (F19 key)
- **C8** (F20 key)
- **C9** (F21 key)
- **4A** (F22 key)
- **4B** (F23 key)
- **4C** (F24 key)
- **6C** (PA1 key)
- **6E** (PA2 key)
- **6B** (PA3 key)
- **6D** (Clear key)
- **6A** (Clear partition key)
- **7D** (Enter key)
- **7E** (Selector pen attention)
- **E6** (Magnetic Operator ID reader)
- **E7** (Magnetic reader number)

background transparency

A 3270 extended attribute that determines (for those devices that support this attribute) whether the graphics presentation layer is to be visible to the operator through the alphanumeric layer.

character set

The multiple character sets or program symbols a device supports. All devices support a base character set. Devices with the APL feature support an alternate character set. Some devices support up to six additional character sets (program symbol sets) or RWS (Read/Write Stores), which may be loaded by the application program via a Load Program Symbol (LPS) Structured Field.

command code

Hexadecimal character sent to a 3270 terminal to read, write, or copy the buffer. Valid command codes are as follows:

- **COPY** (Copy)
- **EAU** (Erase All Unprotected)
- **EW** (Erase Write)
- **EWA** (Erase Write Alternate)
- **RB** (Read Buffer)
- **RM** (Read Modified)
- **RMA** (Read Modified All)
- **W** (Write)
- **WSF** (Write Structured Field)

COPY

A command code that causes the device buffer to be copied to another device, usually a printer.

CP

Create Partition. A structured field that defines a partition for a device, including such items as width, height, and cell size.

CUT

Control Unit Terminal. A terminal whose data streams are executed and generated by the control unit (for example, an IBM 3174). The terminal performs only display functions. All keystrokes are sent to the control unit for execution. Some examples of CUT terminals are 3180, 3278, and 3279.

DBCS

Double-Byte Character Set. In countries where an alphabet is not used, characters are used to represent words. Since a single-byte character set (SBCS) can have at most 256 characters, a double-byte character set, using two bytes, is used. It provides for 256×256 (65,536) possible characters.

DBCS requires special processing for optimization because DBCS fields and characters are specified using special orders.

DFT

Distributed Function Terminal. A terminal whose data streams are executed and generated by the terminal. The terminal performs all functions. Some DFT terminals are 3290, 3179, and 3192.

EAU Erase All Unprotected. A command code that causes all unprotected fields to be erased.

ESDS Entry-Sequenced Data Set. The type of VSAM data set used by the Monitor for optional printing of user-specified screens, statistics, and/or the traces.

EUA Erase Unprotected-to-Address. A 3270 order that erases all unprotected buffer positions from the current buffer address to a specified address.

EW Erase Write. A 3270 command code that causes the buffer to be set to all nulls (X'00') before the write occurs. The buffer is set to its default screen size.

EWA Erase Write Alternate. A 3270 command code that causes the buffer to be set to all nulls (X'00') before the write occurs. The buffer is set to its alternate screen size.

extended attribute An attribute not supported in the original 3270 architecture that includes such things as color and extended highlighting.

extended color An extended attribute that defines colors such as red and blue.

extended highlighting An extended attribute that defines reverse video, blink, or underscore.

field On a 3270, an area on the screen that starts with an attribute byte and ends with the next attribute byte. Except on terminals with extended attributes, all characters in the field share the same attributes.

field outlining A 3270 extended field attribute used for displaying and printing the field frame by a combination of horizontal and vertical lines. This attribute may be used to improve the readability of the screens and print-out.

field validation A 3270 extended field attribute used to specify the mandatory fill, mandatory entry, and trigger attributes of a field.

file definition table FDT is a member in AUTHLIB that contains the VSAM cluster data set name and the DDNAME. This member is used to allocate and open the PSFOPT and SOPOPT Options, and the PSFPRINT and SOPRINT VSAM files.

GE Graphic Escape. A 3270 order which, combined with the byte following, generates a character from the alternate character set of the device.

generic Applid Refers to a group of similarly named Applids. An example is AB*, which refers to all Applid's that start with AB.

generic entry A table entry that uses wildcard characters.

generic LU A group of similarly named terminals. An example is PS*, which refers to all LUs that start with PS.

high-level qualifier One or more parts of a data set name that combine with a low-level qualifier or a suffix to make the complete data set name.

hilevel *See* high-level qualifier.

HLQ *See* high-level qualifier.

IC Insert Cursor. A 3270 order that causes the cursor to be placed in the current buffer location.

LCID Local Character Set Identifier. The 3270 architecture supports program symbols. An application can use program symbols by issuing a Load Program Symbol (LPS) Structured Field, which equates one of the six Read/Write Stores (RWS) in a device with a user-specified identifier called the LCID. The LCID may be referred to in subsequent SA, SFE, or MF orders.

light-pen-detectable A field attribute on a 3270 that causes the field to be eligible for selection with a light-pen. The field then behaves similarly to a field modified by the terminal operator.

LPS Load Program Symbol. A structured field used to define program symbols to a device; it defines the relationship between the LCID and the RWS.

MDT Modified Data Tag. A bit in each attribute byte describing the field in the 3270 buffer. This bit is set On if the terminal operator modifies the field, or it can be set ‘premodified’ by the application program. On a subsequent read-modified command, only the modified fields are sent back to the CPU or communications controller.

MF Modify Field. A 3270 order that modifies an existing attribute in the 3270 buffer or extended buffer.

MPP Maximum Print Position. On SCS Printers, it indicates the maximum print position in which a character may be printed.

non-display field Also known as dark, an attribute of a 3270 field that causes data in the field to not be displayed.

PA Program Attention. A key designated PAn on a 3270 terminal keyboard. When used instead of the Enter key, it designates a particular function to be executed by the Monitor.

partition A concept in the extended 3270 data stream architecture in which the terminal buffer storage is divided into multiple areas. Each area is called a partition. A partition can be written to or read from individually, using the appropriate structured fields.

partition ID A binary number that identifies which partition a structured field is addressing.

premodified field Any attribute in the output data stream that has the MDT bit set On by the application program.

program symbols A data stream that contains definable symbols (characters) for 3270s that have that feature.

protected An attribute of a 3270 field that makes the field protected from a terminal operator; that is, the terminal operator may not enter data in that field or alter it in any manner.

PT Program Tab. A PT order advances the current buffer address to the first character of the next unprotected field. It causes the erasure of the data up to the end of the current field.

query A data stream containing a query-structured field. It is sent from the host to a terminal that can describe what 3270 features it supports.

query reply A data stream containing a query-structured field It is sent from a terminal to the host in response to a query.

RA Repeat-to-Address. A 3270 order that causes a specified character to be repeatedly copied into a buffer until it reaches a specified buffer address.

RB Read Buffer. A command code that causes the AID byte, cursor address, and device buffer to be read inbound. The format of the data stream after the cursor address is a function of the reply mode. The RB contrasts with the RM (Read Modified), in which only the fields with the MDT (Modified Data Tag) bit ON are transmitted inbound.

RM Read Modified. A command code that causes the AID byte (for a short read, such as PA1 or Clear) or the AID byte, cursor address, and all fields with the MDT (Modified Data Tag) bit On to be transmitted, each of which is prefixed by an SBA. The format of the data is affected by the Reply Mode. If the AID is Light-Pen, then only the SBAs are transmitted inbound.

RMA Read Modified All. A command code that functions exactly like an RM (Read Modified), except that the format for all AID’s includes all modified fields.

RWS Read/Write Store. Certain 3270 devices have the capability to be loaded with up to six different sets of program symbols or character sets. The hardware area in which they are kept is called a Read/Write Store.

SA Set Attribute. A 3270 order that specifies an extended attribute. This order may be specified at any position in a field.

SBA Set Buffer Address. A 3270 order that changes the current buffer address to a specified value.

SCS printer SNA Character String Printer. A printer, under VTAM SNA architecture, which accepts a data stream defined as LU TYPE 1. The data stream is characterized by embedded orders and commands that are executed as they are received at the printer, allowing concurrent data transfer and printing. This printer differs from an LU Type 3 printer that accepts 3270 data streams containing both buffer and printer orders which cannot be printed until the full data stream has been received by the printer.

SF Start Field or structured field. Start Field is a 3270 order that causes a field to be defined starting at the current buffer address. For definition of structured field, see corresponding glossary entry.

SFE Start Field Extended. A 3270 order that is similar to the SF order, except that it may specify extended attributes as well.

shift out/shift in A special pair of 3270 orders indicating that the characters between the two orders are DBCS characters. The Shift Out (SO) order is indicated by X’0E’. The Shift In (SI) order is indicated by X'0F'.

SNA data streams System Network Architecture. Data streams that contain special SNA characters for formatting the data streams.

SRM Set Reply Mode. A structured field that causes the setting of the inbound reply mode. There are three inbound reply modes: Field Mode (FM), Extended Field (EF) mode, and Character Mode (CM). Each mode causes progressively more information to be returned on read commands. This mode enables the application program to exploit more of the device capabilities.

structured field An architectural extension to 3270 and SCS data streams. It allows the use of multiple functions, such as defining partitions and Load Program Symbols (LPS). An SF may be present in both outbound and inbound 3270 data streams and are implemented by the Write Structured Field command and Structured Field Aid. In SCS data streams, they are implemented with a FMH1 header. The valid structured field codes are as follows:

- **X’00’** (Reset Partition)
- **X’01’** (Read Partition)
- **X’03’** (Erase/Reset)

- **X’06’** (Load Program Symbols [LPS])
- **X’09’** (Set Reply Mode [SRM])
- **X’0B’** (Set Window Origin)
- **X’0C’** (Create Partition [CP])
- **X’0D’** (Destroy Partition)
- **X’0E’** (Activate Partition)
- **X’40’** (3270 Outbound Data Stream)
- **X’41’** (SCS Data)
- **X’4A’** (Select Format Group)
- **X’4B’** (Present Absolute Format)
- **X’4C’** (Present Relative Format)
- **X’80’** (3270 Inbound Data Stream)
- **X’81’** (Query Reply)
- **X’D0’** (PC File Transfer)
- **X’0F01’** (Magnetic Stripe Reader [MSR] Control)
- **X’0F02’**Destination/Origin)
- **X’0F0A’** (Modify Partition)
- **X’0F0F’** (Graphic Data)
- **X’0F10’** (Graphic Picture)
- **X’0F11’** (Graphic Control)
- **X’0F1F’** (Other Equipment Manufacturer [OEM] Data)
- **X’0F71’** (Text Header Outbound)
- **X’0FB1’** (Text Header Inbound)
- **X’0FC1’** (Type 1 Text)
- **X’1034’** (Save/Restore Format)

type value For 3270 extended data streams, type value means a type/value pair of hexadecimal characters that follow an SA, MF, or SFE order in the data stream. They may define color, extended highlighting, or other features. There are only certain valid values. See the *IBM 3270 Component Description* manual for more information.

VSAM Virtual Storage Access Method. The access method used by ULTRAOPT for the *xxx*OPT files and all optional files for printing.

VTAM Virtual Telecommunications Access Method. The telecommunications access method that ULTRAOPT optimizes.

VTAM RPL VTAM Request Parameter List. A VTAM control block that describes the data stream being sent or received by VTAM. It is useful for debugging problems.

W Write. A command code that updates the device buffer with the data stream that normally follows.

WCC Write Control Character. A 3270 write control character is sent to the 3270 terminal to control print format, the alarm, keyboard lock, start the printer, and set the MDT bits off.

wildcard A character that can represent any other character. In ULTRAOPT, the wildcard character is an asterisk (*).

WSF Write Structured Field. A command code that indicates that a series of one or more structured fields follows. This code allows an architectural extension that allows program symbols to be loaded, partitions to be defined, modified, and deleted.

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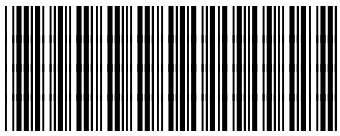

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