

# **ULTRAOPT<sup>TM</sup>** **Customization Guide**

**Version 4.2**

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**Address** BMC Software, Inc.  
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  - 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.

This book provides the information that you need to customize the ULTRAOPT products. It assumes that you are familiar with the system, including its PROCLIB, APF-authorization procedures, DASD requirements, VSAM conventions, and VTAM application names. For example, you are expected to know the VTAM Applid for each application whose data streams you intend to intercept. ULTRAOPT/CICS should be customized by your VTAM system programmer. ULTRAOPT/IMS should be customized by VTAM and IMS system programmers.

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)
- System Modification Program Extended (SMP/E)

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

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# How This Book Is Organized

This book is organized as follows. In addition, an index appears at the end of the book.

Chapter/Appendix	Description
Chapter 1, "Installation Overview"	describes preparations you must make and information you need to gather before you can start the installation
Chapter 2, "Installation Preparation"	describes how to prepare ULTRAOPT for installation
Chapter 3, "Installation Customization"	describes how to customize ULTRAOPT after it has been installed
Chapter 4, "CICS Exit Program Installation"	describes how to set up the exit program to include/exclude transactions from optimization
Chapter 5, "Before Starting ULTRAOPT"	describes how to start the BMC Primary Subsystem and the ULTRAOPT subsystem after the installation is complete
Chapter 6, "Implementation Tips"	provides information on how to best use ULTRAOPT with certain parameters or options in certain environments; describes some common problems and solutions
Chapter 7, "Startup Parameters"	describes each of the startup parameters that are available for ULTRAOPT
Appendix A, "Product Overviews"	provides an overview of ULTRAOPT and how it differs from the IMS optimizers
Appendix B, "ULTRAOPT Test Procedures"	provides some useful information for installing and checking performance in a test environment
Appendix C, "Local Format Storage Optimization"	explains how to set up ULTRAOPT and your controllers for use with the Local Format Storage (LFS) option

## 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	<i>OS/390 and z/OS Installer Guide</i>	provides information about the OS/390 and z/OS Installer
	<i>ULTRAOPT Customization Guide</i>	provides installation planning information, instructions for customizing ULTRAOPT, and instructions for setup and testing
core documents	<i>BMC Software Subsystem User Guide</i>	provides information about the operation, implementation, and messages that are issued by the BMC Software Subsystems
	<i>ULTRAOPT General Information</i>	provides an overview of ULTRAOPT
	<i>ULTRAOPT User Guide</i>	provides information about using ULTRAOPT at your data center
	<i>ULTRAOPT Messages Manual</i>	provides a list of messages that you might receive while using ULTRAOPT
supplemental documents	release notes, technical bulletins, flashes	provide current information about ULTRAOPT

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

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# 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 <b>SEARCH DB</b> in the designated field.
specific (standard) keyboard key names	Press <b>Enter</b> .
field names, text on a panel	Type the appropriate entry in the <b>Command</b> field.
directories, file names, Web addresses	The BMC Software home page is at <b>www.bmc.com</b> .
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.
code examples, syntax statements, system messages, screen text	//STEPLIB DD  The table <i>table_name</i> is not available.
emphasized words, new terms, variables	The instructions that you give to the software are called <i>commands</i> .  In this message, the variable <i>file_name</i> 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.

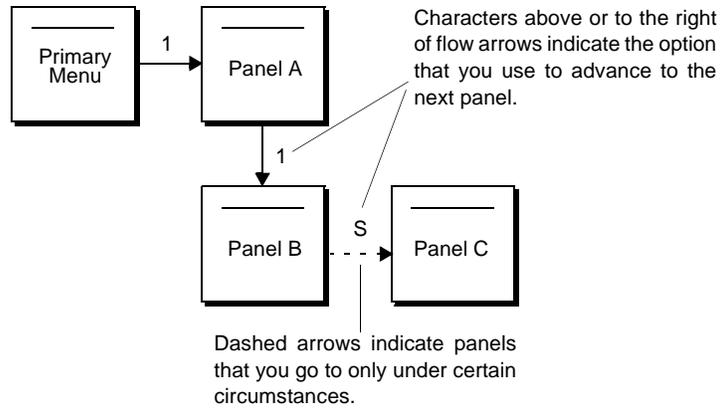
**Warning!** Warnings alert you to situations that could cause problems, such as loss of data, if you do not follow instructions carefully.

**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:



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# Chapter 1 Installation Overview

This chapter provides an overview of the installation process. This chapter contains the following sections:

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## Installation System Overview

ULTRAOPT can be installed by using the OS/390 and z/OS Installer. The OS/390 and z/OS Installer is an ISPF application that generates a set of batch jobs in job control language (JCL). You use the installation batch jobs to unload and customize BMC Software products from distribution media. You also use the batch jobs to apply maintenance to installed products.

### Installation Methods

The installation system supports the following methods of installation:

- Standard installation provides a fast IEBCOPY installation process that requires less expertise than a System Modification Program Extended (SMP/E) installation.  
  
**Note:** Standard installation generates an SMP/E environment that is required for maintenance.
- SMP/E is an industry-standard installation program that provides a variety of capabilities for unloading products and maintenance. SMP/E provides more flexibility than the Standard installation method for setting up and using an SMP/E environment, but it is more complicated and time consuming.

### Installation Process

The installation process includes unloading products from distribution tape or downloading products from the BMC Software Electronic Software Distribution site. Products are customized for use on your system. You can also use the installation system to perform other tasks, such as applying maintenance and managing licensing authority.

For more information about installing ULTRAOPT by using the OS/390 and z/OS Installer, see the *OS/390 and z/OS Installer Guide*. For information about customizing ULTRAOPT when the product has been installed, see Chapter 3, “Installation Customization.”

## Distribution Tapes

Every product shipment includes the following items:

- base installation (BMI) tape containing the ISPF panels and programs that are necessary to unload and customize BMC Software products and solutions
- one or more product tapes containing BMC Software products and customization steps that are required by the products

Table 1-1 describes the tapes that are required for an ULTRAOPT installation.

**Table 1-1** ULTRAOPT Product Tapes

Installation Method	Tapes Shipped	Tape Contents
Standard	BMlymd	ISPF panels and programs required to unload and customize BMC Software products and solutions The OS/390 and z/OS Installer is loaded from the BMlymd tape.
	A1Symd	ISPF panels and programs to unload and customize common technology The BMC Software Security Facility is loaded from the AnSymd tapes.
	A2Symd	
	A3Symd	
	C1Symd	ISPF panels and programs required to unload and customize S/390 Online products ULTRAOPT is loaded from the C1Symd tape.
SMP/E	BMlymd	ISPF panels and programs required to unload and customize BMC Software products and solutions The OS/390 and z/OS Installer is loaded from the BMlymd tape.
	A1Pymd	ISPF panels and programs to unload and customize common technology The BMC Software Security Facility is loaded from the AnPymd tapes.
	A2Pymd	
	A3Pymd	
		C1Pymd
	BBCUM	cumulative maintenance

# Installation Checklist

The installation checklist outlines the steps that you must perform to install and run your product (or products). The checklist summarizes what you must do and refers you to detailed instructions.

The checklist is divided into the following sections:

- “Preparation Steps” on page 1-5
- “Installation Steps” on page 1-6
- “Customization Steps” on page 1-7

When you have completed the installation, see “Where To Go From Here” on page 1-8.

## Combining Checklists for Multiple Products

The checklist is for the product (or products) that are listed in “Products” on page 1-4. You can use the Installation Checklist Generator to create a checklist that integrates the checklist in this book with checklists in other product books.

When you use the checklist generator, you select the products that you are going to install and the checklist generator produces an integrated checklist. The integrated checklist outlines all steps that you must complete for successful installation of all your products.

The checklist generator is available on your documentation CD. For information about running the checklist generator, see the *OS/390 and z/OS Installer Guide*.

## Products

This checklist pertains to the following BMC Software products:

- ULTRAOPT/CICS version 4.2.00
- ULTRAOPT/IMS version 4.2.00

## Preparation Steps

The following preparation steps help you prepare for installation of your products. The steps describe the tasks that you must complete and the items that you must assemble before you start installation.

✓	Step	Task	Description	Reference
	1	assemble needed materials	Gather all installation tapes, tape cover letters, product release notes, product technical bulletins, the <i>OS/390 and z/OS Installer Guide</i> , customization guides, planning guides, and so on.	your product shipment and the <b>support page</b> on the BMC Software Web site
	2	review product release notes	The release notes describe enhancements, changes, and fixes for a product and contain important information you need to know.	your product shipment
	3	review technical bulletins and flashes	Technical bulletins and flashes contain information about problems that have been identified since the product was last released.	your product shipment or the <b>support page</b> on the BMC Software Web site
	4	obtain product passwords	Contact BMC Software to obtain the passwords for your products.	<i>OS/390 and z/OS Installer Guide</i> , "BMC Software Product Authorization" appendix product authorization letter
	5	read prerequisites	Prerequisites state the operating system version requirements, space requirements, authorization requirements, and so on.	<i>ULTRAOPT Customization Guide</i> , "Installation Preparation" chapter
	6	read migration considerations	Migration considerations describe the process of migrating from a previous version of the product or from another product.	<i>ULTRAOPT Customization Guide</i> , "Installation Preparation" chapter
	7	read installation considerations	Installation considerations describe information about running with other products and product implementation.	<i>ULTRAOPT Customization Guide</i> , "Installation Preparation" chapter
	8	obtain authorization to complete the installation	Reading the installation tapes or creating the installation data sets might require RACF authorization.	contact your system administrator, security administrator, or other administrator
	9	obtain authorization to complete customization	Customization of some products might require APF authorization.	<i>ULTRAOPT Customization Guide</i> , "Installation Preparation" chapter

✓	Step	Task	Description	Reference
	10	complete planning, testing, and setup	This information is required before product installation and for migration from another product.	<i>ULTRAOPT Customization Guide</i> , "Installation Overview" chapter <i>ULTRAOPT Customization Guide</i> , "Installation Preparation" chapter <i>ULTRAOPT Customization Guide</i> , "ULTRAOPT Test Procedures" appendix
	11	fill out worksheets	A worksheet contains information, such as data set names and library locations, that you will need for completing installation.	<i>ULTRAOPT Customization Guide</i> , "Installation Overview" chapter

## Installation Steps

The following installation steps help you run the BMC Software OS/390 and z/OS Installer to successfully complete installation for all of your OS/390 and z/OS BMC Software products. The installation system combines tape images, copies files to your system (Standard or SMP/E), creates installation JCL, and applies maintenance to installed products.

✓	Step	Task	Description	Reference
	1	understand the installation system	The installation system has features and functions that you should be familiar with before using it.	<i>OS/390 and z/OS Installer Guide</i> , "Introduction" chapter
	2	unload the base installation libraries from the installation tape	The base installation libraries contain the installation system.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	3	create the customized installation libraries	The customized installation libraries specify a site-specific installation environment.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	4	start the installation system	The installation system automates many installation steps.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	5	specify repository information	The repository profile contains installation and customization options that are used when performing subsequent installations.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	6	specify user options	The user options determine how the installation system runs and specify where installation JCL is stored.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	7	select the products to install	The installation system generates all the steps necessary for the products you want to install.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter

✓	Step	Task	Description	Reference
	8	run the JCL that was created by the installation system	The installation system presents installation JCL for your approval and helps you to run the JCL.	<i>OS/390 and z/OS Installer Guide</i> , "Running Installation JCL" chapter
	9	specify product authorization passwords	Permission to run your products is granted.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter

## Customization Steps

The following customization steps describe the tasks that you must complete to run your product (for some products, additional customization options might be available once the product is running). Some tasks might be performed by using the installation system, while other tasks might be performed by using a separate utility.

✓	Step	Task	Description	Reference
	1	choose the customization option in the installation system	Customization is started through the customization option in the installation system.	<i>OS/390 and z/OS Installer Guide</i> , "Using the Installation System" chapter
	2	create or update system objects, components, or resources	System objects, components, and resources include such items as sysplex or coupling facility, VTAM, TCP/IP, and LPARs.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	3	create or update subsystem objects, components, or resources	Subsystem objects, components, and resources include such items as DB2 plans, DB2 table spaces, and APPLIDs.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	4	allocate, create, or update data sets or files	Many products require specific data sets or files.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	5	set up data collectors	Many products use a data collector to store system data that they have collected.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	6	install or update the interface	Some products require customization of ISPF or require the use of an interface other than ISPF.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	7	create or update profiles or global parameters	Most products require profiles or parameters to be set or updated.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	8	create or update the initialization PROC, CLIST, REXX EXEC, or started task	Most products require a startup routine to run.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter

✓	Step	Task	Description	Reference
	9	define or update security	All products provide information for interfacing to RACF or other security products. Some products include their own security features in addition to or instead of RACF security.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	10	implement user exits	Some products provide user exits for interfacing with the product.	<i>ULTRAOPT Customization Guide</i> , "CICS Exit Program Installation" chapter
	11	perform additional customization tasks for your products	Some products require additional tasks to be performed before the products are completely installed.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter
	12	verify customization	Some products provide information to verify customization of the product.	<i>ULTRAOPT Customization Guide</i> , "Installation Customization" chapter

## Where To Go From Here

When installation of your products is complete, refer to the following books:

Product	Book
ULTRAOPT/CICS	<i>ULTRAOPT Customization Guide</i>
ULTRAOPT/IMS	<i>ULTRAOPT Customization Guide</i>

## Preinstallation Worksheets

During installation, you must provide information about your system. Except for the VSAM options and VSAM print files, no default values are provided for the requested information. Table 1-2 on page 1-10 summarizes the preinstallation tasks and provides you with a worksheet. Before you start the process, gather the information that is described in Table 1-2. Make copies of this worksheet for each system. You can record the information for your data center in the **Information** column.

**Table 1-2 Preinstallation Tasks Worksheet**

Preparation	Information	
Calculate the required amounts of ECSA and virtual storage. For more information, see Chapter 2, "Installation Preparation."		
Configure controllers for LFS if necessary. For more information, see Appendix C, "Local Format Storage Optimization."		
Review optional CICS exit program information in Chapter 4, "CICS Exit Program Installation."		
Gather the following required system information:		
Identify the installation procedure to use.	Standard	SMP/E
Choose the high-level qualifier for the installation library and load library.		
Specify job card information. The installation system provides four lines on which you can specify any special job card JCL that you require.		
Specify the base installation tape VOLSER (from the tape label).		
Specify the preinstallation VOLSER for the product distribution tapes.		
Specify the procedures library (PROCLIB).		
Choose the high-level qualifier for target and distribution libraries.		
Obtain authorization passwords from BMC Software. (You will need your CPU ID for a permanent license.) Product codes are as follows: BFW = MAINVIEW for VTAM ULC = ULTRAOPT/CICS ULI = ULTRAOPT/IMS Chapter 2, "Installation Preparation," explains how to obtain product authorization codes.	_____	_____
	_____	_____
	_____	_____
Specify the APF-authorized load library that you want to use.		
Specify the ULTRAOPT subsystem ACB name.		
Specify the NPA ACB name, if used.		
Specify the LFS ACB name, if used.		
Specify the VTAM library for Applid definitions (VTAMLST). Chapter 2, "Installation Preparation," explains where to find VTAM Applids.		
Determine user catalog name (for VSAM files).		
Specify system management facility (SMF) system ID.		
Specify VSAM option and print file names (if different from these default names).	SOPOPT	
	SOPPRINT	
Locate maintenance tapes, if required.		

## Trial Plans

The trial plan provides a checklist for a common ULTRAOPT installation. Copy the appropriate pages and complete them before you install the product. You will find that performing this exercise speeds your installation significantly.

These checklists summarize information found elsewhere in this book.

**Note:** To install ULTRAOPT with the Local Format Storage (LFS) feature, see Appendix C, “Local Format Storage Optimization.”

## Preinstallation

Use Table 1-3 as a preinstallation checklist.

**Table 1-3** ULTRAOPT Trial Plan Preinstallation Checklist (Part 1 of 3)

Action Item		Information
1	Verify environmental requirements:	
	a. operating system—MVS/ESA, OS/390, or z/OS	
	b. MVS/TSO	
	c. 60 KB CSA available	
	d. DASD (approximately 8 MB for the load library)	
	e. DASD for a larger common page data set	
	f. real storage or CPU cycle constraints	
	g. maintenance is current for target applications	
2	Identify applications for optimization testing.	
	a. subsystems such as TSO, CICS (ULTRAOPT/CICS only), and IMS (ULTRAOPT/IMS only)	
	b. session managers such as TPX, MAI, and MultSess (session managers increase ECSA requirements)	
	c. user code (exit programs) that intercepts SVCs before BMCP	

**Table 1-3 ULTRAOPT Trial Plan Preinstallation Checklist (Part 2 of 3)**

Action Item		Information
3	Identify terminals for optimization testing.	
	a. number of each display type (Models 2, 3, 4, 5) (copy to ECSA worksheet)	
	b. number of each type of display that is using extended attributes (copy to ECSA worksheet)	
	c. 3270 emulators	
	d. printers (LU1 and LU3)	
	e. if have any LU0 3270 terminals, use APSTAT and MODEL2 startup parameters	
	f. ensure that number of virtual LUs (pooled LUs, session manager LUs) is included in count of terminated or unoptimized sessions (copy to ECSA worksheet)	
4	Review the requirements of terminal/printers to determine optimization exclusions.	
	a. Erase Input Key allowed? (If yes, reduced optimization results, but data integrity is OK.)	
	b. Local Copy (exclude)	
	c. SCS printers using Horizontal Tabs (Check the options Monitor panel to ensure that this option is on.)	
	d. Any devices that scan data streams for specific character strings? (If yes, you must exclude them.)	
5	Determine ECSA requirements.	
	a. calculate required ECSA storage by using the ECSA worksheet	
	b. multiply the calculated amount by <i>at least</i> 150 percent for dynamic overage	
	c. ask MVS system programmer to add the overage amount to the system ECSA (CSA= parameter) that is currently defined in SYS1.PARMLIB(IEASYSxx)	
6	Review the following ULTRAOPT rules of interception:	
	a. default applications intercepted	
	b. session managers	
	c. include vs. exclude processing order	
	d. BSR (and effect of BSR on products such as NPM and NetSpy)	
	e. interception occurs when the application ACB is opened	
	f. ULTRAOPT provides the VTAM interface for all intercepted applications	
7	Determine the statistical information configuration.	
	a. statistics collection interval	
	b. statistics file size (a function of the Statistics interval)	
	c. statistics traffic impact on the central control unit (CCU)/network (a function of the Statistics interval)	
	d. statistics printing/reset interval	

**Table 1-3 ULTRAOPT Trial Plan Preinstallation Checklist (Part 3 of 3)**

Action Item		Information
8	Establish performance baseline measurements.	
	a. response time (average and peak)	
	b. combined utilization of host resources of the applications plus VTAM plus ULTRAOPT	
	c. CCU utilization	
	d. line utilization	
	e. throughput (check the application subsystem's method of measuring transaction throughput)	
9	Establish economic baselines for product cost justification.	
	a. revenue value (or profit margin) per transaction or loss per hour of application downtime	
	b. size of outbound and inbound messages (panels)	
	c. number of panels per transaction	
	d. number of concurrent users of system during "prime time"	
	e. number of transactions per hour during "prime time" (total or transactions per user)	
	f. length of "prime time" window (in hours or minutes)	

## Installation and Customization

Use Table 1-4 as a checklist for installing and customizing ULTRAOPT.

**Table 1-4 ULTRAOPT Trial Plan Installation and Customization Checklist**

Action Item		Information
1	Install the product tapes by using the installation system. Use the Installation Checklist Generator (ICG), the preinstallation worksheet on Table 1-2 on page 1-10, and the <i>OS/390 and z/OS Installer Guide</i> .	
2	Customize ULTRAOPT by using AutoCustomization or manual customization. For more information about these methods, see Chapter 3, "Installation Customization."	

## Test

Use Table 1-5 as a checklist for testing ULTRAOPT before using the product in your production environment.

Table 1-5 ULTRAOPT Trial Plan Test Checklist (Part 1 of 3)

Action Item		Information	
1	Verify the paging subsystem configuration.		
	a. verify that test system common page data set contains sufficient DASD to back up all of ECSA		
	b. because ULTRAOPT uses a significant amount of ESCA, BMC Software recommends that the common paging subsystem be isolated from other paging subsystems and be tuned to perform efficiently		
2	Configure BMC Software startup.		
	a. update the start order (JES, VTAM, BMC Software Primary Subsystem [BMCP], and ULTRAOPT, followed by applications)		
	b. activate the BMCP		
3	Perform a no-interception test.		
	a. start ULTRAOPT with the NOINT startup parameter and without the CSALIMIT startup parameter		
	b. initiate a 3270 monitor session through TSO		
	c. create include/exclude tables for test applications and for LUs (review overlap with any existing 3270 SUPEROPTIMIZER®/CICS includes)		
	d. if migrating from 3270 SUPEROPTIMIZER/CICS, perform the following steps: <ul style="list-style-type: none"> <li>• ensure that this product startup is removed from the subsystem startup deck</li> <li>• create and/or convert transaction exclusion tables if necessary</li> </ul>		
	e. stop ULTRAOPT		
4	Perform interception without optimization.		
	a. restart ULTRAOPT with MAXOPT=0 parameter (instead of NOINT)		
	b. verify ULTRAOPT status by using console commands:	DISPLAY <i>subsysid</i> ,ACTIVE (for intercepted applications) to ensure that you are intercepting only those applications that you intend to intercept	
		DISPLAY <i>subsysid</i> ,ID= <i>luname</i> (for intercepted LUs) to ensure that you are intercepting only those LUs that you intend to intercept	
		DISPLAY <i>subsysid</i> ,OPTIONS (for startup options) to ensure that all needed options are set	
		DISPLAY <i>subsysid</i> ,ECSA (for ECSA usage)	
	c. stop ULTRAOPT (which closes the intercepted application's ACBs)		

Table 1-5 ULTRAOPT Trial Plan Test Checklist (Part 2 of 3)

Action Item		Information
5	Perform an optimization test. <ul style="list-style-type: none"> <li data-bbox="310 327 386 367">a. restart ULTRAOPT (remove MAXOPT=0)</li> <li data-bbox="310 367 386 499">b. if using a nonintercepted session manager, use OPTAPPLS parameter to optimize background sessions between application and session manager For more information, see Chapter 6, "Implementation Tips."</li> <li data-bbox="310 499 386 1304">c. verify ULTRAOPT status by using MVS console commands:               <ul style="list-style-type: none"> <li data-bbox="402 552 1000 583">DISPLAY <i>subsysid</i>,ACTIVE (for intercepted applications)</li> <li data-bbox="402 594 946 625">DISPLAY <i>subsysid</i>,ID=<i>luname</i> (for intercepted LUs)</li> <li data-bbox="402 636 927 667">DISPLAY <i>subsysid</i>,OPTIONS (for startup options)</li> <li data-bbox="402 678 865 709">DISPLAY <i>subsysid</i>,ECSA (for ECSA usage)</li> <li data-bbox="402 720 967 783">review data stream optimization statistics (by using ULTRAOPT Monitor panels 2.1.0 and 2.2.0)</li> <li data-bbox="402 793 862 825">compare before and after optimization rates</li> <li data-bbox="402 835 1149 898">review ULTRAOPT Monitor panels 2.3.0 and 2.4.0 for any exclusions or errors</li> </ul> </li> <li data-bbox="310 909 386 1304">d. review effect of optimization on the following network resources:               <ul style="list-style-type: none"> <li data-bbox="402 961 675 993">VTAM/CPU cycles/buffers</li> <li data-bbox="402 1003 711 1035">CCU cycles and NCP buffers</li> <li data-bbox="402 1045 545 1077">line utilization</li> <li data-bbox="402 1087 675 1119">end-to-end response time</li> <li data-bbox="402 1129 784 1161">other (routers, gateways, and so on)</li> <li data-bbox="402 1171 1117 1234">throughput (NCP or CPU cycles might not decrease, but transaction volume should increase)</li> </ul> </li> <li data-bbox="310 1245 386 1304">e. stop ULTRAOPT</li> </ul>	
6	Repeat Steps 4 and 5 for other test applications.	
7	Include session manager for optimization. <ul style="list-style-type: none"> <li data-bbox="310 1398 386 1461">a. double-check ECSA (are all the ACBs that are generated by the session manager included in your calculations?)</li> <li data-bbox="310 1461 386 1503">b. repeat Steps 4 to 6 with the NOBSR option</li> <li data-bbox="310 1503 386 1577">c. repeat Steps 4 to 6 with the BSR option (session manager and background sessions must be intercepted)</li> <li data-bbox="310 1577 386 1619">d. check total bytes reduced, not just the optimization percentage</li> <li data-bbox="310 1619 386 1682">e. turn off OPTAPPLS if it was on for earlier testing (for example, Step 5b)</li> </ul>	
8	Repeat Steps 4 to 7 for other session manager products.	

Table 1-5 ULTRAOPT Trial Plan Test Checklist (Part 3 of 3)

Action Item	Information
9	<p><b>(For IMS only)</b> Test reopening IMS ACB (for times when IMS is started before ULTRAOPT/IMS):</p> <ul style="list-style-type: none"> <li>a. start IMS</li> <li>b. start ULTRAOPT/IMS</li> <li>c. from IMS, issue operator commands /STOP DC and /START DC</li> <li>d. from the MVS console, issue the command D <i>subsysid</i>,ACTIVE to verify that IMS is now being intercepted</li> <li>e. stop ULTRAOPT (which closes the intercepted IMS ACBs)</li> </ul>
10	<p><b>(For IMS only)</b> Test scenarios of terminating applications and checkpointing the IMS dump queue. Ensure that everything closes normally, and that no abends occur. <b>Note:</b> ULTRAOPT/CICS users can perform similar tests with CICS. Here are some recommended scenarios:</p> <ul style="list-style-type: none"> <li>a. closing ACBs <ul style="list-style-type: none"> <li>by operator command /STOP DC</li> <li>by V NET,INACT,ID=</li> </ul> </li> <li>b. stopping VTAM <ul style="list-style-type: none"> <li>Z NET</li> <li>Z NET,QUICK</li> <li>Z NET,CANCEL</li> </ul> </li> <li>c. stopping ULTRAOPT <ul style="list-style-type: none"> <li>Z <i>subsysid</i></li> <li>Z <i>subsysid</i>,QUICK</li> <li>Z <i>subsysid</i>,CANCEL</li> </ul> </li> <li>d. checkpoint dump queue /CHE DUMPQ</li> </ul>

## Production

Use Table 1-6 as a checklist for putting ULTRAOPT into your production environment.

**Table 1-6 ULTRAOPT Trial Plan Production Checklist**

Action Item		Information
1	Obtain permanent product license and CPU password.	
2	Update include/exclude tables if necessary.	
3	Remove 3270 SUPEROPTIMIZER/CICS if present.	
4	If production LPAR is different from the test LPAR perform the following steps:	
	a. verify ECSA value in the CSA= parameter in SYS1.PARMLIB(IEASYSxx)	
	b. verify location and tuning of common paging subsystem	
5	Verify subsystem startup sequence.	
6	Review options data sets for any modifications.	
7	Update the following console operator procedures:	
	a. ULTRAOPT cancellation effect	
	b. ULTRAOPT display/debug commands	
	c. do <i>not</i> free any "orphaned" ECSA until ULTRAOPT is shut down For more information, see "Appendix A, "Product Overviews."	
8	For last-minute maintenance or frequently asked questions, see <a href="http://www.bmc.com.support.html">http://www.bmc.com.support.html</a> .	
9	Start the BMC Software Primary Subsystem.	
10	Start the ULTRAOPT subsystem.	
11	Bring up applications subsystems.	

## ECSA Use Estimations

This section provides worksheets for estimating ECSA use in your environment and provides examples that show estimating ECSA usage on several systems.

**Note:** To estimate ECSA when you install ULTRAOPT with the Local Format Storage (LFS) feature, see Appendix C, “Local Format Storage Optimization.”

## ECSA Worksheet

This section includes a worksheet for use in estimating the amount of virtual memory (ECSA) for ULTRAOPT.

**Note:** In the following worksheet, *sessions* implies *sessions to intercepted Applids*.

**Warning!** Use this worksheet as an estimating tool. Actual results might vary (depending on the environment in which the subsystem is installed) and might exceed the estimate because of the variable amount that is used for processing VTAM functions. It is important to add some overage to the estimated amount.

If you have ULTRAOPT/CICS or ULTRAOPT/IMS without LFS, use Table 1-7 to estimate your ECSA.

**Table 1-7 ECSA Storage Requirements for ULTRAOPT**

Feature	Bytes	No.	Total
base module requirement and internal trace	2000 KB	1	2000 KB
data stream trace buffer size from panel 3.4	user-defined	1	
intercepted Applids	14 KB		
sessions with Programmed Symbol optimization (using the OPTPS startup parameter) <sup>1</sup>	76 KB		
optimized Model 2 terminal sessions <sup>1</sup>	3 KB		
optimized Model 2 sessions with ext. attributes <sup>1</sup>	6 KB		
optimized Model 3, 4, or 5 terminal sessions <sup>1</sup>	6 KB		
optimized Model 3, 4, or 5 sessions with ext. attributes <sup>1</sup>	10 KB		
terminated or unoptimized sessions (any model)	1 KB		
sessions with applications such as TSO and session managers that use RECEIVE OPTCD=SPECIFIC <sup>2</sup>	5 KB		
	Subtotal		_____
To calculate variable overage for VTAM API and EXIT requests, multiply the Subtotal by 0.5 and add that product to the Subtotal:	<b>Grand Total</b>		_____

<sup>1</sup> With the XPVT startup parameter, much of the IMS and CICS session storage is allocated in extended private. TSO and session manager sessions are still allocated in ECSA. See "Extended Private Storage" on page 2-8.

<sup>2</sup> To determine whether an application uses RECEIVE OPTCD=SPECIFIC, ask the application programmer or examine an API trace for the application. CICS and IMS use RECEIVE OPTCD=ANY; so their additional session storage requirements are negligible.

**Note:** Systems with little or no optimization, such as test systems, might use more ECSA than this estimate. The discrepancy is caused by the higher percentage of ECSA that is used for VTAM API requests and exits in such systems.

## ECSA Estimation Examples

This section includes examples of how to estimate ECSA usage.

### Using ULTRAOPT without a Session Manager

This example assumes the following operating environment:

- ULTRAOPT/IMS without LFS
- no Session Manager
- only IMS intercepted

Using ULTRAOPT/IMS, you have a network with 3000 Model 2 terminals (2000 of which use extended attributes), 1000 Model 3 terminals, 1000 Model 4 terminals, and 1000 Model 5 terminals. Only the Model 5 terminals are excluded from optimization; all others are included. Each terminal has an active session. In this example, three IMS control regions are intercepted.

Table 1-8 estimates the required ECSA storage for the scenario in this example.

**Table 1-8** ULTRAOPT/IMS ECSA Storage Example

Feature	Bytes	No.	Total
base module requirement	2000 KB	1	2000 KB
data stream trace buffer size from panel 3.4	user-defined	1	1000 KB
intercepted Applids	14 KB	3	42 KB
optimized Model 2 terminal sessions	3 KB	1000	3000 KB
optimized Model 2 sessions with extended attributes	6 KB	2000	12,000 KB
optimized Model 3 terminal sessions	6 KB	1000	6000 KB
optimized Model 4 terminal sessions	6 KB	1000	6000 KB
terminated or unoptimized sessions (any model)	1 KB	1000	1000 KB
Subtotal			31.04 MB
To calculate variable overage for VTAM API and EXIT requests, multiply Subtotal by 0.5 and add that product to the Subtotal:		<b>Grand Total</b>	46.56 MB

**Note:** This example would also apply to ULTRAOPT/CICS, where only CICS applications are intercepted.

## Using ULTRAOPT with a Session Manager

This example assumes the following operating environment:

- ULTRAOPT/CICS without LFS
- with session manager
- intercept TSO and CICS

You have a network with 1000 model 2 terminals and 500 model 3 terminals. All use extended attributes and are logged on to Candle CL/SUPERSESSION (which is intercepted).

All 1500 terminals use CL/SUPERSESSION to access CICS and TSO simultaneously. The number of intercepted ACBs assumes that Candle CL/SUPERSESSION is configured to use a shared ACB (virtual terminal) for each user providing background sessions to CICS and TSO (both intercepted).

In this situation, all user sessions are intercepted at the session manager level. Interception at this level eliminates the need to specify the OPTAPPL parameter to intercept the background sessions.

The background sessions between the 1500 shared CL/SUPERSESSION ACBs and the CICS and TSO ACBs are not optimized because they were already optimized by ULTRAOPT at the session manager level. Those ACBs are intercepted to allow BSR to be used.

These 3000 background sessions do not factor into the calculation for optimized sessions, but they are counted as unoptimized sessions. The total number of open ACBs is as follows:

$$1501(\text{CL/SUPERSESSION}) + 1501(\text{TSO}) + 1(\text{CICS}) = 3003 \text{ ACBs}$$

Table 1-9 estimates the required ECSA storage for the scenario in this example.

**Table 1-9 ULTRAOPT/CICS ECSA Storage Example**

Feature	Bytes	No.	Total
base module requirement	2000 KB	1	2000 KB
data stream trace buffer size from panel 3.4	user-defined	1	1000 KB
intercepted Applids	14 KB	3003	42,042 KB
optimized Model 2 sessions with extended attributes	6 KB	1000	6000 KB
optimized Model 3 sessions with extended attributes	10 KB	500	5000 KB
terminated or unoptimized sessions (any model)	1 KB	3000	3000 KB
sessions with applications such as TSO and session managers that use RECEIVE OPTCD=SPECIFIC	5 KB	3000	15,000 KB
Subtotal			74.04 MB
To calculate variable overage for VTAM API and EXIT requests, multiply Subtotal by 0.5 and add that product to the Subtotal:		<b>Grand Total</b>	111.06 MB

**Note:** This example would also apply to ULTRAOPT/IMS without LFS where IMS and the other applications (TSO and the session manager) are intercepted.

## ECSA Calculations Review

**Note:** When you have estimated ECSA usage based on the preceding worksheets and examples, you want to be certain your calculations are correct. If a sufficient amount of ECSA is not available for ULTRAOPT, you will experience serious problems with your system.

Use this section to help you examine your ECSA estimate.

The specific configuration in place in your environment will determine the amount of ECSA required by ULTRAOPT. As a general rule, if you calculated ULTRAOPT’s ECSA needs at 10 MB or less, you probably need to review your calculations.

For example, if you have determined that ULTRAOPT will require 3 MB of ECSA and have asked your systems programmer to add that amount to what you have currently defined, you will probably have problems even on a very small test system. ULTRAOPT requires 2 MB of ECSA *just to initialize*. If you are already running close to 80 percent or above ECSA usage, you will not be able to perform any meaningful tests, as ULTRAOPT restricts its activities when ECSA utilization reaches that threshold.

In general, if you have a small number of applications intercepted (such as three IMS applications) and are optimizing up to several thousand users, *without a session manager*, you should probably add around 50 MB to the ECSA that is defined on your system.

If you have any questions about calculating ULTRAOPT storage needs, contact your BMC Software customer support representative for assistance.

### **Using a Session Manager**

If you have a session manager, you might need to add 200 MB to 300 MB of ECSA to your system because session managers are typically configured to use individual ACBs for each background session established. Allowing for this configuration raises ULTRAOPT's ECSA consumption tremendously. In addition to the individual ACBs created, you must reserve some ECSA for each session's actual work; see the MODEL<sub>x</sub> lines in the ECSA worksheets. TSO interception also raises ULTRAOPT usage.

When optimizing a session manager, you can reduce the CPU cost in the session manager and the background applications by making use of the BSR feature. For more information about session managers, OPTAPPLS, and BSR, see Chapter 6, "Implementation Tips."



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## Chapter 2 Installation Preparation

This chapter provides information about preparing for ULTRAOPT installation. This chapter describes the materials, system, storage, authorization, product libraries, function modification IDs (FMIDs), allocation data set members, and DDDEF members that are required when you install ULTRAOPT.

This chapter contains the following sections:

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Required Materials . . . . .	2-2
Books and Notices . . . . .	2-2
Checklists . . . . .	2-3
Worksheets . . . . .	2-3
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System Hardware and Software Requirements . . . . .	2-4
Virtual Memory Requirements . . . . .	2-5
Common Paging Subsystem . . . . .	2-11
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## Overview

Before you install ULTRAOPT, you must gather specific information. This chapter describes the materials that can help you install and customize ULTRAOPT.

If you are a new user or if you migrating to ULTRAOPT from another IMS or CICS optimizing product and you want to understand how ULTRAOPT fits into your product environment, see Appendix A, “Product Overviews.”

## Required Materials

This section describes the materials that you must gather and review before installing ULTRAOPT.

## Books and Notices

Table 2-1 lists the installation and customization books that you will need to install and customize ULTRAOPT.

**Table 2-1** Installation and Customization Materials

<b>Material</b>	<b>Description</b>
release notes, flashes, and technical bulletins	provide important product information and last-minute information
<i>OS/390 and z/OS Installer Guide</i>	provides information about the OS/390 and z/OS Installer
<i>ULTRAOPT Customization Guide</i>	provides installation planning information, instructions for setup and testing, and instructions for customizing ULTRAOPT when it has been installed by using the OS/390 and z/OS Installer
<i>ULTRAOPT User Guide</i>	describes ULTRAOPT startup parameters and operator commands and provides information for using the ULTRAOPT products at your data center

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## Checklists

The installation checklist outlines the steps that you must perform to install and run ULTRAOPT. The checklist summarizes what you must do and refers you to detailed instructions.

The Installation Checklist Generator is available on your documentation CD, and the most current version is on the BMC Software Web site at <http://www.bmc.com/support.html>. Using the checklist generator, you can select a set of products that are available in the installation system to produce an integrated checklist which lists each step you must complete for successful installation.

The checklist provides the following information:

- list of preinstallation tasks to complete and items to assemble
- specific installation tasks to help you run the installation system and successfully complete the installation
- list of the customization tasks necessary to run your product
- references to where you can find additional or supporting information

You can run the Installation Checklist Generator *or* you can copy and combine checklists from the customization books for the BMC Software products that you plan to install.

## Worksheets

Worksheets are provided for many BMC Software products. A worksheet contains information, such as data set names and library locations, that you will need for completing installation. Before beginning installation, copy and combine all worksheets from the customization books for the BMC Software products that you plan to install.

## Prerequisites

This section describes the hardware, software, storage, and authorization requirements for ULTRAOPT.

### System Hardware and Software Requirements

The hardware and software requirements for ULTRAOPT are as follows:

- MVS/ESA, OS/390, or z/OS
- VTAM 4.3 (or later)
- 60 KB of CSA storage
- MVS/TSO
- sufficient ECSA (see “ECSA Estimation Overview” on page 2-5)

The ULTRAOPT subsystem does not contain any hardware-sensitive code or files. You can change direct access storage devices (DASD), 37xx, modems, and so on at any time. The subsystem checks the CPU ID to verify that each product is authorized to run on this CPU. During the trial period, you can obtain a temporary product authorization code that enables the product to run on any CPU. If you need to change or add a CPU after you have obtained a permanent license, contact your BMC Software sales representative.

Review the latest technical bulletins for authorized program analysis reports (APARs) that must be applied.

**Note:** Only one version of ULTRAOPT at a time can be active on a single MVS image.

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## Virtual Memory Requirements

Most of the virtual storage that is used by ULTRAOPT is obtained from the extended common storage area (ECSA); most subsystems and previous BMC Software optimization products obtain storage in the extended *private* storage area (XPVT).

**Warning!** Because ECSA is a critical shared resource, it is vital that your MVS system programmer define a sufficient amount of it to the system in SYS1.PARMLIB before starting ULTRAOPT. You must perform an initial program load (IPL) on the system to change your ECSA definition. If you do not define enough ECSA and system usage of defined ECSA reaches 95 percent, no more session logons can be established to intercepted applications.

For a worksheet that explains how to estimate the amount of virtual memory to define in ECSA, see Chapter 1, “Installation Overview.”

### ECSA Estimation Overview

To avoid estimating your ECSA requirements, your MVS system programmer can simply define 300 MB or more to the system. Be sure that your common page data set can back up or accommodate your actual ECSA usage. Defining an arbitrarily large amount of ECSA will take away from the largest possible size of any private address space; however, the following statements are true:

- Defining a large amount of ECSA still leaves more than 1.5 GB of addressability for private virtual storage.
- ECSA refers to virtual memory, not real memory.
- The product only obtains storage from the total free ECSA pool when needed and will not need all 300 MB for most environments.

The subsystem obtains virtual storage as needed for handling data streams, traces, VTAM functions, and unique formats for LFS. The amount of storage used depends on the number and/or presentation space (screen) size of the following items:

- intercepted application control blocks (ACBs)
- sessions established to intercepted Applids
- sessions using extended attributes
- 3174 controllers using LFS
- unique formats stored with LFS optimization
- outstanding VTAM API and EXIT requests
- outstanding VTAM SEND/RECEIVE requests
- user-allocated data stream trace buffer
- internal trace table buffer

To accurately estimate your ECSA usage, you *must* understand the rules governing the interception of ACBs, which determine how many applications, LUs, and sessions you have. These rules are described in the *ULTRAOPT User Guide*.

The ECSA worksheets for estimating your ECSA usage are provided in Chapter 1, “Installation Overview.” If you are using the LFS feature, the ECSA worksheets are provided in Appendix C, “Local Format Storage Optimization.”

### **Multiple-ACB Applications (Session Managers) Estimation**

When estimating the ECSA requirements for multiple-ACB applications (such as session managers optimized by ULTRAOPT), the most important consideration is to ensure that your MVS system has enough free ECSA to handle ULTRAOPT storage requirements for the potentially large number of ACBs that the session manager can OPEN (because ALL of its ACBs are intercepted).

The subsystem intercepts *every* ACB opened under an included application’s address space (but none for applications that are not included). These interceptions might include session manager virtual terminal ACBs, which might be numerous.

For information on estimating ECSA storage use, see the instructions in Chapter 1, “Installation Overview.” To estimate ECSA storage use when you are using the LFS feature, see Appendix C, “Local Format Storage Optimization.” For more information about session managers, OPTAPPLS, and BSR, see Chapter 6, “Implementation Tips.”

## Storage Shortages

The ULTRAOPT subsystem constantly observes the way the system uses ECSA. When overall system ECSA use reaches 80 percent of the total amount that is defined for the system, ULTRAOPT limits its activities as follows:

- 80 percent or higher—The product stops intercepting newly opened ACBs.

**Note:** In this context, “newly opened ACBs” refers to any request to OPEN an application ACB. That includes ACBs that were previously being intercepted and then were closed and now are being opened again. For example, if you shut down IMS when ECSA use is more than 80 percent, the IMS ACB will not be intercepted if it is reopened while the system ECSA use is still more than 80 percent.

- 90 percent or higher—Optimization stops.
- 95 percent or higher—The product stops accepting new sessions (new logons are rejected).

You can affect the calculation of this percentage by using the CSALIMIT startup parameter or operator command. Startup parameters are described in Chapter 7, “Startup Parameters.” Operator commands are described in the *ULTRAOPT User Guide*. The calculation is based on the product’s use of ECSA as a percentage of the CSALIMIT value. The CSALIMIT command may be used only if a non-zero CSALIMIT startup parameter was used.

You can change these percentages by using the CSALVLS startup parameter or operator command.

When deciding how much system ECSA to define in SYS1.PARMLIB(IEASYSxx), you should consider how the rest of your system uses ECSA. The ECSA that is used by the rest of the system plus the ECSA that is used by ULTRAOPT must be less than 80 percent of total system ECSA.

**Warning!** Use the ECSA worksheets as estimating tools. Actual results might vary (depending on the environment in which the subsystem is installed) and might exceed the estimate because of the variable amount that is used for processing VTAM functions. It is important to add some overage to the estimated amount.

The total ECSA figure from the worksheets is approximately how much storage the ULTRAOPT subsystem uses. The equation is as follows:

$$\text{ECSA from table} + \text{System ECSA used} < 0.8 \times \text{Total ECSA}$$

To ensure that you have sufficient coverage, multiply the ECSA grand total from the table by 1.5 before applying it to the preceding formula.

### Terminated or Unoptimized Sessions

The ECSA worksheets in Chapter 1, “Installation Overview,” provide examples for several types of systems. Each ULTRAOPT worksheet has a row to plan for storage for “terminated or unoptimized sessions.” These rows help you plan for SCBEs, the control blocks which represent individual sessions.

There is one SCBE for each session to intercepted applications. By default, these SCBEs are placed on a “free queue” within ULTRAOPT after the session is terminated and are reused when the next LU session is established. This is a function of the RSCBE startup parameter, which allows these control blocks to be reused more readily for other LUs.

Using the RSCBE startup parameter or operator command can decrease ULTRAOPT ECSA usage somewhat, although the savings might not be significant in your environment. The parameter has the following effects:

- Use the default startup parameter RSCBE to have the statistics more closely represent the number of concurrent sessions in use. If you use the RSCBE parameter, you may ignore the “Terminated or unoptimized” row in the ULTRAOPT worksheets.
- Use the startup parameter NORSCBE to retain statistics for every LU that has logged on to an intercepted application since starting ULTRAOPT. This parameter causes the ULTRAOPT monitor to display statistics for every session that has existed since ULTRAOPT was initialized.

### Extended Private Storage

STOR=XPVT is an ULTRAOPT startup parameter. It allows some ULTRAOPT control blocks to be allocated in extended private area of virtual storage of the targeted address space (IMS or CICS), rather than allocating all storage in ECSA (the default). This allocation applies only to IMS and CICS sessions; users logging on to IMS or CICS cause ULTRAOPT to allocate and use storage in extended private area.

XPVT is available *only* as a startup parameter; no corresponding operator command is available. Consequently, the only way to activate or deactivate this option is to recycle ULTRAOPT with STOR=XPVT specified or omitted from the list of parameters in the ULTRAOPT started task.

You might want to use the XPVT option if you are constrained on the amount of ECSA your systems programmer has defined in your environment. New customers might also want to use XPVT. Use of XPVT does not completely eliminate ULTRAOPT use of ECSA but significantly reduces it for customers using IMS or CICS.

### Disadvantages

- FRBWA command does not apply to affected sessions (IMS or CICS) when using XPVT.
- The D subsysid,STORAGE command lists *common* (ECSA) storage control blocks. When ULTRAOPT is using the STOR=XPVT startup parameter, there is very little to display because many of ULTRAOPT control blocks are moved to extended private storage.

### Recommendations

- You might want to consider using REGION=0M on the IMS and CICS regions that ULTRAOPT is going to intercept while using XPVT. Ensure that *each* IMS and CICS has adequate free extended private storage to accommodate 75 percent of the value obtained in your ECSA calculations for IMS and CICS (75 percent of the Grand Total value), excluding any storage required for LFS. (All LFS storage will be obtained in ECSA, regardless of the use of the XPVT option.)

For example, if you calculated your ECSA Grand Total to be 100 MB (without LFS), ensure that you have 75 MB of extended private storage available to your IMS or CICS.

**Warning!** The xxxUSI exit (and perhaps others) can affect the amount of region actually obtained for an address space. Check with your MVS systems programmer to determine whether such a situation is in place in your environment.

- For existing ULTRAOPT customers, it is recommended that you *do not* decrease the amount of ECSA that is defined on your system initially. After activating XPVT, let the system run long enough to determine “normal” ECSA usage with the new option, then adjust if necessary. Continue to monitor your virtual storage usage and make changes as required.

- For new ULTRAOPT customers, it might be necessary to add some ECSA to your system. For more information, see “New Customers” on page 2-10.
- Ensure that the local page data set is large enough to accommodate the potential increased activity. Be aware of the real and extended storage that is available and of the possible effects on your paging subsystem.

**Warning!** If paging is occurring on your system, be aware that ULTRAOPT paging activity will move from primarily using the common page data set to a combination of the common and local page data sets, with most activity going to the local data set.

### **New Customers**

If you are a new ULTRAOPT customer and want to try using the `STOR=XPVT` option, perform the following actions:

- Complete the ECSA calculations. Note the estimated grand total value for IMS and CICS sessions.
- Ensure that your IMS and CICS regions have 75 percent of the value just calculated available in extended private storage.
- BMC Software recommends that you add 50 percent of the grand total value just calculated to the amount of ECSA that is available on your system.
- Monitor and adjust the ECSA amount as necessary.

BMC Software recommends having 75 percent of the grand total available in extended private of the intercepted IMS and CICS applications and 50 percent of the grand total added to ECSA. These percentages add up to 125 percent of the grand total. This amount helps ensure that you have enough virtual storage of each type. A shortage of either resource causes severe application difficulties and outages. Allowing more *virtual* storage to be available prevents an application outage because of the lack of these resources yet has no effect on your actual *real* storage usage. When ULTRAOPT begins to use virtual storage, it allocates storage and begins competing for real storage.

## Common Paging Subsystem

Because ULTRAOPT can use a significant amount of ECSA, BMC Software recommends that you tune your common paging subsystem to ensure that it is isolated from other paging subsystems and performs as efficiently as possible. If you are using the `STOR=XPVT` startup parameter, you should also tune your local page data sets to ensure optimum performance.

## 24-Bit Private Area Memory Requirements

While intercepting an application, the ULTRAOPT subsystem uses that application's private area to store a copy of its ACB. For applications that open a large number of ACBs (session managers), the amount of private storage that is used can be significant.

The subsystem defines the following classes of storage, as necessary, below the 16 MB line in private storage:

- ACB, EXLST, and NIB COPY (256 bytes)

Sixteen of these control block combinations fit in a 4 KB page. ULTRAOPT allocates one control block combination per open ACB.

- ACBRIVL (107 bytes)

ULTRAOPT allocates these vectors in subpool 230 in key 6 for each open ACB.

- VDB TPEND reason code 8 IRB (160 bytes)

Twenty-five of these control block combinations fit in a 4 KB page. ULTRAOPT allocates one control block combination per open ACB when the subsystem shuts down.

- CAB IRBs (192 bytes)

Twenty-one of these control block combinations fit in a 4 KB page. ULTRAOPT allocates one control block combination for each task with one or more open ACBs.

- EWABs (640 bytes)

One of these control blocks fits in a 4 KB page because it goes in a task-related subpool and is the only one for each task in key 6. ULTRAOPT allocates one per task with an open ACB. This control block is used to drive exits in AMODE 24.

If you use the ACB31 startup parameter, systems with MVS/ESA and Data Facility Product (DFP) 2.3 allocate class 1 above the 16 MB line in the 31-bit private area and class 2 is not used.

If an application's private region below the 16 MB line does not have enough storage available to maintain the ACB copies and the ACBRIVL vectors, the copies can be allocated from 31-bit storage above the line. To switch to this mode of operation, use start option ACB31.

## DASD Storage Requirements

When you have calculated the amount of storage that is required, verify that your Common Page Data Set contains sufficient DASD space to back up this storage.

The OS/390 and z/OS Installer calculates the amount of DASD storage that is required to install the products that you have selected. If you want, you can change the amount of DASD storage that is recommended by the installation system.

## Authorization Requirements

This section describes the requirements for security products, for dispatching priorities, and for VTAM Applids.

## RACF Requirements

A security product like Resource Access Control Facility (RACF) is required for the OS/390 eNetwork Communications Server version 2.5 (or later) Internet Protocol (IP) environment. Each unit of work in the system that requires Unix System Services must be associated with a Unix System Services identity. A valid identity refers to the presence of a valid Unix user ID (UID), a valid Unix group ID (GID), and a valid HOME directory for such user. The UID and the GID are defined through the OMVS segment, in the RACF profile, and in the RACF group profile.

For more information about RACF, see the IBM *IP Planning and Migration Guide*.

**Note:** If the started task is not defined to a user ID that has a defined OMVS segment, MVS message ICH408I might be issued. If the HOME directory is not specified for the user ID, the socket call might fail.

## Dispatching Priority

When initialization is complete, ULTRAOPT executes most of its code under each optimized application's address space, using that address space's dispatching priority. However, the Monitor component is run partially under the TSO user's address space and partially under the ULTRAOPT address space. BMC Software recommends setting the ULTRAOPT dispatching priority to be the same as the VTAM dispatching authority. In addition, BMC Software also recommends setting the dispatching priority of the VTAM applications lower than that of VTAM.

## VTAM Applids

To optimize an application's data streams, you must specify the application ID (Applid) on the appropriate Monitor 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 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 data center. In each member, search for a statement of the following form:

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

*label* is the Applid. This statement, known as the application's Applid, defines a minor node. There might be more than one per major node, depending on how your system is configured.

## Product Authorization

Ensure that you have the bypass product authorization passwords for each product that you want to install. You must supply them during installation. If the bypass product authorization passwords are not in the shipping box, they are available from your BMC Software sales representative, as described in the *OS/390 and z/OS Installer Guide*. This procedure installs each product for which you have a product authorization password.

Before you can use ULTRAOPT, you must perform product authorization. For more information about the BMC Software Product Authorization utility, see the *OS/390 and z/OS Installer Guide*.

## Installation Considerations

This section discusses options for the installation and servicing of BMC Software products. It can help you determine which product distribution method is appropriate for your site's installation and maintenance goals.

### Installation Method Selection

The most desirable installation method should suit your product configuration needs while requiring the least amount of time and effort to install your products. To help you choose the best installation method, consider the following items:

- existing BMC Software products that are installed at your site
- BMC Software products that you plan to trial or add to your data center
- maintenance level of BMC Software products at your site
- time and effort that are required for product customization
- installer's knowledge of SMP/E procedures and terminology

**Note:** Any existing products that are replaced by using the OS/390 and z/OS Installer must be recustomized. For more information about customizing ULTRAOPT, see the *ULTRAOPT Customization Guide*.

Before you can install ULTRAOPT and make it operational, you must consider the following prerequisites:

- operating system software requirements for ULTRAOPT
- amount of virtual storage that is required for operation of ULTRAOPT
- amount of DASD storage that is required for installation of ULTRAOPT by using the OS/390 and z/OS Installer
- target system changes that you might need to make before installing and customizing ULTRAOPT

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## Target System Changes

Before installing and customizing ULTRAOPT, you must make the following target system changes:

- Determine whether your site security system controls access to tape data sets at the data set name level.

If your security system controls access to tape data sets at the data set name level, perform the following actions:

- Define a rule for each data set to provide read access (by first scanning the tape to determine the data set names).
  - Execute the installation jobs by using an authority level that is sufficient to provide generic read access.
- If you will perform AutoCustomization, you must ensure write access to the following items:
    - SYS1.PARMLIB
    - JES procedure library (SYS1.PROCLIB or equivalent)
    - previously APF-authorized load library
    - SYS1.VTAMLST (or equivalent) for MAINVIEW Alternate Access

## Data Set Management

Before installing and customizing ULTRAOPT, you might want to establish a data set management plan.

The following example demonstrates how some customers manage their ULTRAOPT data sets when installing and maintaining the product. In the example, *hilevel* is the high-level qualifier.

### Installation

1. Install the product using the OS/390 and z/OS Installer.
2. Copy the modules from *hilevel*.BBLINK to an authorized ULTRAOPT test load library.
3. Test ULTRAOPT in your test environment.
4. Back up the ULTRAOPT production load library.
5. Copy the modules from the ULTRAOPT test load library to your ULTRAOPT production load library.
6. Archive or migrate the *hilevel*.\* data sets until they are needed to apply maintenance.

## Maintenance

The PUT system was developed to make the latest service and maintenance for the BMC Software products that are installed with the OS/390 and z/OS Installer available to customers at regular intervals. For more information, visit the OS/390 and z/OS Product Compatibility and Maintenance section of the Customer Support page on the BMC Software Web site at [http://www.bmc.com/products/os\\_maintenance/](http://www.bmc.com/products/os_maintenance/).

1. Recall the *hilevel.\** data sets that were archived or migrated.
2. Receive, apply, and accept maintenance from each new PUT tape.
3. Copy the modules from *hilevel.BBLINK* to an authorized ULTRAOPT test load library.
4. Test the maintenance in your test environment.
5. Back up the ULTRAOPT production load library.
6. Copy the tested ULTRAOPT test load library to the ULTRAOPT production load library.
7. Archive or migrate the *hilevel.\** data sets until they are needed to apply maintenance.
8. Repeat Steps 1 through 7 as needed.

## Product Implementation

This section describes the product libraries, function modification IDs (FMIDs), allocation data set members, and DDDEF members that are provided when you install ULTRAOPT. For more information about product implementation, see Chapter 4, “CICS Exit Program Installation,” Chapter 5, “Before Starting ULTRAOPT,” and Chapter 6, “Implementation Tips.”

## Product Libraries

Table 2-2 lists the product target libraries and distribution libraries that are allocated to ULTRAOPT during installation. The installation system prompts you to type a high-level qualifier for the libraries.

**Table 2-2** ULTRAOPT Target and Distribution Libraries

Target Library	Distribution Library
BBACTDEF	ABBACTDF
BBCLIB	ABBCLIB
BBHELP	ABBHELP
BBILIB	ABBILIB
BBLINK	ABBLINK
BBMAC	ABBMAC
BBMLIB	ABBMLIB
BBPARAM	ABBPARAM
BBPLIB	ABBPLIB
BBPROF	ABBPROF
BBSAMP	ABBSAMP
BBSLIB	ABBSLIB
BBTLIB	ABBTLIB
BBUSER	ABBUSER
BBVDEF	ABBVDEF

## SMP/E FMIDs

Table 2-3 lists the FMIDs for ULTRAOPT. For a list of FMIDs that are required for MAINVIEW for VTAM, see the *MAINVIEW Installation Requirements Guide*.

**Warning!** Table 2-3 might be out of date. Every time you apply maintenance, check or rerun the list online to make it current.

**Table 2-3** ULTRAOPT FMIDs

FMIDs
BBAPW32
BBBBP11
BBNCF12
BBNUF12

## Data Set Allocation Jobs

**Note:** Customize each job for the ULTRAOPT release level that you are installing.

The following ULTRAOPT data set allocation jobs are available in \$B65ALOC:

- #@AALLOC
- #@MALLOC
- #@YALLOC

For more information about allocating and constructing product data sets with SMP/E, see the *OS/390 and z/OS Installer Guide*.

## DDDEF Statement Members

The contents of the #@ADDDEF member and other members are copied in \$B70DDEF. If you are using DDDEF statement members, the following DDDEF members are required to install ULTRAOPT at your site:

- #@ADDDEF
- #@MDDDEF
- #@YDDDEF

## Where to Go from Here

Install ULTRAOPT by using the OS/390 and z/OS Installer. For more information, see the *OS/390 and z/OS Installer Guide*.

When ULTRAOPT has been installed, you must customize it to make the basic functions operational. To customize ULTRAOPT, see Chapter 3, “Installation Customization.”

---

---

# Chapter 3 Installation Customization

This chapter describes how to customize ULTRAOPT to make the basic product functions operational.

This chapter contains the following sections:

Overview . . . . .	3-2
AutoCustomization . . . . .	3-2
Prerequisites . . . . .	3-3
Before Customization. . . . .	3-3
Task 1—Invoking AutoCustomization. . . . .	3-5
Task 2—Choosing a Product to Customize . . . . .	3-6
Task 3—Customizing the Product . . . . .	3-7
Task 4—Executing SOP Steps . . . . .	3-9
Manual Customization . . . . .	3-11
Prerequisites . . . . .	3-11
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Task 2.F—Copying VTAM Definitions to the VTAM Library . . . . .	3-29
Task 2.G—Defining the VSAM Options File and the VSAM Print File . . . . .	3-30

## Overview

When you have installed ULTRAOPT, you must customize the product to make the basic functions operational by using one of the following methods:

- AutoCustomization
- manual customization

When you have completed customization, verify that ULTRAOPT functions are operational.

## AutoCustomization

AutoCustomization lets you perform the minimum steps that are required to make ULTRAOPT operational.

AutoCustomization is an interactive, online ISPF dialog that customizes installed BMC Software products. AutoCustomization minimizes mistakes, propagates information for shared customization steps, lets you browse steps before you perform them, and marks each step as it is completed. You can also bypass steps if you prefer to perform them manually.

To get help at any time during AutoCustomization, type **HELP** on the COMMAND line or press **F1**.

When you have selected one or more products, AutoCustomization presents a comprehensive list of sequentially numbered steps that you must complete before the product is operational. The number of steps depends on the product. Most steps are required, but some are optional.

BMC Software recommends that you browse all steps and compile a list of questions or required information before selecting steps in AutoCustomization. By having all the information in advance, you can answer the questions promptly and proceed through the AutoCustomization process in a more efficient manner.

**Note:** Although you can browse steps in any order, you cannot select them in any order. Each step *must* be selected, even if it is optional and will be bypassed. Because many steps share information that is given in previous steps, all steps must be selected and completed in the order given.

When all required steps are marked completed, the product is considered operational. When you return to the product list from the step list, the status of the product changes from UNMODIFIED to OPERATIONAL.

However, if you bypass any required steps in the list of numbered steps then return to the product list, the status of the product is changed to INCOMPLETE; the product is not operational.

Verify that the ULTRAOPT functions work properly by using the functions as described in the *ULTRAOPT User Guide*.

**Note:** If you installed BMC Software products in multiple target and distribution zones, you must run AutoCustomization for each set of target libraries and distribution libraries.

## Prerequisites

To execute AutoCustomization, you must meet the following prerequisites:

- ISPF/PDF 2.3 or higher
- access authority

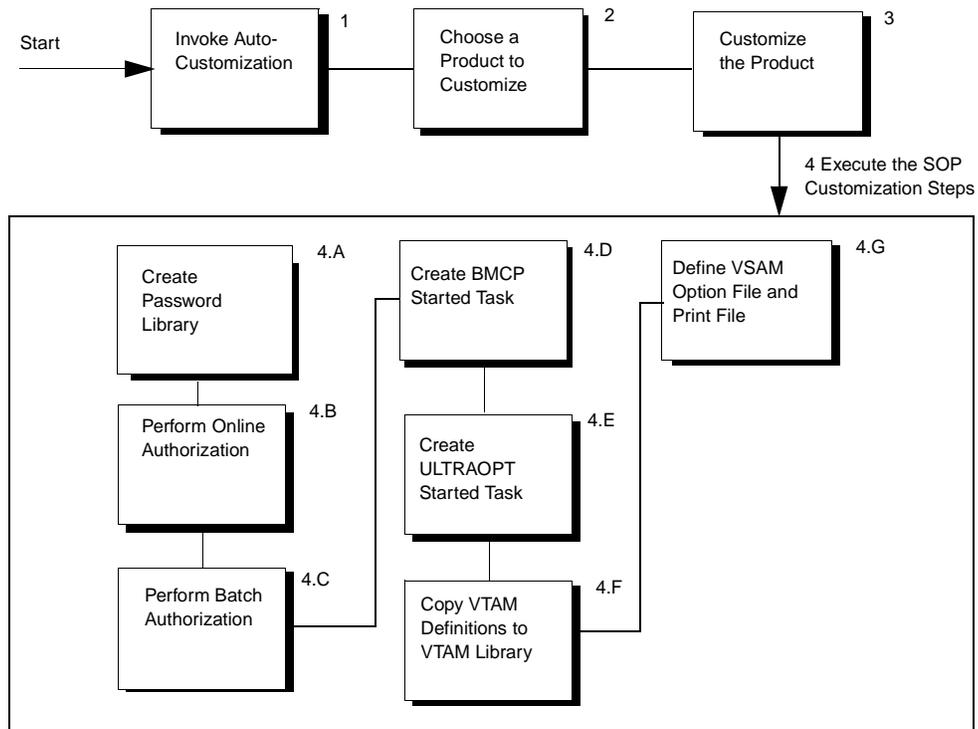
## Before Customization

Ensure write access to the following items:

- SYS1.PARMLIB
- JES procedure library (SYS1PROCLIB or equivalent)
- previously Authorized Program Facility (APF)-authorized load library
- SYS1.VTAMLST or equivalent for MAINVIEW Alternate Access

Figure 3-1 shows a flowchart of the AutoCustomization installation process.

**Figure 3-1 AutoCustomization Process**



## Task 1—Invoking AutoCustomization

---

**Summary:** In this task, you will invoke AutoCustomization.

---

AutoCustomization is executed online. You do not need to allocate any libraries or modify panels before invoking AutoCustomization. To invoke AutoCustomization, perform the following steps:

**Step 1** On any ISPF panel COMMAND line, type the following command:

```
TSO EX 'hilevel.BBCLIB(BBCUST)'
```

**Step 2** Press **Enter**.

**Step 3** Supply the high-level qualifier of your target libraries, as requested by AutoCustomization.

**Step 4** Press **Enter**.

AutoCustomization displays the Product Customization menu (Figure 3-2 on page 3-6), where you can choose a product to customize.

## Task 2—Choosing a Product to Customize

**Summary:** In this task, you will choose to customize ULTRAOPT.

The Product Customization menu (Figure 3-2) shows a list of your products and the status of each. To choose to customize ULTRAOPT, perform the following steps:

- Step 1** Move the cursor to the left of the **ULTRAOPT** product.
- Step 2** Type **S**.
- Step 3** Press **Enter** to select the product.

AutoCustomization invokes the Product Customization Steps menu for ULTRAOPT.

**Figure 3-2 Sample AutoCustomization Product Customization Menu**

```

BMC Software ----- PRODUCT CUSTOMIZATION ----- Row 1 to 6 of 6
COMMAND ==>>>                                     SCROLL ==>> PAGE

Valid line command:                                Valid primary commands:
S - Select a product for customization             MAINT - Recustomize all products after
  (you may select more than one)                   applying SMP maintenance
                                                    HELP  - Display an overview of this
                                                    product customization dialog

Product                Status
-----
MAINVIEW ALARM          INCOMPLETE
MAINVIEW FOR IP         OPERATIONAL
MAINVIEW FOR VTAM       OPERATIONAL
MAINVIEW INFRASTRUCTURE OPERATIONAL
SUPEROPTIMIZER CICS     OPERATIONAL
ULTRAOPT                OPERATIONAL
***** Bottom of data *****

```

## Task 3—Customizing the Product

When you invoke AutoCustomization and access the Product Customization Steps panel for ULTRAOPT, the product customization steps are displayed. Figure 3-3 shows the Product Customization Steps panel that is displayed for ULTRAOPT (SOP).

You can customize the ULTRAOPT online environment manually or automatically. BMC Software provides AutoCustomization procedures that help you customize the environment step by step.

If you need help completing the shared (SHR) steps during AutoCustomization, see “Manual Customization” on page 3-11. The step numbers from AutoCustomization might not match exactly the manual customization steps, but the activities of the steps should coincide and be similarly named.

For information about selecting and completing the SOP steps, see “Task 4—Executing SOP Steps” on page 3-9.

**Figure 3-3 Sample Product Customization Steps Panel**

```

BMC Software ----- PRODUCT CUSTOMIZATION STEPS ----- Row 1 to 11 of 11
COMMAND ==>                                           SCROLL ==> PAGE

Valid line commands:                                Status (S)      Flag (F)
S - Select a step (Must be selected in sequence)   -----
B - Browse a step (No action is taken; step may    + completed    o optional
   be browsed out of sequence)                    - bypassed

Step S F Description                                     Product
-----
 1 +   Specify jobcards and other operational defaults      SHR
 2 + o  Generate JCL to run Installation Verification Program  SHR
 3 - o  Add the BMC Software load library to your system APF list  SHR
 4 - o  Add the BMC Software load library to your system link list  SHR
 5 - o  Create Password Library                                  SOP
 6 - o  Online Authorization for Product codes BFW, ULI, and ULC    SOP
 7 - o  Batch Authorization for Product codes BFW, ULI, and ULC    SOP
 8 - o  Create BMCP Started Task                                  SOP
 9 - o  Create ULTRAOPT Started Task                              SOP
10 - o  Copy VTAM Definitions to VTAM Library                    SOP
11 + o  Define VSAM Option File and Print File                    SOP
***** Bottom of data *****

```

Several steps are listed on the left side of the panel. To the right of each step number is the status indicator. The status of each step is indicated by a plus sign (+) for the steps that were completed during AutoCustomization, or by a minus sign (-) for a step that was bypassed. The status indicator is blank initially. The indicator changes to a minus sign if the step is selected but bypassed. The indicator changes to a plus sign when the step is completed.

To the right of the status indicator is a flag indicator (o) for optional steps.

On the far right of the panel is the Product step indicator. This indicator shows whether the step is shared (SHR) or product-specific. In Figure 3-3, Steps 1 through 11 are shared. Steps 12 and 13 are product-specific (indicated by the product name abbreviation in the **Product** column).

## Task 4—Executing SOP Steps

**Summary:** In this task, you will execute SOP customization steps.

### Before You Begin

**Note:** If you have not used AutoCustomization, or if you are unsure about a step, use the browse (B) line command to browse the step before selecting it. For more information, see “To Browse a Step” on page 3-10.

Each SOP step is described in Table 3-1. The panels for each step prompt you for specific customization information; HELP is available when you press **F1**.

For more information about each step, see “Manual Customization” on page 3-11.

**Table 3-1** SOP AutoCustomization Steps

Step	Description
Create Password Library	(optional) Lets you create the JCL for the Product Authorization library data set that contains the password for the PAS and the ULTRAOPT started task.
Online Authorization for Product codes BFW, ULI, ULC	(optional) Lets you interactively process Product Authorization (password) requests online. You can process a BMC Software-supplied password, display the contents of the Product Authorization table, or display information about the processor that you are using.
Batch Authorization for Product codes BFW, ULI, ULC	(optional) Lets you use a batch program to manage the Product Authorization library.
Create BMCP Started Task	(optional) Lets you create and edit the BMC Software Primary Subsystem (BMCP) startup procedure.
Create ULTRAOPT Started Task	(optional) Lets you create and edit the ULTRAOPT subsystem startup procedure.
Copy VTAM Definitions to VTAM Library	(optional) Lets you create the definitions in your VTAMLST that are required for your ULTRAOPT address space.
Define VSAM Option File and Print File	(optional) Lets you create the VSAM files that are required for your ULTRAOPT address space.

### To Browse a Step

To obtain more information before selecting a step for installation, you can browse the step. You can browse steps in any order; no sequential restrictions exist.

To browse a step, perform the following steps:

- Step 1** Move the cursor to the left of the step number that you want to browse.
- Step 2** Type **B**.
- Step 3** Press **Enter**.

A screen that contains information specific to that product is displayed. Each step might have several screens. Each screen contains questions about customizing the installation of the product.

### To Select a Step

Selecting a step is different from browsing a step. Each step must be selected in sequential order. Because the information given in one step might be used in a following step, you must complete each step before continuing to the next.

To select a step, perform the following steps:

- Step 1** Move the cursor to the left of the step that you want to select.
- Step 2** Type **S**.
- Step 3** Press **Enter**.

When the step has been completed, (or bypassed), AutoCustomization returns to the list of steps. The status of the step that you selected is updated to reflect whether the step was completed or bypassed.

### To Exit AutoCustomization

You might need to exit AutoCustomization before completing the installation of a product. The status of each step remains as you left it until you resume AutoCustomization. The status of the product on the Product Customization menu changes to `INCOMPLETE`.

When all required steps are marked completed, the product is considered operational and the status of the product changes from UNMODIFIED to OPERATIONAL.

## Manual Customization

Manual customization lets you customize ULTRAOPT to best suit your needs.

### Prerequisites

To execute manual customization, you must have the proper access authority. Verify that the ULTRAOPT functions work properly by using the procedures that are described in the *ULTRAOPT User Guide*.

### Process

Figure 3-4 shows the manual customization process.

**Figure 3-4 Manual Customization Process**

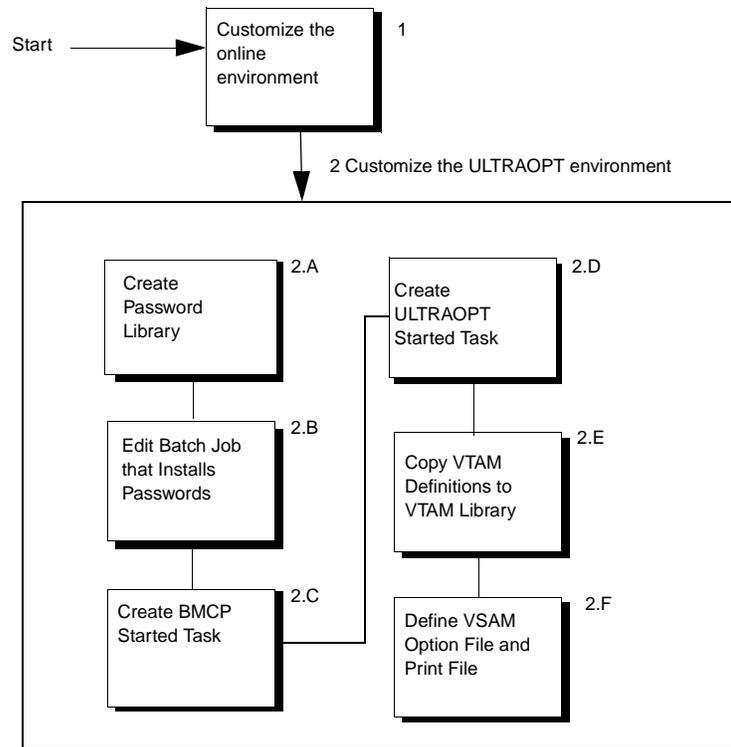


Table 3-2 briefly describes each step in the manual customization process. The right column names the data set member containing the sample JCL that is included on the tape. These samples are in the *hilevel.BBSAMP* data set on the tape, but you can specify a different high-level qualifier when you write the JCL to unload the tape.

**Table 3-2 Summary of Manual Customization Process**

<b>Task</b>	<b>Description</b>	<b>Data Set Member</b>
1	Customize the online environment.	
2	Customize the ULTRAOPT online environment.	
2.A	Create the password library.	SOPLIB
2.B	Edit the batch jobs that install your bypass Product Authorization password in the product authorization load module.	SOPSEC
2.C	Edit the startup procedures for BMC Software Primary Subsystem.	SOPBMCP
2.D	Edit the startup procedures for each product: <ul style="list-style-type: none"> <li>• ULTRAOPT/CICS</li> <li>• ULTRAOPT/IMS</li> </ul>	SOPULTRA
2.E	Edit your VTAMLST Applid definitions. This data set member contains a sample definition of a VTAM Applid.	SOPVTAM
2.F	Create a VSAM options file for ULTRAOPT.	SOPVSAM
	Create a VSAM print file for ULTRAOPT.	

You might have to edit certain lines in these jobs to conform to the requirements of your system, especially if you use the Storage Management Subsystem (SMS). Sometimes SMS has a problem with the jobs that create the VSAM options files (SOPVSAM).

## Customizing the Online Environment

Before you can customize ULTRAOPT, you must customize the basic online environment. You can customize the environment manually or automatically. BMC Software provides AutoCustomization procedures that help you customize the environment automatically. This section describes the steps for customizing the environment manually.

## Task 1.A—Specifying Job Cards and Other Operational Defaults

**Summary:** In this task, you will specify job cards and other operational defaults.

This task is required.

In the customization steps for data set allocations, you are instructed to specify the volume serial ID and unit type. In other steps, you are asked to supply the high-level qualifier (*hilevel*) for the product libraries.

To specify jobcards and other operational defaults, write down the volume ID and the unit type for the product libraries.

Table 3-3 lists the items that are requested; you can write the values in the **Information** column.

**Table 3-3 Information for Product Libraries**

Item	Description	Information
Prefix	high-level qualifier that was used	
Unit-T	generic unit name for temporary data sets	
Unit-P	generic unit name for permanent data sets	
VOLSER	volume ID for permanent data sets	
SYSID	MVS image identifier The SYSID cannot exceed eight characters.	

The SYSID value is used to build data set names for data sets that cannot be shared across multiple systems. In all cases where *hilevel* is referenced, this value is the prefix value for your product libraries and the SYSID value that is defined in Table 3-3.

## Task 1.B—Reviewing Virtual Storage Requirements

---

**Summary:** In this task, you will review the virtual storage requirements for ULTRAOPT.

---

This task is optional.

To review the estimated storage requirements that apply to ULTRAOPT, see Chapter 1, “Installation Overview.”

## Task 1.C—Generating JCL to Run the Installation Verification Program

**Summary:** In this task, you will generate JCL to run the Installation Verification Program (IVP).

This task is optional.

### BBSAMP Member BBAIVP

Member BBSAMP contains sample JCL that you can use to run program BBAIVP. BBAIVP is a batch job that examines load modules to validate product installation. BBAIVP reports the following information:

- modules that are marked as not executable
- programs that are not marked reentrant when BBAIVP expected them to be marked as reentrant
- modules that contain unresolved references

BBAIVP does not report weak references (references that are expected to be unresolved).

- name of the library and the number of modules that BBAIVP checked

### To Run BBAIVP

**Step 1** Replace ???????? in BBSAMP member BBAIVP with your high-level qualifier.

The REPORT statement or a SYSPRINT statement, shown in Figure 3-5, specifies the data set for the BBAIVP report. The SYSLIB statement specifies the data set for BBAIVP to check.

**Figure 3-5 BBAIVP JCL to Validate Product Installation**

```
// IVP      EXEC  PGM=BBAIVP
// STEPLIB DD  DISP=SHR,DSN=?????????.BBLOAD
// REPORT  DD  SYSOUT=*
// SYSLIB  DD  DISP=SHR,DSN=?????????.BBLINK
```

**Step 2** Submit BBAIVP for processing.

**Step 3** Check your job output for the following condition codes:

00	No errors found
08	One or more unresolved references (see the report for details)
12	One or more modules that should be marked as reentrant (see the report for details)
16	An operational error A message was written to the REPORT file or to SYSLOG.

**Note:** The product might operate properly even if errors are found; however, you should contact BMC Software Customer Support so that they can determine whether a problem exists.

---

## Task 1.D—Adding the BMC Software Load Library to Your System APF List

---

**Summary:** In this task, you will add the BMC Software load library to your system APF list.

---

This task is optional.

The BMC Software load library, *hilevel.BBLINK*, contains authorized programs. An entry for BBLINK must reside in your APF list defining BBLINK as an authorized library. If you did not use AutoCustomization to add a BBLINK entry to your APF list, you must add an entry manually to your APF list for this data set.

### To Edit BAIAPF for Temporary Authorization

To help you temporarily APF-authorize the BBLINK library, you can use the BBILIB member BAIAPF as a model.

- Step 1** Create UBBSAMP member BAIAPF.
- Step 2** Copy BBILIB member BAIAPF to the new member.
- Step 3** Change the PROC statement PREFIX parameter from @PREFIX to *hilevel*.  
*hilevel* is the high-level qualifier for the product libraries.
- Step 4** Change the PROC statement LIB parameter from @BBIAPF to a previously authorized library.
- Step 5** Change the PROC statement VOL parameter from @BBIVOL to the volume where the product libraries reside.
- Step 6** Submit the job.

### To Edit IEAAPFxx or PROGxx for Permanent Authorization

Use the Authorized Program Facility. Contact a system programmer for assistance in updating one of the following members:

- SYS1.PARMLIB member IEAAPFxx
- SYS1.PARMLIB member PROGxx (for service point (SP) 5 and later)

### **IEAAPFxx**

xx identifies the APF suffix that is specified in the IEASYS member that was used for the last MVS initial program load (IPL).

**Note:** An IPL is required before the SYS1.PARMLIB change can take effect.

### **PROGxx**

xx identifies the member in SYS1.PARMLIB that contains the parameters which define the list of APF-authorized libraries.

In PROGxx, you can specify multiple PROGxx members with the PROG parameter as follows:

```
PROG=(xx, . . . ,xx)
```

xx can be any two alphanumeric characters; for example:

```
PROG=( 01 , 02 )
```

Libraries are placed in the APF list as follows:

- libraries that are specified in the PROGxx members
  - if you have an existing IEAAPFxx member and PROGxx, both are processed
- To use only PROGxx, change IEAAPFxx to PROGxx and remove the APF parameters from IEASYSxx and IEASYS00.
- if you have PROGxx and EXITxx, PROGxx is processed before EXITxx
- To use only PROGxx, change EXITxx to PROGxx and remove the EXIT parameters from IEASYSxx and IEASYS00.

An IPL is required before the SYS1.PARMLIB change can take effect. Or, you can authorize the new libraries with the MVS SET command as follows:

```
T PROG=xx
```

xx identifies the SYS1.PARMLIB member.

For more information about APF-authorization, see the IBM *MVS/ESA SP version 5 Initialization and Tuning Reference* manual.

## Task 1.E—Adding the BMC Software Load Library to Your System Link List

---

**Summary:** In this task, you will add the BMC Software load library to your system link list.

---

This task is optional.

### Before You Begin

The BMC Software load library, *hilevel.BBLINK*, can be added to your system link list. BBLINK contains authorized programs. Before you complete this task, consider the following requirements:

- MVS requires that any data sets which have been added to your system link list be cataloged in the master catalog.
- If you are not adding BBLINK to your link list, you must specify a STEPLIB DD statement in your MAINVIEW startup procedures.

### To Add BBLINK to Your System Link List

**Step 1** Add the following line to your SYS1.PARMLIB(LNKLISTxx) member:

```
hilevel.BBLINK,
```

*hilevel* is the high-level data set qualifier that you used throughout this installation for your BMC Software product data sets.

**Step 2** Remove the STEPLIB DD statement for *hilevel.BBLINK* from the MAINVIEW startup procedures, such as the CAS and PAS started task procedures.

**Step 3** Update your system link list dynamically.

## Customizing the ULTRAOPT Environment

Before you can begin optimization, the online environment for ULTRAOPT must be customized. You can customize the environment manually or automatically. BMC Software provides AutoCustomization procedures that help you customize the environment automatically. This section describes the steps for customizing the ULTRAOPT environment manually.

## Task 2.A—Creating the MAINVIEW for VTAM PAS

**Summary:** In this task, you will create the MAINVIEW for VTAM PAS.

To create the MAINVIEW for VTAM PAS, perform the following steps:

- Step 1** Select *hilevel*.BBSAMP member SOPPAS.
- Step 2** To customize the SOPPAS procedure, follow the instructions at the top of the BBSAMP(SOPPAS) member.

The sample member is shown in Figure 3-6.

**Figure 3-6 Sample BBSAMP Member SOPPAS**

```

/*  CHANGE LOG:
/*
/*          CREATED BY ?USER ON ?DATE AT ?TIME
/*
/*-----
//SOPPAS  PROC
//SOP9MV00 EXEC PGM=SOP9MV00,
//          PARM=( 'SSID=?SSID' ,           <----- SUBSYSTEM ID
//              'XDM=NO' ,
//              'SVCPTDEF=SOP9AASP' ,
//              'RECON=YES' ) ,
//          ACCT=                             <----- ACCOUNTING INFO
/******
/*
/* SSID - ?SSID          (THIS PARAMETER HAS NO DEFAULT VALUE)          *
/*                                                                *
/*          SPECIFIES THE SUBSYSTEM ID USED TO IDENTIFY THE MAINVIEW    *
/*          COORDINATING ADDRESS SPACE (CAS).  THIS PAS USES THE SSID  *
/*          PARAMETER TO CONNECT TO THE CORRECT CAS, SO THE SAME VALUE  *
/*          MUST BE SPECIFIED BOTH FOR THIS SSID PARAMETER AND FOR THE  *
/*          CAS SSID PARAMETER.                                          *
/*                                                                *
/******
//STEPLIB DD  DISP=SHR,DSN=?BBCHILV.BBLINK
/*
/* ACTION DEFINITION TABLES.
/*
//BBACTDEF DD  DISP=SHR,DSN=?BBCHILV.BBACTDEF
/*
/* VIEW DEFINITIONS.
/*
//BBVDEF DD  DISP=SHR,DSN=?BBCHILV.BBVDEF
/*
/* PARM DEFINITIONS.
/*
//BBIPARM DD  DISP=SHR,DSN=?BBCHILV.BBPARM
/*
//SYSPRINT DD  SYSOUT=*
//SYSTEM DD  SYSOUT=*

```

- Step 3** Save your changes.
- Step 4** Copy the member to your procedure library.

## Task 2.B—Creating the Password Library

**Summary:** In this task, you will create the ULTRAOPT password library.

To create the ULTRAOPT password library, perform the following steps:

- Step 1** Select *hilevel.BBSAMP(SOPLIB)*.
- Step 2** To customize the SOPLIB, follow the instructions at the top of the SOPLIB member.

The sample member is shown in Figure 3-7.

**Figure 3-7 Sample BBSAMP Member SOPLIB**

```

//* CHANGE LOG:
//*
//*          CREATED BY ?USER ON ?DATE AT ?TIME
//*
//*-----
//**//IEFBR14 EXEC PGM=IEFBR14
//**//DELETE DD DISP=(MOD,DELETE),DSN=?BBCHILV.BMCPSWD,
//**//          UNIT=SYSDA,SPACE=(TRK,0)
//*-----
//IEFBR14 EXEC PGM=IEFBR14
//CATLG DD DISP=(NEW,CATLG),DSN=?BBCHILV.BMCPSWD,
//          DCB=(RECFM=U,LRECL=0,BLKSIZE=19069),
//          UNIT=SYSDA,SPACE=(TRK,(5,5,5))

```

**Step 3** Save your changes.

**Step 4** Submit the job.

## Task 2.C—Editing the Batch Jobs

**Summary:** In this task, you will edit the batch jobs that install your bypass Product Authorization password in the product authorization load module.

To edit the batch jobs, perform the following steps:

- Step 1** Select *hilevel.BBSAMP(SOPSEC)*.
- Step 2** To customize the SOPSEC, follow the instructions at the top of the SOPSEC member.

The sample member is shown in Figure 3-8.

**Figure 3-8 Sample BBSAMP Member SOPSEC (Part 1 of 2)**

```

/* CHANGE LOG:
/*
/*          CREATED BY ?USER ON ?DATE AT ?TIME
/*
/*-----
/*
/*          ON THE EXEC STATEMENT:
/*          SECSEC3B EXEC PGM=SECSEC3B,PARM=BFW
/*          THE PARM=XXX DETERMINES THE PRODUCT CODE FOR WHICH YOU
/*          ARE APPLYING AUTHORIZATION CODES.
/*          BFW = MAINVIEW FOR VTAM
/*          ULI = ULTRAOPT FOR IMS
/*          ULC = ULTRAOPT FOR CICS
/*
/*
/* VALID KEYWORDS AND EXAMPLES ARE:
/*
/*          PSWD      ==>  PSWD=XXX,XXX,XXX,XXX
/*                      WHERE XXX,XXX,XXX,XXX IS THE PASSWORD
/*
/*          OLDCPUID ==>  OLDCPUID=SSSSS-MMMM
/*                      WHERE SSSSS IS THE CPU SERIAL NUMBER OF
/*                      YOUR "OLD" CPU
/*                      MMMM IS THE CPU MODEL NUMBER OF
/*                      YOUR "OLD" CPU
/*          THE "OLDCPUID" KEYWORD IS USED WITH "DELETE", "REPLACE",
/*          AND "MODIFY" PASSWORDS.
/*
/*          NEWCPUID ==>  NEWCPUID=CCCCC-NNNN
/*                      WHERE CCCCC IS THE CPU SERIAL NUMBER OF
/*                      YOUR "NEW" OR CURRENT CPU
/*                      NNNN IS THE CPU MODEL NUMBER OF
/*                      YOUR "NEW" OR CURRENT CPU
/*          THIS KEYWORD IS USED WITH "ADD" AND "REPLACE PASSWORDS
/*
/*          LIST      ==>  LIST
/*          THIS KEYWORD WILL LIST ALL OF THE ENTRIES IN THE
/*          PRODUCT AUTHORIZATION TABLE.
/*
/*
/*

```

**Figure 3-8 Sample BBSAMP Member SOPSEC (Part 2 of 2)**


---

```

/** KEYWORD SYNTAX FOR PSWD, NEWCPUID, OLDCPUID:          *
/** THE SYNTAX FOR THE PSWD, NEWCPUID, AND OLDCPUID KEYWORDS IS *
/** FREE FORM. THESE KEYWORDS MAY START IN ANY COLUMN AND IN ANY *
/** ORDER AS LONG AS THE STATEMENT DOES NOT EXCEED COLUMN 72. *
/** ALL KEYWORDS MUST BE SPECIFIED ON A SINGLE LINE WITHOUT *
/** COMMENTS. THE SYSIN CONTROL STATEMENT CAN NOT BE CONTINUED. *
/** MULTIPLE SYSIN CONTROL STATEMENTS CAN BE PROCESSED IN A *
/** SINGLE JOB STEP. *
/** *
/** KEYWORD SYNTAX FOR LIST: *
/** THE LIST KEYWORD CAN NOT BE SPECIFIED WITH ANY OTHER KEYWORD. *
/** IF SPECIFIED IN CONJUNCTION WITH OTHER KEYWORDS, IT WILL BE *
/** IGNORED AND WILL NOT BE PROCESSED. THE LIST KEYWORD SHOULD *
/** NOT EXCEED COLUMN 72. *
/** *
/** EXAMPLES: *
/** *
/**PROCESS AN "ADD" PASSWORD: *
/** PSWD=123,456,789,ABC NEWCPUID=98765-4321 *
/** *
/**PROCESS A "DELETE" PASSWORD: *
/** PSWD=123,456,789,ABC OLDCPUID=98765-4321 *
/** *
/**PROCESS A "MODIFY" PASSWORD: *
/** PSWD=123,456,789,ABC OLDCPUID=98765-4321 *
/** *
/**PROCESS A "REPLACE" PASSWORD: *
/** PSWD=123,456,789,ABC OLDCPUID=98765-4321 NEWCPUID=98777-4321 *
/** *
/**PROCESS A "TEMPORARY" PASSWORD: *
/** PSWD=123,456,789,ABC *
/** *
/**REPORT PROCESSOR INFORMATION AND AUTHORIZATION: *
/** LIST *
/** *
/******* *
/** *
/**SECSEC3B EXEC PGM=SECSEC3B,PARM=BFW <-- CHANGE IF NECESSARY *
/** *
/**STEPLIB DD DISP=SHR,DSN=?BBLINK *
/**SYSPRINT DD SYSOUT=* *
/**SYSLIB DD DISP=SHR,DSN=?BBCHILV.BMCPSWD *
/**SYSIN DD * *
LIST
/*

```

---

**Step 3** Save your changes.

**Step 4** Submit the job.

## Task 2.D—Creating the BMCP Started Task

**Summary:** In this task, you will create the BMC Software Primary Subsystem (BMCP) started task.

For more information about BMCP, see the *BMC Software Subsystem User Guide*. To create the BMCP started task, perform the following steps:

- Step 1** Select *hilevel.BBSAMP(SOPBMCP)*.
- Step 2** To customize the SOPBMCP, follow the instructions at the top of the SOPBMCP member.

The sample member is shown in Figure 3-9.

**Figure 3-9** Sample BBSAMP Member SOPBMCP

```

/* CHANGE LOG:
/*
/*          CREATED BY ?USER ON ?DATE AT ?TIME
/*
/*-----
//SOPBMCP  PROC
/*
/* THIS PROCEDURE STARTS THE BMC PRIMARY SUBSYSTEM
/* AND SHOULD BE MODIFIED BY THE INSTALLER TO ENSURE
/* THE VALUE SPECIFIED FOR THE FOLLOWING PARAMETER
/* IS CONSISTENT WITH THE INSTALLATION'S STANDARDS:
/*
/*      SUBSYSID =BMCP          SPECIFIES THE 4-CHARACTER NAME THAT
/*                              THE SUBSYSTEM IS TO BE KNOWN BY.
/*                              IT CANNOT BE THE SAME AS THE MAINVIEW
/*                              CAS SUBSYSTEM NAME.
/*                              IT CANNOT BE THE SAME AS THE ULTRAOPT
/*                              SUBSYSTEM NAME.
/*
/* ONCE THE BMC PRIMARY SUBSYSTEM HAS BEEN STARTED, THIS
/* PARAMETER IS UNMODIFIABLE UNTIL THE NEXT IPL.
/*
/* ON SUBSEQUENT STARTS WITHOUT AN INTERVENING IPL, IT
/* WILL BE IGNORED.
/*
//SSAS      EXEC PGM=BPSMDSP4,
//          PARM='SUBSYSID=BMCP',          <----- SUBSYSTEM ID
//          REGION=2048K,
//          TIME=1440,
//          ACCT=                          <----- ACCOUNTING INFO
//STEPLIB DD  DISP=SHR,DSN=?BBCHILV.BBLINK

```

- Step 3** Save your changes.
- Step 4** Copy the member to your procedure library.

## Task 2.E—Creating the ULTRAOPT Started Task

**Summary:** In this task, you will create the ULTRAOPT started task.

**Note:** The UNIX for OS/390 (OMVS) segment must be defined in your external security facility. For more information, see “RACF Requirements” on page 2-12.

To create the ULTRAOPT started task, perform the following steps:

- Step 1** Select *hilevel.BBSAMP(SOPULTRA)*.
- Step 2** To customize the SOPULTRA, follow the instructions at the top of the SOPULTRA member. The sample member is shown in Figure 3-10.

**Figure 3-10** Sample BBSAMP Member SOPULTRA

```

/* CHANGE LOG:
/*
/*          CREATED BY ?USER ON ?DATE AT ?TIME
/*
/*-----
/*
/* THIS PROCEDURE STARTS THE ULTRAOPT SUBSYSTEM
/* AND SHOULD BE MODIFIED BY THE INSTALLER TO ENSURE
/* THAT THE VALUES SPECIFIED FOR THE FOLLOWING PARAMETERS
/* ARE CONSISTENT WITH THE INSTALLATION'S STANDARDS:
/*
/*      SUBSYSID=BSOP          SPECIFIES THE 4-CHARACTER NAME THAT
/*                             THE SUBSYSTEM IS TO BE KNOWN BY.
/*                             IT CANNOT BE THE SAME AS THE BMC
/*                             PRIMARY SUBSYSTEM NAME.
/*                             IT CANNOT BE THE SAME AS THE MAINVIEW
/*                             CAS SUBSYSTEM NAME.
/*
/* THIS PARM, ONCE SELECTED, IS UNMODIFIABLE UNTIL THE NEXT IPL.
/* ON SUBSEQUENT RESTARTS WITHOUT AN INTERVENING IPL,
/* IT WILL BE IGNORED.
/*
/*      APPLID=SOPACB        SPECIFIES THE REQUIRED VTAM APPLID
/*
//SOPULTRA PROC
//SOPINM01 EXEC PGM=SOPINM01,
//          PARM=('SUBSYSID=BSOP',          <----- SUBSYSTEM ID
//          'NOINT',
//          'APPLID=SOPACB'),              <----- VTAM APPLID
//          REGION=0M,
//          TIME=1440
//SYSUDUMP DD  SYSOUT=A
//STEPLIB DD  DISP=SHR,DSN=?BBCHILV.BBLINK
//          DD  DISP=SHR,DSN=NCP3705.NCPLIB <----- NCP RRT
//VTAMLST DD  DISP=SHR,DSN=SYS1.VTAMLST   <----- NCP SOURCE
//BMCPSWD DD  DISP=SHR,DSN=?BBCHILV.BMCPSWD <----- PSWD DSN

```

- Step 3** Save your changes.
- Step 4** Copy the member to your procedure library.

## Task 2.F—Copying VTAM Definitions to the VTAM Library

**Summary:** In this task, you will copy VTAM definitions to the VTAM library.

To copy VTAM definitions to the VTAM library, perform the following steps:

- Step 1** Select *hilevel.BBSAMP(SOPVTAM)*.
- Step 2** To customize the SOPVTAM, follow the instructions at the top of the SOPVTAM member.

The sample member is shown in Figure 3-11.

**Figure 3-11 Sample BBSAMP Member SOPVTAM**

```

/* CHANGE LOG:
/*
/*          CREATED BY ?USER ON ?DATE AT ?TIME
/*
/*-----
/* THIS JOB COPIES THE SAMPLE VTAM APPLID DEFINITIONS TO
/* SYS1.VTAMLIST.
/*-----
//IEBGENER EXEC PGM=IEBGENER
//SYSPRINT DD  SYSOUT=*
//SYSUT1 DD   *
          VBUILD TYPE=APPL
SOPACB  APPL  ACBNAME=SOPACB,          <-- CHANGE IF NECESSARY  *
          AUTH=(ACQ,SPO),              *
          SRBEXIT=YES,                  *
          SONSCIP=YES
SOPNPA  APPL  ACBNAME=SOPNPA,          <-- CHANGE IF NECESSARY  *
          AUTH=(ACQ,SPO),              *
          PARSES=NO
/*
//SYSUT2 DD  DISP=SHR,
//          DSN=SYS1.VTAMLST(SOPAPPL)  <-- CHANGE IF NECESSARY
//SYSIN   DD  DUMMY

```

**Step 3** Save your changes.

**Step 4** Submit the job.

## Task 2.G—Defining the VSAM Options File and the VSAM Print File

**Summary:** In this task, you will define the VSAM options file and the VSAM print file.

### Before You Begin

Use the data set member SOPVSAM to perform the following tasks:

- define VSAM options file
- define VSAM print file
- create FDT member and place it in the load library

If you are installing one or more of the ULTRAOPT products on multiple systems, complete this task then see Chapter 6, “Implementation Tips.”

### To Define the VSAM Options File and the VSAM Print File

- Step 1** Select *hilevel.BBSAMP(SOPVSAM)*.
- Step 2** To customize the SOPVSAM, follow the instructions at the top of the SOPVSAM member.

The sample member is shown in Figure 3-12.

**Figure 3-12 Sample BBSAMP Member SOPVSAM (Part 1 of 2)**

```

/**
/** THIS JOB CREATES THE OPTIONS VSAM FILE AND FDT.
/** THIS JOB CREATES THE PRINT VSAM FILE AND FDT.
/**
/** SYSID MUST BE THE SMFID OF THE MACHINE ULTRAOPT WILL RUN ON.
/**
//SOPBAMS EXEC PGM=SOPBAMS,PARM='SYSID=?SMFID' <-- CHANGE IF NECESSARY
/**
//STEPLIB DD DISP=SHR,DSN=?BBCHILV.BBLINK
/**
//AUTHLIB DD DISP=SHR,DSN=?BBCHILV.BBLINK
/**
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
/**-----*
/** SPECIFY THE VOL SER AND THE USER CATALOG. *
/** THE DATA SET NAMES MAY BE CHANGED. *
/**-----*
//SYSIN DD *
DELETE ?BBCHILV.SOPOPT CLUSTER
DEFINE CLUSTER (NAME(?BBCHILV.SOPOPT) -
VOLUMES(111111) /* <----- CHANGE */ -
FILE(SOPOPT) -
RECORDS(10,5) -
NUMBERED -
UNIQUE -
RECORDSIZE(4084,4084)) -
DATA (NAME(?BBCHILV.SOPOPT.DATA))

```

**Figure 3-12 Sample BBSAMP Member SOPVSAM (Part 2 of 2)**

---

```
DELETE ?BBCHILV.SOPPRINT CLUSTER
DEFINE CLUSTER (NAME(?BBCHILV.SOPPRINT) -
  VOLUMES(111111) /* <----- CHANGE */ -
  FILE(SOPPRINT) -
  RECORDS(500,500) -
  NONINDEXED -
  REUSE -
  RECORDSIZE(3440,3440)) -
  DATA (NAME(?BBCHILV.SOPPRINT.DATA))
```

---

**Step 3** Save your changes.

**Step 4** Submit the job.



---

---

# Chapter 4 CICS Exit Program Installation

This chapter describes how to install the CICS exit program (SOPCUS.xx), which is necessary to include or exclude CICS transactions from optimization with the ULTRAOPT Monitor. If you do not need to exclude data streams from optimization based on CICS transaction names, you do not need to perform this task.

This chapter also describes how to ensure that the CICS exit program is enabled. This chapter contains the following sections:

Overview . . . . .	4-2
Task 1—Updating System Initialization Parameters . . . . .	4-3
Task 2—Defining Program Resources . . . . .	4-5
Task 3—Updating the Program List Table Program Initialization . . . . .	4-8
Task 4—Enabling the CICS Exit Program . . . . .	4-9

## Overview

The CICS exit program (SOPCUS $xx$ ) is a method that is designed to include/exclude CICS transactions from optimization. The exit program enables ULTRAOPT to determine what transactions are running in CICS. When the Transids are identified, you can include/exclude transactions with the ULTRAOPT monitor.

Adding the exit program to the CICS PLTPI enables the exit program to run when a transaction is attached in CICS. The include/exclude table is used by ULTRAOPT to determine whether the transaction is included in, or excluded from, optimization. The exit program records Transids in the ULTRAOPT control blocks.

With SOPCINIT in the initialization PLT, you will see a message during initialization that the CICS Transid exit has been enabled successfully. Without the user exit, ULTRAOPT cannot track the transid and the include/exclude tables will not work.

The tasks to install the CICS exit program are as follows:

1. Update the system initialization parameters. Depending on existing parameters, this step *might not* be required. For more information, see “Task 1—Updating System Initialization Parameters” on page 4-3.
2. Define program resources. For more information, see “Task 2—Defining Program Resources” on page 4-5.
3. Add the SOPCINIT program to the Program List Table Program Initialization (PLTPI). Attempting to include or exclude CICS transactions without the CICS exit SOPCINIT in the PLTPI table will generate unpredictable results. For more information, see “Task 3—Updating the Program List Table Program Initialization” on page 4-8.

Repeat each task for every CICS system on which the exit program runs.

## Task 1—Updating System Initialization Parameters

---

**Summary:** In this task, you will update the CICS system initialization parameters.

---

To update the CICS system initialization parameters, perform the following steps:

**Step 1** Choose one of the following options:

- If your installation already has the initialization parameters EXITS=YES and PLTPI=xx in the SIT or in the CICS override PARM, this installation task is *not* required.
- Reassemble the SIT.
- Change the CICS override parameters

**Step 2** Update the following CICS system initialization parameters:

- EXITS=YES
- PLTPI=xx

### To Set EXITS=YES

**Note:** This update is required for CICS/VS and CICS/MVS. It is *not* required for CICS/ESA.

Set EXITS=YES in the DFHSIT.

**To Set PLTPI=xx**

Choose one of the following options:

- If PLTPI=NO, continue to Step 1.
- If PLTPI=xx, you can skip this task and continue with “Task 2—Defining Program Resources” on page 4-5.

**Step 1** If PLTPI=NO, create a DFHPLTxx program as follows:

---

```
DFHPLT TYPE=INITIAL , SUFFIX=xx
DFHPLT TYPE=ENTRY , PROGRAM=SOPCINIT
DFHPLT TYPE=FINAL
END
```

---

**Step 2** Define the DFHPLTxx program to CICS as follows:

```
CEDA DEF PROG(DFHPLTxx) LANG(ASSEMBLER) GROUP(plt)
```

**Note:** *GROUP* is a user-selectable parameter. The PLT group should be a group in the startup list. If not, it should be added, as follows:

```
CEDA ADD GROUP(plt) LIST(xxx)
```

**Step 3** Give the entry a suffix in the system initialization parameters:

```
PLTPI=xx
```

## Task 2—Defining Program Resources

---

**Summary:** In this task, you will define program resources.

---

### Before You Begin

This task lists the required program definitions and provides sample RDO entries for installing the CICS exit program. Before defining the programs to CICS, ensure that they are included in a CICS Resident Program Library data set.

### To Define Resources for CICS 1.7 through CICS 2.1.1

For CICS 1.7 through CICS 2.1.1, ensure that the following CICS INQUIRESET modules are defined:

- For batch processing, ensure that your PPT contains the following entry:

```
DFHPPT TYPE=GROUP , FN=INQUIRESET
```

- For RDO, ensure that DFHINQUI is in the list that was specified in your GRPLIST initialization parameter.

### To Specify Required Program Definitions

The name of the exit program is determined by the CICS release that you are running. Table 4-1 lists the program definitions that are required for CICS. The language for the modules is CICS assembler.

**Table 4-1 Required Program Definitions**

<b>CICS Release</b>	<b>Required Program Definitions</b>
all releases of CICS	SOPCINIT
CICS/ESA 4.1	SOPCUS41
CICS Transaction Server 1.1	SOPCUS51
CICS Transaction Server 1.2	SOPCUS52
CICS Transaction Server .1.3 or later	SOPCUS53

## To Define Sample RDO Entries

Define the programs dynamically through the CICS RDO facility, as follows:

**Step 1** For all releases of CICS, add the following program entry:

---

```
CEDA DEF PROGRAM(SOPCINIT) GROUP(SOP) LANGUAGE(ASSEMBLER)
      DATALOCATION(ANY) EXECKEY(CICS)
```

---

**Step 2** Choose one of the following options:

- Add the following program entry for your specific release of CICS, using the program definitions in Table 4-1 on page 4-6.
- If you do not know the CICS release you are running, you can add a program entry for each release. The SOPCINIT program will determine the correct CICS release and enable the appropriate exit program.

---

```
CEDA DEF PROGRAM(SOPCUSxx) GROUP(SOP) LANGUAGE(ASSEMBLER)
      DATALOCATION(ANY) EXECKEY(CICS) RES(YES)
```

---

**Step 3** Add the group dynamically to CICS:

```
CEDA INSTALL GROUP(SOP)
```

**Step 4** Add the new group to the startup list:

```
CEDA ADD GROUP(SOP) LIST(startup list)
```

## Task 3—Updating the Program List Table Program Initialization

---

**Summary:** In this task, you will update the PLTPI.

---

If you did not need to create the DFHPLTxx program described in the “Task 1—Updating System Initialization Parameters” on page 4-3, *this task is required*.

If you created the DFHPLTxx program in Task 1, the SOPCINIT program was added at that time.

**Step 1** To run SOPCINIT during CICS initialization, update the PLTPI.

When SOPCINIT runs, a write-to-operator (WTO) message is sent to the operator’s console (MVS only) and to the programmer’s log.

**Step 2** To add the SOPCINIT program to an existing PLTPI, make the following entry to cause the program to be executed during CICS initialization:

```
DFHPLT TYPE=ENTRY, PROGRAM=SOPCINIT
```

---

## Task 4—Enabling the CICS Exit Program

---

**Summary:** In this task, you will enable the CICS exit program.

---

To enable the CICS exit program, perform the following steps:

**Step 1** When you have completed the tasks to install the CICS exit program, perform one of the following actions to enable the exit program:

- Shut down the system and restart CICS.
- Invoke the CECI transaction to dynamically enable the CICS exit program without restarting:

```
CECI LINK PROGRAM(SOPCINIT)
```

SOPCINIT issues a WTO message to inform you whether the CICS exit program (CICS transid exit) was enabled successfully.

**Step 2** When the CICS exit program is installed successfully, your updates to the Applid.Transid include/exclude tables become effective. If you are unable to exclude by CICS transaction ID as expected, perform the following steps to verify correct installation:

**2.A** Capture a wraparound data stream trace of the application/transaction to be excluded. On the Environment panel, the Applid and Transid that are traced are displayed in the upper right corner.

**2.B** Log on to CICS, and issue the following command:

```
CEMT INQ PROGRAM (SOPCINIT)
```

```
CEMT INQ PROGRAM (SOPCUSxx)
```

**2.C** Look for the use-count for these programs. If the use-count equals zero, the programs have not been used.

If these steps yield unexpected results, verify the installation tasks of the CICS exit program as described in “Overview” on page 4-2.



---

---

# Chapter 5 Before Starting ULTRAOPT

This chapter presents a list of questions to consider before starting the ULTRAOPT product subsystem. This chapter also provides a list of the transactions that are intercepted and describes the VTAM application start order. This chapter includes the following sections:

Product Subsystem Considerations . . . . .	5-2
Interception Defaults . . . . .	5-3
VTAM Application Start Order . . . . .	5-4
Where to Go from Here . . . . .	5-4

## Product Subsystem Considerations

Before starting the product subsystem, answer the following questions:

- Does your system have enough ECSA allocated?

Follow the procedures in Chapter 1, “Installation Overview,” for estimating ECSA use and ensure that you perform an IPL on your system with enough ECSA specified in `SYS1.PARMLIB(IEASYSxx)`. Ensure that you account for applications that open multiple ACBs, such as session managers.

- Are you building Applid include and exclude tables?

If you are starting ULTRAOPT for the first time (or if no include or exclude entries are stored in SOPOPT) and you want only to intercept specific Applids, use the NOINT startup parameter. NOINT ensures that nothing is being intercepted (instead of everything) while you build your include and exclude tables.

To begin intercepting the specified applications, you can remove NOINT and recycle and restart ULTRAOPT.

**Note:** To intercept all eligible or included applications, you must completely remove the NOINT parameter. Changing the parameter to INT causes ULTRAOPT to print interception messages.

- If you are installing ULTRAOPT, have you reviewed the implementation tips in Chapter 6, “Implementation Tips,” for additional information that will help you set up ULTRAOPT?

**Note:** By default, the ULTRPROC startup procedure uses the startup parameter NOINT. Using NOINT is part of the trial plans and test procedures that are described in Appendix B, “ULTRAOPT Test Procedures.” When you are finished testing and are ready to intercept ACBs, remove the NOINT parameter.

## Interception Defaults

You might want to intercept all IMS/VS regions, CICS regions, TSO, and the following session managers:

- CA-VMAN
- CL/SUPERSESSION
- InterSession
- NC-ACCESS
- NET/MASTER MAI
- NetView Access
- Teleview
- TPX
- TUBES
- VTAM/SWITCH

ULTRAOPT/CICS can be customized to intercept all VTAM applications except IMS; by default (without customization), it will intercept all CICS applications.

ULTRAOPT/IMS can be customized to intercept all VTAM applications except CICS; by default (without customization), it will intercept all IMS applications.

If the options file that you created during installation is not open (for example, dynamic allocation failed), ULTRAOPT will, by default, intercept only the Applids that are appropriate for the ULTRAOPT towers that are authorized.

For ULTRAOPT to optimize all VTAM applications in your system, your console operators must start ULTRAOPT immediately after starting VTAM.

## VTAM Application Start Order

Table 5-1 lists the application start order for your operators.

**Table 5-1 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 <i>are not</i> going to intercept.
5	Start the BMC Software Primary Subsystem and <i>wait for it to finish initializing</i> (approximately 6 seconds).
6	Start the product subsystem and <i>wait for it to finish initializing</i> .
7	Start VTAM applications that you <i>are</i> going to intercept.

## Where to Go from Here

Before starting ULTRAOPT in your production environment, review the tasks in the following table.

Task	Reference
implementing ULTRAOPT	Chapter 6, "Implementation Tips"
testing ULTRAOPT	Appendix B, "ULTRAOPT Test Procedures"
using ULTRAOPT	<i>ULTRAOPT User Guide</i>

---

---

# Chapter 6 Implementation Tips

This chapter describes the best ways to configure ULTRAOPT. This chapter contains the following sections:

Overview . . . . .	6-2
Maximum Optimization . . . . .	6-2
OPTAPPLS and BSR Options . . . . .	6-3
BSR with OPTAPPLS . . . . .	6-4
BSR without OPTAPPLS . . . . .	6-5
OPTAPPLS without BSR . . . . .	6-6
TN3270 Terminal Optimization through TCP/IP MVS . . . . .	6-7
Session Managers . . . . .	6-8
Background Sessions with a User Exit . . . . .	6-9
Application-Interception Problems . . . . .	6-10
Session-Optimization Problems . . . . .	6-10
Cross-Domain Problems . . . . .	6-11
Programmed Symbol Optimization . . . . .	6-11
SYSIN DD for Startup Parameters . . . . .	6-11
Tuning the Optimizer for CPU Usage . . . . .	6-12
Measuring Optimizer CPU Usage . . . . .	6-13
CPU Usage with BSR . . . . .	6-14
Multiple-System Environment . . . . .	6-15
Considerations . . . . .	6-15
Single-System VSAM Files . . . . .	6-16
Modifying FDT Modules for Multiple-System Environments . . . . .	6-17
Product Applid Names . . . . .	6-22
Product Authorization Security Module . . . . .	6-22
Displaying Processor Information . . . . .	6-24
Changing Systems . . . . .	6-26

## Overview

This chapter describes tips to help you configure ULTRAOPT.

### Maximum Optimization

Maximum optimization is achieved by using optimization options and features that *remove the largest number of bytes from your data streams*. The maximum amount of optimization is not just the highest percentage optimization. For example, you have one application that achieves a total of 95 percent optimization. However, this application represents only 10 percent of your data stream traffic. If you only optimize the data streams for that application, the 95 percent does not represent your entire environment.

The number of data streams that are included for optimization also determines the maximum optimization. To ensure that the *largest number of bytes* is removed from all data streams, determine why data streams were excluded from optimization. If you can decrease the number of data streams that are excluded, you can increase your optimization.

To ensure that your system is achieving maximum optimization, review the items in Table 6-1.

**Table 6-1 Optimization Checklist (Part 1 of 2)**

X	Action Item
	Ensure that Imaging is on for CRTs <i>and</i> printers.
	Ensure that Input Suppression is on.
	Check LUs excluded by Imaging, Input Suppression, and SNA Data Compression exclude/include options. Ensure that each LU is excluded for a valid reason.
	Ensure that SCS Printer optimization is on and Horizontal Tab optimization is on for printers that support horizontal tabs. The initial default for Horizontal Tab optimization is off, so you might need to turn it on.
	Check Applids and LUs excluded from Global optimization. Ensure that each Applid and LU is excluded for a valid reason.
	Check all entries and tables that are used. Ensure that each LU or Applid is listed for a valid reason.
	If you use an exit program, determine that it does not bypass data streams unnecessarily. Check the use of the Local Format Storage User Exit.
	Ensure that Local Format Storage (LFS) is on (if applicable) and that you have properly included or excluded data streams. Imaging and Input Suppression optimization must be on. Also ensure that the controllers which process these data streams support LFS.

**Table 6-1 Optimization Checklist (Part 2 of 2)**

X	Action Item
	Ensure that all Applids which you want to optimize are intercepted.
	Verify that you are using all start options that are necessary for your environment. For more information, see the "Inclusion and Exclusion Rules" topic in the <i>ULTRAOPT User Guide</i> .
	Look at the statistics on panels 2.3.0 and 2.4.0 to ensure that no data streams are being excluded unexpectedly.

## OPTAPPLS and BSR Options

The OPTAPPLS option and the BSR option affect application-to-application sessions.

OPTAPPLS enables optimization of eligible (3270 or SCS) application-to-application data streams. (OPTAPPLS is the default for ULTRAOPT/CICS and ULTRAOPT/IMS; so eligible application-to-application data streams normally *are* optimized.) OPTAPPLS is useful for the following situations:

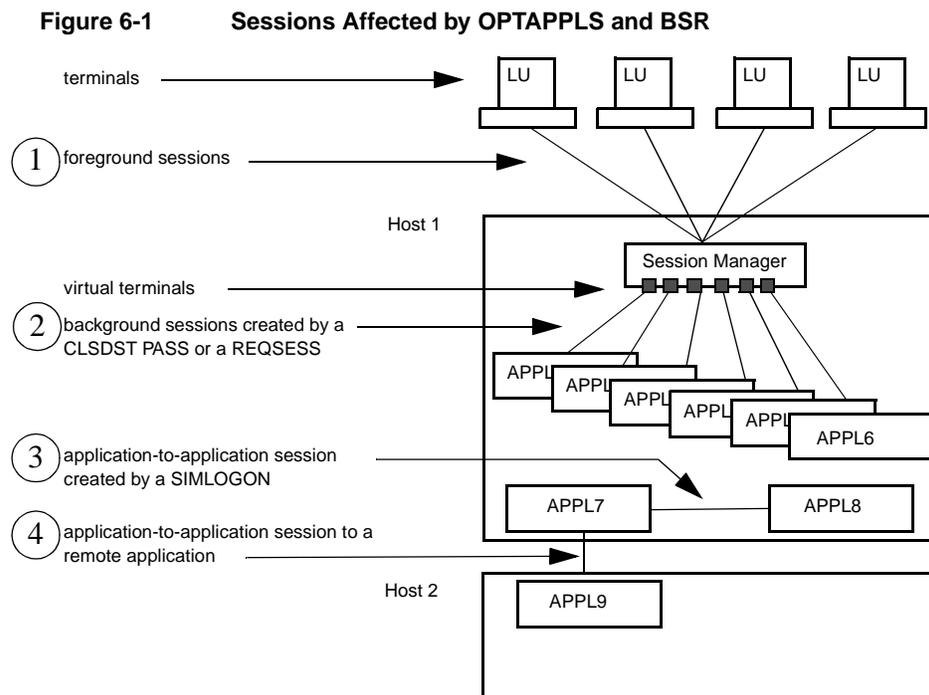
- TPNS virtual terminal APPLs that are logged on to optimized applications
- TCP/IP virtual terminal APPLs that are logged on to optimized applications
- non-intercepted session manager virtual terminal APPLs that are logged on to optimized applications
- cross-domain session manager virtual terminal APPLs that are logged on to optimized applications

The BSR option is used for sessions between intercepted applications in the same host if the session was created by a CLSDST PASS or a REQSESS (such as a session manager's background sessions). This option overrides OPTAPPLS for those sessions.

The Bypass Send and Receive (BSR) function is in effect by default in ULTRAOPT/CICS and ULTRAOPT/IMS. BSR performs the following actions for sessions that are created by a CLSDST PASS or a REQSESS:

- bypasses VTAM SEND and RECEIVE protocols, saving CPU instructions and VTAM overhead
- removes the opportunity for optimization of those sessions

Figure 6-1 shows sessions that are affected by each function and combination of OPTAPPLS and BSR.



## BSR with OPTAPPLS

BSR and OPTAPPLS are the defaults for ULTRAOPT/CICS and ULTRAOPT/IMS.

Combining BSR and OPTAPPLS gives you the best of both options by optimizing application-to-application sessions that cannot use BSR (for example, if the secondary logical unit is in another domain), while still using BSR where possible.

If you choose to change the default settings for BSR or OPTAPPLS, Table 6-2 might help you understand the effects of your actions. The session numbers in the table are from Figure 6-1 on page 6-4.

**Table 6-2 Effects of BSR and OPTAPPLS**

Session	BSR and OPTAPPLS	Optimization
1	BSR	NO—BSR does not apply to this kind of session because it is not application to application.
	OPT	N/A—These sessions can be optimized as usual. OPTAPPLS does not apply.
2	BSR	YES—BSR is applied to these sessions, and VTAM SENDs and RECEIVEs are bypassed.
	OPT	NO—Application-to-application sessions are not optimized because BSR preempts OPTAPPLS for this kind of session.
3	BSR	NO—BSR does not apply to this kind of session because it was initiated by a SIMLOGON.
	OPT	YES—This session can be optimized by OPTAPPLS if it is a 3270 or SCS data stream.
4	BSR	NO—BSR does not apply to this kind of session because it is cross-domain.
	OPT	YES—This session will be optimized if APPL7 is a primary logical unit and the session uses 3270 or SCS data streams.

## BSR without OPTAPPLS

BSR by itself is useful with session managers, where optimizing the background sessions is a waste of resources. Because you do not need to optimize, you can use BSR to bypass VTAM SENDs and RECEIVEs.

To disable OPTAPPLS, use the ULTRAOPT command *subsysid* NO OPTAPP.

BSR has no effect on sessions that are created by any means other than a CLSDST PASS or a REQSESS. Table 6-3 shows the session numbers for BSR optimization without OPTAPPLS. The session numbers in the table are from Figure 6-1 on page 6-4.

**Table 6-3 BSR without OPTAPPLS**

Session	BSR or OPTAPPLS	Optimization
1	BSR	NO—BSR does not apply to this kind of session because it is not application to application.
	OPT	N/A—These sessions can be optimized as usual. OPTAPPLS does not apply.
2	BSR	YES—BSR is applied to these sessions, and VTAM SENDs and RECEIVEs are bypassed.
	OPT	NO—Application-to-application sessions are not optimized.
3	BSR	NO—BSR does not apply to this kind of session because it was initiated by a SIMLOGON.
	OPT	NO—Application-to-application sessions are not optimized.
4	BSR	NO—BSR does not apply to this kind of session because it is cross-domain.
	OPT	NO—Application-to-application sessions are not optimized.

## OPTAPPLS without BSR

OPTAPPLS lets you optimize all 3270 or SCS application-to-application sessions by including the primary application in an Applid table. The secondary application must be an included LU.

To disable BSR, use the NOBSR startup parameter.

If these data streams were already optimized in the foreground sessions, it might waste some CPU time and VTAM resources.

Optimizing this type of session is useful if you have an application such as the IBM Teleprocessing Network Simulator (TPNS), which uses applications to simulate terminals that need to be optimized.

Another example is TCP/IP MVS, which uses applications to represent downstream TCP/IP 3270 devices that need to be optimized.

Table 6-4 shows the session numbers for OPTAPPLS optimization without BSR. The session numbers in the table are from Figure 6-1 on page 6-4.

**Table 6-4 OPTAPPLS without BSR**

Session	BSR or OPTAPPLS	Optimization
1	BSR	NO—BSR does not apply to this kind of session because it is not application to application.
	OPT	N/A—These sessions can be optimized as usual. OPTAPPLS doesn't apply.
2	BSR	NO—NOBSR is on, so BSR is not applied.
	OPT	YES—These sessions can be optimized by OPTAPPLS because BSR is not on.
3	BSR	NO—BSR does not apply to this kind of session because it was initiated by a SIMLOGON.
	OPT	YES—This session can be optimized by OPTAPPLS if it is a 3270 or SCS data stream.
4	BSR	NO—BSR does not apply to this kind of session because it is cross-domain.
	OPT	YES—This session will be optimized if APPL7 is a primary logical unit and the session uses 3270 or SCS data streams.

**Note:** Excluding the Applid of the application-to-application session is equivalent to using NOBSR for the excluded application's sessions. Excluding them might be preferable to using NOBSR in some cases because NOBSR affects the entire system.

## TN3270 Terminal Optimization through TCP/IP MVS

You must use the OPTAPPLS startup parameter to optimize data streams between VTAM host applications (for example, IMS and CICS) and TCP/IP MVS applications that are acting in pass-through or relay mode for downstream TN3270 terminals.

OPTAPPLS is necessary to implement optimization across the application-to-application session between the host application and the TCP/IP MVS virtual terminal application.

For more information about the TN3270 feature of ULTRAOPT, see the *ULTRAOPT User Guide*.

## Session Managers

When optimizing a session manager, the most important consideration is to ensure that your MVS system has enough free extended common storage area (ECSA) to accommodate ULTRAOPT storage requirements for the potentially large number of ACBs that the session manager can OPEN (because *all* of its ACBs get intercepted). For information about estimating ESCA storage use, see Chapter 1, “Installation Overview.” The session control blocks (SCBEs) used for the “background” (relay) sessions also contribute to ECSA storage use.

For sessions to background applications (such as CICS and IMS) that flow through an optimized session manager, optimization occurs in the session manager by way of the foreground session. The optimization statistics in the Monitor will reflect optimization occurring for the session manager, not for the background applications.

If the session manager is not intercepted or optimized, the optimization work can be moved to the background applications, but only when using the default OPTAPPLS startup parameter (or *subsysid* OPTAPP operator command).

OPTAPPLS is especially useful in the following situations:

- when the session manager is not to be optimized during incremental system testing
- when sessions to optimized applications in this host originate from a session manager in another domain that is not running ULTRAOPT because that session manager is not optimized

**Note:** Some session managers might use automated scripts that scan the data streams for position-dependent data. Optimizing the background sessions by using OPTAPPLS might be disruptive to such scripts.

When optimizing a session manager, you can reduce the CPU cost in the session manager *and* the background applications by making use of the BSR feature. For more information, see “OPTAPPLS and BSR Options” on page 6-3.

## Background Sessions with a User Exit

You can use the Monitor to exclude an LU from optimization (regardless of the application it is logged on to) and to exclude an application from optimization (regardless of which LUs are logged on to it). However, these exclusions do not account for a situation in which an LU is logged on to an optimized session manager for logging on to multiple background applications.

Normally, in that last case, the session manager's sessions with the LU are optimized. If you need to selectively exclude some of the LU background sessions while including the others and your session manager supports the NetSpy interface, you can write a user exit. To implementing such an exit, perform the following tasks:

- Customize the sample user exit *hilevel.BBSAMP(SOPUSERS)* to recognize the background applications whose sessions should be excluded.

This user exit *depends* on the session manager supporting the NetSpy interface (NetSpy itself does not need to be installed). With this interface, the session manager issues a message to NetSpy each time a session switch occurs.

- Write the user exit to see the NetSpy session-switch message and recognize whether the new session should be optimized.

The sample user exit shows *compare* instructions that check for the Applids of the background applications BCH31IMS and BCHCIC32, whose sessions to the session manager need to be excluded. The OPTNOOPTBGD mask can be applied to the OPTFLAG to implement the exclusion for that session. You can customize these *compare* instructions as desired.

If the session manager does not support the NetSpy interface, an alternative solution is to exclude the session manager from optimization then control the optimization of its background sessions by including or excluding the background applications as desired. Use the default startup parameter OPTAPPLS to optimize the application-to-application sessions at the background applications.

## Application-Interception Problems

To verify that an application is intercepted, issue the command `D subsysid,ACTIVE` and look for the desired application in the list of currently intercepted active applications. If the response from that command does not match your expectations, see the interception rules that are described in the *ULTRAOPT User Guide*.

## Session-Optimization Problems

To optimize a session, you must intercept the application that is the primary logical unit (PLU) for the session. To verify that the PLU application is intercepted, see “Application-Interception Problems” on page 6-10.

If a session manager or any other intermediate application is involved, ensure that the correct application is being intercepted. For example, a terminal logged on to IMS through a session manager is optimized in the session manager if the session manager is being optimized.

If only IMS is being optimized in this example, the optimization occurs in IMS only, provided that you use the default `OPTAPPLS` startup parameter. When you know that the application is intercepted, issue the command `D subsysid,ID=luname`. *luname* is the name of the secondary logical unit (SLU) in session with the intercepted application.

The SLU is normally the terminal or printer except for cases like the session manager example, in which the SLU is the session manager virtual terminal. The response to that command will look like the following example:

BMC634I	NAME	STATUS	CID	VCID	LU	OPT	BSR
BMC635I	applid	ACTIV-P	xxxxxxx	yyyyyyyy	zz	Y/N	NO

If the value under the **OPT** column is **YES**, ULTRAOPT has determined that the device is an optimizable session partner. **OPT=YES** does not necessarily indicate that the session is optimized. To determine whether the session is optimized, use the statistics on panels 2.2.0, 2.3.0, and 2.4.0 of the Monitor.

If the value under the **OPT** column is **NO**, ULTRAOPT has determined in advance that this session partner is not eligible for optimization, regardless of whether the session is included for optimization. To determine why the session is not eligible for optimization, see the *ULTRAOPT User Guide*.

## Cross-Domain Problems

ULTRAOPT performs optimization by intercepting and altering the data streams flowing between the application and its owning VTAM. Because of this design, ULTRAOPT is not concerned with the location of the session partner (terminal or printer). Because the session partner can be owned by any VTAM domain (host), there are no cross-domain considerations.

The optimized applications must reside in the same domain as ULTRAOPT. For the special case of a cross-domain application-to-application 3270 session, ULTRAOPT must be running on the same host as the application that is acting as the session's PLU to perform optimization.

## Programmed Symbol Optimization

The startup parameter OPTPS is recommended for systems with terminals using programmed symbol (PS) data streams (such as GDDM). Many such data streams are large and inefficiently generated and could benefit significantly from optimization. But optimizing PS data streams requires a 76 KB buffer that is allocated from ECSA for each concurrent session by using PS data streams.

If this option is used, ensure that your system has enough free ECSA defined to support this storage requirement. For ECSA storage use estimates, see Chapter 1, "Installation Overview."

## SYSIN DD for Startup Parameters

You can use a SYSIN DD statement for startup parameters. With this feature, the startup procedure can be "frozen." Changes can be implemented by modifying the contents of the data set that the SYSIN DD points to, facilitating compliance with change control procedures. The SYSIN DD statement also removes the limitation of 100-byte parameter strings.

A sample parameter file is provided with the distribution tape in member *hilevel.BBSAMP(TACPRM)*. The parameter file syntax rules are as follows:

- Any asterisk (\*) or blank ( ) in column 1 causes that line to be treated as a comment line.
- Input is scanned up to and including column 71.

- A comma (,) at the end of a line (before column 72) is interpreted as a continuation character.

For example, the file might contain the following parameter:

---

```
* Comment starting with asterisk in column 1
PARM1 ,
PARM2 ,
PARM3 ,
PARMLAST ,
END
```

---

- If a syntax error (for example, a missing continuation) or an invalid parameter occurs, the subsystem will not initialize.

## Tuning the Optimizer for CPU Usage

If your data center has a limited amount of CPU time available, you might want to tune the Optimizer for minimum CPU usage. Tuning the Optimizer for CPU usage *might not yield* the maximum amount of optimization.

To tune the Optimizer for minimum CPU usage, review the items in Table 6-5.

**Table 6-5 Checklist for Tuning the Optimizer for Minimum CPU Usage**

<b>X</b>	<b>Action Items</b>
	Ensure that Imaging is on for both CRTs and printers.
	Avoid using tables with long lists of exclude and include entries.
	Do not use any user exit programs.
	Do not use a Wraparound data stream trace.
	Do not start a BSOP TRACE unless necessary.
	Ensure that other optimizer products are removed or inactive.
	Ensure that BSR is in effect, where applicable.
	Ensure that you are not using the BWAD startup parameter.
	Do not use the startup parameter APSTAT unless necessary. (If you are using OPTAPPLS, then APSTAT is unnecessary.)

## Measuring Optimizer CPU Usage

The total wall-clock time on the Optimizer's CPU Wall-Clock Time panel (4.3.0) is not actual CPU usage. It is the elapsed time from the start of optimizing a data stream until it is finished. Page-faults, excluding data streams, and other interruptions are not subtracted from the total.

It takes less than one millisecond of elapsed time to optimize a data stream on an IBM zSeries 900 processor. The time varies according to the following items:

- original data stream length
- complexity of the data stream
- amount of optimization achieved

Before you install ULTRAOPT, measure the CPU time used by each of your applications (Applids) and VTAM.

When ULTRAOPT is completely operational (optimization is active for the entire CPU), measure the CPU time that is used by each Applid and VTAM a second time. This measurement is necessary because ULTRAOPT executes its code under the intercepted application's address space. Compare the message rates before and after to determine whether throughput increased.

## CPU Usage with BSR

To understand CPU usage when using BSR, consider the following example:

### Example

In this example, the system uses BMC Software SUPEROPTIMIZER® products for every CICS and IMS region, and every user logs on to CICS and IMS through a session manager. In that environment, the SUPEROPTIMIZER products consume CPU under the address spaces of CICS and IMS. VTAM consumes CPU under the address spaces of CICS, IMS, and the session manager when any of those applications issues a VTAM SEND or RECEIVE.

When the SUPEROPTIMIZER products are replaced by ULTRAOPT by using BSR, the VTAM CPU time used will tend to drop; and the Optimizer time that is used in CICS and IMS is almost entirely removed (because all sessions use BSR).

ULTRAOPT consumes CPU time under the session manager; so its CPU time rises. However, that increase in the session manager should be offset by the decreases in CICS and IMS CPU time. Message throughput might increase, because ULTRAOPT moves the Optimizer workload away from CICS and IMS subsystem TCB and performs work by dispatching SRBs instead.

The total number of bytes that are reduced should be greater under ULTRAOPT because it can optimize READ BUFFER commands that are generated by the session manager during a session switch.

If the session manager is used to access other applications that were previously not optimized, the optimization benefits of those newly optimized sessions result in some additional CPU cost.

To accurately measure the overall CPU savings of BSR, normalize the results by dividing the total CPU time that is expended across all regions by the total number of optimized messages. The result is the CPU expense per optimized message. It is necessary for a fair assessment because ULTRAOPT might result in higher throughput and more load on the subsystems per unit of real time. The CPU time should also be divided by the total number of bytes that are reduced under both test cases to determine the CPU cost saved per byte.

Running ULTRAOPT always incurs some CPU costs because running ULTRAOPT is intended to trade host system resources to save network resources, increase throughput, reduce response time, and increase user productivity.

# Multiple-System Environment

This section explains some special considerations for installing one or more of the ULTRAOPT products on multiple systems and for migrating from one system to another. This section also provides figures that compare the setups for a single-system environment and multiple-system environments.

Installing ULTRAOPT to run on multiple systems is not complicated. You must decide whether to use separate options and print files or whether to use shared options and print files for the multiple systems.

## Considerations

The ULTRAOPT subsystem is installed in a single load library for use by two or more different systems. When you use multiple systems, there are a few considerations for the following files. These files are customized and unique for each system.

- file definition table (FDT) module (contains references to VSAM files)
- VSAM options file
- VSAM print file
- product authorization security module

Although the temporary trial password will work for multiple systems during the trial period, you will need a permanent password for each ULTRAOPT product on each CPU when the trial period expires. For more information, see “Displaying Processor Information” on page 6-24.

Review the following considerations before deciding whether to use separate VSAM files or to use shared VSAM files:

- When the VSAM files are shared, changes that are made on one system are reflected on the other system. Changes include events such as updating include/exclude tables and turning optimization on or off.
- When two systems write to the same VSAM file, you must consider file integrity. What happens if changes at same time from different systems?
- When the VSAM files are separate and you update one VSAM file in one system, VSAM files in other systems are not updated.

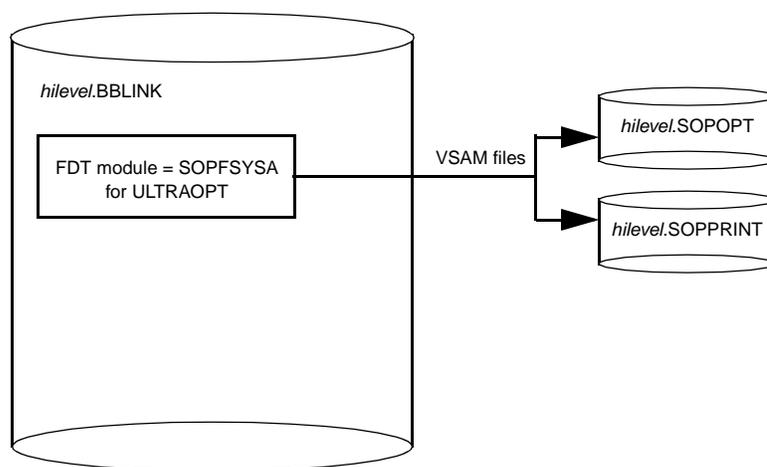
## Single-System VSAM Files

When you customize ULTRAOPT by using AutoCustomization, the FDT module name is created in the Define VSAM Option File and Print File step. The FDT module is constructed by concatenating a product-related character string with the SMF ID (SOPFxxxx for ULTRAOPT, where xxxx is the SMF ID).

Figure 6-2 shows an example of the VSAM files that are referenced in the SOPFxxxx module in the *hilevel.BBLINK* library for a system where ULTRAOPT is installed on only one CPU.

In this example, SOPFxxxx is SOPFSYSA. The FDT module contains the data set name references to VSAM options and print files. *hilevel.SOPOPT* is the data set name of the ULTRAOPT options file, and *hilevel.SOPPRINT* is the data set name of the ULTRAOPT print file.

**Figure 6-2** Single System Using VSAM Files



## Modifying FDT Modules for Multiple-System Environments

---

**Summary:** In this task, you will modify the installation so that multiple systems reference the appropriate VSAM files.

---

### Before You Begin

Before you begin this task, complete the following steps:

- Install ULTRAOPT by using the OS/390 and z/OS Installer. For more information, see the *OS/390 and z/OS Installer Guide*.
- Complete the Define VSAM Option File and Print File step when customizing ULTRAOPT. For more information, see Chapter 3, “Installation Customization.”
- Choose one of the following methods for using VSAM options and print files on multiple systems:
  - Share VSAM options and print files.
  - Use separate VSAM options and print files.

## To Share VSAM Options and Print Files

**Warning!** The JCL that is generated in this task uses a DELETE command that deletes and redefines any VSAM files that you have already created for a system. To share VSAM options and print files without deleting and redefining existing files, see “To Share VSAM Options and Print Files by Copying an FDT Module” on page 6-19.

- Step 1** Access the Product Customization Steps panel (Figure 3-3 on page 3-7).
- Step 2** Select the Define VSAM Option File and Print File step. The Define VSAM Files panel (Figure 6-3) is displayed.

**Figure 6-3 Define VSAM Files Panel**

```

MAINVIEW VTAM ----- DEFINE VSAM FILES ----- CUSTOMIZATION
COMMAND ==>>

The MAINVIEW for VTAM ULTRAOPT Address Space requires VSAM files.

Do you need to create VSAM files ? ==>> YES (YES or NO)

* YES assists you in creating the files.
* NO bypasses this step.

In the PROCEDURE LIBRARY field enter the library name to contain the procedure.
In the PROC MEMBER NAME enter the name for the procedure.

PROCEDURE LIBRARY ==>> 'hilevel.UBBSAMP'
PASSWORD          ==>>          (If password protected)
PROC MEMBER NAME  ==>> SOPVSAM  (Enter a name for the startup procedure)
REPLACE MEMBER?  ==>> NO       (If duplicate member in PROCEDURE LIBRARY)
SMF ID ?         ==>> xxxxx    (SMF ID of system running ULTRAOPT)

When you press ENTER, jcl are created and you are placed
in an edit session to make further changes, if necessary.

Press ENTER to continue, HELP for more information, or END to exit.
    
```

- Step 3** Change the name of the startup procedure that is displayed in the **PROC MEMBER NAME** field. For example, SOPVSAM2.

**Note:** Copying the FDT modules in the SOPVSAM file and changing the FDT module names does not change the internal VSAM file references. Both systems use the same options and print to the same file. Changing an option in one system changes it in the other system.

- Step 4** Type **NO** in the **REPLACE MEMBER?** field.

- Step 5** In the **SMF ID ?** field type the SMF ID of the system where you are running ULTRAOPT. For example, SYSB.
- Step 6** Press **Enter**.
- Step 7** Modify the JCL as necessary and submit the job.

The job creates FDT module SOPFSYSB, deletes existing VSAM files, and redefines VSAM options files and print files.

**To Share VSAM Options and Print Files by Copying an FDT Module**

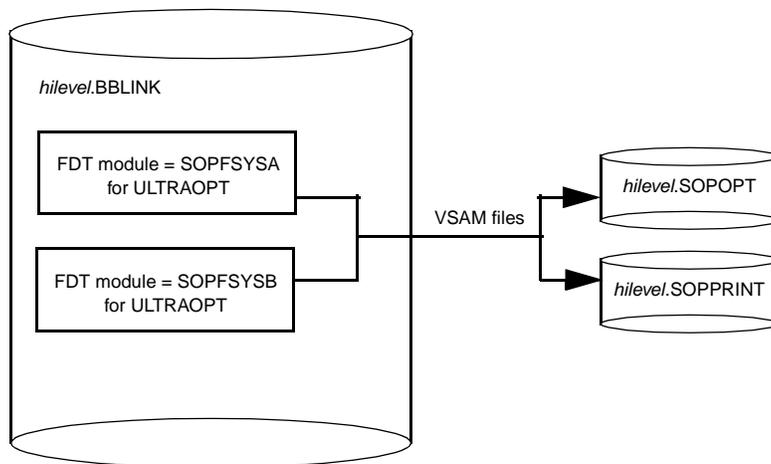
By using the TSO copy utility, copy FDT module SOPFxxx. Name the module SOPFxxxn. For example, copy SOPFSYSA and name it SOPFSYSB.

**Illustration**

Figure 6-4 shows an example of the VSAM files that are referenced in the SOPFxxx modules in the *hilevel.BBLINK* library for a system where ULTRAOPT is installed on two CPUs.

In this example, the FDT modules, SOPFSYSA and SOPFSYSB, contain the same data set name references to VSAM options and print files. *hilevel.SOPOPT* is the data set name of the ULTRAOPT options file, and *hilevel.SOPPRINT* is the data set name of the ULTRAOPT print file.

**Figure 6-4 Multiple-System Files Using Same VSAM Files**



## To Use Separate VSAM Options and Print Files

- Step 1** Access the Product Customization Steps panel (Figure 3-3 on page 3-7).
- Step 2** Select the Define VSAM Option File and Print File step. The Define VSAM Files panel (Figure 6-3 on page 6-18) is displayed.
- Step 3** Change the name of the startup procedure that is displayed in the **PROC MEMBER NAME** field. For example, SOPVSAM2.
- Step 4** Type **NO** in the **REPLACE MEMBER?** field.
- Step 5** In the **SMF ID ?** field type the SMF ID of the system where you are running ULTRAOPT. For example, SYSB.
- Step 6** Press **Enter**.

JCL that is created by the AutoCustomization utility is displayed. Figure 6-5 shows a sample of the JCL that is created.

**Figure 6-5 Sample JCL Created by the Define VSAM Step**

---

```

000033 //SYSIN DD *
==CHG> DELETE RCHRWB.MV22F.SOPOPT CLUSTER
==CHG> DEFINE CLUSTER (NAME(hilevel.SOPOPT) -
000036 VOLUMES(111111) /* <----- CHANGE */ -
000037 FILE(SOPOPT) -
000038 RECORDS(10,5) -
000039 NUMBERED -
000040 UNIQUE -
000041 RECORDSIZE(4084,4084) -
    
```

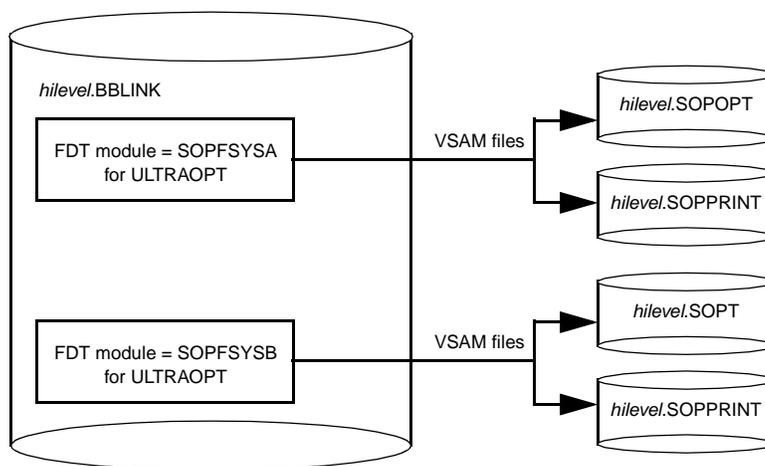
---

- Step 7** Modify the JCL as necessary. You must change the cluster name (for example, from *hilevel.SOPOPT* to *hilevel.SYSB*).
- Step 8** Submit the job.  
  
The job creates FDT module SOPFSYSB and new VSAM options files and print files.
- Step 9** Perform one of the following steps:
  - If you are using permanent product authorization passwords, add a new password to the product authorization security module.
  - If you are using a bypass password for a product, you do not need to process another password. All systems that share the load library containing the security module with the bypass password can use that product.

Enabling two systems to use separate VSAM options and print files is more involved than enabling two systems to share VSAM options and print files. Figure 6-6 shows an example of the VSAM files that are referenced in the SOPF<sub>xxxx</sub> modules in the *hilevel.BBLINK* library for a system where ULTRAOPT is installed on two CPUs.

In this example, the FDT modules, SOPFSYSA and SOPFSYSB, contain different data set name references to VSAM options and print files. *hilevel.SOPOPT* is the data set name of the ULTRAOPT options file, and *hilevel.SOPPRINT* is the data set name of the ULTRAOPT print file.

**Figure 6-6 Multiple-System Files Using Separate VSAM Files**



## Product Applid Names

Generally, Applid names can be the same on each system for ULTRAOPT. For ULTRAOPT with LFS, however, when multiple hosts use a single LFS controller, the formats are grouped by the host ULTRAOPT LFS Applid name. These LFS Applid names must be different on each host.

## Product Authorization Security Module

Figure 6-7 shows an example of the contents of a product authorization module (*prdTBL3l*) on multiple systems. *prd* is the product code—ULC is the product code for ULTRAOPT/CICS and ULI is the product code for ULTRAOPT/IMS. *l* is the license type—P is a permanent license and T is a temporary (or trial) license.

In this example, ULCTBL3P contains CPU authorization for SYSA and SYSB. The passwords that are contained in ULCTBL3P cannot be used to run ULTRAOPT/CICS on SYSC or SYSD. Each system requires a separate license and password.

**Figure 6-7** Product Authorization Module in Multiple Systems

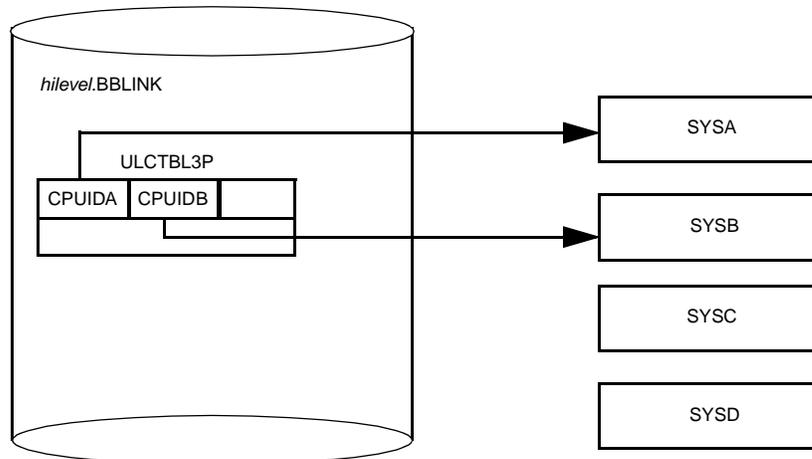
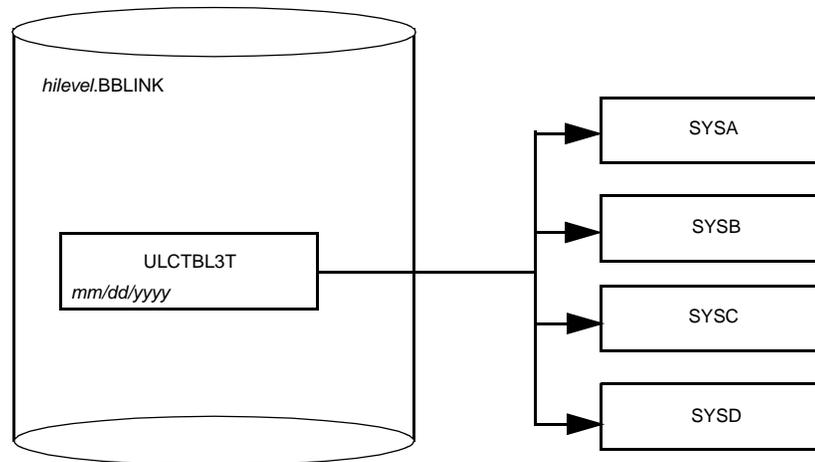


Figure 6-8 shows an example of the product authorization module ULCTBL3T. A temporary license provides authorizations on multiple CPUs because temporary passwords are based on expiration dates.

**Figure 6-8** Temporary Product Authorization Modules



## Displaying Processor Information

---

**Summary:** In this task, you will display processor information.

---

The product authorization password for ULTRAOPT is based on the CPU ID, the model number, and the submodel number. To display the processor information, perform the following steps:

- Step 1** Access the Product Customization Steps panel (Figure 3-3 on page 3-7).
- Step 2** Select the Online Authorization for Product codes BFW, ULI, and ULC step. The Online Authorization panel (Figure 6-9) is displayed.

**Figure 6-9 Online Authorization Panel**

```

MAINVIEW VTAM ----- ONLINE AUTHORIZATION ----- CUSTOMIZATION
COMMAND ==>

You are installing one or more BMC products that require a Product
Authorization password. If you have not already specified passwords
during the installation process, you should do so now. This dialog will
assist you in creating a password table for each product or updating an
existing password table.

Do you want to authorize a product now? ==> YES (YES or NO)

    * NO bypasses this step.
    * YES continues the dialog to authorize a product.

If you reply YES, select either the Online Authorization dialog, or the
Batch Authorization dialog: ==> O (O or B)

Enter the three character Product code: ==> ____

Verify existence of Password data set: ==> NO (YES or NO)

To continue, press ENTER
    
```

- Step 3** Type ULC (ULTRAOPT/CICS) or ULI (ULTRAOPT/IMS) in the **Enter the three character Product code** field.

**Step 4** Type **NO** in the **Verify existence of Password data set** field, and press **Enter**.

An Option panel (Figure 6-10) is displayed.

**Figure 6-10 Product Authorization Option Panel**

```

BMC Product Authorization Primary Menu
COMMAND ===> _____

Select an option. Type additional information if applicable. Then press Enter.

Options

_ 1. Process password (Requires password library and password)
  2. Display product authorization (Requires password library only)
  3. Display current processor information
  4. Help about...
  5. Exit

Additional information

Password library . . . . . 'hilevel.BMCPSWD'

Authorization password . . ____ ____ ____ ____
    
```

**Step 5** To display current processor information, select option 3—**Display current processor information**.

## Changing Systems

Changing ULTRAOPT to another CPU involves a number of considerations.

### SMF ID

The FDT module name is constructed by concatenating a product-related character string with the SMF ID (SOPF $xxxx$  for ULTRAOPT, where  $xxxx$  is the SMF ID). If the new SMF ID is the same as the old one, ULTRAOPT is still able to find the FDT module.

If the SMF ID for the new system is different from the previous SMF ID, rename the FDT module for each product accordingly. For example, if you are changing from an SMF ID of SYSA to SYSB, rename the ULTRAOPT FDT module from SOPFSYSA to SOPFSYSB.

### Password

The product authorization password for ULTRAOPT is based on the CPU ID, the model number, and the submodel number. To display the processor information, see “Displaying Processor Information” on page 6-24. If the CPU ID, the model number, or the submodel number changes, call your BMC Software sales representative for a replacement password. If the numbers do not change, you do not need a new password.

### ECSA Calculations

If you are using the same VTAM and MVS libraries, running the same VTAM applications and using the same number of terminals, you will use the same amount of ECSA. You do not need to recalculate or define a different amount.

If you are using different VTAM and MVS libraries, you will need to recalculate your ECSA usage to make sure that enough ECSA is defined.

### VSAM Options and Print Files

You should not have to change the names of your VSAM options files or print files. If you change the names, run the job to rename options and print files, or rerun the job to switch to a different VSAM options or print file, depending on the situation. The jobs are described in the *ULTRAOPT User Guide*.

**Data Set Names**

If you change any of the ULTRAOPT data set names, ensure that you change the appropriate references to those data sets in the startup procedure and any other affected jobs. If the ULTRAOPT load library name changes, make sure the new one is APF authorized.

**SYS1.VTAMLST**

If you are using a new SYS1.VTAMLST file, ensure that the product Applid names are correctly defined. For more information, see “VTAM Applids” on page 2-13.



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# Chapter 7 Startup Parameters

This chapter describes startup parameters that you can use with ULTRAOPT.

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# Parameter Descriptions

The descriptions of the startup parameters are listed alphabetically to help you find them more easily. In the startup procedure, you can use them in any order.

**Note:** If you are using more than five parameters in the ULTRAOPT startup procedure, the SYSIN DD statement removes the limitation of 100-byte parameter strings. For more information about using the SYSIN data set for parameter specification, see Chapter 6, “Implementation Tips.”

Some startup parameters have equivalent operator commands. For more information about operator commands, see the *ULTRAOPT User Guide*.

## Parameters

This section lists the parameters that you can use in ULTRAOPT.

### ACB31 | NOACB31—Obtain Private ACB Storage

The default parameter—ACB31—obtains storage in the Applid’s private area above the 16 MB line. The parameter NOACB31 can be used to cause the subsystem to obtain storage in the application’s private area below the 16 MB line.

ACB31 might be useful for an environment containing an Applid that opens thousands of application control blocks (ACBs)—such as a session manager—under its address space. This use of private storage is discussed in more detail in Chapter 2, “Installation Preparation.” This option is effective only for systems with MVS/ESA and MVS/DFP 2.3 (or later).

The operator commands *subsysid* ACB31 | NOACB31 can be used to toggle the default startup parameter setting.

## ADVLFS—LFS with Extended Attribute Terminals

The ADVLFS parameter is only for ULTRAOPT with Local Format Storage (LFS). ADVLFS specifies that, when using LFS optimization on your extended attribute terminals, ULTRAOPT determines whether to use the format presentation or the Imaging optimization technique. BMC Software recommends this parameter for LFS. If you omit this parameter, LFS might be used in some cases where Imaging optimization would produce even better results.

If this parameter is omitted, the default value is used. The default is off (do not perform advanced checking of LFS optimization). To turn on ADVLFS, add the parameter to the startup procedure.

## ALLMSG—Issue Interception Messages

When ALLMSG is specified, message BMC13134 is issued when a VTAM application opens an ACB that is intercepted by ULTRAOPT; message BMC13129 is issued when a VTAM application opens an ACB that is *not* intercepted.

If this parameter is omitted, the default value is used. The default is off (do not print interception messages). To issue interception messages, add the ALLMSG parameter to the startup procedure.

When ALLMSG is off, the messages are not issued unless the startup parameter INTMSG is added to the startup procedure. For more information, see “INTMSG—Interception Messages” on page 7-11.

## APPLID—Set the Name of the Application

The APPLID parameter specifies the required ULTRAOPT subsystem application name. The name is user-selectable and a maximum of eight characters. APPLID is a *required* parameter; there is no default. The APPLID parameter must match the Applid coded as the label of the APPL macro in the application major node in VTAMLST. It is not the name of the major node.

**Note:** If you are using ULTRAOPT with LFS, you must also use the LAPPLID parameter for the LFS (“LAPPLID—Set Application Name for LFS” on page 7-12).

If you are using the MAINVIEW for VTAM network control program (NCP) data collection feature, you must also add the NAPPLID parameter in the application major node in VTAMLST (“NAPPLID—Set Application Name for NPA” on page 7-14).

## APSTAT—Application Status

The APSTAT parameter lets ULTRAOPT issue the command INQUIRE OPTCD=APPSTAT to determine whether a session partner is really an application. This option lets you obtain optimization on certain LU0, local, bisync 3270, and non-SNA 3270 devices, which might initially appear to be unoptimizable applications. If this parameter is omitted, certain devices might not be optimized.

If this parameter is omitted, the default value is used. The default is off (do not issue INQUIRE OPTCD=APPSTAT). To issue the application status command, add the APSTAT parameter to the startup procedure.

## ASYRCVSC—Asynchronous Receive Scheduling

**Note:** This parameter is not recommended by BMC Software.

The ASYRCVSC parameter causes the subsystem to process RECEIVE-ANYs and RESETSR requests asynchronously. This parameter is useful for applications that are driven by one main task (such as IMS and CICS). When ASYRCVSC is specified, the system uses additional CPU but attains greater throughput.

As with all tuning parameters, its effects should be carefully observed and evaluated to obtain the best results for your environment. This parameter can be set only by using a startup parameter.

If this parameter is omitted, the default value is used. The default is off (process RECEIVE-ANYs and RESETSR requests synchronously). To turn on ASYRCVSC, add the parameter in the startup procedure.

## BSR | NOBSR—Bypass SEND and RECEIVE

If the BSR parameter is specified, ULTRAOPT bypasses VTAM for application-to-application SENDs and RECEIVEs in the same host. BSR saves CPU time and eliminates any need for optimization on that session. If NOBSR is specified, ULTRAOPT routes application-to-application SENDs and RECEIVEs through VTAM.

The default value is BSR (bypass VTAM SENDs and RECEIVEs).

NOBSR should be used only if you need to force traffic through VTAM or force optimization on intercepted application-to-application sessions using the startup parameter OPTAPPLS because BSR would preempt OPTAPPLS for applications in the same host.

**Note:** When using the VTAM trace facility to monitor application sessions and BSR is specified, application-to-application SENDs and RECEIVeS do not appear in your trace because VTAM is being bypassed. A VTAM display of the session partners indicates no SENDs or RECEIVeS.

If you are using the ULTRAOPT BSR feature, statistics gathered using NetSpy, IBM's Network Performance Monitor (NPM), or Resource Management Facility (RMF) might not be valid.

## BSR%—Adjust Bypass VTAM SENDs and RECEIVeS Percentages

The BSR% parameter adjusts the percentage of sessions to which Bypass Send and Receive (BSR) is applied. BSR is used for a session between applications within the same host if the session was created by a CLSDST PASS or a REQSESS (such as a session manager's background sessions). BSR overrides the OPTAPPLS parameter for those sessions. For more information about the use of BSR and OPTAPPLS, see "OPTAPPLS and BSR Options" on page 6-3.

BSR performs these tasks for sessions that are created by a CLSDST PASS or a REQSESS:

- bypasses VTAM's SEND and RECEIVE protocols, saving CPU instructions and VTAM overhead
- removes the opportunity and the need for optimization of data streams between applications in the same host

If you are using BSR and you need to gather statistics using NetSpy, IBM's Network Performance Monitor (NPM), or Resource Management Facility (RMF), you can use the BSR% parameter. This parameter lets you include only a specified percentage of your sessions in BSR.

BSR% can be entered in the following formats only:

- BSR%=100 (100 percent of eligible sessions use BSR)
- BSR%=90 (90 percent of your sessions use BSR)
- BSR%=80 (80 percent of your sessions use BSR)
- BSR%=50 (50 percent of your sessions use BSR)

The default is BSR%=100. To specify that no sessions use BSR, use the NOBSR parameter.

## BWAD—Write Additional Diagnostic Information

**Note:** Do not use the BWAD parameter unless directed to do so by BMC Software Customer Support personnel because it results in a significant increase in CPU time used.

This parameter activates traces that you can use to diagnose buffer work area (BWA) storage problems. It also enables validity checking that is used during BWA storage management. The trace records are written to an internal trace table in virtual storage and are included in the contents of any dump that is initiated by a functional recovery routine (FRR). If the BSOP TRACE command is in effect and the Generalized Trace Facility (GTF) is started, these records will be recorded by GTF.

If this parameter is omitted, the default value is used. The default is off (do not create additional diagnostic information about BWA storage management).

If you are advised to activate the BWAD parameter, start the system GTF task with options that allow GTF to collect all USR records, or specific USR records of type 0C0. Start the ULTRAOPT internal GTF trace by using the startup parameter GTF or the operator command *subsysid* TRACE.

## CHACC | NOCHACC—Chain Accumulation for LU1 Devices

This parameter enables accumulation of LU1 data stream chains in a buffer until the entire data stream is received before sending it on to the device.

If this parameter is omitted, the default value is used. The default is off (do not accumulate LU1 chains—which might not have sufficient buffer space—and send each LU1 chain on as soon as it is received).

## CSALIMIT—Limit the Use of CSA

**Warning!** This parameter is not recommended by BMC Software.

The value of the CSALIMIT parameter limits the total amount of extended common storage area (ECSA) storage that is used by the product subsystem. The CSALIMIT parameter is defined using kilobytes (KB) or megabytes (MB). For example, 6000, 6000 KB, or 6 M all mean 6 megabytes. Use up to eight characters with no non-numeric characters except *K* or *M*. The default limitation is the amount of ECSA that is available on your system.

Setting CSALIMIT to zero has the following effects:

- No limit to CSA usage.
- Product subsystem monitors the ECSA that is 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 allow the CSALIMIT operator command to function again.

This value affects the ECSA utilization thresholds by defining what amount of memory the thresholds are a percentage of.

## CSALVLS—Set the ECSA Utilization Thresholds

Use the CSALVLS parameter to set ECSA utilization thresholds. When overall system ECSA use reaches each level percentage of the total ECSA that is defined, 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 to intercepted applications are rejected).

The format for this parameter is CSALVLS=(xx,yy,zz).

xx is the level 1 threshold, yy is the level 2 threshold, and zz is the level 3 threshold. 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. The defaults are  $x=80%$ ,  $y=90%$ , and  $z=95%$ .

You can omit values by leaving them out, but you must still include the comma delimiter; for example, (,99). In this case, the default values are used for the values that are omitted.

## DEFER—Defer Storage of Formats

The startup parameter DEFER 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 is loaded and also prevents loading of formats that are referenced fewer than  $n + 1$  times. The format for this parameter is DEFER=nnnnn. The default value of  $n$  is zero. You can use any value between 0 and 99999. BMC Software recommends DEFER for controllers that cannot support LFSLRU.

## DNR | NODNR—Enable Domain Name Resolution Function

This parameter enables the domain name resolution (DNR) function. The DNR function resolves an IP address to a domain name, and provides the IP address of a domain name. DNR is the default parameter. Use the NODNR parameter to disable the DNR function.

## DSERR—Set Data Stream Error Recording

The DSERR startup parameter sets the data stream error (DSERR) recording option. The format for this parameter is DSERR=*xxxx*.

*xxxx* is one of the following values:

**BOTH** activates DSERR recording to syslog and SMF  
**LOG** activates DSERR recording to syslog  
**NO** disables DSERR recording  
**SMF** activates DSERR recording to SMF

The default is no (DSERR recording is disabled).

**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.

## EXTLFS | NOEXTLFS—LFS with Extended Attribute Terminals

Use the EXTLFS parameter for ULTRAOPT with LFS. EXTLFS specifies that, with LFS optimization on extended attribute terminals, ULTRAOPT downloads formats containing primary and extended attributes. With LFS on terminals that do not have extended attributes, EXTLFS loads formats containing only the base presentation space. The EXTLFS parameter might increase ECSA and controller LFS storage requirements. Without the EXTLFS parameter, you will not obtain optimal results on extended attribute terminals. The default is NOEXTLFS (do not download formats containing primary and extended attributes).

## FRBWA | NOFRBWA—Free Buffer Work Areas

When the FRBWA parameter 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 the threshold for 4 KB BWAs is 256. Freeing BWAs prevents too many of them from accumulating. The default is NOFRBWA (do not free BWAs).

## FRR | NOFRR—Disable the Functional Recovery Routine

**Warning!** If you disable FRR and you experience a fatal error, application systems (for example, IMS or CICS) might abend.

The global NOFRR parameter disables the functional recovery routine (FRR). Each routine in ULTRAOPT is supported by an FRR. If an area of code abends, FRR routines perform a First Failure Data Capture (for example, dumps) and recover from the abend, bypassing the failing code and returning a bad return code to the caller of the routine.

However, the protection that is provided by FRR results in additional CPU overhead. If you have been running ULTRAOPT for an extended period, have experienced no fatal errors, and want to improve performance, specify the NOFRR parameter to disable FRR. If this parameter is omitted, FRR protection is fully enabled.

## GTFTRACE—Write Internal Trace Records to GTF

The GTFTRACE parameter writes the product's internal trace function to GTF to collect additional information for problem solving. Without this parameter, the product subsystem does not write internal trace records to GTF unless the *xxxx* TRACE command is issued (*xxxx* is the ULTRAOPT subsystem ID).

If this parameter is omitted, the default value is used. The default is off (do not automatically write records to GTF).

## HPO—High Performance Option

The High Performance Option (HPO) global parameter disables validity checking for data storage operations (for example, buffer transfers). This parameter can increase performance for error-free applications. Applications experiencing errors can corrupt storage. If this parameter is omitted, normal validity checking is performed at the expense of some CPU time.

If this parameter is omitted, the default value is used. The default is off (perform all validity checking).

## INT | NOINT—Do Not Intercept Application ACBs

The NOINT parameter specifies that no ACBs be intercepted and no data streams are optimized. BMC Software recommends this parameter when starting ULTRAOPT for the first time, so that you can build the initial include and exclude tables. When you are ready to intercept applications, you can issue the INT operator command as described in the *ULTRAOPT User Guide*. (Applications already started would have to be restarted to be intercepted.) If this parameter is omitted, all eligible or included applications are intercepted.

## INTMSG—Interception Messages

When INTMSG is specified, message BMC13129I is issued when a VTAM application opens an ACB that is not intercepted by ULTRAOPT.

If this parameter is omitted, the default value is used. The default is off (do not print interception messages). To issue interception messages, add the INTMSG parameter to the startup procedure.

When INTMSG is off, the messages are not issued unless the startup parameter ALLMSG is added to the startup procedure. For more information, see “ALLMSG—Issue Interception Messages” on page 7-4.

## JES—Set System ID for MVS Image

The JES parameter lets you supply any unique four-character system ID to identify the MVS image on which the product is being started. If this parameter is not specified, the default image name is the SMF system ID.

The string that is supplied with this parameter identifies the load module containing the File Definition Table (FDT), which points to the VSAM files. The load module name is SOPFxxxx (xxxx is this ID). In previous releases, the load module name was always the SMF system ID; now, you can designate any value as the system ID by supplying it with the JES parameter.

If you use this parameter, the jobs that allocate the VSAM files—in sample JCL member *hilevel.BBSAMP(SOPVSAM)* and in sample JCL member *hilevel.BBSAMP(SOPJOPTN)*—must have the xxxx string from JES=xxxx coded in the parameter statement in the format `PARM='SYSID=xxxx'`.

## LAPPLID—Set Application Name for LFS

The LAPPLID parameter is for ULTRAOPT with LFS. It specifies the application name that is used to implement local format storage. The name is user-selectable and a maximum of eight characters. If LFS is used, the LAPPLID parameter is required. It must match the Applid coded as the label of the APPL macro for the LFS application in the VTAMLST application major node for ULTRAOPT.

## LFSLRU—Least Recently Used Formats

The LFSLRU parameter is for ULTRAOPT with LFS only. The parameter lets you delete the least recently used formats from LFS storage in the IBM 3174 controller when storage is exhausted. If you do not use the LFSLRU parameter, the controller load LU LFS storage space is reset when storage is exhausted and multiple copies of unrefined formats might consume controller storage (unless you use the DEFER parameter).

If this parameter is omitted, the default value is used. The default is off (reset the load LU LFS storage space when storage is exhausted).

For information about the minimum microcode level required to use the LFSLRU parameter, see Appendix C, “Local Format Storage Optimization.”

## MAXOPT—Set Maximum Sessions to Optimize

This parameter controls the number of sessions that ULTRAOPT will optimize. Every time a user logs on a new session, the MAXOPT value is checked against the number of sessions that are 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.

The format for this parameter is MAXOPT=*xxxxx*. The value you specify for *xxxxx* is the maximum number of sessions that can be optimized from 0 to 99999. If *xxxxx* is a pound sign (#), the number of sessions is unlimited. When set to zero, no new sessions will be optimized. The default for MAXOPT is unlimited.

Optimization is dynamic while MAXOPT is in use. As the threshold is exceeded and relieved, ULTRAOPT will adjust the number of sessions being optimized to keep that value as close as possible to your specified MAXOPT threshold.

## MINFMT—Do Not Load Small Formats

If you are using ULTRAOPT with LFS, the MINFMT parameter specifies that formats smaller than approximately 256 bytes are not to be loaded on the LFS-capable controller. Data streams are examined *before* optimization for their size. If that size is less than 256 bytes, the format for that data stream will not be included for LFS.

MINFMT is useful if you are using the LFSLRU parameter to reuse format storage. The small formats are less likely to be reused and can eventually clog up the format storage area.

If this parameter is omitted, the default value is used. The default is off (load all formats). To change the size of the minimum format, see the MINFMTSZ parameter.

## MINFMTSZ—Set Small Format Size

This parameter works with the MINFMT parameter to let you change the minimum size LFS format from 256 bytes to an approximate value between 1 byte and 9999 bytes. Data streams are examined *before* optimization for their size. Any data stream less than the MINFMTSZ setting will not be loaded into the LFS-capable controller. When selecting a minimize size format, you might want to take into account the overall optimization percentage that is typical at your site.

The format for this parameter is MINFMTSZ=*nnnn*. The default is MINFMTSZ=256 (which is the same as MINFMTSZ=0). If MINFMT is off, MINFMTSZ is ignored.

## MLFS—Support Multiple-Host LFS Controllers

If you are using ULTRAOPT with LFS and you have at least one IBM 3174 controller connected to multiple hosts, use the MLFS parameter. If you are using multiple hosts with a controller, ensure that the ULTRAOPT LFS Applid name is different on each host.

MLFS causes ULTRAOPT to reset the controller by the group name, which is set to be the LFS Applid name when ULTRAOPT first establishes a session with the controller. Do not change the LFS Applid name. If you do, you must perform an initial program load (IML) on the controller or otherwise clear the original group name and create the new group name. The default for MLFS is off (do not support multiple hosts for LFS).

More information on setting up a 3174 controller for use with multiple hosts is included in Chapter 6, “Implementation Tips.”

## MODEL2—Use Default Model 2 Screen Size

The MODEL2 parameter is for ULTRAOPT. It provides a default model 2 screen size (24 by 80) for sessions (LU type 0, 2, or 3) that should be optimized but otherwise cannot because 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 parameter is ignored; and ULTRAOPT optimizes data streams for the device, using the size in the QUERY REPLY command instead of the model 2 size.

If this parameter is omitted, 3270 sessions established without a presentation space defined in the BIND or QUERY REPLY are not optimized.

## NAPPLID—Set Application Name for NPA

The NAPPLID parameter is for MAINVIEW for VTAM. This parameter specifies the required network performance analyzer (NPA) application name. The name is user-selectable and a maximum of eight characters.

The APPLID parameter must match the Applid coded as the label of the APPL macro in the application major node in VTAMLST. It is *not* the name of the major node.

If you are using the MAINVIEW for VTAM NCP data collection feature, you must add the following statement:

NAPPLID=NPA session ACB name, same as ACBNAME added in the Edit VTAM Applid Major Node Definitions task

**Note:** For more information about editing the VTAM Applid major node definition, see the “VTAM Applids” on page 2-13.

## NCOLLECT—Define NCP for NPA Collection

The NCOLLECT parameter is for MAINVIEW for VTAM. This parameter defines the NCP for data collection. If you are using the MAINVIEW for VTAM NCP data collection feature, you must add the following statement:

```
NCOLLECT=(NCPNAME, NPALUNAME)
```

*NCPNAME* will match the NCP source member in SYS1.VTAMLIST.  
*NPALUNAME* will match the first logical unit (LU) name that is defined in the NPARSC group in the NCP source.

**Note:** To enable NPA collection within the NCP, you must define a resource group with NPARSC=YES and you must add NPA=YES to the BUILD statement of the NCP. For more information, see the *NCP Resource Definition Guide*.

## NEWDAY—Issue Message on New Day

The NEWDAY parameter issues a date message at the beginning of each day, so that the time stamps in the job log can easily be correlated to the current date. Most operator and system messages issued by ULTRAOPT are written to its job log. JES adds a time stamp to the messages but does not indicate the date. BMC Software recommends the NEWDAY startup parameter so that ULTRAOPT will issue a date stamp message daily.

The message will be issued just after midnight each day and also immediately after ULTRAOPT was first started. By looking for the preceding occurrence of this message, you can determine the date that subsequent messages were issued.

The message text is

```
BMC13039I ULTRAOPT HAS DETECTED A NEW DAY yyyy.ddd
```

yyyy is the year and ddd is the Julian calendar day. The format for this parameter is NEWDAY=ON | OFF. The default for NEWDAY is off (do not print the NEWDAY message at the beginning of each day).

## NOLU0—Do Not Optimize LU0 Data Streams

When the NOLU0 parameter is on, data streams for LU0 sessions are not passed to the Optimizer. This parameter is valid for ULTRAOPT/IMS and ULTRAOPT/CICS; however, it is usually not necessary for ULTRAOPT/IMS because ULTRAOPT/IMS already suppresses optimization for the subset of LU0 sessions established with session parameters FMPROF=04 and TSPROF=04 in the BIND (“SLUP” sessions).

If this parameter is omitted, the default value is used. The default is off (optimize LU0 data streams). By default, ULTRAOPT/CICS optimizes eligible SLUP sessions and other eligible LU0 sessions as long as NOLU0 is not on. ULTRAOPT/IMS optimizes eligible non-SLUP LU0 sessions as long as NOLU0 is not on. The *xxxx* LU0 operator command can be used to return to the default setting.

## NOQLFS—Do Not Query Non-LFS Devices

The NOQLFS parameter 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 returns an LFS management LU (LOCADDR=01).
- The LFS management LU is in session with the LFS Applid.

NOQLFS prevents devices on non-LFS controllers from getting queried.

QLFS is the default parameter setting because some controllers might 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.

## NOSRBTIM—Disable Timer for SRBs

SRBs are MVS units of dispatch that can enter infinite loops. If no time-out is set for these SRBs, all processes within the CPU might become busy processing these looping SRBs. By default, ULTRAOPT sets a 2-second timer for each SRB. If you have been running ULTRAOPT for an extended period and are confident that you will not encounter any SRB looping situations, you can increase performance by specifying the NOSRBTIM parameter to disable the SRB timer. If this parameter is omitted, SRB loops are detected and result in system-completion code S05B.

## OPTAPPLS | NOOPTAPP—Optimize Application-to-Application Data Streams

The OPTAPPLS parameter enables optimization of certain application-to-application data streams. (OPTAPPLS is the default for ULTRAOPT; so application-to-application data streams normally *are* optimized.) OPTAPPLS is useful for the following situations:

- TPNS virtual terminal Applids that are logged on to optimized applications
- TCP/IP virtual terminal Applids that are logged on to optimized applications
- non-intercepted session manager virtual terminal Applids that are logged on to optimized applications
- cross-domain session manager virtual terminal Applids that are logged on to optimized applications

If you have virtual terminals from an optimized session manager and the *foreground* sessions are already optimized, using OPTAPPLS unnecessarily optimizes the background sessions unless BSR is on. BSR prevents optimization of data streams between applications in the same host, which, in this case, are the session manager background sessions between the virtual terminals and the applications.

To disable optimization of certain application-to-application data streams, use the NOOPTAPP parameter.

## OPTPS—Optimize Programmed Symbols

The OPTPS parameter activates optimization for programmed symbols (PS). If omitted, optimization is not performed for PS 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.

Activating this form of optimization results in additional ECSA storage use of 76 KB for each optimized session using Programmed Symbol data streams.

If this parameter is omitted, the default value is used. The default is off (do not optimize PS data streams).

## QUERYP | NOQUERYP—Control Terminal Queries

The QUERYP parameter is for ULTRAOPT only and is used to control the issuing of a query to a terminal. When using QUERYP, a terminal is only queried if it is included for LFS optimization and if the *query bit* is on in the LOGMODE's 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.

Do not use QUERYP if you have LFS terminals without the query bit on. If all LFS terminals have the query bit on, BMC Software recommends QUERYP because it can prevent issuing queries to devices whose controller or microcode does not support queries. The default for this parameter is NOQUERYP.

## RECANY—Receive Any

This parameter changes the size of the request parameter list (RPL) Receive Any buffer. The RECANY parameter value is defined in kilobytes (KB). The format for this parameter is RECANY=*n*. The default for RECANY is 1. This parameter lets you specify *n* as a 1 KB to 4 KB RPL buffer size for Receive Any data.

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 might cause a performance degradation if these sessions are bound with a larger SEND/RECEIVE request unit (RU) size. You might 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) might need to be adjusted to accommodate the larger buffer size.

## RESPTM | NORESPTM—Response Time Statistics

The RESPTM parameter invokes host and network response time monitoring for all applications and sessions except TSO. (The TSORSP parameter turns on response time monitoring for TSO.) Statistics that are collected can be viewed by using 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. The default parameter is NORESPTM (do not collect response time statistics).

To use any other RTM options (TSORSP, RTMINT, and RTMSMGR), the RESPTM parameter must be in effect. For more information about RTM, see the *ULTRAOPT User Guide*.

## RSCBE | NORSCBE—Reuse Session Control Blocks

The RSCBE parameter frees session control blocks (SCBEs) for LUs whose optimized sessions have terminated. When an LU session is terminated, its SCBE is only being used to retain statistics. When the RSCBE startup parameter (or operator command *subsysid* RSCBE) is used, the statistics for terminated LU sessions are no longer displayed on panel 2.2.0 (only LUs with active optimized sessions appear).

RSCBE results in saving almost 1 KB of ECSA per reused SCBE and also ensures that the number of SCBEs does not exceed the highest total number of concurrent active primary and secondary half sessions to intercepted applications. RSCBE is the default parameter. To disable the reuse of session control blocks, use the NORSCBE parameter.

## RTMINT—Response Time Monitor Interval

The RTMINT parameter specifies the interval for which response time statistics are collected before being reset. The format for this parameter is `RTMINT=mmmm`.

*mmmm* specifies the number of minutes between 0 and 1440 (24 hours). By default, ULTRAOPT resets response time statistics every 15 minutes.

Before you can use the RTMINT parameter, the RESPTM parameter must be in effect.

## RTMSMGR—Response Time Monitor Session Manager LU Name Display

The RTMSMGR parameter 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 parameter is in effect, 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 option.

## SHUTMSG—Shutdown Verification Message

The SHUTMSG parameter provides a verification message when you shut down the ULTRAOPT subsystem.

If this parameter is omitted, the default value is used. The default is off (no message is provided upon shutdown). If you are running MAINVIEW for VTAM, BMC Software recommends turning on SHUTMSG.

**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.

## SMFINT—Set SMF Recording Interval

This parameter lets you specify how often the SMF record that is specified by the SMFREC parameter is to be put in the SMF data set. The format for this parameter is SMFINT=*xx*. The default for SMFINT is 15. *xx* is the interval in minutes, and can be 01, 15, 30, or 60.

For example, to specify that the product should generate the SMF record every 15 minutes, use SMFINT=15 in your startup parameter list. The product does not record unless the SMFREC parameter is also present in the startup parameter list.

For information about using these startup parameters, see the *ULTRAOPT User Guide*. For information about SMF records, setting up the SMF data set, and specifying the SMF record types that may be captured, see the IBM System Management Facilities documentation.

'*hilevel.BBSAMP(SMF251)*' is a sample SAS job to format ULTRAOPT SMF records.

**Note:** ULTRAOPT SMF records are taken from Monitor statistics panel 2.2.0, which is then reset. You should not log SMF records while printing or resetting statistics. If you do, statistics are continuously being reset by both functions; and neither the panel 2.2.0 statistics nor the SMF records will accurately reflect activity on your system. To write accurate SMF records, you should disable any Print/Reset function on the Print/Reset Statistics panel.

## SMFREC—Set Type of SMF Record

The SMFREC parameter lets you specify what type of SMF record to put in the SMF data set. The format for this parameter is SMFREC=*xxx*. The default for SMFREC is 251. *xxx* is the user SMF record type 128 to 255. For example, to specify that SMF records be designated as type 251, use SMFREC=251 in your startup parameter list. ULTRAOPT does not record unless the SMFINT parameter is also present in the startup parameter list.

If your data center has not allowed SMF to record the *xxx* record type, you will be prompted to specify a record type that is included in the SMF parameter definition (in 'SYS1.PARMLIB(SMFPRM*xx*)').

For information about using these startup parameters, see the *ULTRAOPT User Guide*. 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.

'*hilevel.BBSAMP(SMF251)*' is a sample SAS job to format ULTRAOPT SMF records.

## SNA4—Use SNA4 Data Compression

The SNA4 parameter compresses data streams using SNA Data Compression (that is, 3600/4700) if both of 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.

If SNA4 is omitted and if you need SNA Data Compression on any data streams that do not conform to the first bulleted item, write a user exit as documented in sample user exit SOPUSERC. If this parameter is omitted, the default value is used. The default is off (do not optimize “SLUP” sessions).

## STOR—Use Extended Private Storage (XPVT)

The STOR parameter lets you reduce the amount of ECSA used by ULTRAOPT on behalf of CICS and IMS applications. Specify STOR=XPVT to use Extended Private Storage. The default is STOR=XCSA, which uses ECSA.

With XPVT, all (non-LFS) BWA, EWA, OWA, RWA, VWA, and RAQ control blocks are moved to IMS or CICS extended private storage. Control blocks related to TSO or Session Manager address spaces are still obtained in ECSA. For more information about virtual memory requirements, see Chapter 2, “Installation Preparation.”

**Note:** XPVT does not affect the performance of BSR. You can use XPVT and BSR for ULTRAOPT/CICS and ULTRAOPT/IMS.

**Warning!** BSR requires ULTRAOPT to obtain *some* ECSA control blocks to transfer data. To observe actual ECSA usage when using XPVT and BSR before lowering ECSA estimates, use `D subsysid,ECSA`.

## SUBSYSID—Set the BMC Software Primary Subsystem Name

The SUBSYSID parameter is required. This parameter specifies the four-character name of the BMC Software Primary Subsystem *or* of the ULTRAOPT subsystem. (This parameter must appear once in each subsystem’s startup procedure.) *Do not* use the same name for the BMC Software Primary Subsystem *and* for the ULTRAOPT subsystem or a name that is already used by another system.

**Note:** When either subsystem has been started, the SUBSYSID parameter cannot be changed until the next IPL.

## TRACE—Set ECSA Internal Trace Size

The TRACE parameter specifies the number of trace records to be written to the ULTRAOPT internal ECSA trace. The format for this parameter is `TRACE=nnnn`. The maximum value of *nnnn* is 1800, which is also the default value. This value specifies that the most recent 1800 trace records will be kept. Specifying `TRACE=0` (or `TRACE=OFF`) turns off ECSA tracing. Any value between 140 and 1800 instructs ULTRAOPT to write that number of records to the internal trace. When the maximum number of records has been written, ULTRAOPT will begin writing over the oldest records.

**Note:** The ECSA trace runs by default, whereas the data space trace defaults to 0/OFF. Both traces may be run simultaneously, but BMC Software recommends running only one.

## TSORSP—Response Time Statistics for TSO

The TSORSP parameter invokes host and network response time monitoring for TSO sessions. Statistics that are collected can be viewed by using the ULTRAOPT Monitor, Response Time Monitor Menu (panel 5.0). If this parameter is omitted, the default value is used. The default is off (do not collect TSO response time statistics).

**Note:** When MAINVIEW for VTAM is active, the default is TSORSP.

Before you can use the TSORSP parameter, the RESPTM parameter must be on.

## USIM—Allocate SCBE for SIMLOGON Sessions

The USIM (Unique SIMlogon) parameter forces the subsystem to allocate a new SCBE for each new session that is initiated by using SIMLOGON, even if an SCBE already exists for that LU from a previous terminated session.

Specify USIM when an application needs each new session to use a new CID. If this parameter is omitted, the default value is used. The default is off (reuse the SCBEs when possible if there is no existing session with that LU).

Using USIM results in 0.7 KB of additional ECSA used for each additional SCBE.

## VTIMEINT—Set VTAM Storage-Checking Timer

The VTIMEINT parameter determines the length of the VTAM storage-checking timer in the ULTRAOPT module SOPMUXIT.

The format for this parameter is VTIMEINT=LONG | SHORT. The default is SHORT (check VTAM storage levels every half second).

Specifying VTIMEINT=SHORT causes ULTRAOPT to check VTAM storage levels every half second. BMC Software recommends this interval because a VTAM buffer expansion can lead to performance and timing-related problems in the SNA network.

Specifying VTIMEINT=LONG indicates that VTAM storage levels will be 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 delay can “hang” the application for the duration of the 30-second interval.



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# Appendix A Product Overviews

This chapter provides an overview of ULTRAOPT/CICS and ULTRAOPT/IMS for new users. It also describes the major differences between ULTRAOPT and other IMS or CICS optimizing products for users who might be migrating from another IMS or CICS optimizing product.

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## Product Information

This chapter is particularly useful in the following circumstances:

- when you are migrating to ULTRAOPT from another IMS or CICS optimizer

ULTRAOPT products are significantly different from IMS and CICS optimizers. This section describes these important differences.

- when you are a new ULTRAOPT user

Understanding the characteristics of an optimization product is necessary to determine how this product fits into your environment. This chapter describes these important characteristics.

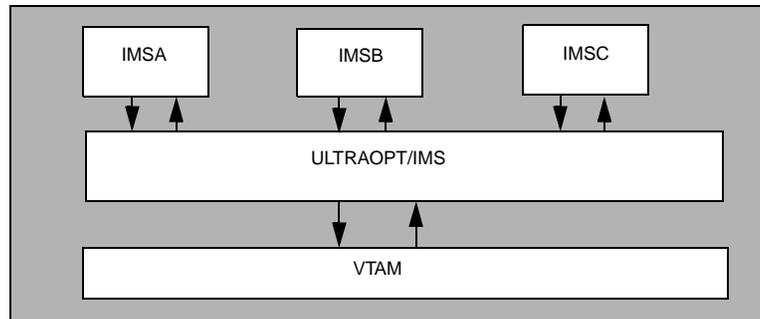
## ULTRAOPT Application Interception

The ULTRAOPT subsystem must intercept an application before optimization can take place. Interception can occur after the product subsystem is fully initialized, with a status of `ACT/READY TO INT` in the product Monitor. When an application opens an application control block (ACB), the BMC Software Primary Subsystem (BMCP) observes this event and notifies the ULTRAOPT subsystem. Examination of the Applid include/exclude tables determines whether or not to intercept the application opening the ACB. If the Applid is included for optimization in ULTRAOPT, the subsystem intercepts that application and begins handling all traffic between it and the Virtual Telecommunications Access Method (VTAM). After interception of an application, the Monitor status changes to `ACT/INTERCEPTING`. As users begin to log on to these intercepted applications, the ULTRAOPT subsystem handles all traffic for these sessions.

## ULTRAOPT Applications Serviced

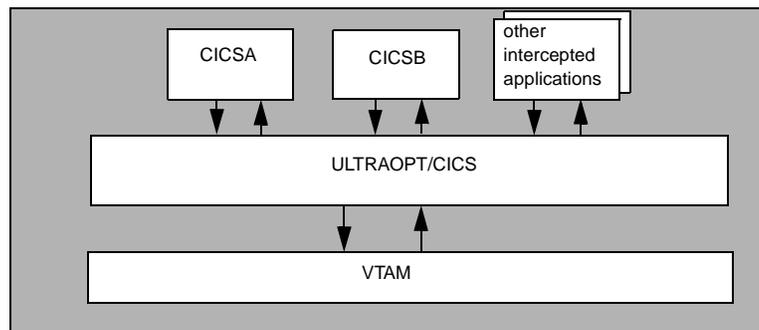
ULTRAOPT/CICS can intercept any application except IMS. ULTRAOPT/IMS can intercept any application except CICS. You are required to install ULTRAOPT only once for each MVS VTAM system. Unlike application-specific optimizers, ULTRAOPT optimizes data streams at the VTAM level for all eligible subsystems. For example, the number of IMS control regions that you have is transparent to ULTRAOPT (Figure A-1).

**Figure A-1 ULTRAOPT/IMS with Multiple IMS Control Regions**



The number of CICS control regions and other applications that you have is transparent to ULTRAOPT (see example in Figure A-2).

**Figure A-2 ULTRAOPT/CICS with Multiple CICS Control Regions and Other Applications**



## VTAM

ULTRAOPT/CICS and ULTRAOPT/IMS are VTAM products. When an application such as IMS opens an ACB, ULTRAOPT determines whether the application is included for optimization. If it is, ULTRAOPT intercepts the ACB OPEN request.

Because these VTAM products sit between VTAM and all intercepted applications (not just IMS), you must treat them the way you treat VTAM: *When you bring one of these products down, all intercepted applications lose communications with VTAM and might abend.* You should first stop any such applications normally. (You might need to stop only IMS communications by using `/STO DC`.)

ULTRAOPT provides a startup parameter (NOINT) that lets you start the product without intercepting any applications. NOINT lets you verify the installation, check its operation, and shut it down, if necessary, without affecting other applications. You should install this product with the assistance of the VTAM system programmer.

## ECSA

ULTRAOPT can save a considerable amount of network traffic. To do so, ULTRAOPT requires some additional CPU cycles and a significant amount of virtual storage. Most of the virtual storage that is used by this product is obtained from the extended common storage area (ECSA). This use of ECSA is different from most subsystems and from previous BMC Software optimizers, which typically obtain storage in the *private* area.

**Warning!** ECSA is a critical, shared resource. It is vital that your MVS system programmer define a sufficient amount of it to the system in `SYS1.PARMLIB` before starting ULTRAOPT. You must perform an initial program load (IPL) on the system to change your ECSA definition. If you do not define enough ECSA and system usage of defined ECSA reaches 95 percent, no more session logons can be established to intercepted applications.

Estimating ECSA use is described in Chapter 2, “Installation Preparation.” The ECSA calculations must consider all intercepted applications and connected devices. Be sure that your common page data set can back up your actual ECSA usage.

If you want to avoid having to estimate ECSA requirements, your MVS system programmer can simply define 300 MB or more to the system. Defining an arbitrarily large amount of ECSA will take away from the largest possible size of any private address space; however, it leaves more than 1.5 gigabytes of addressability for private virtual storage. When defining ECSA storage, remember the following items:

- ECSA refers to virtual memory, not real memory.
- The product obtains storage only from the total free ECSA pool when required, and does not need all 300 MB for most environments.

## Affected Applications and Devices

ULTRAOPT/CICS can intercept CICS and all VTAM applications except IMS. ULTRAOPT/IMS can intercept IMS and all VTAM applications except CICS. This capability is different from that of application-specific optimizers—ULTRAOPT can optimize data streams to any 3270 devices that communicate to these applications (such as SCS printers). It is also important to know which devices, transactions, and applications might not support the 3270 data stream standard or are not tolerant of certain kinds of optimization so that you can exclude them.

Adjusting the include and exclude tables for various applications, logical units (LUs), and types of optimization is more complex; but it lets you achieve significantly better optimization than you would obtain if you had less control.

## Exclude by Transaction ID

You do not need to exclude a standard 3270 data stream unless it goes to a device (called a logical unit in ULTRAOPT) that does not support standard 3270 data streams. Because ULTRAOPT lets you exclude LUs, you need only to exclude non-standard 3270 transactions.

## Exclude CICS Transactions via an Exit Program

ULTRAOPT uses a Monitor panel with a CICS exit program to include/exclude Transids from optimization. You must have the CICS exit program enabled in order to include/exclude transactions. The actual transids to be included/excluded are defined by using the Monitor. For more information, see Chapter 4, “CICS Exit Program Installation.”

## Exclude IMS Transactions

Beginning with ULTRAOPT version 2.0.01, users have the ability to manage global optimization of data streams based on IMS transaction ID (Transid) from the Monitor (the user interface). A panel in the ULTRAOPT monitor allows specifications of the Applid.Transid to be included/excluded.

Prior versions of ULTRAOPT required the use of an ULTRAOPT user exit to manage IMS transactions based on the Transid. The BMC Software utility to build the ULTRAOPT user exit is still available for including and excluding IMS transactions globally or from individual optimization techniques. See controlling IMS transids by using a user exit in the *ULTRAOPT User Guide*.

## Optimizer Overview

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

ULTRAOPT *substantially* reduces the length of outbound and inbound data streams for 3270 terminals and SCS printers. For outbound data streams, the amount of reduction can be as high as 95 percent (usually in the range of 40 to 95 percent). For inbound data streams, the amount of reduction can be as high as 90 percent (usually in the range of 30 to 90 percent).

ULTRAOPT can also compress outbound SNA data streams for 3600/4700 controllers and 3790 devices with decompression capability. This amount can be as high as 45 percent, with an average range of 20 to 40 percent.

## Optimizer Subsystems

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

- BMCP

This subsystem must be started before ULTRAOPT. After BMCP initialization is complete, the address space is no longer active and no CPU time is used. BMCP can be shut down if you want to remove it from the system.

The function of BMCP in an ULTRAOPT environment is to detect when an application opens an ACB and to notify ULTRAOPT. (The BMCP is also used by other BMC Software products. When those products are active, the BMCP additionally notifies them of significant events.) The BMCP actually continues to monitor significant events until the next IPL, regardless of actions performed against the BMCP address space.

- ULTRAOPT subsystem

This subsystem contains the modules that perform optimization for ULTRAOPT. The actions of this subsystem are transparent:

- All new and existing VTAM Applids operate without any change.
- No modifications are made to VTAM.

This subsystem performs the following functions:

- reduces data stream lengths
- analyzes data streams for application *and* hardware errors
- traces VTAM data streams according to user-specified criteria
- saves statistics on optimization

## Optimizer Design Objectives

The Optimizer component functions as follows:

- adjusts dynamically to the VTAM release that your data center is using
- captures data streams for customer analysis
- adjusts dynamically to any data center customization changes that are selected from the Monitor component
- executes its code and acquires storage above the 16 MB line

Because CPU time is a critical resource, the Optimizer component uses as little CPU time as possible while still reducing data streams by a high percentage.

Other significant design features of the Optimizer component are as follows:

- The Optimizer processes and optimizes data streams containing any combination of the following items:
  - extended attributes
  - program symbols
  - color
  - vector graphics
  - APL text keyboards
  - hardware partitions
  - 12-bit, 14-bit, and 16-bit addressing
  - double-byte character set (DBCS)
  - write structured fields, including outbound data streams containing embedded 3270 data streams

**Note:** ULTRAOPT can optimize data streams containing DBCS characters. DBCS optimization is very different from only providing DBCS support, which usually means that DBCS characters are recognized and the data streams containing these characters are passed but not optimized through the system.

- PC file transfers are recognized and bypassed automatically (not optimized) with no user action or customization required.
- All 3270 inbound and outbound data streams (except excluded data streams) are checked for hardware-generated or application-generated errors.
- Several user exits are provided so that you can write exit programs to pre-process data streams, post-process data streams, or include/exclude a data stream for optimization based on special user criteria such as an IMS Transid or format name.

The Optimizer component has the following specifications:

- an application program written in assembler language
- reentrant
- 400 KB
- RMODE=ANY AMODE=31

# Optimization and Compression Techniques

When the Optimizer 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. The various techniques are described below.

## Imaging Optimization

Imaging<sup>®</sup> optimization remembers what is displayed on each terminal screen. It transmits only the data necessary to make the appropriate changes to the screen. Imaging optimization supports partitioned terminals (for example, 3179, 3180, 3193, 3290, and 3775).

## Input Suppression Optimization

Using this technique, the Optimizer reduces the length of inbound data streams. Input Suppression optimization does the following:

- uses the Imaging optimization technique to remove all unnecessary data and control characters from the data stream transmitted from a terminal to your host application

This removal is accomplished with the Optimizer software in your host CPU. No hardware changes are needed.

- allows additional adjustments to *outbound* data streams to further reduce their lengths
- reduces the number of characters transmitted and the number of line turnarounds

Depending on the hardware that your site is using, inbound data streams are usually transmitted in segments of 256 or 512 bytes. When each segment is transmitted from the terminal to the host, the host must acknowledge that it has received the data before the next segment can be transmitted.

The protocol that the hardware and software follow to accomplish this verification process is called Line Turnaround. If Input Suppression can reduce your inbound data streams from two pieces to only one piece, the number of line turnarounds is also reduced.

## Erase Input Key Allowed Optimization

Erase Input Key Allowed optimization is a partial implementation of Input Suppression optimization. It is provided for data centers that have terminal operators using the **Erase Input** key.

When Erase Input Key Allowed is **NO**, full Input Suppression is in effect; and the Erase Input key should not be used. When Erase Input Key Allowed is **YES**, partial Input Suppression is in effect; and the **Erase Input** key may be used.

The percentage of reduction in the length of data streams is higher with full Input Suppression (Erase Input Key Allowed is **NO**) than it is with partial Input Suppression (Erase Input Key Allowed is **YES**).

**Erase Input** and **Erase EOF** are two separate keys on the keyboard with two functions. **Erase EOF** can be used with Input Suppression.

## Conventional Optimization

The features of Conventional optimization are as follows:

- *Attribute Elimination* eliminates all attributes that are embedded in outbound data streams sent to printers.
- *Blank Elimination* removes blanks from protected fields in outbound data streams that are sent to CRTs and printers.
- *Field Merge* lets your data center eliminate start field orders from consecutive protected fields when the field attributes are the same.
- *Non-Display Fields* eliminates protected non-display fields from outbound data streams that are sent to CRTs and printers.

Conventional optimization sorts data streams and eliminates repeating strings of characters, unnecessary or redundant user data, and unnecessary 3270 control characters.

The Conventional technique is used when ULTRAOPT Imaging techniques cannot be used or when ULTRAOPT is installed but Imaging is turned off.

## SCS Printer Optimization

SCS Printer optimization optimizes outbound data streams for SCS printers, speeding up transmission of these data streams to the printer.

## SCS Horizontal Tabs Optimization

This technique reduces the length of SCS printer data streams. SCS Horizontal Tabs optimization uses two horizontal formatting codes: Set Horizontal Format and Horizontal Tab.

If you have SCS printers that do not support these codes, you cannot use this technique.

## SNA Data Compression

SNA Data Compression compresses outbound data streams for 3600/4700 controllers and 3790 user programs that run application programs supporting SNA data decompression. This technique expands compressed inbound data streams that were compressed by the application LUs.

## Bypass Send and Receive

For application-to-application sessions in the same host, ULTRAOPT lets you bypass VTAM for all SENDs and RECEIVEs for sessions that are created by a CLSDST PASS or a REQSESS (such as a session manager's background sessions). This ability improves your response time and reduces the amount of CPU time that is used for these sessions. Bypass Send and Receive (BSR) sessions are not optimized because there is no need to optimize data that never leaves the system.

Some CPU usage is saved because

- VTAM does not have to execute SENDs and RECEIVEs under those applications' address spaces.
- No optimization is necessary in the background applications' address spaces.

## Invoking BSR

By default, BSR is invoked when you start ULTRAOPT. You can disable it with the NOBSR start-up parameter. Any application being intercepted can benefit from BSR. The benefits of BSR are only derived when both partners of the application-to-application session are being intercepted.

**Note:** When using BSR, application-to-application SENDs and RECEIVES do not appear in your VTAM trace because VTAM is being bypassed. A VTAM display of the session partners also indicates no SENDs or RECEIVES.

If you are using BSR, statistics gathered using NetSpy, the IBM Network Performance Monitor (NPM), Resource Management Facility (RMF), or some other statistics monitoring application, may not be valid.

## Using BSR to Optimize Session Manager Performance

Session managers can be a great productivity tool for your terminal users, but they consume a significant amount of CPU time when used with optimizers. You can improve optimized session manager performance on your systems by using the ULTRAOPT BSR feature.

If your data center uses a session manager to access multiple applications (for example, IMS, various CICSs, or TSO) during a single terminal session, the BSR feature can significantly reduce the CPU cost per optimized message.

Figure A-3 shows an example of a user logging on to a session manager and starting several background sessions with various applications. Each transaction requires three SENDS and three RECEIVES:

- The session manager RECEIVES the message from the terminal and issues a SEND to the application (for example, CICS).
- CICS issues a RECEIVE and a SEND to the session manager.
- The session manager issues a RECEIVE and a SEND to the terminal.

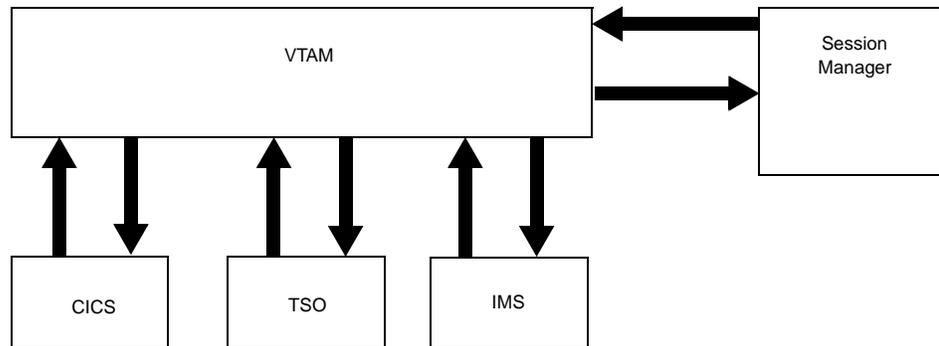
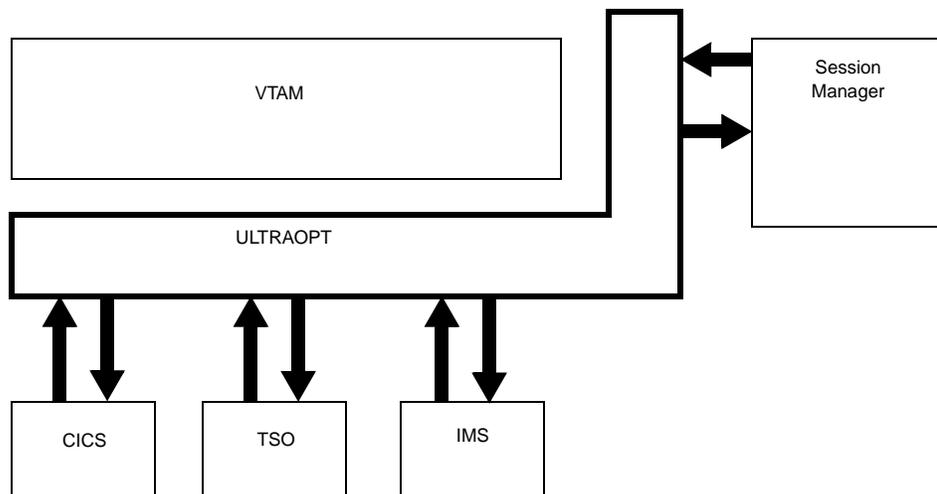
**Figure A-3 Subsystem Communication without ULTRAOPT**

Figure A-4 shows an example of how the ULTRAOPT BSR feature lets you shorten the very long path lengths of session managers by eliminating the SENDs and RECEIVEs between applications (Applids) in the same host.

**Figure A-4 Subsystem Communication with ULTRAOPT and BSR**



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# Appendix B    **ULTRAOPT Test Procedures**

This chapter provides information on how ULTRAOPT operates in a test environment. You should test each type of application, device, and session manager that you want to optimize. This testing will help you determine how the products function on your system.

This chapter contains the following sections:

Test Environments . . . . .	B-2
General Guidelines . . . . .	B-2
Guidelines for Upgrade Customers . . . . .	B-3
ECSA Release . . . . .	B-5
Devices and Software that Search Data Streams . . . . .	B-6
Different Levels of ULTRAOPT . . . . .	B-6
Setting Up for Testing . . . . .	B-7
Increasing the Scope of Your Test . . . . .	B-8
Analyzing Performance . . . . .	B-9
Testing Migration from Another IMS Optimizer . . . . .	B-10
ULTRAOPT Operation Customization . . . . .	B-12
Response Time . . . . .	B-13

## Test Environments

This section provides general guidelines for installing ULTRAOPT in a test environment.

New users can use the enclosed bypass password to authorize the product on any CPU during the free trial period.

### General Guidelines

Use the following general guidelines for installing ULTRAOPT in a test environment:

- Install the combination of products on your test system that you will ultimately want in production.
- If you do not have a test system, make a copy of the production load library (*hilevel.BBLINK*) and install the new product in the copy load library.
- When the test and evaluation process is complete, move the test system files to the production system. (Ensure that your production system's product authorization module is not overwritten.)
- If you overwrite your product authorization module by mistake, you can add your permanent password to the new product authorization module.

## Guidelines for Upgrade Customers

These guidelines are for customers who are already running one or more products on their system:

- Remove any previous versions of ULTRAOPT.
- Initially, if one product is entirely new, you should install both products as new in the test environment.
- Choose one of the following options:
  - Copy the options files from the existing product.
  - Make new options files and print files. Set the options and tables again.
- The back-level checker program detects existing BMCP subsystem and any other BMC Software load modules in the specified libraries. From the list provided, check that these BMC Software products are the correct versions.
- If you install one product on a system that already has a *different* product installed, the existing product's security module is not affected.
- If you are installing a new version of a product you already have, use the maintenance installation procedure that is described in the *OS/390 and z/OS Installer Guide*; otherwise, the existing security module will be overwritten. For maintenance releases, it is assumed that you have a permanent password for your test system.

## Guidelines for OS/390 and z/OS Installer

If you have existing products and you plan to add ULTRAOPT, perform the following actions:

- Order a Standard tape containing the new ULTRAOPT product for trial, install the products as described in the *OS/390 and z/OS Installer Guide* and the *ULTRAOPT Customization Guide*, and run ULTRAOPT with existing products on the same CPU.

**Warning!** Standard-formatted tapes cannot be installed into an existing SMP/E environment. The Standard installation process always creates new global, target, and distribution library zones to contain the product that is being installed.

All BMC Software products must reside in the same SMP/E data sets. If you decide to license ULTRAOPT after a trial, you can perform either of the following actions:

- Order an SMP/E product tape that contains ULTRAOPT and install ULTRAOPT into your existing SMP/E data sets by using the procedures that are described in the *OS/390 and z/OS Installer Guide* and the *ULTRAOPT Customization Guide*.

Only new products must be customized. However, existing products might need to be recustomized. To determine whether an existing product must be recustomized, access the AutoCustomization CLIST, select the Maintenance option, and run it. Any components that must be recustomized are shown.

- Order a Standard product tape that contains your existing products and ULTRAOPT:
  - The amount of time that is required to install the products is less if you use the Standard installation procedures than if you use the SMP/E installation procedures.
  - All products are at current maintenance levels.
  - All products, new and existing, must be recustomized.
- Order an SMP/E product tape that contains ULTRAOPT, and install ULTRAOPT in separate SMP/E data sets by using the procedures that are described in the *OS/390 and z/OS Installer Guide* and the *ULTRAOPT Customization Guide*. You can run the new and existing products concurrently on the same CPU.

If you decide to license ULTRAOPT after the trial, you can use the same SMP/E product tape to install ULTRAOPT into SMP/E data sets containing existing products.

## ECSA Release

ULTRAOPT allocates ECSA on behalf of an intercepted application while running in its address space. Once ECSA is obtained by the ULTRAOPT subsystem, most of it is not released back to MVS until the subsystem is shut down.

The subsystem manages storage by using cell pools that it can share among multiple Applids. When an intercepted Applid that first allocated a particular cell pool shuts down, that cell pool should not be freed because other Applids might be sharing it. The portion of the pool used by the Applid that is shut down is added to the subsystem's internal free storage queue for future use by another Applid.

**Warning!** Several CSA monitor products might see such storage as having been orphaned by the Applid that shut down. Those monitors might let you free the storage. ULTRAOPT might still be using this storage in optimizing Applids that are still being intercepted. Freeing such storage could cause lost sessions, abends, or system hangs, resulting in a system IPL.

## Devices and Software that Search Data Streams

Examine your system for devices or software (such as PC software and session manager scripts) that intercept outbound or inbound data streams to search for specific information. After ULTRAOPT is installed, the data that is being searched for might no longer be transmitted.

If you discover such devices or applications, test them when optimization is active to ensure that they work correctly. If optimization causes incorrect results, consider one of the following alternatives:

- Use the Monitor component to exclude the devices or applications from Imaging optimization (panel 1.2.1). If the target information is position-dependent, the devices might need to be excluded from global optimization.
- Use one of the User Exits (controlled from Option 1.5.x in the Monitor) to insert data into the outbound data stream (after optimization) or the inbound data stream (after the Optimizer has finished its processing).

## Different Levels of ULTRAOPT

To test different levels of ULTRAOPT (moving back and forth among versions) define separate VSAM files for the different levels.

## Setting Up for Testing

---

**Summary:** In this task, you will set up a test environment.

---

**Warning!** ULTRAOPT should be tested in a test environment that is separate from your production environment.

### Before You Begin

Before you begin this task, consider the following recommendations:

- When you start the ULTRAOPT subsystem for the first time, include NOINT and exclude CSALIMIT from your startup parameters. (The Online Install System does this by default.) NOINT without CSALIMIT tells the subsystem not to intercept any applications and not to limit the CSA and ECSA.
- Do not free ECSA until shutdown. For more information about this recommendation, see “ECSA Release” on page B-5.

### To Set up a Test Environment

**Step 1** Calculate the amount of ECSA storage that is required by using the worksheets and examples provided in Chapter 1, “Installation Overview.”

If using the LFS feature, you must calculate ECSA for the formats and add that amount to the ECSA storage required for ULTRAOPT.

**Step 2** Start the subsystem.

**Step 3** Add a test application to the include file, as described in the *ULTRAOPT User Guide*.

**Step 4** Shut down the subsystem.

**Step 5** Remove the NOINT parameter, and restart the subsystem.

You are now ready to test the products.

## Increasing the Scope of Your Test

---

**Summary:** In this task, you will increase the scope of your test.

---

**Warning!** ULTRAOPT should be tested in a test environment that is separate from your production environment.

### Before You Begin

If your data center uses devices and software that search data streams, see “Devices and Software that Search Data Streams” on page B-6.

### To Increase the Scope of Your Test

**Step 1** When you are satisfied with the test results, expand your test to include all Applids, device types, and session managers that you want to test.

**Note:** To include a list of Applids, create an Applid include table as described in the *ULTRAOPT User Guide*.

BMC Software recommends that you test the following items:

- each application that you intend to use with ULTRAOPT
- each application with all of the device types that you plan to use (including as many different terminal types as you can for the Applid and verify that everything works the way it should)
- your session managers—one at a time—after you have tested your application types

### Where to Go from Here

If you have a problem increasing the scope of your test, contact BMC Software Customer Support. Instructions for contacting Customer Support are listed on the back of the title page.

**Note:** BMC Software continues to test ULTRAOPT with a wide variety of applications in a number of environments. It is impossible to test them all, and occasionally combinations appear that have not been tested. You should test all your applications, sessions, and data streams with ULTRAOPT before putting them into production.

## Analyzing Performance

---

**Summary:** In this task, you will request statistics for performance analysis.

---

When you have expanded the scope of your testing to include all applications, device types, and session managers that you want to optimize, run statistics to check performance. To request statistics, perform the following steps:

**Step 1** When the subsystem has been running several days, use the statistics panels to analyze its performance.

**Step 2** Check the following statistics for ULTRAOPT:

- data stream optimization statistics
- data streams you or the Optimizer component excluded
- LFS statistics
- data stream errors:
  - application outbound data stream errors
  - hardware inbound data stream errors

**Step 3** If you have used any other optimizers, you can compare these statistics to those optimizers. Ensure that data streams are being optimized, and that data streams which are not being optimized are as few as possible.

## Testing Migration from Another IMS Optimizer

---

**Summary:** In this task, you will test your migration from one IMS optimizer to ULTRAOPT.

---

**Warning!** ULTRAOPT should be tested in a test environment that is separate from your production environment.

### Before You Begin

Before you begin testing your migration from another IMS optimizer, perform the following actions:

- Test the transactions that you were excluding with 3270 SUPEROPTIMIZER®/IMS; ULTRAOPT might be able to optimize them, making Transid exclusion unnecessary.
- Convert the transaction exclusions in your old options file into input for the ULTRAOPT Transid-exclusion user exit program, as described in the *ULTRAOPT User Guide*. Use the transaction utility to build the ULTRAOPT Transid-exclusion user exit, which you activate in the ULTRAOPT Monitor.

## To Test Your Migration

When ULTRAOPT is installed and performing as expected, remove the other IMS optimizer by using the following steps. If you do not perform these steps, unnecessary CPU instructions are executed under the IMS address space.

- Step 1** Shut down the old optimizer product.
- Step 2** Remove the Monitor transaction definition from the IMS control region.
- 2.A** Remove the Monitor APPLCTN and TRANSACT statements from IMS Stage 1 input.
  - 2.B** Remove the Monitor transaction from your IMS control region.
  - 2.C** Perform an IMS PSBGEN.
  - 2.D** Perform an IMS ACBGEN.
  - 2.E** Remove the link for module IOPMPP from BMC.ISO.LOAD to your site's IMS PGMLIB or appropriate MPP library.
- Step 3** Remove the Optimizer modules from RESLIB.
- Step 4** Perform one of the following steps:
- If you used the batch installation process, use SMP to remove the change that you made to your IMS region during the Optimizer installation.
  - If you used the Quick Installation process, remove the Optimizer product code from the STEPLIB concatenation.
- Step 5** If your IMS control region procedure contains the following DD statement, delete it:
- ```
//BMCRESLB DD DSN=IMSVS.RESLIB,DISP=SHR
```
- Step 6** Remove the IOPOPT and IOPRINT VSAM files and associated FDTs.

## ULTRAOPT Operation Customization

This section summarizes preparations that you can make to run ULTRAOPT. You are not required to complete these preparations until you use the features that they provide.

- use Local Format Storage (LFS) optimization

To use LFS optimization, you must customize one or more of your IBM 3174 controllers to be LFS-compatible. For information about customizing your 3174 controllers, see Appendix C, “Local Format Storage Optimization.”

- write an LFS exit program

If using RPQ 8Q0929 for microcode B4.2 in your 3174 controller, you do not need an LFS user exit program.

If you are not using RPQ 8Q0929 for microcode B4.2 in your 3174 controller, you must write an exit to tell the Optimizer component which terminals are connected to which 3174s.

If you install ULTRAOPT *with* LFS, the installation procedure creates a job to assemble and link the exit program. For information about writing a user exit, see the *ULTRAOPT User Guide*.

- write optional exit programs

The installation procedure includes assembling and linking these exits, if applicable. The exit programs that you would write are for ULTRAOPT to process data streams before or after optimization. For more information, see the *ULTRAOPT User Guide*.

---

## Response Time

Some data centers use the reaction of their terminal users to measure improvements in response time. Most terminal operators are aware of their terminal response time and are sensitive to changes—large and small. Their reactions to a quicker response time can be very important. These people might be your most critical resource and might be one of the most important reasons your data center wants to improve response time. Methods that you can use to measure response time:

- ULTRAOPT response time monitor (RTM) feature

The ULTRAOPT RTM feature provides statistics about host and network response times by application or by terminal. Definite response is used to measure inbound and outbound response times. This feature is available through the ULTRAOPT Monitor (option 5.0). For more details, see the *ULTRAOPT User Guide*.

- network performance monitor (NPM)

NPM can be used to measure outbound response time. NPM does not measure any reduction caused by Input Suppression because it assumes that the lengths of inbound data streams are trivial (not necessarily true). NPM uses definite response mode for measuring inbound response time.

A definite response mode request is expedited—it has priority on the line. The inbound data stream actually transmitted is not expedited or measured by NPM. Definite response mode can cause CICS to save TIOAs and can cause storage shortages, making CICS internal response times worse.

- IBM 3174 response time monitor (RTM)

This method is accurate and available at no extra cost on IBM 3174s.

- telecommunications hardware monitors

Hardware monitors usually measure only line time (the time it takes for data streams to be transmitted from the point after the NCP has processed the data streams to the terminal and back). Several important measurements that are often overlooked:

- processing time in NCP
- processing time in VTAM
- wait time spent in queues
- transmission time from NCP to the host
- transmission time from the host to NCP

- stopwatch

The stopwatch method is readily available but lacks accuracy if you are concerned about hundredths or thousandths of a second.

---

---

# Appendix C Local Format Storage Optimization

This appendix contains information that only applies to ULTRAOPT when you are using Local Format Storage (LFS) optimization.

This appendix contains the following sections:

|                                                              |      |
|--------------------------------------------------------------|------|
| Managing LFS Optimization . . . . .                          | C-2  |
| Format Distribution and Management . . . . .                 | C-2  |
| Format Loads . . . . .                                       | C-3  |
| Formats Retrieval . . . . .                                  | C-4  |
| Control Unit LU Definitions . . . . .                        | C-5  |
| LFS Controller Memory Requirements . . . . .                 | C-7  |
| IBM 3174 Customization . . . . .                             | C-9  |
| Configuration Support A . . . . .                            | C-9  |
| Configuration Support B or Configuration Support C . . . . . | C-11 |
| NetView DM for Microcode Distribution . . . . .              | C-14 |
| DEFER Startup Parameter . . . . .                            | C-17 |
| 3270 Query Data Streams . . . . .                            | C-17 |
| Controllers with Multiple Hosts . . . . .                    | C-19 |
| Controller Memory . . . . .                                  | C-19 |
| VTAM LU Definitions . . . . .                                | C-19 |
| MLFS Startup Parameter . . . . .                             | C-20 |
| Additional Information . . . . .                             | C-20 |
| ECSA Use Estimation Worksheets . . . . .                     | C-29 |

## Managing LFS Optimization

ULTRAOPT is designed to create, load, and efficiently manage formats maintained by LFS, if your controllers are configured to support LFS. ULTRAOPT products implement LFS, the optimization of the formats, and the normal display of the formats on user terminals without requiring changes to your VTAM application programs.

### Format Distribution and Management

During normal application activities, ULTRAOPT intercepts user-selected VTAM SENDs. Outbound 3270 data stream images of each presentation screen generated by an application are constructed for display on user terminals or terminal emulator programs.

LFS uses the 3270 data stream transmission and control protocol to load, identify, and manage the formats stored by the controller.

ULTRAOPT uses structured fields to convey instructions to the controller. These instructions route the formats to the LFS function, control their storage, and control their retrieval and presentation.

ULTRAOPT uses LFS to determine the number of formats loaded, the number of format names used, and the amount of LFS storage allocated that is currently available.

## Format Loads

ULTRAOPT products create and dynamically load formats concurrently with the generation of data streams by the host application. When a data stream is generated by the application, ULTRAOPT creates structured fields to download the format specific data to the LFS function on the controller.

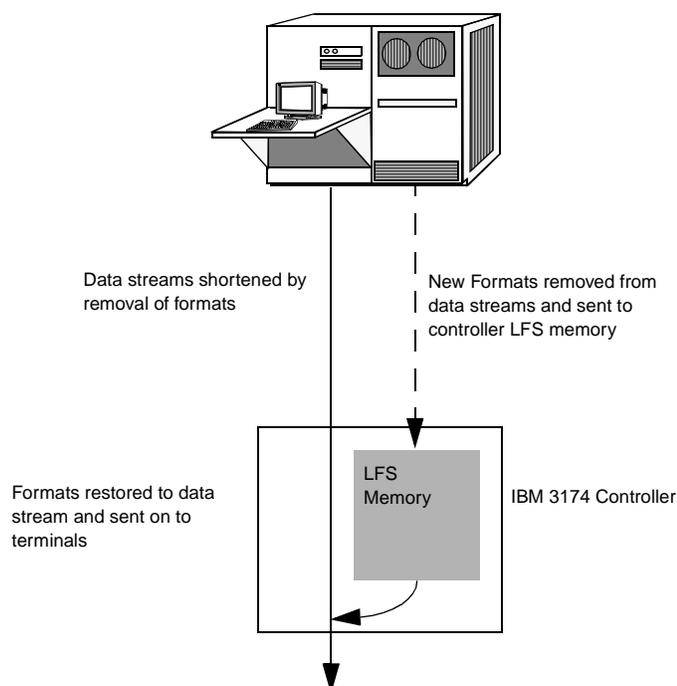
As host application activities increase and new formats are generated, ULTRAOPT continues to load each new format into the appropriate controller or server until the memory allocated to LFS is exhausted. If the memory allocated to LFS is exhausted, ULTRAOPT resets LFS memory and reloads the formats into memory or optionally deletes the least recently used format. Reloading does not require ULTRAOPT to dynamically relearn which formats were stored.

ULTRAOPT can load formats continually for an indefinite period or until there is no application activity. The rate at which new formats are loaded into LFS memory is directly proportional to the number of new formats generated by an application or a series of applications. The rate increases until all applicable formats are loaded or LFS memory is exhausted and must be reset.

## Formats Retrieval

Once LFS memory is loaded with one or more formats, the formats are immediately available for display on user terminals. If a terminal user requires a format that has been loaded into controller memory, ULTRAOPT retrieves the format, provides any variable data, and displays the format on the terminal. Figure C-1 shows the sequence of events during the loading and retrieval of a format from LFS storage and its display on a user terminal.

**Figure C-1 Loading and Retrieving Formats**



ULTRAOPT creates outbound 3270 data streams, using formats already stored in LFS memory. If the format that is used by a data stream is not stored in LFS but closely matches a format stored there, ULTRAOPT sends an LFS command to the controller retrieving the similar format. ULTRAOPT takes all data in the original data stream that did not match and sends it along with structured fields that reference the name of the format stored in LFS to the controller.

The LFS function receives the structured fields, retrieves the format from the correct directory in memory, updates the format, and sends the screen to a terminal or PC for display.

Transmitting a limited amount of data to retrieve a stored format eliminates the transmission overhead that is normally incurred when transmitting an entire screen to the controller or server.

## Control Unit LU Definitions

For each IBM 3174 control unit that you use for LFS optimization, a VTAM LU definition must be created. The definitions must be inserted *immediately* following the PU definition for the control unit or server. BMC Software recommends use of the LOGAPPL parameter, although it can be omitted and the following operator command can be used instead:

```
V NET,ACT, ID=controlunitLUname, LOGON=SOPLFS
```

*controlunitLUname* is the LU at LOCADDR 1 or the server load LU name.  
For example:

```
V NET,ACT, ID=L12301, LOGON=SOPLFS
```

*SOPLFS* is the SOPLFS Applid that was defined during installation.

To deactivate the session between the SOPLFS Appl and the LOCADDR=01 LU, you must use the VTAM FORCE option. For example,

```
V NET, INACT, ID=L12301, F
```

*hilevel.SOP.CNTL* (SOPLFSLU) contains the sample control unit definition that is shown in Figure C-2.

**Figure C-2 Sample VTAM Control Unit LU Definition**

---

```

BMCL300 VBUILD TYPE=LOCAL
P300     PU      CUADDR=300,
          DISCNT=NO,
          MAXBFRU=15,
          PUTYPE=2,
          DLOGMOD=N32702,
          ISTATUS=ACTIVE,
          MODETAB=SNAMODE,
          PACING=0,
          SSCPFM=USSSCS,
          USSTAB=SNAUSS6,
          VPACING=0
L12301   LU      LOCADDR=1,      <== MUST BE 1
          LOGAPPL=SOPLFS, <== CHANGE IF NECESSARY
*   TO MATCH LFS APPLID
L300A1  LU      LOCADDR=2

```

---

**Warning!** BMC Software does not recommend sharing LFS storage among multiple hosts. The LOCADDR=1 LU is permitted to establish a session with only one host application at a time. For a controller to support multiple hosts, it must have RPQ 8Q1008, which enables each host to have a separate address space on the controller.

---

# LFS Controller Memory Requirements

The amount of storage required to allocate for LFS depends on the following items:

- number of unique formats the terminal displays
- size and complexity of each format (ULTRAOPT optimizes each format that is stored in LFS memory)
- number of unique formats with extended attributes to be stored on the controller (if the startup option EXTLFS is used)

You should allocate the maximum amount of memory available to LFS.

Benchmark trials and regression testing have shown that each optimized format on the average occupies the following amount of memory:

- 800 bytes without extended attribute terminals (monochrome)
- 1000 bytes with extended attribute terminals when using EXTLFS
- 1800 bytes with monochrome and extended attribute terminals when using EXTLFS because both formats are stored

If you can estimate or are aware of the total number of unique formats displayed by your controller, you can use these averages to calculate your storage requirements.

For example, if a controller displays 512 unique formats with no extended attributes, allocate at least 400 KB of LFS storage. If a controller displays 512 unique formats with monochrome and extended attributes, allocate 1 MB of LFS storage.

**Note:** You may increase your calculated LFS memory size by a factor of two or more to ensure that sufficient storage is available for your formats. If the LFS storage is used up, ULTRAOPT must reset LFS storage and reload the formats.

If you have specified the LFSLRU parameter, ULTRAOPT deletes the least recently used format to free storage. Larger storage amounts always yield higher performance. BMC Software recommends using LFSLRU.

The number of formats that are displayed by a controller also depends on the types of applications that the users who are connected to the controller are accessing. For example, users who are executing an insurance application to process claims might be working with a limited number of unique formats. It is easier to estimate the number of unique formats in this situation than when users are accessing multiple applications.

You might want to limit the use of LFS optimization (with include/exclude entries) to only those applications that use a limited number of formats. You can control which applications' formats use controller storage.

These estimates can provide you with a starting point that lets you accurately calculate the specific requirements of your data center. You can experiment with different amounts of storage and use the ULTRAOPT Monitor to observe the effectiveness of your choices.

The Local Format Storage panel (option 2.5) from the Data Stream Statistics Menu displays the following information:

- total amount of LFS storage that is available
- amount of LFS storage that is used to store formats
- number of formats that are loaded and purged, or number of resets
- number of terminals that use LFS

Close examination of these statistics, especially the amount of LFS storage that is used to store your current formats and the number of times that LFS storage has been reset, should let you determine when to increase your LFS memory allocation.

You can use the DEFER startup parameter to help relieve controller storage shortages at the expense of some optimization. For more information on DEFER, see “DEFER Startup Parameter” on page C-17.

**Note:** LFS also requires ECSA storage. For detailed information about estimating ECSA usage, see Chapter 1, “Installation Overview.”

---

# IBM 3174 Customization

To implement LFS on an IBM 3174 controller, the microcode used to IML the controller must be customized. The customization procedure includes or enables LFS in the controller microcode and allocates local storage for LFS.

IBM 3174 controllers are supported by the following series of microcode:

- Configuration Support A
- Configuration Support B
- Configuration Support C

At this time, only control unit terminals (CUTs) are supported by LFS.

## Configuration Support A

If your IBM 3174 controllers are executing Configuration Support A microcode, you must purchase *RPQ 8X0024* from IBM and use it to customize your controllers to support LFS. The RPQ requires *microcode level 5.0 and patch A4E81* for LFS to work correctly. The customizing and distributing procedure is shown in Figure C-3 on page C-10.

The customizing instructions that are summarized in Figure C-3 on page C-10 presume that Central Site Customization facilities are being used to customize control disks for distribution to network IBM 3174 sites and that you are familiar with the complete procedure.

The customization procedure performs the following tasks:

- merges RPQ 8X0024 with the central site control disk to produce a master for copying (the control disk might be a diskette or a fixed disk)
- allocates memory for LFS (during the merge procedure, you will be asked how much memory you want to allocate for LFS)
- generates control disks for your network site IBM 3174 controllers

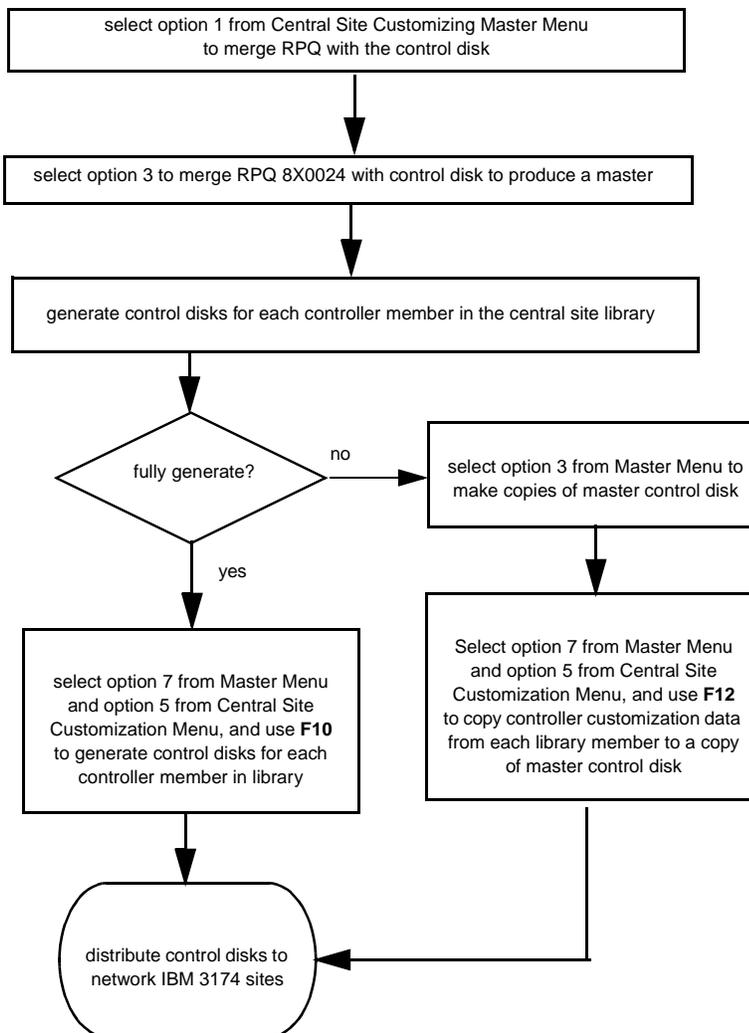
To change a value that has already been accepted by the procedure, restart the merge procedure to input a new value.

If necessary, change other controller-dependent configuration variables.

No further changes are required to support LFS.

For complete details about Configuration Support A customization, see the *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support A*. Figure C-3 shows the customization and distribution procedure for Configuration Support A.

**Figure C-3 Configuration Support A Customization Procedure**



## Configuration Support B or Configuration Support C

If your IBM 3174 controllers are executing Configuration Support B or C microcode, when configuring the controller using IBM Central Site Customization facilities, you must respond to configuration question 179 to successfully enable LFS and allocate LFS storage for your controllers. The customization and distribution procedure is shown in Figure C-4 on page C-13.

The customization instructions shown in Figure C-4 on page C-13 assume that Central Site Customization facilities are being used to customize Control Disks for distribution to network IBM 3174 sites and that you are familiar with the complete procedure.

The IBM 3174 customization procedure performs the following:

- responds to configuration question 179 to enable LFS, allocates memory, and produces a master control disk for copying

BMC Software recommends a three-digit setting of *105*:

- Digit 1 enables LFS.
- Digit 2 disables operator selected formats.
- Digit 3 allocates 1024 KB of LFS memory.

If you accept the default, LFS will not be enabled.

- generates control disks for your network site IBM 3174 controllers

If necessary, change other controller-dependent configuration variables (for example, questions 500, 501, and 503).

No further changes are required to support LFS.

**Note:** If your IBM 3174 controllers are executing Configuration Support B or C, you must install the following patches, depending on the microcode level, for LFS to work correctly:

- B4.0 requires patches PCA28B1 through PCA28B7.
- B4.1 requires patches PCA91D1 through PCA91D7.
- B4.2 requires patches PCA9961 through PCA9967.
- C2.0 requires patches PCA9971 through PCA9977.

For complete details about Configuration Support B or C customization, consult the *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support B* or the *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support C*.

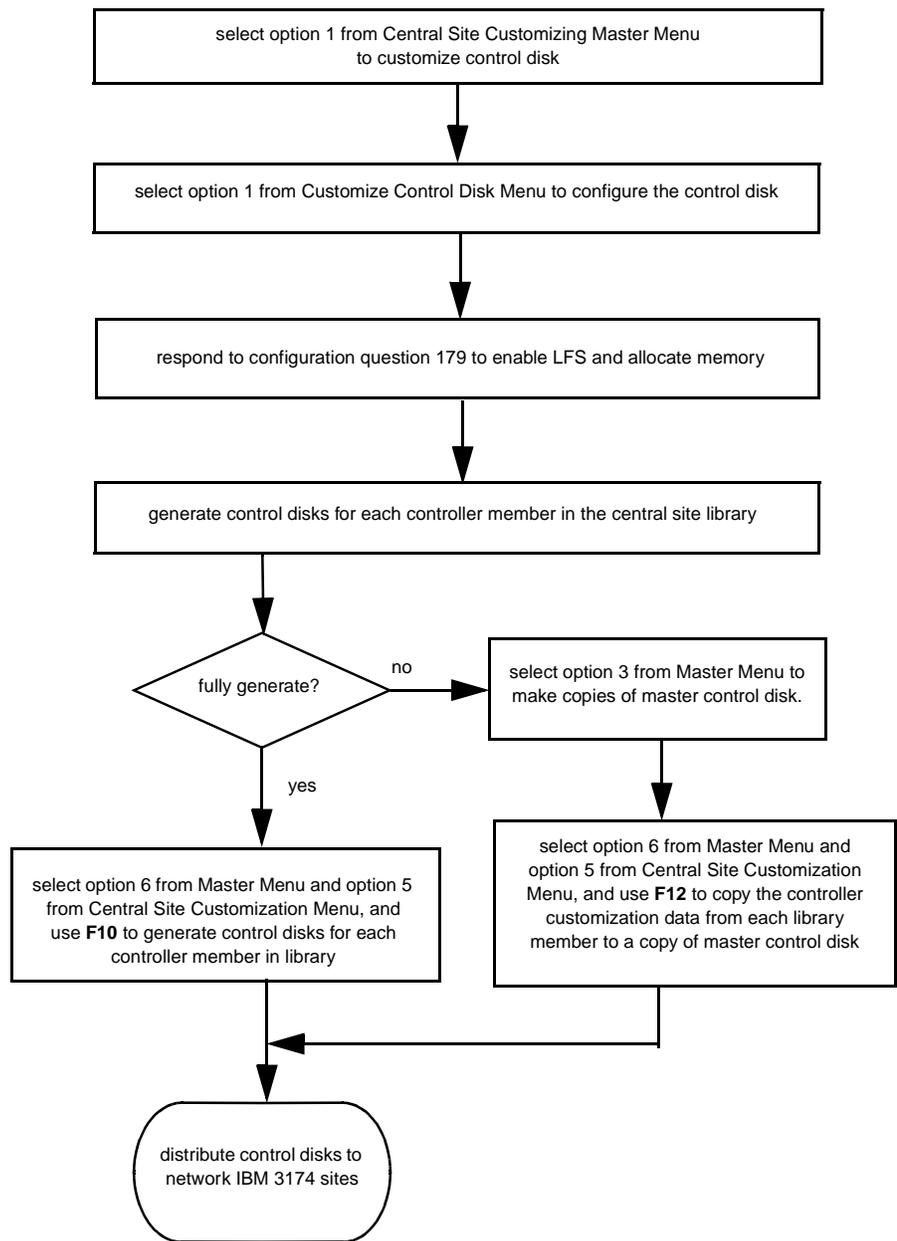
If you have a 3174 controller with Configuration Support B and microcode level 4.2, you can install RPQ 8Q0929. With this RPQ installed, the controller responds to ULTRAOPT queries with the LU name of the LOCADDR1 LU.

Because an LFS user exit program is required only to supply this LU name for each controller, the user exit is no longer needed. This RPQ also shortens the length of the 3270 orders, thus providing even better optimization of your data streams.

You would still need the user exit if you had any controllers in the system that did not have RPQ 8Q0929 installed or that supported multiple-host LFS, as described in “Controllers with Multiple Hosts” on page C-19.

Figure C-4 shows the customization procedure for Configuration Support B and Configuration Support C.

**Figure C-4 Configuration Support B and C Customization Procedure**



## NetView DM for Microcode Distribution

If you use Central Site Change Management (CSCM) and the NetView Distribution Manager (DM), you can use these facilities to centrally distribute microcode and customize data to all IBM 3174 controllers in your network. NetView DM is fully supported on controllers executing Configuration Support B and C microcode and on controllers executing Configuration Support A (release 4 or 5) microcode.

**Note:** NetView DM might not function properly with IBM 3174 controllers provided by other vendors.

CSCM uses NetView DM and a central site IBM 3174 to customize microcode and/or modify controller-dependent configuration data for distribution to your network controllers.

The central site IBM 3174 maintains the central site library where the IBM 3174 microcode is stored with configuration data for controller in your network. The central site IBM 3174 is the source of all changes to the microcode (for example, updates and RPQs), and NetView DM is the repository from which changes are propagated to your network controllers.

Figure C-5 on page C-15 shows the basic NetView DM distribution procedure and the required NetView DM functions. Figure C-6 on page C-16 shows the distribution. The instructions assume that you are familiar with the details of the complete NetView DM distribution procedure.

The NetView DM distribution procedure is as follows:

1. Complete a NetView DM Transmission Plan.
2. Submit the Transmission Plan to NetView DM for execution.
3. NetView DM executes the RETRIEVE function to request the microcode and the controller configuration data from the IBM 3174 central site library that must be distributed.
4. The microcode and configuration data are deposited in the NetView DM Resource Repository.
5. NetView DM executes the INSTALL and SEND functions to distribute and incorporate the controller updates.
6. NetView DM executes the ACTIVATE function to IML the network IBM 3174 sites.

For complete details about the use of NetView DM with IBM 3174 controllers executing Configuration Support A, B, and C microcode, see the following documents:

- *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support A*
- *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support B*
- *IBM 3174 Establishment Controller Central Site Customizing User's Guide for Configuration Support C*

Figure C-5 shows the NetView DM microcode distribution procedure.

**Figure C-5 NetView DM Microcode Distribution Procedure**

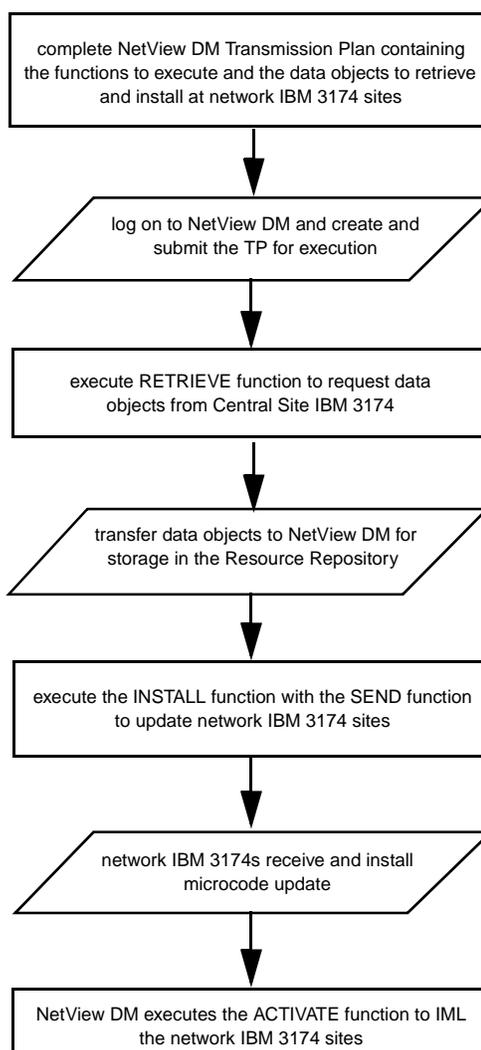
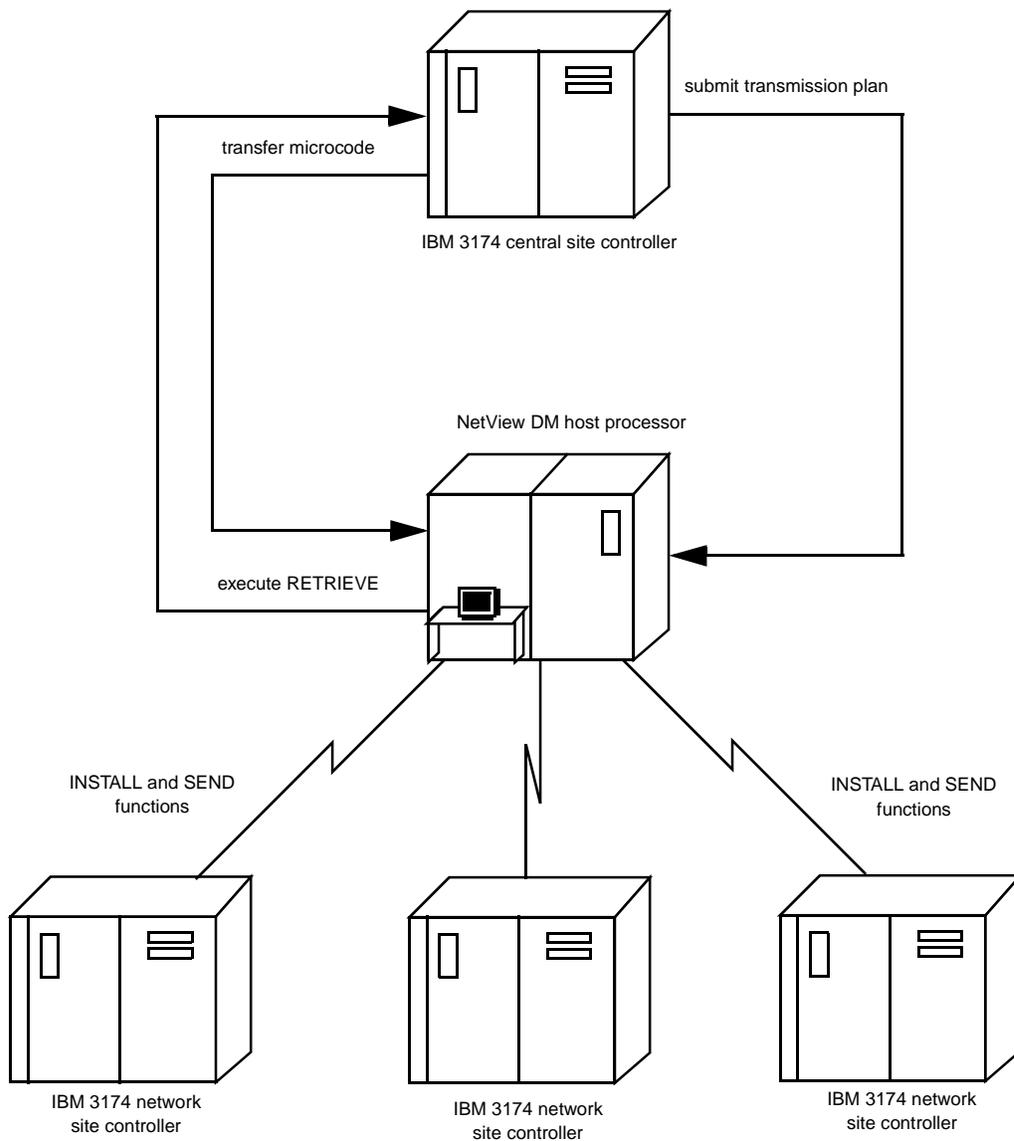


Figure C-6 shows how NetView DM updates network IBM 3174 controllers.

**Figure C-6 NetView DM Update of Network IBM 3174 Controllers**



## DEFER Startup Parameter

The startup option `DEFER= $n$`  for LFS allows ULTRAOPT to defer loading a particular format until ULTRAOPT has seen that panel  $n + 1$  times and has refined its format. This parameter is for saving controller storage by loading fewer formats.

DEFER ensures that only the refined version of the format gets loaded; it 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. This option reduces the accumulation of stale versions of the same format.

Although DEFER is designed to save controller storage, it can reduce optimization, especially for larger values of  $n$ . If you have a large percentage of panels that are used fewer than  $n$  times, you will save a larger percentage of controller storage and suffer a larger reduction in optimization. If most of your panels are used  $n+1$  or more times, reduction in optimization will be a smaller percentage.

If you are short of controller storage, you should specify `DEFER=1` and test it. If you are still short on controller storage, adjust the value of  $n$  until you have a satisfactory compromise on controller storage use and optimization.

## 3270 Query Data Streams

If ULTRAOPT was started with the LAPPLID parameter and if that LAPPLID has established a session with any IBM 3174 control unit's `LOCADDR=01 LU`, ULTRAOPT is considered to be configured for LFS.

When configured for LFS, ULTRAOPT will issue a 3270 query (at session establishment) to all terminals that are included for LFS optimization. The query is issued to determine whether that terminal really supports LFS format presentation. If that terminal's controller has been correctly configured for LFS support and if that terminal is a CUT mode terminal, the controller replies on behalf of the terminal that format presentation is supported.

If you have terminals that cannot reply to a query and do not tolerate being queried, those terminals should be added to an LFS Exclude LU table on Monitor panel 1.3.5 to prevent them from being queried.

If it is not convenient for you to exclude them specifically, the following procedure is a possible solution:

- Step 1** Identify each terminal that does not support a query by ensuring that the “query bit” in the PSERVIC area of its BIND is off.
- Step 2** For each terminal that does support a query, ensure that the “query bit” in the PSERVIC area of its BIND is on.
- Step 3** Use the QUERYYP startup parameter to prevent ULTRAOPT from querying those terminals whose “query bit” indicates that they do not support query. Those terminals will not be queried; they are not eligible for LFS.

**Note:** The “query bit” in the BIND is usually derived from the device's LOGMODE entry and is on if the PSERVIC begins with *xx8*.

Without QUERYYP or an LFS exclude LU table, all controllers devices are queried when the devices log on to optimized applications as long as any controller is configured for LFS. If a controller does not support LFS and its devices do not tolerate being queried, the QUERYYP parameter or an LFS exclude table will prevent them from getting queried.

If using QUERYYP or an exclude LU table is inconvenient, use the start option NOQLFS to suppress queries for an entire controller. When NOQLFS is in effect, devices on a non-LFS controller are not queried. A controller is determined to be non-LFS when any *one* of the following conditions is true:

- No LFS user exit is defined for ULTRAOPT on the system to which the devices are logging on (not necessarily the system that owns the controller).
- No LOCADDR=01 LU name is returned by the LFS user exit for this device.
- No session exists between the LAPPLID and the LOCADDR=01 LU name was returned by the LFS user exit for this device.

If you are using RPQ 8Q0929 for microcode B4.2, the LOCADDR=01 LU name is returned in the query reply instead of the LFS user exit; therefore, NOQLFS must not be used in that case.

**Note:** All references to LOCADDR=01 LU also imply any other LOCADDRs that are used for an LFS control session. With multiple-host support, LOCADDRs 01 through 08 can be used for that purpose.

## Controllers with Multiple Hosts

It is possible to use one IBM 3174 controller with up to eight hosts and get LFS optimization for sessions to each host. (You cannot share formats among hosts.) LFS optimization works in exactly the same way for each host.

There are several prerequisites for this configuration:

- Install ULTRAOPT with LFS on each host. Ensure that the ULTRAOPT LFS Applid names are unique.
- The controller must execute Configuration Support B only.
- The microcode must be at level 4.2.
- You must install IBM (chargeable) RPQ 8Q1008.

### Controller Memory

Multiple-host support is achieved by dividing the controller LFS memory into eight address spaces, one space for each host. If you only use two LFS hosts, the other six address spaces are not used.

When you configure the controller, question number 179 asks how much controller memory you want to allocate for LFS. The number that you specify is divided by eight, and each eighth is available for one LFS host. (You *do not* want to install RPQ 8Q1008 on a controller that is connected only to one LFS host because doing so would waste seven-eighths of your LFS memory.)

### VTAM LU Definitions

The RPQ enables LOCADDRs 1 through 8 to all support LFS. When you create the VTAM LU definitions as shown in Figure C-2 on page C-6, you use a different LOCADDR number (1 through 8) for each host that is connected to the controller. These first eight LU addresses are reserved for multiple-host use and are not available during customization. The resulting LFS user exit changes are described in the *ULTRAOPT User Guide*.

## MLFS Startup Parameter

If you are using multiple-host LFS support in a controller, you must use the MLFS startup parameter (or operator command). Multiple-host LFS support has no adverse effect on non-multiple-host controllers.

## Additional Information

The following setup considerations related to LFS are described in Chapter 7, “Startup Parameters.”

- The startup options that pertain to LFS are as follows:
  - ADVLFS
  - EXTLFS
  - LAPPLID=
  - QUERYYP
  - NOQLFS
  - DEFER=
  - LFSLRU
  - MLFS
- Using LFS on extended-attribute terminals is described with the startup parameters ADVLFS and EXTLFS.
- Creating an LFS user exit.
- Monitoring LFS statistics.
- If you inactivate the LFS ACB (V NET,INACT), you can reopen it again using the operator command *subsysid* OPENLACB.

## Trial Plans

The trial plan provides a checklist for a common ULTRAOPT installation with local format storage. Copy the appropriate pages and complete them before you install the product. You will find that performing this exercise speeds your installation significantly.

These checklists summarize information found elsewhere in this book.

## Preinstallation

Use Table C-1 as a preinstallation checklist.

**Table C-1** ULTRAOPT with LFS Trial Plan Preinstallation Checklist (Part 1 of 3)

| Action Item |                                                 | Information                                                                                     |  |
|-------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------|--|
| 1           | Verify environmental requirements:              |                                                                                                 |  |
|             | a.                                              | operating system—MVS/ESA, OS/390, or z/OS                                                       |  |
|             | b.                                              | MVS/TSO                                                                                         |  |
|             | c.                                              | 60 KB CSA available                                                                             |  |
|             | d.                                              | DASD (approximately 8 MB for the load library)                                                  |  |
|             | e.                                              | DASD for a larger common page data set                                                          |  |
|             | f.                                              | real storage or CPU cycle constraints                                                           |  |
|             | g.                                              | maintenance is current for target applications                                                  |  |
| 2           | Identify applications for optimization testing. |                                                                                                 |  |
|             | a.                                              | subsystems such as TSO, CICS (ULTRAOPT/CICS only), and IMS (ULTRAOPT/IMS only)                  |  |
|             | b.                                              | session managers such as TPX, MAI, and MultSess (session managers increase ECSA requirements)   |  |
|             | c.                                              | user code (exit programs) that intercepts SVCs before the BMC Software Primary Subsystem (BMCP) |  |

Table C-1 ULTRAOPT with LFS Trial Plan Preinstallation Checklist (Part 2 of 3)

| Action Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Information                                                                                                                                                    |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------|--|
| 3 Identify terminals for optimization testing. <table border="1" data-bbox="253 327 1167 789"> <tr> <td data-bbox="253 327 318 401">a.</td> <td data-bbox="318 327 1167 401">number of each type of display (Models 2, 3, 4, 5)<br/>(copy to ECSA worksheet)</td> </tr> <tr> <td data-bbox="253 401 318 474">b.</td> <td data-bbox="318 401 1167 474">number of each type of display that is using extended attributes<br/>(copy to ECSA worksheet)</td> </tr> <tr> <td data-bbox="253 474 318 520">c.</td> <td data-bbox="318 474 1167 520">3270 emulators</td> </tr> <tr> <td data-bbox="253 520 318 567">d.</td> <td data-bbox="318 520 1167 567">printers (LU1 and LU3)</td> </tr> <tr> <td data-bbox="253 567 318 640">e.</td> <td data-bbox="318 567 1167 640">if have any LU0 3270 terminals, use APSTAT and MODEL2 startup parameters</td> </tr> <tr> <td data-bbox="253 640 318 743">f.</td> <td data-bbox="318 640 1167 743">ensure that the number of virtual LUs (pooled LUs, session manager LUs) is included in count of terminated or unoptimized sessions<br/>(copy to ECSA worksheet)</td> </tr> <tr> <td data-bbox="253 743 318 789">g.</td> <td data-bbox="318 743 1167 789">DFT terminals? (LFS works with CUT terminals only)</td> </tr> </table>                                                          | a.                                                                                                                                                             | number of each type of display (Models 2, 3, 4, 5)<br>(copy to ECSA worksheet)                | b. | number of each type of display that is using extended attributes<br>(copy to ECSA worksheet) | c. | 3270 emulators                                                                                                                              | d. | printers (LU1 and LU3)                                                                                 | e. | if have any LU0 3270 terminals, use APSTAT and MODEL2 startup parameters | f. | ensure that the number of virtual LUs (pooled LUs, session manager LUs) is included in count of terminated or unoptimized sessions<br>(copy to ECSA worksheet) | g. | DFT terminals? (LFS works with CUT terminals only)                      |  |
| a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | number of each type of display (Models 2, 3, 4, 5)<br>(copy to ECSA worksheet)                                                                                 |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| b.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | number of each type of display that is using extended attributes<br>(copy to ECSA worksheet)                                                                   |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| c.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3270 emulators                                                                                                                                                 |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| d.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | printers (LU1 and LU3)                                                                                                                                         |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| e.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | if have any LU0 3270 terminals, use APSTAT and MODEL2 startup parameters                                                                                       |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| f.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ensure that the number of virtual LUs (pooled LUs, session manager LUs) is included in count of terminated or unoptimized sessions<br>(copy to ECSA worksheet) |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| g.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DFT terminals? (LFS works with CUT terminals only)                                                                                                             |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| 4 Review the requirements of terminal/printers to determine optimization exclusions. <table border="1" data-bbox="253 837 1167 1110"> <tr> <td data-bbox="253 837 318 911">a.</td> <td data-bbox="318 837 1167 911">Erase Input Key allowed?<br/>(If yes, reduced optimization results, but data integrity is OK.)</td> </tr> <tr> <td data-bbox="253 911 318 957">b.</td> <td data-bbox="318 911 1167 957">Local Copy (exclude)</td> </tr> <tr> <td data-bbox="253 957 318 1031">c.</td> <td data-bbox="318 957 1167 1031">SCS printers using Horizontal Tabs<br/>(Check the options Monitor panel to ensure that this option is on.)</td> </tr> <tr> <td data-bbox="253 1031 318 1110">d.</td> <td data-bbox="318 1031 1167 1110">Any devices that scan data streams for specific character strings?<br/>(If yes, you must exclude them.)</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | a.                                                                                                                                                             | Erase Input Key allowed?<br>(If yes, reduced optimization results, but data integrity is OK.) | b. | Local Copy (exclude)                                                                         | c. | SCS printers using Horizontal Tabs<br>(Check the options Monitor panel to ensure that this option is on.)                                   | d. | Any devices that scan data streams for specific character strings?<br>(If yes, you must exclude them.) |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Erase Input Key allowed?<br>(If yes, reduced optimization results, but data integrity is OK.)                                                                  |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| b.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Local Copy (exclude)                                                                                                                                           |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| c.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | SCS printers using Horizontal Tabs<br>(Check the options Monitor panel to ensure that this option is on.)                                                      |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| d.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Any devices that scan data streams for specific character strings?<br>(If yes, you must exclude them.)                                                         |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| 8 Determine Local Format Storage (LFS) requirements. <table border="1" data-bbox="253 1159 1167 1549"> <tr> <td data-bbox="253 1159 318 1205">a</td> <td data-bbox="318 1159 1167 1205">do your brands/models of controller support LFS?</td> </tr> <tr> <td data-bbox="253 1205 318 1251">b</td> <td data-bbox="318 1205 1167 1251">does the level of microcode support LFS?</td> </tr> <tr> <td data-bbox="253 1251 318 1297">c</td> <td data-bbox="318 1251 1167 1297">do the controllers have sufficient memory for LFS?</td> </tr> <tr> <td data-bbox="253 1297 318 1371">d</td> <td data-bbox="318 1297 1167 1371">review the startup parameters for LFS (ADVLFS, DEFER, LAPPLID, LFSLRU, MLFS, NOQLFS, QUERYYP)</td> </tr> <tr> <td data-bbox="253 1371 318 1417">e</td> <td data-bbox="318 1371 1167 1417">ensure that EVSA for LFS is available (LFS requires significant ECSA)</td> </tr> <tr> <td data-bbox="253 1417 318 1488">f</td> <td data-bbox="318 1417 1167 1488">use an INCLUDE table to sure that only those applications that can really benefit from LFS are optimized by LFS (see ULTRAOPT Monitor panel 1.3.5)</td> </tr> <tr> <td data-bbox="253 1488 318 1549">g</td> <td data-bbox="318 1488 1167 1549">write LFS user exit or use RPQ for LOCADDR=01 (for B4.2 use RPQ 8Q0929)</td> </tr> </table> | a                                                                                                                                                              | do your brands/models of controller support LFS?                                              | b  | does the level of microcode support LFS?                                                     | c  | do the controllers have sufficient memory for LFS?                                                                                          | d  | review the startup parameters for LFS (ADVLFS, DEFER, LAPPLID, LFSLRU, MLFS, NOQLFS, QUERYYP)          | e  | ensure that EVSA for LFS is available (LFS requires significant ECSA)    | f  | use an INCLUDE table to sure that only those applications that can really benefit from LFS are optimized by LFS (see ULTRAOPT Monitor panel 1.3.5)             | g  | write LFS user exit or use RPQ for LOCADDR=01 (for B4.2 use RPQ 8Q0929) |  |
| a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | do your brands/models of controller support LFS?                                                                                                               |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | does the level of microcode support LFS?                                                                                                                       |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | do the controllers have sufficient memory for LFS?                                                                                                             |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | review the startup parameters for LFS (ADVLFS, DEFER, LAPPLID, LFSLRU, MLFS, NOQLFS, QUERYYP)                                                                  |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| e                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ensure that EVSA for LFS is available (LFS requires significant ECSA)                                                                                          |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| f                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | use an INCLUDE table to sure that only those applications that can really benefit from LFS are optimized by LFS (see ULTRAOPT Monitor panel 1.3.5)             |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | write LFS user exit or use RPQ for LOCADDR=01 (for B4.2 use RPQ 8Q0929)                                                                                        |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| 6 Determine ECSA requirements. <table border="1" data-bbox="253 1598 1167 1753"> <tr> <td data-bbox="253 1598 318 1644">a.</td> <td data-bbox="318 1598 1167 1644">calculate required ECSA storage by using the ECSA worksheet</td> </tr> <tr> <td data-bbox="253 1644 318 1690">b.</td> <td data-bbox="318 1644 1167 1690">multiply the calculated amount by <i>at least</i> 150 percent for dynamic overage</td> </tr> <tr> <td data-bbox="253 1690 318 1753">c.</td> <td data-bbox="318 1690 1167 1753">ask MVS system programmer to add the overage amount to the system ECSA (CSA= parameter) that is currently defined in SYS1.PARMLIB(IEASYSxx)</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | a.                                                                                                                                                             | calculate required ECSA storage by using the ECSA worksheet                                   | b. | multiply the calculated amount by <i>at least</i> 150 percent for dynamic overage            | c. | ask MVS system programmer to add the overage amount to the system ECSA (CSA= parameter) that is currently defined in SYS1.PARMLIB(IEASYSxx) |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | calculate required ECSA storage by using the ECSA worksheet                                                                                                    |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| b.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | multiply the calculated amount by <i>at least</i> 150 percent for dynamic overage                                                                              |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |
| c.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ask MVS system programmer to add the overage amount to the system ECSA (CSA= parameter) that is currently defined in SYS1.PARMLIB(IEASYSxx)                    |                                                                                               |    |                                                                                              |    |                                                                                                                                             |    |                                                                                                        |    |                                                                          |    |                                                                                                                                                                |    |                                                                         |  |

**Table C-1** ULTRAOPT with LFS Trial Plan Preinstallation Checklist (Part 3 of 3)

| Action Item |                                                                                                                | Information |
|-------------|----------------------------------------------------------------------------------------------------------------|-------------|
| 7           | Review the following ULTRAOPT rules of interception:                                                           |             |
|             | a. default applications intercepted                                                                            |             |
|             | b. session managers                                                                                            |             |
|             | c. include vs. exclude processing order                                                                        |             |
|             | d. BSR (and effect of BSR on products such as NPM and NetSpy)                                                  |             |
|             | e. interception occurs when the application ACB is opened                                                      |             |
|             | f. ULTRAOPT provides the VTAM interface for all intercepted applications                                       |             |
| 8           | Determine the statistical information configuration.                                                           |             |
|             | a. statistics collection interval                                                                              |             |
|             | b. statistics file size (a function of the Statistics interval)                                                |             |
|             | c. statistics traffic impact on the central control unit (CCU)/network (a function of the Statistics interval) |             |
|             | d. statistics printing/reset interval                                                                          |             |
| 9           | Establish performance baseline measurements.                                                                   |             |
|             | a. response time (average and peak)                                                                            |             |
|             | b. combined utilization of host resources of the applications plus VTAM plus ULTRAOPT                          |             |
|             | c. CCU utilization                                                                                             |             |
|             | d. line utilization                                                                                            |             |
|             | e. throughput (check the application subsystem's method of measuring transaction throughput)                   |             |
| 10          | Establish economic baselines for product cost justification.                                                   |             |
|             | a. revenue value (or profit margin) per transaction or loss per hour of application downtime                   |             |
|             | b. size of outbound and inbound messages (panels)                                                              |             |
|             | c. number of panels per transaction                                                                            |             |
|             | d. number of concurrent users of system during "prime time"                                                    |             |
|             | e. number of transactions per hour during "prime time" (total or transactions per user)                        |             |
|             | f. length of "prime time" window (in hours or minutes)                                                         |             |

## Installation and Customization

Use Table C-2 as a checklist for installing and customizing ULTRAOPT.

**Table C-2 ULTRAOPT with LFS Trial Plan Installation and Customization Checklist**

| Action Item |                                                                                                                                                                                          | Information |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1           | Install the product tapes by using the installation system.<br>Use the preinstallation worksheet in Chapter 1, "Installation Overview," and the <i>OS/390 and z/OS Installer Guide</i> . |             |
| 2           | Customize ULTRAOPT by using AutoCustomization or manual customization.<br>For more information about these methods, see Chapter 3, "Installation Customization."                         |             |
| 3           | Set up Local Format Storage (LFS).                                                                                                                                                       |             |
| a           | define VTAM Applid for LFS in the LOGAPPL parameter for the load LU's definition in the SYS1.VTAMLST data set                                                                            |             |
| b           | define LFS exit to return LOCADDR=01 LU for each LFS LU                                                                                                                                  |             |
| c           | customize 3174 controllers for LFS                                                                                                                                                       |             |
| d           | define LOCADDR=01 LU in VTAM for local terminals in the <b>NCP gen</b> for remote terminals                                                                                              |             |
| e           | review ULTRAOPT startup parameters again                                                                                                                                                 |             |

## Test

Use Table C-3 as a checklist for testing ULTRAOPT before using the product in your production environment.

**Table C-3 ULTRAOPT with LFS Trial Plan Test Checklist (Part 1 of 4)**

| Action Item |                                                                                                                                                                                           | Information |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1           | Verify the paging subsystem configuration.                                                                                                                                                |             |
| a.          | verify that test system common page data set contains sufficient DASD to back up all of ECSA                                                                                              |             |
| b.          | because ULTRAOPT uses a significant amount of ESCA, BMC Software recommends that the common paging subsystem be isolated from other paging subsystems and be tuned to perform efficiently |             |
| 2           | Configure BMC Software startup.                                                                                                                                                           |             |
| a.          | update the start order (JES, VTAM, BMCP, and ULTRAOPT, followed by applications)                                                                                                          |             |
| b.          | activate the BMCP                                                                                                                                                                         |             |

Table C-3 ULTRAOPT with LFS Trial Plan Test Checklist (Part 2 of 4)

| Action Item |                                                                 | Information                                                                                                                                                                                                                                                                     |
|-------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3           | Perform a no-interception test.                                 |                                                                                                                                                                                                                                                                                 |
|             | a.                                                              | start ULTRAOPT with the NOINT startup parameter and without the CSALIMIT startup parameter                                                                                                                                                                                      |
|             | b.                                                              | initiate a 3270 monitor session through TSO                                                                                                                                                                                                                                     |
|             | c.                                                              | create include/exclude tables for test applications and for LUs (review overlap with any existing 3270 SUPEROPTIMIZER <sup>®</sup> /CICS includes)                                                                                                                              |
|             | d.                                                              | if migrating from 3270 SUPEROPTIMIZER/CICS, perform the following steps: <ul style="list-style-type: none"> <li>ensure that this product startup is removed from the subsystem startup deck</li> <li>create and/or convert transaction exclusion tables if necessary</li> </ul> |
|             | e.                                                              | stop ULTRAOPT                                                                                                                                                                                                                                                                   |
| 4           | Perform interception without optimization.                      |                                                                                                                                                                                                                                                                                 |
|             | a.                                                              | restart ULTRAOPT with MAXOPT=0 parameter (instead of NOINT)                                                                                                                                                                                                                     |
|             | b.                                                              | verify ULTRAOPT status by using console commands:                                                                                                                                                                                                                               |
|             |                                                                 | DISPLAY <i>subsysid</i> ,ACTIVE (for intercepted applications) to ensure that you are intercepting only those applications that you intend to intercept                                                                                                                         |
|             |                                                                 | DISPLAY <i>subsysid</i> ,ID= <i>luname</i> (for intercepted LUs) to ensure that you are intercepting only those LUs that you intend to intercept                                                                                                                                |
|             |                                                                 | DISPLAY <i>subsysid</i> ,OPTIONS (for startup options) to ensure that all needed options are set                                                                                                                                                                                |
|             |                                                                 | DISPLAY <i>subsysid</i> ,ECSA (for ECSA usage)                                                                                                                                                                                                                                  |
| c.          | stop ULTRAOPT (which closes the intercepted application's ACBs) |                                                                                                                                                                                                                                                                                 |

**Table C-3 ULTRAOPT with LFS Trial Plan Test Checklist (Part 3 of 4)**

| Action Item                          |                                                                                           | Information                                                                                                                                   |  |
|--------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--|
| 5                                    | Perform an optimization test.                                                             |                                                                                                                                               |  |
|                                      | a.                                                                                        | restart ULTRAOPT (remove MAXOPT=0)                                                                                                            |  |
|                                      | b.                                                                                        | if using a nonintercepted session manager, use the OPTAPPLS parameter to optimize background sessions between application and session manager |  |
|                                      | c.                                                                                        | verify ULTRAOPT status by using MVS console commands:                                                                                         |  |
|                                      |                                                                                           | DISPLAY <i>subsysid</i> ,ACTIVE (for intercepted applications)                                                                                |  |
|                                      |                                                                                           | DISPLAY <i>subsysid</i> ,ID= <i>luname</i> (for intercepted LUs)                                                                              |  |
|                                      |                                                                                           | DISPLAY <i>subsysid</i> ,OPTIONS (for startup options)                                                                                        |  |
|                                      |                                                                                           | DISPLAY <i>subsysid</i> ,ECSA (for ECSA usage)                                                                                                |  |
|                                      |                                                                                           | review data stream optimization statistics (on ULTRAOPT Monitor panels 2.1.0 and 2.2.0)                                                       |  |
|                                      |                                                                                           | compare before and after optimization rates                                                                                                   |  |
|                                      |                                                                                           | review ULTRAOPT Monitor panels 2.3.0 and 2.4.0 for any exclusions or errors                                                                   |  |
|                                      | d.                                                                                        | review effect of optimization on the following network resources:                                                                             |  |
|                                      |                                                                                           | VTAM/CPU cycles/buffers                                                                                                                       |  |
|                                      |                                                                                           | CCU cycles and NCP buffers                                                                                                                    |  |
|                                      |                                                                                           | line utilization                                                                                                                              |  |
| end-to-end response time             |                                                                                           |                                                                                                                                               |  |
| other (routers, gateways, and so on) |                                                                                           |                                                                                                                                               |  |
| e.                                   | throughput (NCP or CPU cycles might not decrease, but transaction volume should increase) |                                                                                                                                               |  |
|                                      | stop ULTRAOPT                                                                             |                                                                                                                                               |  |
| 6                                    | Add LFS support to test application and repeat Step 4 (optional)                          |                                                                                                                                               |  |
| 7                                    | Repeat Steps 4 to 6 for other test applications.                                          |                                                                                                                                               |  |
| 8                                    | Include session manager for optimization.                                                 |                                                                                                                                               |  |
|                                      | a.                                                                                        | double-check ECSA (are all the ACBs that are generated by the session manager included in your calculations?)                                 |  |
|                                      | b.                                                                                        | repeat Steps 4 to 7 with the NOBSR option                                                                                                     |  |
|                                      | c.                                                                                        | repeat Steps 4 to 7 with the BSR option (session manager and background sessions must be intercepted)                                         |  |
|                                      | d.                                                                                        | check total bytes reduced, not just the optimization percentage                                                                               |  |
|                                      | e.                                                                                        | turn off OPTAPPLS if it was on for earlier testing (for example, Step 5b)                                                                     |  |
| 9                                    | Repeat Steps 4 to 8 for other session manager products.                                   |                                                                                                                                               |  |

Table C-3 ULTRAOPT with LFS Trial Plan Test Checklist (Part 4 of 4)

| Action Item |                                                                                                                                                                                                                                                                                           | Information                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 10          | <b>(For IMS only)</b> Test reopening IMS ACB<br>(for times when IMS is started before ULTRAOPT/IMS):                                                                                                                                                                                      |                                                                                                               |
|             | a.                                                                                                                                                                                                                                                                                        | start IMS                                                                                                     |
|             | b.                                                                                                                                                                                                                                                                                        | start ULTRAOPT/IMS                                                                                            |
|             | c.                                                                                                                                                                                                                                                                                        | from IMS, issue operator commands /STOP DC and /START DC                                                      |
|             | d.                                                                                                                                                                                                                                                                                        | from the MVS console, issue the command D <i>subsysid</i> ,ACTIVE to verify that IMS is now being intercepted |
|             | e.                                                                                                                                                                                                                                                                                        | stop ULTRAOPT (which closes the intercepted IMS ACBs)                                                         |
| 11          | <b>(For IMS only)</b> Test scenarios of terminating applications and checkpointing the IMS dump queue. Ensure that everything closes normally, and that no abends occur.<br><b>Note:</b> ULTRAOPT/CICS users can perform similar tests with CICS.<br>Here are some recommended scenarios: |                                                                                                               |
|             | a.                                                                                                                                                                                                                                                                                        | closing ACBs                                                                                                  |
|             |                                                                                                                                                                                                                                                                                           | by operator command /STOP DC                                                                                  |
|             |                                                                                                                                                                                                                                                                                           | by V NET,INACT,ID=                                                                                            |
|             | b.                                                                                                                                                                                                                                                                                        | stopping VTAM                                                                                                 |
|             |                                                                                                                                                                                                                                                                                           | Z NET                                                                                                         |
|             |                                                                                                                                                                                                                                                                                           | Z NET,QUICK                                                                                                   |
|             |                                                                                                                                                                                                                                                                                           | Z NET,CANCEL                                                                                                  |
|             | c.                                                                                                                                                                                                                                                                                        | stopping ULTRAOPT                                                                                             |
|             |                                                                                                                                                                                                                                                                                           | Z <i>subsysid</i>                                                                                             |
|             |                                                                                                                                                                                                                                                                                           | Z <i>subsysid</i> ,QUICK                                                                                      |
|             |                                                                                                                                                                                                                                                                                           | Z <i>subsysid</i> ,CANCEL                                                                                     |
|             | d.                                                                                                                                                                                                                                                                                        | checkpoint dump queue /CHE DUMPQ                                                                              |

## Production

Use Table C-4 as a checklist for putting ULTRAOPT into your production environment.

**Table C-4 ULTRAOPT with LFS Trial Plan Production Checklist**

| Action Item |                                                                                                                                                | Information |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1           | Obtain permanent product license and CPU password.                                                                                             |             |
| 2           | Update include/exclude tables if necessary.                                                                                                    |             |
| 3           | Remove 3270 SUPEROPTIMIZER/CICS if present.                                                                                                    |             |
| 4           | If production LPAR is different from the test LPAR perform the following steps:                                                                |             |
|             | a. verify ECSA value in the CSA= parameter in SYS1.PARMLIB(IEASYSxx)                                                                           |             |
|             | b. verify location and tuning of common paging subsystem                                                                                       |             |
| 5           | Verify subsystem startup sequence.                                                                                                             |             |
| 6           | Review options data sets for any modifications.                                                                                                |             |
| 7           | Update the following console operator procedures:                                                                                              |             |
|             | a. ULTRAOPT cancellation effect                                                                                                                |             |
|             | b. ULTRAOPT display/debug commands                                                                                                             |             |
|             | c. do <i>not</i> free any "orphaned" ECSA until ULTRAOPT is shut down<br>For more information, see "Appendix A, "Product Overviews."           |             |
| 8           | For last-minute maintenance or frequently asked questions, see <a href="http://www.bmc.com.support.html">http://www.bmc.com.support.html</a> . |             |
| 9           | Start the BMCP.                                                                                                                                |             |
| 10          | Start the ULTRAOPT subsystem.                                                                                                                  |             |
| 11          | Bring up applications subsystems.                                                                                                              |             |

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## ECSA Use Estimation Worksheets

This section includes the following worksheets for use in estimating the amount of virtual memory (ECSA) in ULTRAOPT:

- with LFS
- with EXTLFS

**Note:** In all the following worksheets, *sessions* implies *sessions to intercepted Applids*.

**Warning!** Use these worksheets as estimating tools. Actual results might vary (depending on the environment in which the subsystem is installed) and might exceed the estimate because of the variable amount that is used for processing VTAM functions. It is important to add some overage to the estimated amount.

When you have estimated ECSA usage based on the ECSA worksheets, you want to be certain your calculations are correct. If a sufficient amount of ECSA is not available for ULTRAOPT's needs, you will experience serious problems with your system. For more information about reviewing your ECSA calculations, see Chapter 1, "Installation Overview."

## Worksheet for ULTRAOPT with LFS

For installing ULTRAOPT/CICS or ULTRAOPT/IMS with LFS but without extended attribute support (startup option EXTLFS), use Table C-5. The term *LFS Formats* in the table refers to the total formats accumulated since the last ULTRAOPT restart, not just active formats.

**Table C-5 ECSA Storage Requirements for ULTRAOPT with LFS**

| Feature                                                                                                                      | Bytes        | No.                | Total   |
|------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|---------|
| base module requirement                                                                                                      | 2000 KB      | 1                  | 2000 KB |
| base for LFS                                                                                                                 | 300 KB       | 1                  | 300 KB  |
| data stream trace buffer size from panel 3.4                                                                                 | user-defined | 1                  |         |
| intercepted Applids                                                                                                          | 14 KB        |                    |         |
| sessions with Programmed Symbol optimization (using the OPTPS startup parameter) <sup>1</sup>                                | 76 KB        |                    |         |
| optimized Model 2 terminal sessions <sup>1</sup>                                                                             | 3 KB         |                    |         |
| optimized Model 2 sessions with ext. attributes <sup>1</sup>                                                                 | 6 KB         |                    |         |
| optimized Model 3, 4, or 5 terminal sessions <sup>1</sup>                                                                    | 6 KB         |                    |         |
| optimized Model 3, 4, or 5 sessions with ext. attributes <sup>1</sup>                                                        | 10 KB        |                    |         |
| 3174 controllers using LFS                                                                                                   | 2 KB         |                    |         |
| Model 2 terminal unique LFS formats                                                                                          | 4 KB         |                    |         |
| Model 3, 4, or 5 terminal unique LFS formats                                                                                 | 8 KB         |                    |         |
| terminated or unoptimized sessions (any model)                                                                               | 1 KB         |                    |         |
| sessions with applications such as TSO and session managers that use RECEIVE OPTCD=SPECIFIC <sup>2</sup>                     | 5 KB         |                    |         |
| Subtotal                                                                                                                     |              |                    | _____   |
| To calculate variable overage for VTAM API and EXIT requests, multiply Subtotal by 0.5 and add that product to the Subtotal: |              | <b>Grand Total</b> | _____   |

<sup>1</sup> With the XPVT startup parameter, much of the IMS and CICS session storage is allocated in extended private. TSO and session manager sessions are still allocated in ECSA. See "Extended Private Storage" on page 2-8.

<sup>2</sup> To find out whether an application uses RECEIVE OPTCD=SPECIFIC, ask the application programmer or examine an API trace for the application. CICS and IMS use RECEIVE OPTCD=ANY; so their additional session storage requirements are negligible.

**Note:** Systems with little or no optimization, such as test systems, might use more ECSA than this estimate because there is a higher percentage of ECSA that is used for VTAM API requests and exits in such systems.

## Worksheet for ULTRAOPT with EXTLFS

If you are installing ULTRAOPT/CICS or ULTRAOPT/IMS with LFS extended attribute support (startup parameter EXTLFS), use Table C-6. The term *LFS Formats* refers to total formats accumulated since the last ULTRAOPT restart, not just active formats.

**Table C-6 ECSA Storage Requirements for ULTRAOPT with EXTLFS**

| Feature                                                                                                                      | Bytes        | No.                | Total   |
|------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|---------|
| base module requirement                                                                                                      | 2000 KB      | 1                  | 2000 KB |
| base for LFS                                                                                                                 | 300 KB       | 1                  | 300 KB  |
| data stream trace buffer size from panel 3.4                                                                                 | user-defined | 1                  |         |
| intercepted Applids                                                                                                          | 14 KB        |                    |         |
| sessions with Programmed Symbol optimization (using the OPTPS startup parameter)                                             | 76 KB        |                    |         |
| optimized Model 2 terminal sessions <sup>1</sup>                                                                             | 3 KB         |                    |         |
| optimized Model 2 sessions with ext. attributes <sup>1</sup>                                                                 | 6 KB         |                    |         |
| optimized Model 3, 4, or 5 terminal sessions <sup>1</sup>                                                                    | 6 KB         |                    |         |
| optimized Model 3, 4, or 5 sessions with ext. attributes <sup>1</sup>                                                        | 10 KB        |                    |         |
| 3174 controllers using LFS                                                                                                   | 2 KB         |                    |         |
| Model 2 terminal unique LFS formats                                                                                          | 4 KB         |                    |         |
| Model 3, 4, or 5 terminal unique LFS formats                                                                                 | 8 KB         |                    |         |
| Model 2 & 3 unique LFS formats with ext. attributes                                                                          | 8 KB         |                    |         |
| Model 4 & 5 unique LFS formats with ext. attributes                                                                          | 12 KB        |                    |         |
| terminated or unoptimized sessions (any model)                                                                               | 1 KB         |                    |         |
| sessions with applications such as TSO and session managers that use RECEIVE OPTCD=SPECIFIC <sup>2</sup>                     | 5 KB         |                    |         |
| Subtotal                                                                                                                     |              |                    | _____   |
| To calculate variable overage for VTAM API and EXIT requests, multiply Subtotal by 0.5 and add that product to the Subtotal: |              | <b>Grand Total</b> | _____   |

<sup>1</sup> With the XPVT startup parameter, much of the IMS and CICS session storage is allocated in extended private. TSO and session manager sessions are still allocated in ECSA. See "Extended Private Storage" on page 2-8.

<sup>2</sup> To find out whether an application uses RECEIVE OPTCD=SPECIFIC, ask the application programmer or examine an API trace for the application. CICS and IMS use RECEIVE OPTCD=ANY; so their additional session storage requirements are negligible.

**Note:** Systems with little or no optimization, such as test systems, might use more ECSA than this estimate because a higher percentage of ECSA is used for VTAM API requests and exits in such systems.



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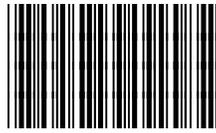
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