HP Client Automation Enterprise

Configuration Server

for the AIX; Enterprise Linux ES, AS; HP-UX; Solaris; SuSE Linux Enterprise Server; and Windows® operating systems

Software Version: 7.20

User Guide

Manufacturing Part Number: None
Document Release Date: July 2008
Software Release Date: July 2008

Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notices

Trademark Notices

Linux is a registered trademark of Linus Torvalds.

Microsoft®, Windows®, and Windows® XP are U.S. registered trademarks of Microsoft Corporation.

OpenLDAP is a registered trademark of the OpenLDAP Foundation.

Documentation Updates

The title page of this document contains the following identifying information:

- Software Version number, which indicates the software version.
  - The number before the period identifies the major release number.
  - The first number after the period identifies the minor release number.
  - The second number after the period represents the minor-minor release number.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

To check for recent updates or to verify that you are using the most recent edition, visit:

http://h20230.www2.hp.com/selfsolve/manuals

This site requires that you register for an HP Passport and sign-in. To register for an HP Passport ID, go to:

http://h20229.www2.hp.com/passport-registration.html

Or click the **New users - please register** link on the HP Passport login page.

You will also receive updated and new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

Table 1 below lists the changes that were made to this document.

Table 1 Documentation changes

Chapter	Version	Changes
N/A	5.00	The chapter, *CM Configuration Server Database Utilities* (formerly Chapter 6), has been deleted. The functionality of these six database utilities has been replaced by the EDMAMS verbs EXPORT_CLASS, EXPORT_INSTANCE, EXPORT_RESOURCE, IMPORT_CLASS, IMPORT_INSTANCE, and IMPORT_RESOURCE, which are documented in Chapter 6, EDM Access Method Services, starting on page 255.
All	5.00	Removed all references to **MVS** and all MVS-related information; MVS is not supported in this release.
All	5.00	In various places in this document, “characters” was replaced with “bytes” due to internationalization considerations.

Chapter	Version	Changes
All	5.00	The default installation directory, `Novadigm`, has been revised for this release. All references to the directory have been updated to *`System Drive`*`:\Program Files\Hewlett-Packard\CM\ConfigurationServer` and `opt/HP/CM/ConfigurationServer`
All	5.00	In various places in this document examples of, and references to, Domains and Classes in the CM Configuration Server Database have been revised to accurately reflect the structure of the database.
All	5.00	All references to "Windows NT service" have been revised to "Windows service."
All	5.10	Removed several obsolete images.
Chapter 2	5.10	Page 57, in the section, Recommended Preventive Measures, revised the information regarding the ZMTHNAME setting.
Chapter 2	5.00	Page 101, added a comprehensive definition of a CM Configuration Server Database object ID.
Chapter 2	7.20	Page 102, added a new section, MANAGER_TYPE Values.
Chapter 3	5.10	Page 135, renamed and revised the section, HP REXX Functions, to include information about functions that *retrieve object names and properties*, as well as two utility functions to *convert between local code page* (LCP) and *UTF-8 strings*.
Chapter 5	5.10	Page 197, revised the section ODBC Data Source Drivers.
Chapter 5	5.10	Page 205, revised the section Install the Necessary Software.
Chapter 6	5.00	Page 280, the EDMAMS verb, COPY_ZRSOURCE, has been deleted from the CM Configuration Server Database. Its functionality is handled by the verb, COPY_CLASS.
Chapter 6	5.00	Page 292, revised the keyword information for the EDMAMS verb, DELETE_FIELD.
Chapter 6	7.20 Jun. '09	Page 310, expanded the Note regarding the reasons for new deck creation.

Chapter	Version	Changes
Chapter 7	5.00	Page 347, is where a new chapter, CM Configuration Server Database Utility, begins. This chapter details the CM Configuration Server Database utility, **RadDBUtil**.
Chapter 7	5.10	Page 363, revised the section, Deleting Bulletins from a Database, with information on using the IGNORE keyword when permanently deleting CM Patch Manager bulletins from the CM Configuration Server Database.
Chapter 7	5.10	Page 368, revised the Export, Delete, and Import syntaxes in Example 8..
Appendix A	5.10	Page 397, revised this appendix (CM Configuration Server Database Methods) so that the CM Configuration Server methods are now documented with their current names, as seen in the `\bin` directory.

Support

You can visit the HP Software support web site at:

www.hp.com/managementsoftware/services

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online software support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support site to:

- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract.

To find more information about access levels, go to:

www.hp.com/managementsoftware/access_level

To register for an HP Passport ID, go to:

www.managementsoftware.hp.com/passport-registration.html

Contents

1 Introduction

At the end of this chapter, you will:

- Know how this guide is arranged in order to more quickly find specific information about the HP Client Automation Configuration Server (Configuration Server).
- Have had a chance to review some basic information about the Configuration Server's relationship with:
  - HP Client Automation Configuration Server Database (Configuration Server Database, CSDB)
  - Client Operations Profiles
- Have had a chance to review some basic information about the Configuration Server, including:
  - System requirements
  - Backing up and directories
  - Version information

Document Overview

This guide describes the HP Client Automation Configuration Server (Configuration Server). It is designed for an **HP Client Automation** (**HPCA**) administrator who is authorized to manage the Configuration Server Database (**CSDB**).

Documentation Map

This section provides an overview of the contents of the chapters in this guide. It is designed to help HPCA administrators quickly locate and navigate to specific Configuration Server information.

Chapter 2 shows how to modify the Configuration Server's `edmprof` file in order to enhance system performance.

The next three chapters describe: how to customize the flow of CSDB processing (Chapter 3); the various approaches to configuring HPCA agent notification (Chapter 4); and the advantages of ODBC connectivity to a SQL database (Chapter 5).

Chapter 6 and Chapter 7 present information about using Access Method Services and the Configuration Server Database utility, RadDBUtil, to manage the CSDB.

The performance aspects of the Configuration Server are described in Chapter 8; Chapter 9 addresses basic troubleshooting issues and recommended actions.

The last two chapters discuss multi-mode Configuration Servers (Chapter 10) and SSL Managers (Chapter 11).

Using this Guide with Core and Satellite Servers

If your environment uses Core and Satellite servers, first read the *Core and Satellite Servers Getting Started Guide* as the installation, configuration, and troubleshooting information in that guide may override the information in this guide.

Overview of Configuration Server

The Configuration Server is the heart of any HP Client Automation implementation. The entire HP Client Automation environment is built around it. In conjunction with the Configuration Server Database (CSDB), the Configuration Server manages software content and policy across a network environment.

The Configuration Server can be installed on a single server or on multiple servers. Once installed, it stores (in the CSDB) application data and HPCA agent-device information, and distributes application packages based on the policies that are established by an administrator.

The Configuration Server can:

- **Manage a HPCA agent's Desired State**
  Dynamically generate an HPCA agent's **desired state** based on situation-specific data, thereby creating a software environment that automatically adapts to user and device changes.
- **Distribute Configuration Server Database Objects**
  Synchronize distributed objects (such as application components, packages, device configurations, and policy relationships) across the network, and automatically manage object transfer between HP Client Automation components.
- **Deliver and Maintain HPCA Policies**
  Maintain enterprise policies in the CSDB. When a device that is being managed by HPCA connects to the Configuration Server all current policies are automatically applied.
- **Issue Connects and Fulfill Requests**
  Contact devices causing them to initiate data requests and desired-state requests. These requests can be according to a schedule or upon notification from an administrator.

Configuration Server Database

The CSDB is stored on the Configuration Server, and is accessed and modified via the HP Client Automation Administrator Configuration Server Database Editor (Admin CSDB Editor). It houses Client Automation products, and is where administrators save and maintain an enterprise's service-entitlement policies.

The CSDB includes the following information.

- The digital assets that are distributed by HP Client Automation.
- The policies that determine package assignment to managed devices and subscribers.
- Security and access rules for administrators of HP Client Automation.

Configuration Server Database Documentation

Consult the following HP Client Automation publications for more information on the structure, use, and components of the CSDB.

- *HP Client Automation Configuration Server Database Reference Guide* (*CSDB Reference Guide*)
- *HP Client Automation Administrator User Guide* (*Admin User Guide*)
- *HP Client Automation Configuration Server, Portal, and Enterprise Manager Getting Started Guide* (*Getting Started Guide*)

Configuration Server and Client Operations Profiles

Client Operations Profiles allow a administrator to identify and prioritize data access points (DAP) without having to use additional customized scripts. A server access profile (SAP) is a generic way of defining all possible DAPs for a service. In a Client Automation environment, the Configuration Server can be a SAP.

In order to do so, a Configuration Server must have a role, or function, defined for the ROLE attribute of the SAP Class in the CSDB. A Configuration Server can assume any of the following roles.

- **Client Operations Profiles (O)**
  This Configuration Server will get the HPCA agent's Client Operations Profiles.
- **Service resolution (S)**
  This Configuration Server will resolve the HPCA agent's services.
- **HPCA agent self-maintenance (M)**
  This Configuration Server will help the HPCA agent perform self-maintenance.
- **Reporting (R)**
  This Configuration Server will store, in the CSDB PROFILE File, reporting objects from the HPCA agent.

- **Data download (D)**
  This Configuration Server will download application data to the HPCA agent.
- **All (A)**
  This Configuration Server will perform all of the functions listed here.

Configuration Server Information

This section presents the following Configuration Server information:

- Platform Support, starting below.
- Backing up the Configuration Server, starting below.
- Configuration Server Version Information, starting on page 26.

Platform Support

For information about the platforms that are supported in this release, see the accompanying release notes.

Backing up the Configuration Server

HP recommends that the Configuration Server (and CSDB) be periodically backed up. To facilitate doing so, a list of the Configuration Server directories (that are installed by default) and their applicable platforms and contents are provided in Table 2 below.

HP recommends that backups be done in accordance with each environment's in-house, corporate protocol.

Table 2 Configuration Server Directories

Directory	Platforms	Contents
`bin`	Windows	The Configuration Server binary files and the `edmprof` file.
	UNIX	The shell scripts that enable you to start, stop, clean up, and query the Configuration Server.

Directory	Platforms	Contents
DB	Windows & UNIX	The Configuration Server Database files.
internet	Windows & UNIX	The ARGS.XML file.
lib	Windows & UNIX	This directory contains files for proper Configuration Server operation; do not modify or delete these files.
log	Windows & UNIX	The Configuration Server log.
modules	Windows	The .tkd files for OS Manager.
rexx	Windows & UNIX	This directory is for storing customized REXX methods. Note: Its subfolder, NOVADIGM, contains the default Configuration Server REXX methods.
shell	Windows	The batch and application files, such as the uninstall and query scripts, and the files that coincide with the Configuration Server options available from the **Start** menu.
	UNIX	This directory is empty.

Configuration Server Version Information

To determine which version of the Configuration Server is running on a machine, query the Configuration Server log file.

To query the Configuration Server version level

1. Go to **Start** → **Programs** → **HP Client Automation** → **Client Automation Configuration Server** → **Log Viewer**.
2. Click **Log Viewer**. The Configuration Server activity log opens.
3. Scroll down to the Configuration Server Information Section.

```
============================================================
Configuration Server Information Section
============================================================
Configuration Server is Version <4.5.1> Build <651>
```

```
Configuration Server built on <Nov 21 2002 at 09:46:34>

version.nvd: <V4.5.2 RCS Level>

Verifying product consistency according to <C:\Program Files\
Hewlett-Packard\CM\ConfigurationServer\bin\version.nvd>file

============================================================
```

1st line = Installed version of the Configuration Server.

3rd line = Service-pack level of the Configuration Server.

4th line = Path to the file `version.nvd`.

4 To find out the Configuration Server version, check the line, `Configuration Server is Version <n.n.n> Build <nnn>`.

If there is a value for the line, `version.nvd: <Vn.n.n RCS Level>`, then a Service Pack has been applied, and the updated Configuration Server version level is reflected.

- If there is no value for the line, `version.nvd: <Vn.n.n RCS Level>`, then either:
  - no Service Pack has been applied, or
  - the `version.nvd` file has been deleted.
- Periodically check the **Product Updates** section of the HP web site for Service Packs for the Configuration Server.
- HP discourages deleting and modifying the file, `version.nvd`.

HP Client Automation Documentation

Table 3 presents a list of Client Automation publications that are associated with the various HP Client Automation products, and which might be referenced in this manual.

Table 3 HP Client Automation Documentation

HP Client Automation Configuration Server Messages Guide (*Configuration Server Messages Guide*)
HP Client Automation Inventory Manager Installation and Configuration Guide (*Inventory Manager Guide*)

HP Client Automation Application Manager and Application Self-Service Manager Installation and Configuration Guide (*Application Manager and Application Self-Service Manager Guide*)
HP Client Automation Portal Installation and Configuration Guide (*Portal Guide*)
HP Configuration Management REXX Programming Guide (*REXX Guide*)
HP Client Automation Configuration Server, Portal, and Enterprise Manager Getting Started Guide (*Getting Started Guide*)
HP Client Automation Administrator User Guide (*Admin User Guide*)
HP Client Automation Messaging Server Installation and Configuration Guide (*Messaging Server Guide*)

2 Tuning the Configuration Server

At the end of this chapter, you will:

- Know how to tune the HP Client Automation Configuration Server (Configuration Server) for maximum performance.
- Be familiar with the Configuration Server `edmprof` file.

Understanding the Tuning Process

The performance of the Configuration Server depends on a number of factors, such as the number of HPCA agents being concurrently processed, the complexity of the configurations for those HPCA agents, the volume of the data being processed, and network bandwidth. The configuration of the Configuration Server log, which documents system status for informational purposes and problem determination, can also alter performance.

The Configuration Server operational parameters are contained in its `edmprof` file. The performance of the Configuration Server can be tuned by working with the settings of the `edmprof` file.

This chapter details the structure of the `edmprof` file and the options that can be specified.

Configuration Server Settings Overview

The Configuration Server `edmprof` file contains the parameters that determine how the Configuration Server will operate. This file is organized into **sections**—with each section containing keywords, called **settings**. The sections can be categorized into functional areas. Further detail for the settings in each of the sections is provided in this chapter.

- **Identification**
  - MGR_STARTUP specifies the Configuration Server by ID, name, type, and communications port.
  - MGR_DIRECTORIES identifies the directory paths for the Configuration Server Databases, REXX methods, and non-REXX methods.
  - MGR_LICENSE contains your unique license string.
- **Specification**
  Configuration Server settings establish application wide technical parameters.
  - MGR_CACHE contains cache-processing options.
  - MGR_TPINIT identifies communications packet sizes.
- **Initialization**

- MGR_ATTACH_LIST determines which Configuration Server programs are initiated at startup, and has options to define their functioning.
- MGR_CLASS specifies which classes and instances of the CSDB are cached during the Configuration Server initialization process.
- SECTION_DELIMITERS specifies which characters are used to distinguish sections in the `edmprof` file.

- **Operations**
  A number of sections in the Configuration Server `edmprof` file contain parameters for system operations.
  - MGR_ACCESS determines Configuration Server access to administrator and console functions.
  - MGR_DB_VERIFY specifies the parameters for automatic CSDB verification at initialization.
  - MGR_DIAGNOSTIC specifies the timing, size, and logging options for verifying adequate disk space for CSDB operations.
  - MGR_DMA specifies parameters for HP Client Automation Distributed Configuration Server (Distributed Configuration Server).
  - MGR_METHODS identifies options for method processing.
  - MGR_NOTIFY specifies the Configuration Server defaults for HPCA agent notifications.
  - MGR_OBJECT_RESOLUTION specifies parameters used in object resolution.
  - MGR_POOLS (*Windows only*) allocates available pools of memory (in different sizes) for system tasks.
  - MGR_RETRY values define how long a HPCA agent is to wait before attempting to reconnect to the Configuration Server.
  - MGR_TASK_LIMIT identifies the maximum concurrent Configuration Server tasks, ongoing and deferred, system related and/or HPCA agent-connect related.
  - MGR_TIMEOUT specifies the amount of time a Configuration Server will wait for an inactive HPCA agent.

- **Monitoring**
  - MGR_LOG and MGR_TRACE identify where the Configuration Server log is located, how flexible it is, and which individual system traces are to be captured in the log.

— MGR_SMTP_MAIL specifies the parameters for using SMTP mail messages to support Configuration Server monitoring.

— MGR_MESSAGE_CONTROL specifies where log messages are to be sent and if they are to be suppressed.

— MGR_USERLOG allows an administrator to establish a user logging facility.

Viewing and Editing Configuration Server Settings

The `edmprof` file can be opened in a text editor, so that its parameters can be viewed and, if necessary, adjusted. It can be found in varying locations, based on operating system, as described below:

- **Windows**
  The `edmprof` file settings are located in the `edmprof.dat` file, located in the `bin` subdirectory of the Configuration Server directory.

  Or, alternatively:

  From the system tray, go to **Start** → **Programs** → **HP Client Automation** → **Client Automation Configuration Server** → **Profile Editor**.

- **UNIX**
  The `edmprof` file settings are located in the `.edmprof` file,, in the `home` directory of the UNIX user ID that installs, starts, stops, and maintains the Configuration Server.

  Although the settings in the `edmprof` file are readily accessible and easy to modify, some of the values are critical to the operation of the Configuration Server. Therefore, it is imperative that you *do not*:

  - alter any `edmprof` file settings unless without consulting this guide first, and then using the recommended values.
  - delete any `edmprof` file settings unless instructed to do so by a member of HP Technical Support.

Configuration Server Settings

Most of the sections of the `edmprof` file can be independently configured, whereas some are based on operating system and communications requirements. While many of the sections are optional, a number are required for proper Configuration Server functioning.

Since some of the sections in the `edmprof` file are optional, and others are platform-specific, it's possible that not all of the settings will be visible in every `edmprof` file.

The `edmprof` file is created during the installation of the Configuration Server. Much of its information is derived directly from parameters that are specified during the installation; while others are automatically entered during the installation.

Two types of values are in the `edmprof` file.

- An **as-installed** value represents a manual input, specified during installation or a derived entry for a required setting.
- A **default** value is established by the Configuration Server if there is a blank value for that setting, whether it is required or manually entered.

- If the value of a setting/parameter is documented as **N/A**, there is no value of that type for that setting/parameter.
- If a value of a setting/parameter has **NONE** (all uppercase) specified, then this is an accepted, optional value for that setting/parameter.

Format of the EDMPROF File

The `edmprof` file is organized into *sections*. Each section contains individual keywords called *settings*. Each setting receives an acceptable *value*, which can be numeric, alphabetic, or alphanumeric.

Some of the settings and values are critical to the operation of the Configuration Server. Do not alter or delete these unless instructed to do so by a member of HP Technical Support.

The following is an example of the format of a section of the `edmprof` file.

Example

```
[MGR_SECTION]
SETTING = VALUE
SETTING = VALUE
SETTING = VALUE
```

The following table presents a list of the `edmprof` file sections, a brief description, and whether the section is required or optional.

Table 4 Sections of the EDMPROF File

Section Name and Description	Required or Optional
MGR_ACCESS Specifies access to the Administrator and Console functions.	Optional
MGR_ATTACH_LIST Specifies the Configuration Server attach list that defines the programs to be attached when the Configuration Server is started.	Required
MGR_CACHE Specifies cache-processing options, such as cache segments, size, and statistics.	Optional
MGR_CLASS Specifies processing parameters for classes and instances.	Optional
MGR_DB_VERIFY Specifies the extent of automatic database verification.	Optional
MGR_DIAGNOSTIC Specifies the parameters for diagnostic Manager (zdiagmgr) tasks.	Optional
MGR_DIRECTORIES Specifies the path for the databases, REXX methods, and non-REXX methods.	Recommended but not required
MGR_DMA Specifies the parameters for Distributed Configuration Server operations.	Optional
MGR_ERROR_CONTROL Specifies how to process errors that are encountered while the Configuration Server is running.	Optional
MGR_LOG Specifies the logging directory and options for the Configuration Server logging facility.	Recommended, but not required

Section Name and Description	Required or Optional
MGR_MESSAGE_CONTROL Specifies where messages are to be sent and whether they are to be suppressed.	Optional
MGR_METHODS Specifies options for method execution.	Recommended, but not required
MGR_NOTIFY Specifies the parameters for notify processing.	Optional
MGR_OBJECT_RESOLUTION Specifies the parameters used in object resolution.	Optional
MGR_POLICY Specifies the IP address/name and port of the HP Client Automation Policy Server (Policy Server), if it has been enabled.	Optional
MGR_POOLS Specifies the allocation of pool sizes on startup.	Optional
MGR_RESOLUTION_FILTERS Specifies the filtering rules for resolution, based on the connection type.	Optional
MGR_RETRY Specifies when an HPCA agent should attempt to reconnect to the Configuration Server, following rejection.	Optional
MGR_RIM Specifies the IP address/name and port of the Inventory Manager, if it has been enabled.	Optional
MGR_ROM Specifies the IP address/name and port of the Information Base, if it has been enabled.	Optional
MGR_RMP Specifies the IP address/name and port of the Portal, if it has been enabled.	Optional
MGR_SMTP_MAIL Specifies the parameters the Configuration Server uses to interface with SMTP.	Optional

Section Name and Description	Required or Optional
MGR_SNMP Contains parameters to specify where SNMP traps are to be sent, and controls the behavior of the built-in SNMP agent.	Optional
MGR_SSL Specifies the parameters for the HP Client Automation Configuration Server SSL Manager task.	Optional
MGR_STARTUP Specifies the Configuration Server ID and TCP/IP port number.	Required
MGR_TASK_LIMIT Specifies the number of concurrent tasks allowed.	Required
MGR_TIMEOUT Specifies how long the Configuration Server will wait for a request from a connected HPCA agent before disconnecting it.	Optional
MGR_TPINIT Specifies communications packet sizes.	Required
MGR_TRACE Controls and influences diagnostic logging for the Configuration Server.	Optional
MGR_USERLOG Specifies the logging directory and options for the user logging facility.	Optional
OBJECT_SIZES Specifies the number of heaps and the heap size for CSDB objects that are being created on the Configuration Server as in-storage CSDB objects.	Optional
RCS_TUNING_CONTROL Provides a mechanism to override the default values that are specified in the Configuration Server self-tuning tool.	Optional
SECTION_DELIMITERS Specifies the left and right delimiters that are to be used for enclosing the section names within the Configuration Server `edmprof` file.	Optional

In the following pages, each section of the `edmprof` file is detailed, covering the individual settings and the values for each. Also described is the impact of tunable settings on Configuration Server performance.

MGR_ACCESS

This section determines access to the Administrator and Console.

Table 5 MGR_ACCESS Settings

Setting	Description
ADMIN	Specifies access to the Administrator. The values are DENY, ALLOW, and IGNORE.
CONSOLE	Specifies access to the Console. The values are DENY, ALLOW, and IGNORE.

Example

```
[MGR_ACCESS]
ADMIN     = DENY
CONSOLE   = DENY
```

Table 6 MGR_ACCESS Values

Setting	Value as Installed	Default Value
ADMIN	DENY	DENY
CONSOLE	DENY	DENY

Access can be controlled by native operating system security features also.

Performance and Usage Considerations

- ADMIN=ALLOW will provide access to the Administrator without checking the ZACCESS domain of the CSDB. Therefore, if ADMIN=ALLOW, and an Administrator attempts an action for which no access rules have been defined, the attempted action will be allowed.
- When ADMIN=DENY, access rules governing Administrator actions are defined in the ZACCESS domain of the CSDB. Therefore, if ADMIN=DENY, the Administrator will be unable to perform an action unless there is an access rule specifically allowing it.
- If ADMIN=IGNORE the Administrator will be able to perform any action because the access rules will be ignored by the Configuration Server.

Setting ADMIN=IGNORE essentially disables all access rules as they relate to Administrator functions.

- Access to the Console is determined by local password security policy. If CONSOLE=ALLOW and local security is not configured, read-only access is granted. If CONSOLE=IGNORE, local Console security is bypassed.

Table 7 HPCA Administrator Access Level Values

Access Value	Definition
ALLOW	This value will result in the Configuration Server *not* checking the administrator access rules before granting access to an administrator to perform CSDB administrator functions. This value disables all administrator access-rule checks, even if they are defined in the database.
DENY	This value will result in the Configuration Server checking administrator access rules before granting access to an administrator to perform CSDB administrator functions. An administrator will be *unable* to perform an action unless there is an access rule defined in the database for that administrator specifically *allowing* it. This is the recommended setting when configuring administrator security. Note: If this option is specified, undefined administrators will not have access to any CSDB administrator functions, unless the ADMINID._NULL_INSTANCE_ is modified to allow such access.
IGNORE	This value will result in the Configuration Server checking administrator access rules before granting access to an administrator to perform CSDB administrator functions. An administrator will be *able* to perform an action unless there is an access rule defined in the database for that administrator specifically *prohibiting* it. Note: If this option is specified, undefined administrators will have full access to all CSDB administrator functions, unless the ADMINID instance exists for that administrator to prohibit such access.

MGR_ATTACH_LIST

In this section, specify which programs (Configuration Server tasks) are to be attached at startup, and set the options for these processes.

Table 8 MGR_ATTACH_LIST Settings

Setting	Description
ATTACH_LIST_SLOTS	Number of slots for the attach list kept in shared memory of the Configuration Server. Every entry is 132 bytes long. HP recommends that this setting be one more than the number of CMD_LINE settings used. For example, if there are seven CMD_LINE settings, set this value to 8. Note: No process starts are required. However, system ability is limited if ZTCPMGR, ZREXXMGR, and ZNFYTMGR are not attached.
CMD_LINE	Command line to use when starting processes. Blanks are not allowed in CMD_LINE= substring. A second format is allowed when multiple instances of the same task are required and need to be separately identified. This format is: CMD_LINE=(NAME=,ADDR=,PORT=). These names should be unique within the Configuration Server.
LIMIT (=CLOSE)	The Configuration Server will drop any HPCA agent connection attempts when LIMIT=CLOSE is specified, *and* either the Task Limit or Storage Limit of the Configuration Server is reached. The Configuration Server will not return an object to the HPCA agent (no return EDMLOCTP), nor will it request the HPCA agent retry the connection. Note: This setting is valid with ztcpmgr only.
RESTART	Use this setting to determine if a Configuration Server task will be restarted when abnormally terminated. Blanks are not allowed in RESTART= substring. The default is **NO**.
RESTART_LIMIT	Number of attempts to restart an attached process that has terminated.
VERIFY_INTERVAL	Interval (in minutes) between verifications that attached processes are still running. If this value is 0, no verification will occur. The default is **1** (minute).

The following table lists the Configuration Server tasks.

Table 9 Configuration Server Tasks

Task Name	Description
zbldpmgr	Patch Build Manager task
zdiagmgr	Diagnostic Manager task
znfytmgr	TCP Notify Manager task
zrexxmgr	REXX Manager task
zrtrymgr	Notify Retry Manager task
zsmtrmgr	SMTP receive Manager task
zsmtsmgr	SMTP send Manager task
zsnmpmgr	SNMP Manager task
zsslmgr	SSL Manager task
ztcpmgr	TCP Manager task
zutilmgr	Utility Manager task

Example

```
[MGR_ATTACH_LIST]
ATTACH_LIST_SLOTS  = 15
RESTART_LIMIT      = 7
VERIFY_INTERVAL    = 5
CMD_LINE           = (zutilmgr) RESTART=YES
CMD_LINE           = (zrexxmgr) RESTART=YES
CMD_LINE           = (zsnmpmgr) RESTART=YES
CMD_LINE           = (zsmtrmgr) RESTART=YES
CMD_LINE           = (zsmtsmgr) RESTART=YES
CMD_LINE           = (znfytmgr) RESTART=YES
CMD_LINE           = (ztcpmgr) RESTART=YES
CMD_LINE           = (ztcpmgr LIMIT=CLOSE) RESTART=YES
CMD_LINE           = (zbldpmgr)
```

Table 10 MGR_ATTACH_LIST Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
ATTACH_LIST _SLOTS	15	15	Number of CMD_LINEs	Number of CMD_LINEs + 1
CMD_LINE	Determined by installation options	Determined by installation options	N/A	N/A
RESTART	YES	NO	N/A	N/A
RESTART_ LIMIT	7	7	0 = No restart	3200

Performance and Usage Considerations

- If the ATTACH_LIST_SLOTS value is too low, the Configuration Server will attach as many tasks as there are slots available. Any remaining tasks will not be attached until a slot becomes vacant. A too-high value could degrade overall system performance by unnecessarily setting aside resources that remain unused.
- The RESTART_LIMIT value should be set higher when critical Configuration Server functions are being performed. Note that regardless of the value in RESTART_LIMIT, the task will not be reinitiated if RESTART=NO.
- To ensure that vital processes continue running, set VERIFY_INTERVAL lower when critical Configuration Server functions are being performed. A higher setting, on the other hand, might save CPU cycles when total demand is a critical factor.
- The ztcpmgr task supports virtual IP addresses. It accepts the IP address and port number on the command line, as in:

  ```
  CMD_LINE = (ztcpmgr addr=1.1.1.94,port=4438)
  ```

  If the address is not specified, the machine address is used.

MGR_CACHE

This section specifies cache-processing options, such as cache size, statistics, load type, and error response.

The settings in this section should be established based on operating system environment and performance needs.

Table 11 MGR_CACHE Settings

Setting	Description
AVERAGE_OBJECT_SIZE	Average size of an object that will be cached.
CACHE_SEGMENTS	Number of cache segments.
CACHE_SIZE	Size of each cache segment.
CACHE_STATS	A YES/NO switch to accumulate statistics.
ICACHE_COUNT_ERROR	Instructs the Configuration Server on what action to take (shut down or log a warning) if the ICACHE instance counts don't match the DCS instance counts when it (the Configuration Server) is starting up. The default is **SHUTDOWN**. Note: The default is SHUTDOWN because running the Configuration Server without the correct number of cached items it is not recommended. See Performance and Usage Considerations, starting on page 44. • SHUTDOWN directs the Configuration Server program (ZTOPTASK) to shut down. • WARN instructs the Configuration Server program to continue loading and record the event in the Configuration Server log. Notes: ICACHE_COUNT_ERROR=SHUTDOWN is the discrete, default behavior in pre-4.5.2 CM Configuration Server versions. If your CM Configuration Server was upgraded to version 4.5.2 from 4.5.1 *and* you want to change the default behavior, this setting must be manually added to the `edmprof` file.

Setting	Description
ICACHE_LOAD_TYPE	The DOMAIN.CLASS entries that are specified in the MGR_CLASS section are loaded, one class at a time, into Index cache via one of the following methods. • **AUTOMATIC** instructs the Configuration Server to auto-determine the loader method (FULL or CHUNKY) to be used. This is the default. • **FULL** instructs the Configuration Server to always use the FULL loader method—loading the database as a single entity. • **CHUNKY** instructs the Configuration Server to always use the CHUNKY loader method—loading each CSDB service one at a time. For more information, see ICACHE_LOAD_TYPE Considerations on page 45.
ICACHE_SIZE	Size of the Index cache.

Example

```
[MGR_CACHE]
AVERAGE_OBJECT_SIZE   = 2048
CACHE_SEGMENTS        = 2
CACHE_SIZE            = 5242880
CACHE_STATS           = NO
ICACHE_COUNT_ERROR    = SHUTDOWN
ICACHE_LOAD_TYPE      = AUTOMATIC
ICACHE_SIZE           = 0
```

Table 12 MGR_CACHE Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
AVERAGE_ OBJECT_SIZE	2048 Bytes	2048	2048	6144
CACHE_SEGMENTS	2	0 (No caching)	0 (No caching)	System resource dependent

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
CACHE_SIZE	5,242,880 Bytes	0	0	System resource dependent
CACHE_STATS	NO	NO	N/A	N/A
ICACHE_ COUNT_ERROR	SHUTDOWN	SHUTDOWN	N/A	N/A
ICACHE_ LOAD_TYPE	AUTOMATIC	AUTOMATIC	N/A	N/A
ICACHE_SIZE	N/A	N/A	0 (No Index caching)	N/A

Performance and Usage Considerations

When modifying any of the cache parameters in this section, take care not to exceed the amount of virtual memory that is available.

Also, sufficient virtual memory must be available to handle the maximum concurrent resolutions workload.

- Classes that are going to be cached are defined in the MGR_CLASS section.

  At a minimum, the SYSTEM.PROCESS and SYSTEM.ZMETHOD classes should be cached.

- If the value of AVERAGE_OBJECT_SIZE is too low, the Configuration Server will have to reconfigure the cache until the object is accommodated.

  If the value of AVERAGE_OBJECT_SIZE is too high, the caching function might not be used efficiently.

- The ICACHE_SIZE setting should be used in conjunction with the CACHE_SEGMENTS setting and the MGR_CLASS section.

  ICACHE_SIZE will be enabled only if the value of CACHE_SEGMENTS is greater than zero.

UNIX Configuration Servers

The recommended value for ICACHE_SIZE is the *total_number_of_instances_in_the_classes_to_be_cached* (see the MGR_CLASS section) multiplied by **64**.

- If ICACHE_COUNT_ERROR=SHUTDOWN and the Configuration Server shuts down, areas to check are:
  - Check the Configuration Server's log file,
  - Check the integrity of the connection to the database,
  - Verify the load type for the database connection method, and
  - Verify the validity of the database.

ICACHE_LOAD_TYPE Considerations

This section presents information that should be considered when specifying a value for ICACHE_LOAD_TYPE.

- If ICACHE_LOAD_TYPE=FULL, the Configuration Server will attempt to load into ICACHE, as a single element, all of the CSDB classes that are specified in the MGR_CLASS section.

  The Configuration Server sequentially accesses all instances in the specified directories.

- If ICACHE_LOAD_TYPE=CHUNKY, the Configuration Server will attempt to load all of the CSDB classes that are specified in the MGR_CLASS section—but as individual entities.
  - **Component Classes**
    The Configuration Server uses the PACKAGE class in the current domain to control the loading of Component class instances—that is, all instances that are associated with a PACKAGE instance will get loaded into ICACHE, but orphan instances (those not associated with a PACKAGE instance) will not get loaded into ICACHE.
  - **Non-Component Classes**
    The Configuration Server uses a systematic approach to load the instances of instances of non-Component classes.

HP recommends the CHUNKY method for large databases because it minimizes the load on the network, thereby decreasing the likelihood of problems and the possibility of the database integrity being compromised.

- If a Configuration Server has a UNC connection (database path starts with \\) to the CSDB and the DMA count exceeds 300K instances, ICACHE_LOAD_TYPE=AUTOMATIC will choose the CHUNKY load method. See UNC Connectivity Issues on page 56.

Purging Dynamic Cache

This section provides precautionary information about purging the dynamic cache on a Configuration Server. It includes information about protection that HP has introduced in order avoid purging the CSDB when an HP Client Automation Proxy Server (Proxy Server) is co-located with the Configuration Server and dynamic cache is enabled.

HP recommends not using dynamic cache for a co-located Proxy Server.

If the dynamic cache root is a CSDB then, by default, this parameter (default=0) prevents automatic dynamic cache purging of aged files when the dynamic cache index is saved. By default, the new parameter automatically safeguards against purging dynamic cache files from a CSDB.

To remove the safeguard and allow a purge of shared resource, dynamic cache files, set the parameter to 1, as shown in the following example.

Example

```
-dynamic -allow -shared -resource -purge 1
```

MGR_CLASS

This section specifies which classes and instances will be cached during the initialization of the Configuration Server.

Table 13 MGR_CLASS Settings

Setting	Description
CLASS	Specifies which classes and instances will be cached at initialization.
	Format: DOMAIN.CLASS={VALUE1,VALUE2,VALUE3,VALUE4} Note: If multiple domains have identical class names, the class templates must be identical. If they are not, performance will be adversely impacted and objects, larger than necessary, might be created from the resolution process. *Cache_Class_Template_&_Base_Instance*, *Cache_All_Instances*, *Heap_Size*, *Max._Number_of_Heaps*.
	VALUE1 To cache (at Configuration Server startup) the _BASE_INSTANCE_ and class template of the associated class, specify **Y**. Otherwise, specify **N**.
	VALUE2 To cache (at Configuration Server startup) all instances in the associated class, specify **Y**. Otherwise, specify **N**.
	VALUE3 This value is numeric and represents the initial size of the resolved object for the associated class. This is the size that each heap in the associated DOMAIN.CLASS will occupy in persistent objects. It should include any attributes that have been classed into the in-storage object as the result of resolution. Typically, the size of the transient class instance can be used for transient objects (such as, ZLOCMGR, ZLOCCLNT, ZSCHEDULE). The default (**2048 bytes**) can be refined for the ZSERVICE and PACKAGE classes, which are typically 3–4 KB in size. Examine the HPCA agent object resulting from a representative resolution in order to determine the most appropriate value. Values specified are generally in 512-byte increments.

Setting	Description
	VALUE4 This is a numeric value that indicates an estimate of the number of heaps that are required for resolution. As each HPCA agent begins resolution, memory is allocated in blocks equal to the sum of all of the products of VALUE3*VALUE4. When memory is exhausted for a persistent class that is being cached, the next increment of storage is obtained in a block determined by the product of VALUE3*VALUE4 for the associated class. For example, if **`SOFTWARE.FILE = Y,Y,2048,100`** was specified, the class template and _BASE_INSTANCE_ are cached at startup. All of the instances of the SOFTWARE.FILE class are cached in memory (if there is enough room in CACHE_SEGMENTS*CACHE_SIZE for the whole class). The working value for the size of each FILE instance after resolution is estimated to be 2048 bytes. An initial allocation for the in-storage FILE object is made for 100 heaps that will require 100*2048 bytes (20 KB). If the resolution mode for the average HPCA agent requires 1000 FILE instances, then one initial allocation of 20 KB and nine subsequent allocations of 20 KB would be required to satisfy the entire 1000 FILE instance in-storage objects.

At startup, classes are cached in the order they appear if VALUE1=Y and VALUE2=Y.

Example

```
[MGR_CLASS]

SYSTEM.PROCESS     = Y,Y,2048,1
SYSTEM.ZMETHOD     = Y,Y,2048,1
SOFTWARE.FILE      = Y,N,4096,1
SOFTWARE.REGISTRY  = Y,Y,4096,1
SOFTWARE.DESKTOP   = Y,Y,2048,1
SOFTWARE.ZSERVICE  = Y,Y,3072,1
```

Table 14 MGR_CLASS Values

Setting	Value as Installed	Default Value
CLASS	N/A	N/A

Performance and Usage Considerations

- You can also specify your own unique classes in this section.
- Note that class instance size and number of instances specified in MGR_CLASS have an impact on storage and performance. A class instance size larger than the actual class size represents wasted storage. A class instance size smaller than the actual class size results in continual resolution performance degradation.
- Only the classes listed will be cached. All instances of listed classes are icached, if required, regardless of the values of the first two parameters in the list.

MGR_DB_VERIFY

This section establishes the level of CSDB verification and whether errors are automatically corrected.

If this function is configured, the Configuration Server will scan the CSDB for Y2K compliance, expanded format (ZBASE), and appropriate CSDB ownership (Configuration Server IDs) at startup.

If errors are found, the CSDB utility can be run against the CSDB to correct the error. See Configuration Server Database Utility starting on page 347 for more information.

Table 15 MGR_DB_VERIFY Settings

Setting	Description
DB_AUTOFIX	A YES/NO switch to determine if the CSDB should be automatically fixed (where possible) if errors are discovered. The default is **NO**.
VERIFY_DEPTH	Specifies the level of CSDB verification. The values are DOMAIN, CLASS, INSTANCE, and RESOURCE for this option. The default is **CLASS**. • If DOMAIN is selected, the verification process will verify down to the DOMAIN level. • If CLASS is selected, the verification process will verify down to the CLASS level. • If INSTANCE is selected, the verification process will verify down to the INSTANCE level. • If RESOURCE is selected, the verification process will verify the entire CSDB.

Example

```
[MGR_DB_VERIFY]

MGR_VERIFY_DEPTH   = CLASS

DB_AUTOFIX         = YES
```

Table 16 MGR_DB_VERIFY Values

Setting	Value as Installed	Default Value
VERIFY_DEPTH	N/A	CLASS
DB_AUTOFIX	N/A	NO

Performance and Usage Considerations

- A value of VERIFY_DEPTH=RESOURCE will result in longer startup times, as the level of detail is deeper. Conversely, VERIFY_DEPTH=CLASS will result in a much quicker startup time, because the level of verification is decreased.
- Refer to the MGR_ERROR_CONTROL section, which offers handling parameters for errors found during the CSDB verification process.

MGR_DIAGNOSTIC

This section establishes the values that the Configuration Server will use to verify that sufficient disk space is available for CSDB operations and logging, as well as the frequency of verification occurrences.

Table 17 MGR_DIAGNOSTIC Settings

Setting	Description
DIAGNOSTIC_INTERVAL	Interval (in seconds) for the diagnostic Configuration Server to verify that sufficient disk space is available for the CSDB and log. If set to 0, monitoring is disabled.
DIAGNOSTIC_MIN_DB_BYTES	The minimum number of bytes established for CSDB operations. The maximum value is 2 GB.
DIAGNOSTIC_MIN_LOG_BYTES	The minimum number of bytes established for logging operations. The maximum value is 2 GB.

Example

```
[MGR_DIAGNOSTIC]

DIAGNOSTIC_INTERVAL       = 900

DIAGNOSTIC_MIN_DB_BYTES   = 50

DIAGNOSTIC_MIN_LOG_BYTES  = 25
```

Table 18 MGR_DIAGNOSTIC Values

Setting	Value as Installed	Default Value
DIAGNOSTIC_INTERVAL	N/A	900
DIAGNOSTIC_MIN_DB_BYTES	N/A	50M
DIAGNOSTIC_MIN_LOG_BYTES	N/A	25M

Performance and Usage Considerations

- Include CMD_LINE=(zdiagmgr) in the MGR_ATTACH_LIST section in order to configure and use this setting.
- On a Configuration Server Database:

— When the DIAGNOSTIC_MIN_DB_BYTES threshold (2GB) is reached, the following will be issued:

  – an SNMP trap of 2040.

  – a message to the Configuration Server log:

    ```
    (9282 - Warning: The volume containing the Configuration
    Server Database has only %.0lf free bytes).
    ```

— When the DIAGNOSTIC_MIN_LOG_BYTES threshold (2GB) is reached, the following will be issued:

  – an SNMP trap of 2045.

  – a message to the Configuration Server log:

    ```
    (9283 - Warning: The volume containing the
    Configuration Server log has only %.0lf free bytes).
    ```

- On the Configuration Server, you can program a REXX that calls the EDMMAILQ method to send a notification e-mail.
- Set the following line in the MGR_MESSAGE_CONTROL section of the `edmprof` file,

  ```
  9282, 9283=LOG,EVENTLOG
  ```

  (This triggers messages 9282 and 9283 to be generated in the Configuration Server log and Windows Event Log.)

MGR_DIRECTORIES

This section specifies the path for the databases, REXX methods, and non-REXX methods. See MGR_LOG to specify the directory path for the Configuration Server log.

- The EXPORT_PATH setting can be used to define a directory for export operations.
- The five USER_PATH*n* settings can be customized for each Client Automation environment.

Table 19 MGR_DIRECTORIES Settings

Setting	Description
DBPATH	Fully qualified directory path for object databases.
EXPORT_PATH	Fully qualified directory path for EXPORT operations, accessible via REXX.
METHOD_PATH	Fully qualified directory path for non-REXX methods.
REXX_PATH	Fully qualified directory path for REXX methods.
USER_PATH1	Working directory to be used by users, accessible via REXX.
USER_PATH2	Working directory to be used by users, accessible via REXX.
USER_PATH3	Working directory to be used by users, accessible via REXX.
USER_PATH4	Working directory to be used by users, accessible via REXX.
USER_PATH5	Working directory to be used by users, accessible via REXX.

Examples

Windows Example:

```
[MGR_DIRECTORIES]

DBPATH        = D:/MGR/DB
EXPORT_PATH   = D:/MGR/BIN/EXPORT
METHOD_PATH   = D:/MGR/BIN
REXX_PATH     = D:/MGR/REXX
USER_PATH1    = D:/MGR/BIN/USER1
USER_PATH2    = D:/MGR/BIN/USER2
```

UNIX Example:

```
[MGR_DIRECTORIES]

DBPATH        = /opt/cmconfigurationserver/DB
EXPORT_PATH   = /opt/cmconfigurationserver/exe/export
METHOD_PATH   = /opt/cmconfigurationserver/exe
REXX_PATH     = /opt/cmconfigurationserver/rexx
USER_PATH1    = /opt/cmconfigurationserver/exe/user1
USER_PATH2    = /opt/cmconfigurationserver/exe/user2
```

Table 20 MGR_DIRECTORIES Values

Setting (REXX Name)	Value as Installed	Default Value
DBPATH	As specified during installation	*Current_directory*
EXPORT_PATH (EXPTPATH)	As specified during installation	*Current_directory*
METHOD_PATH	As specified during installation	*Current_directory*
REXX_PATH	As specified during installation	*Current_directory*
USER_PATH1 (USRPATH1)	As specified during installation	*Current_directory*
USER_PATH2 (USRPATH2)	As specified during installation	*Current_directory*
USER_PATH3 (USRPATH3)	As specified during installation	*Current_directory*
USER_PATH4 (USRPATH4)	As specified during installation	*Current_directory*
USER_PATH5 (USRPATH5)	As specified during installation	*Current_directory*

Performance and Usage Considerations

- The REXX directory specified in this section is further defined by the samples subdirectory, which contains a set of sample REXX methods.
- HP supports Universal Naming Code (UNC), which allows paths in the `edmprof` file to be specified as shown below:

```
\\VFH_LAPTOP\DRIVE_D\CMCSDB
```

When using UNC, the address must be preceded by two backslashes (****), with a single backslash (****) used to separate each subfolder.

UNC Connectivity Issues

Interruptions in UNC connectivity to a CSDB might result in critical database classes not being accessed during the resolution process. This failed access could lead to incomplete and erroneous resolution of Client Automation services and, possibly, the inadvertent removal of applications. If this happens, the following errors will appear in the Configuration Server log:

```
NVD7005E 06:19:52 <172.26.132.24  /1930>   Radia Client
--! ERROR:  CLASS    <PRIMARY.POLICY.USER> NOT FOUND

NVD7005E 06:19:52 <172.26.132.24  /1930>   Radia Client
--! ERROR:  CLASS    <PRIMARY.POLICY.ZBASE> NOT FOUND

ERROR:  CLASS <LICENSE.80d40ad0fd2a4ded8c9d26254e8daf0c
.MDEVICE> NOT FOUND

NVD5113E 02:25:17 <172.31.18.5     /668>   Radia Client
--! ERROR RC=<4>    CREATING INSTANCE<LICENSE.80d40ad0fd2
a4ded8c9d26254e8daf0c.MDEVICE.3B06A9B26C5047D886942D1E2EC4A46E
>
```

Also, during Configuration Server startup, the following will be seen in the Configuration Server log:

```
Configuration Server Database is on <Remote> <NTFS>
<Uncompressed> Drive    <\\example\RCSDB\>

NVD9268I 02:17:34 <ztoptask   /FB4>   System Task
--- Drive <\\example\RCSDB\> supports <255> character file
names

NVD9269I 02:17:34 <ztoptask   /FB4>   System Task
--- Drive  <\\example\RCSDB\> supports <Case-Sensitivity Case-
Preservation Unicode File-Compression>

NVD9271I 02:17:34 <ztoptask   /FB4>   System Task
--- Database resides in <\\example\RCSDB\DB\>
```

The UNC-mapped drive will be reflected in the DBPATH setting of the MGR_DIRECTORIES section in the `edmprof` file.

Recommended Preventive Measures

HP recommends, in addition to the preventive measures detailed here, that the Configuration Server be monitored—especially if UNC disconnects are frequently occurring.

HP recommends the following measures be taken in order to minimize the impact of UNC connectivity interruptions.

- At Configuration Server startup, cache all CSDB classes that are used for resolution.

  (See MGR_CACHE on page 42, and MGR_CLASS on page 47.)

- In the MGR_CACHE section of the `edmprof` file, type **`ICACHE_LOAD_TYPE=CHUNKY`**.

  (See MGR_CACHE on page 42.)

- In the CSDB ensure the following settings for the PRIMARY.SYSTEM.ZMETHOD.LDAP_RESOLVE method:
  - ZMTHTYPE (method type) is set to `REXX`
  - ZMTHNAME (method name) is set to `RADISH`

If policy resolution is being driven by a method other than LDAP_RESOLVE, and the configuration is uncertain, contact HP Technical Support before making any changes to the CSDB.

These settings will result in the HPCA agent connects and resolutions being stopped—preventing the HPCA agents from doing anything, thereby protecting them in the event they are presented an empty catalog. This also prevents the removal of applications.

MGR_DMA

This section specifies the timeout parameter and the directory path for the Distributed Configuration Server (formerly known as the Distributed Manager Adapter, DMA), and enables you to specify values for these options.

You must have the Distributed Configuration Server installed to enable these parameters.

Table 21 MGR_DMA Settings

Setting	Description
ADMIN_LIST	If SECURITY_METHOD is specified this setting is required. It defines the list of administrator user IDs that are allowed to do login. The format is comma-separated, no spaces, and case-sensitive. For EDMSIGNR, the user IDs must be defined in the Configuration Server's native security system.
DMA_TIMEOUT	Maximum interval (in seconds) that the Distributed Configuration Server will wait for tasks to complete before allowing a commit. A value of 0 means wait indefinitely.
DMA_STAGE_PATH	Path in which staging directories will be created.
SECURITY_METHOD	Name of the security method to be used to verify logins. (Optional) If Distributed Configuration Server security is wanted, the recommended value is EDMSIGNR. If not specified, no login is required.

Examples

Windows Example:

```
[MGR_DMA]

DMA_TIMEOUT     = 0

DMA_STAGE_PATH  = D:\MGR\
```

UNIX Example:

```
[MGR_DMA]

DMA_TIMEOUT     = 600
```

```
DMA_STAGE_PATH  = /radconfigsrvr/
```

Table 22 MGR_DMA Values

Setting	Value as Installed	Default Value
ADMIN_LIST	N/A	None
DMA_TIMEOUT	N/A	600
DMA_STAGE_PATH	N/A	ZTOPTASK Path
SECURITY_METHOD	N/A	None

Performance and Usage Considerations

- In order to decrease the chance of the Distributed Configuration Server synchronization timing out without having committed database updates, increase the value of DMA_TIMEOUT.

MGR_ERROR_CONTROL

This section specifies error-handling parameters for the Configuration Server.

Table 23 MGR_ERROR_CONTROL Settings

Setting	Description
DBERROR	Describes the type of error and the response. The format is: (*Error Type*) = (*Response*) Valid values for (Response) are: [SHUTDOWN, IGNORE], [NOEMAIL, EMAIL], [NOSNMP, SNMP]
UserEmailErrorsTo	E-mail address of the administrator to whom error messages should be sent.

The actions taken by the settings in this section depend on the levels specified for VERIFY_DEPTH and the errors discovered during MGR_DB_VERIFY processing.

Example

```
[MGR_ERROR_CONTROL]

DBERROR                 = IGNORE,EMAIL

UserEmailErrorsTo       = administrator@yourcompany.com
```

Table 24 MGR_ERROR_CONTROL Values

Setting	Value as Installed	Default Value
DBERROR	N/A	[SHUTDOWN] [NOEMAIL] [NOSNMP]
UserEmailErrorsTo	N/A	N/A

Performance and Usage Considerations

- Currently, the only DBERROR supported is DBError. Examples of DBErrors are instances with 0 length, attempting to load a template that does not exist, and so forth.
- The UserEmailErrorsTo value must be a valid e-mail address.

MGR_LOG

This section specifies the logging directory and logging options for the Configuration Server logging facility. It also provides detailed information about reclaiming dormant HPCA agent-device licenses.

Table 25 MGR_LOG Settings

Setting	Description
DIRECTORY	Fully qualified directory path where the Configuration Server log is written.
DISABLE_NT_ EVENT_LOGGING	If YES is specified, the Configuration Server logger will disable its Windows Event logging support. This means that messages sent to the Configuration Server log will not be sent to the Windows Event log even if EVENTLOG is specified in the section MGR_MESSAGE_CONTROL. If NO is specified, such messages will be echoed to the Windows Event log if EVENTLOG is specified in the MGR_MESSAGE_CONTROL section. Note: This parameter affects only the event logging of Configuration Server log messages. Some Windows Event log records are written without any corresponding Configuration Server log messages. *Windows only*.
DISABLE_SNMP _TRAP_LOGGING	If YES is specified, the Configuration Server logger will disable its SNMP trapping support. This means that messages sent to the Configuration Server log will not be sent to the primary SNMP Manager as traps, even if SNMPTRAP is specified in the section MGR_MESSAGE_CONTROL. If NO is specified, such messages will be sent to the SNMP Manager as traps, if SNMPTRAP is specified in the MGR_MESSAGE_CONTROL section. Note: This parameter affects only the trapping of Configuration Server log messages. Some SNMP traps are issued without any corresponding Configuration Server log messages.
FLUSH_SIZE	The number of bytes between automatic flushes of operating system buffers for Configuration Server log file.
MESSAGE_DATE	Allows insertion of the date into every line in the log. Values are JULIAN (YYYYDDD), GREGORIAN (DDMMYYYY), and ISO (YYYYMMDD).

Setting	Description
MESSAGE _DELIMITER	The left and right delimiters that are used for enclosing the task name and task ID in the Configuration Server log messages. The format is MESSAGE_DELIMITER=xy, where *x* is the left delimiter and *y* is the right delimiter. The options are: [ ], ( ), < >, and { }. The default is **[ ]**.
MESSAGE _PREFIX	The 3-digit, alphabetic, Configuration Server identifier that will precede Configuration Server log messages. Specify any 3-digit, alphabetic value. The default is NVD. Note: If you have log scrapers, verify that they work properly with the NVD setting. If not, change this to **RAD**.
MESSAGE _WIDTH	The maximum width (in bytes) of the messages in the Configuration Server log.
PIPE_SIZE	The maximum amount (in bytes) of log messages that can be queued by the Configuration Server logging facility while the log file is busy. When the value of PIPE_SIZE is reached, any task that issues a log message will freeze until the pipe starts emptying.
SWITCH_TOD	A time-of-day specification that will, each day, automatically trigger log switching (see Log Switching on page 65). The value must be 5 characters, expressed in base-24 time (00:00–23:59), with a colon separator, as in HH:MM. Notes: This is a scheduled event that causes the log to switch; it is independent of, and runs regardless of, any previous log-switching activity. This setting can be used to activate license reclamation using `ZLICUTIL.EXE`. For more information, see License Reclamation, on page 67. This setting is not part of the Configuration Server installation; it must be manually added. HP recommends that this be set to an off-peak, low-activity time.
THRESHOLD or THRESHHOLD (both accepted)	The maximum number of lines that will be written to the Configuration Server log before it is automatically switched to the next log. When the limit is reached, a new log file is created, regardless of SWITCH_TOD setting. Note: For a more detailed description of this setting and how it can be used for license reclamation, see Log Switching, on page 65.

Examples

Windows Example:

```
[MGR_LOG]
DIRECTORY           = D:\Program Files\Hewlett-Packard\HPCA\
                      ConfigurationServer\log
FLUSH_SIZE          = 100000
MESSAGE_DATE        = JULIAN
MESSAGE_DELIMITER   = []
MESSAGE_PREFIX      = NVD
MESSAGE_WIDTH       = 256
PIPE_SIZE           = 1000000
SWITCH_TOD          = 23:38
THRESHHOLD          = -5000000
```

UNIX Example:

```
[MGR_LOG]
DIRECTORY           = /opt/HP/HPCA/ConfigurationServer/log
FLUSH_SIZE          = 100000
MESSAGE_DATE        = ISO
MESSAGE_DELIMITER   = ()
MESSAGE_WIDTH       = 256
MESSAGE_PREFIX      = NVD
PIPE_SIZE           = 1000000
SWITCH_TOD          = 23:38
THRESHHOLD          = -5000000
```

Table 26 MGR_LOG Values

Setting	Value as Installed	Default Value	Minimum Value
DIRECTORY	`Program Files\ Hewlett-Packard\ CM\Configuration Server\log` `HP/CM/Configurati onServer/log`	*`Current_directory`* `Program Files\ Hewlett-Packard\ CM\Configuration Server\log` `HP/CM/Configurati onServer/log`	N/A
DISABLE_NT _EVENT_LOGGING	Varies across platforms.	NO	N/A
DISABLE_SNMP _TRAP_LOGGING	Varies across platforms.	NO	N/A
FLUSH_SIZE	1000 bytes	5000 bytes	1
MESSAGE_DATE	N/A	N/A	N/A
MESSAGE _DELIMITER	N/A	[ ]	N/A
MESSAGE_PREFIX	NVD	NVD	N/A
MESSAGE_WIDTH	256	90	80
PIPE_SIZE	1000000 bytes	1 MB	1 MB
SWITCH_TOD	N/A	N/A	N/A
THRESHOLD	-5000000 lines	100000 lines	1

Performance and Usage Considerations

- Increasing the FLUSH_SIZE will enhance performance, but will delay messages flushed to the log file.
- Increase MESSAGE_WIDTH if log messages are being truncated.
- When closely monitoring system status using the Configuration Server log, set THRESHOLD to a positive value to create and save successive portions of the Configuration Server log. If disk storage space is critical, set the value to a negative number in order to reuse the allocated log disk space.
- If numerous Configuration Server methods are being invoked, use the MGR_METHODS.LOG_LIMIT setting to control the size of the Configuration Server log for each method. Additionally, the

MGR_TASK_LIMIT.TASK_LOG_LIM setting controls the number of messages printed by the execution of each task.

- When modifying parameters in this section as they relate to memory or disk utilization, take care not to exceed the maximum amount of memory or storage space available.

Log Switching

By default, the Configuration Server log will be switched according to the log size value of THRESHOLD and the amount of Configuration Server activity. However, log switching can be configured to automatically occur on a daily basis, at a scheduled time. This is done by specifying the SWITCH_TOD setting and modifying the THRESHOLD setting. THRESHOLD can also dictate what happens to the log that gets rolled over. These sections describe how to do this.

SWITCH_TOD

Specify the time-of-day for the Configuration Server log to automatically roll over. This setting is independent of THRESHOLD, but can be used with it to trigger either of two REXX methods (`ZLOGSWCH.REX` or `ZLOGWRAP.REX`) to launch the user-implemented license-reclamation utility, ZLICUTIL, as described on page 67 in the section, License Reclamation.

THRESHOLD

This setting determines how large the Configuration Server log can be before it is switched to a new log. The value of this setting will dictate what happens to the log that is rolled out, as described in this section.

- If THRESHOLD ≥ 0, the old log will be renamed and saved, and the Configuration Server REXX method, ZLOGSWCH, will run.

  The Configuration Server's log directory (`ConfigurationServer\log`) will have multiple log files whose names conform to the following operating system-specific conventions.

  ISO is the International Standards Organization.

  Configuration Server ID is the value of the `edmprof` file's setting MGR_STARTUP.MGR_NAME.

  Windows

  — The *standard* log naming format is the Configuration Server log prefix (nvd), followed by the letter **r**, and the Configuration Server ID:

```
nvdmr001.log
```

— The *log switch* format is the **r** replaced by an **s**, followed by the Configuration Server ID, and the ISO-formatted date and time (each preceded by an underscore) appended:

```
nvdms001_20050427_075835.log
```

UNIX

— The *standard* log naming format is the Configuration Server log prefix (nvd), followed by the Configuration Server ID, an underscore, and the manager designation:

```
nvd001_manager.log
```

— The *log switch* format is an **s** added to the prefix, followed by the manager designation, and the ISO-formatted date and time (each preceded by an underscore) appended:

```
nvds001_manager_20050427_083357.log
```

This THRESHOLD setting will result in multiple Configuration Server log files. To differentiate between them, check the date on which they were modified.

HP recommends this setting because it results in saved, rather than deleted, log files.

- If THRESHOLD < 0, the old log will be overwritten (but not deleted), and the Configuration Server REXX method, ZLOGWRAP, will run.

  The Configuration Server log directory will have just one old log file whose name conforms to the following operating system-specific conventions.

ISO is the International Standards Organization.

Configuration Server ID is the value of the `edmprof` file's setting MGR_STARTUP.MGR_NAME.

Windows

— The *standard* log naming format is the Configuration Server log prefix (nvd), followed by the letter **r**, and the Configuration Server ID:

```
nvdmr001.log
```

— The *log wrap* (dump) format is the **r** replaced by a **d**:

```
nvdmd001.log
```

UNIX

— The *standard* log naming format is the Configuration Server log prefix (nvd), followed by the Configuration Server ID, an underscore, and the manager designation:

```
nvd001_manager.log
```

— The *log wrap* (dump) format sees the manager designation being replaced by mgrdump:

```
nvd001_mgrdump.log
```

At the next log switch, the previous log (from the last wrap) will be replaced/overlaid by the newly switched log.

ZLICUTIL

The Configuration Server REXX utility, ZLICUTIL, can be used with ZLOGSWCH and ZLOGWRAP for daily license reclamation. For more information, see License Reclamation below.

License Reclamation

A Configuration Server license string supports a certain number of HPCA agent devices. To keep only active, current devices in a license count, the Configuration Server allows the reclamation of HPCA agent-device licenses. If an HPCA agent device hasn't connected to the Configuration Server for a specified number of days, its license becomes inactive and can be reclaimed in the license count by the Configuration Server utility, ZLICUTIL.

Considerations

- By default, license reclamation occurs only at Configuration Server shutdown.
- To make license reclamation occur daily:
  - Specify values for SWITCH_TOD and THRESHOLD (see SWITCH_TOD and THRESHOLD in Table 25 on page 61).
  - Modify the appropriate REXX (either ZLOGSWCH or ZLOGWRAP) so that a log-switching REXX method will launch the license utility, ZLICUTIL, when it gets called.
- Licenses that are aged out via ZLICUTIL are not immediately available. They are reclaimed only at the next midnight.

The exception to this condition is that aged-out licenses will be immediately available when the Configuration Server is restarted.

The following instructions detail how to implement license reclamation on a Configuration Server.

To reclaim licenses daily

1 Add the log switch setting, SWITCH_TOD, to the MGR_LOG section of the `edmprof` file, and specify a valid value (see SWITCH_TOD in Table 25 on page 61), such as:

```
[MGR_LOG]
SWITCH_TOD = 23:45
```

2 Specify a value for THRESHOLD, as described on page 62.

3 Navigate to the directory in which the Configuration Server methods reside, such as either:

```
System Drive:\Program Files\Hewlett-Packard\CM\
ConfigurationServer\rexx\NOVADIGM
```

or

```
/opt/HP/CM/ConfigurationServer/rexx/NOVADIGM
```

and copy either ZLOGSWCH or ZLOGWRAP (or both) up one level to the `rexx` directory.

During the Configuration Server installation, the REXX methods are, by default, installed to the platform-specific directories that are listed in step 3.

Before making changes to either ZLOGSWCH or ZLOGWRAP, be sure to copy it up one level to the `rexx` directory

4 Open the ZLOGSWCH (or ZLOGWRAP) file, and add the commands shown here:

```
call edmget zcvt

ADDRESS CMD "ZLICUTIL" zcvt.dbpath zcvt.rptpath
zcvt.uuid zcvt.mgrid zcvt.syspath || license.nvd
```

See the section, Configuration Server Running as a Windows Service on page 69, for Windows-specific configuration information.

5 Save and close ZLOGSWCH (or ZLOGWRAP).

From this point on, the license reclamation feature will be started asynchronously when the log switch is invoked.

Configuration Server Running as a Windows Service

This section describes the changes that are necessary if the Configuration Server is running as a service on a Windows machine.

This information is relevant *only* if the Configuration Server is configured as a Windows service; if it is not, this information is not applicable.

The directory in which Windows always first looks for its "service" programs is `Windows\system32`. Therefore, in order for a program to be run as a service, it must be located here; if it is not, it won't be found by Windows—or Windows has to be instructed to look elsewhere.

Even though the Configuration Server might be set up to run as a Windows service, it probably isn't in this directory—rather, it is likely in the directory that was specified during the installation (the default of which is *`System Drive`*`:\Program Files\Hewlett-Packard\CM\ConfigurationServer`). Therefore, Windows has to be told where to find the program files. Instructions for doing this are in the following section.

Directing Windows to the Configuration Server Program Files

To resolve the issue of Windows not being able to find the Configuration Server files, make the following changes to the ZLOGSWCH (or ZLOGWRAP) REXX method.

1. Specify the *fully qualified path name* of the directory in which ZLICUTIL resides so that Windows will know where to look. (See the example that follows.)
2. Add a fifth argument—the *fully qualified path name* of the directory in which the file `license.nvd` resides.

Examples

Original ZLOGSWCH (or ZLOGWRAP) REXX method command:

```
ADDRESS CMD "START ZLICUTIL" zcvt.dbpath "System Drive:
\Program Files\Hewlett-Packard\CM\ConfigurationServer\log"
"05c87c3e95194a9d9251fee5cbfddafb" zcvt.mgrid
```

Revised ZLOGSWCH (or ZLOGWRAP) REXX method command:

```
ADDRESS CMD "START FULLY_QUALIFIED_BIN_PATH\ZLICUTIL.EXE"
zcvt.dbpath "System Drive:\Program Files\Hewlett-Packard\CM
\ConfigurationServer\log" "05c87c3e95194a9d9251fee5cbfddafb"
zcvt.mgrid "FULLY_QUALIFIED_BIN_PATH\LICENSE.NVD"
```

MGR_MESSAGE_CONTROL

This section specifies which log messages are to be sent and to where, or if they are to be suppressed.

Table 27 MGR_MESSAGE_CONTROL Settings

Setting	Description
nnnnn = (*Destination*)	(*Message_Number*) = (*Message_Destination*)

The left side of the equals sign (=) specifies which messages are to be affected by the command. There is an "ALL" directive that can be used to affect all messages (0001-9999). Also, if there is no destination after the equals sign, the message has no associated destination, so it is suppressed.

The following table presents a list of the six destinations for log messages.

Table 28 MGR_MESSAGE_CONTROL Log Message Destinations

Destination	Description
EVENTLOG	Write log messages to the Windows Event log. (*Windows only*)
LOG	Write log messages to the Configuration Server log.
REXX	Write log messages to a pre-determined REXX (named MGRLOG). Important: MGRLOG is not an existing REXX, and therefore, must be created in order to use this facility. Note: The MGRLOG REXX will receive the message number and the message text as its first and second input parameters. You can then process the information in whatever manner you chose.
SNMPTRAP	Write log messages as traps to the current SNMP Manager.
USERLOG	Write log messages to the user log. Note: You must first activate the user log feature in the MGR_USERLOG section of the `edmprof` file, by specifying ACTIVATE=YES.

Example

```
[MGR_MESSAGE_CONTROL]

ALL                              = SNMPTRAP
```

```
500                              =
520-600                          = LOG
225, 300                         =
220-299, 400, 542-545, 803       = EVENTLOG,REXX,USERLOG
```

In this example:

- The first line will send all messages to the SNMP Manager as traps.

  Keep in mind that this means that no messages will be written to the Configuration Server log; all messages will go out as SNMP traps only, unless subsequent entries specifically override this.

- The second line will cause message 500 to be suppressed—that is, it will not be written to the Configuration Server log.
- The third line will cause messages 520 through 600 (inclusive) to be written to the Configuration Server log.
- The fourth line will suppress messages 225 and 300 only; all others will be written to the Configuration Server log.
- The fifth line will cause messages 220 through 299 (inclusive), 400, 542 through 545 (inclusive), and 803 to be written to the Windows Event log, the pre-determined REXX, and the user log.

Table 29 MGR_MESSAGE_CONTROL Values

Setting	Value as Installed	Default Value
nnnnn = (*Destination*)	N/A	ALL=LOG

Performance and Usage Considerations

- SNMPTRAP should be used as a destination only if the address of the SNMP Manager has been configured in the SNMP section.
- Any line that does not contain an equals sign (=) is treated as a comment. In addition, lines that begin with an asterisk (*), double forward slashes (//), or a slash (/) are treated as comments. Blanks and tabs can occur anywhere on the line, even ahead of the comment specifications.
- ALL = will suppress all messages.
- Any errors encountered in parsing a line cause the entire line to be ignored and an error message to be written to STDERR.

MGR_METHODS

This section specifies options for method execution.

Table 30 MGR_METHODS Settings

Setting	Description
LOG_LIMIT	Maximum number of messages that a method can issue to the Configuration Server log. When this limit is reached, a message will be written stating that the message limit has been reached and that all other messages from the method will be ignored.
TIMEOUT	The duration (in seconds) that a Configuration Server will wait for a response from a method that is running. After this interval, if no response is received, the Configuration Server will terminate the method.

Example

```
[MGR_METHODS]
LOG_LIMIT                                = 0
TIMEOUT                                  = 300
```

Table 31 MGR_METHODS Value

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
LOG_LIMIT	0	0 = No Limit	0	2,147,483,647
TIMEOUT	300 (seconds)	60 (seconds)	0	32000

Performance and Usage Considerations

- The number of messages generated by the execution of a method is also affected by the TASK_LOG_LIM setting in MGR_TASK_LIMIT.
- Tune system resource usage with the TIMEOUT setting. If system resources are critical, lower the TIMEOUT setting to free up unused processing cycles.
- When the TIMEOUT value is reached, the method is terminated and messages are written to the Configuration Server log.
- If the TIMEOUT=0, the method will continue in effect until its conclusion.

MGR_NOTIFY

This section specifies the defaults for the Configuration Server's HPCA agent notification.

Table 32 MGR_NOTIFY Settings

Setting	Description
ISSUE_WAKE_ON_LAN	Enables support for TCP Wake-On-LAN.
NFY_RETRY	Number of times to attempt re-notification after initial, unsuccessful attempt.
NFYT_TIMEOUT	Notify timeout (in seconds) for TCP/IP HPCA agents.
RECOVERY_DOMAIN	The Domain that the Retry Manager will access in order to reinitiate notifies after the Configuration Server has prematurely shut down.
SUBNET_MASK	This value is used to convert a destination IP address into a subnet address for EDMWAKE. Note: Applicable only to version 4.3 CM Configuration Server, with Service Pack 2.
WAKE_ON_LAN_TTL	This value is the number of routers that the WOL broadcast is allowed to pass. The default is **99**. Note: Before establishing this value, consult your network administrator.

Example

```
[MGR_NOTIFY]

NFYT_TIMEOUT          = 120

NFY_RETRY             = 5

SUBNET_MASK           = 255.255.0.0

ISSUE_WAKE_ON_LAN     = YES

RECOVERY_DOMAIN       = ALL

WAKE_ON_LAN_TTL       = 99
```

In some network addressing schemes, a class A IP address is used with a class B or class C subnet mask. This often results in problems, caused by parameters passed by a Configuration Server while trying to invoke EDMWAKE. If specified, the SUBNET_MASK parameter will cause the Notify Manager to use this mask from the `edmprof` file, rather than generate the subnet mask according to the network type.

For example, if the notify for IP address, 10.241.5.5 failed, EDMWAKE will be issued for subnet address, 10.241.255.255.

Table 33 MGR_NOTIFY Values

Setting	Value as Installed	Default Value	Value Range
ISSUE_WAKE_ON_LAN	N/A	NO	YES/NO
NFY_RETRY	N/A	0	32000
NFYT_TIMEOUT	120 seconds	0	32000
RECOVERY_DOMAIN	N/A	ALL	RETRY/ALL
SUBNET_MASK	N/A	N/A	N/A
WAKE_ON_LAN_TTL	99	99	99

Performance and Usage Considerations

- Establish MGR_NOTIFY settings based on network operations parameters.
- The MGR_NOTIFY settings should be coordinated with values in the MGR_RETRY and MGR_TASK_LIMIT sections.
- In order for the Wake-On-LAN Notify function to operate, and to allow the retrying of failed operations, zrtrymgr must be specified under MGR_ATTACH_LIST.

MGR_OBJECT_RESOLUTION

This section specifies the parameters to use during object resolution.

Table 34 MGR_OBJECT_RESOLUTION Settings

Setting	Description
ALLOW_DUPLICATE_INSTANCES	Allow or disallow duplicate instances to be used during object resolution. Values are YES and NO.
ALWAYS_CALL_ZADMIN	Force object resolution to call the ZADMIN method to process the ZADMIN object. Values are YES and NO.
ZERRORM_MAX_ERRORS	Maximum number of errors associated with a ZERRORM event.
ZERRORM_MAX_WARNINGS	Maximum number of warnings associated with a ZERRORM event.

Example

```
[MGR_OBJECT_RESOLUTION]

ALWAYS_CALL_ZADMIN             = YES

ZERRORM_MAX_WARNINGS           = 50

ZERRORM_MAX_ERRORS             = 50

ALLOW_DUPLICATE_INSTANCES      = YES
```

Table 35 MGR_OBJECT_RESOLUTION Values

Setting	Value as Installed	Default Value
ALWAYS_CALL_ZADMIN	YES	NO
ALLOW_DUPLICATE_INSTANCES	N/A	YES
ZERRORM_MAX_WARNINGS	N/A	50
ZERRORM_MAX_ERRORS	N/A	50

Performance and Usage Considerations

- ALLOW_DUPLICATE_INSTANCES=NO will cause the Configuration Server to eliminate duplicate services at resolution. This might result in the elimination of duplicate SOFTWARE.FILE instances on the HPCA

agent. As the size of the SOFTWARE.FILE object grows, the resolution time will increase.

- HP recommends that you do not modify or remove ALWAYS_CALL_ZADMIN, as doing so might prohibit administrator type functions.

MGR_POLICY

This section specifies the IP address/name and port of the HP Client Automation Policy Server (Policy Server), if it has been enabled.

This section will be present only if the Policy Server option was selected during the Configuration Server installation.

Table 36 MGR_POLICY Settings

Setting	Description
HTTP_HOST	The IP address of the Policy Server. If the Policy Server is co-located with the Configuration Server, specify **`localhost`**.
HTTP_PORT	The port of the Policy Server. The default is **3466**.

Example

```
[MGR_POLICY]
HTTP_HOST  = localhost
HTTP_PORT  = 3466
```

Table 37 MGR_POLICY Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
HTTP_HOST	None	N/A	N/A	N/A
HTTP_PORT	N/A	3466	N/A	N/A

MGR_POOLS

This section of the `edmprof` file is specific to Windows operating systems.

This section allows you to specify allocations (pools) of memory in different sizes, prior to Configuration Server startup. These allocations can be changed dynamically while the Configuration Server is running by using modify commands. In addition, you can establish percentage-of-waste tolerances (the amount of memory that is not used by a specific requirement) for each of the allocations.

You can establish pools of any size. The pool sizes specified, however, should be multiples of eight. If not, they will be rounded up to the next multiple of eight by the system. Likewise, you can specify any number of pools.

The sizes and number of pools you establish, as well as the percentage of waste tolerated, should be based on the workload and operating requirements of your environment.

When the Configuration Server requires memory, the pools are searched from smallest to largest until a pool is found in which the memory requirement fits. When that pool is found, the first item on the free list is used to resolve the request—providing that the percent of space wasted is not above the value specified for that pool. If there is no item on the free list, then the memory allocation is redirected to the standard C heap. If the C heap is also exhausted, a host system native-storage request will be performed to satisfy the memory request.

The format for specific pool allocation is:

(Pool Size) = (number of elements for that pool size),
(specific percentage of waste tolerated),(expansion increments).

The specific percentage of waste tolerated parameter is optional. The expansion increments default is **1**.

Table 38 MGR_POOLS Settings

Setting	Description
WASTE_TOLERATED	The general percentage of waste that will be tolerated to fit a specific requirement to an available pool. The default is **100** (%).

Setting	Description
ALLOCATION_SIZE _ERROR_THRESHOLD	Deny memory allocations above this size.
ALLOCATION_SIZE_ REPORTING_THRESHOLD	Report memory allocations above this size.
XXXXXX	The allocation for the *XXXXXX* byte pool. Any reasonable number of these can be specified.

By default, the MGR_POOLS section establishes the pool sizes shown in the example below.

Example

```
[MGR_POOLS]

WASTE_TOLERATED                        = 100
ALLOCATION_SIZE_ERROR_THRESHOLD        = 4194304
ALLOCATION_SIZE_REPORTING_THRESHOLD    = 65536
168                                    = 150
296                                    = 50
552                                    = 20
1064                                   = 10
2100                                   = 5000
2700                                   = 100
4136                                   = 4
8232                                   = 2
12500                                  = 2
```

Table 39 MGR_POOLS Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
WASTE_TOLERATED	100	100 (%)	0	100 (%)
ALLOCATION_SIZE _ERROR_THRESHOLD	4 MB	4 MB	0 (disabled)	2 GB
ALLOCATION_SIZE_ REPORTING_THRESHOLD	64 KB	64 KB	0 (disabled)	2 GB

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
XXXXXX	N/A	(See Table 38 on page 79)	0	32767

Performance and Usage Considerations

- Provisions should be made for pools that are the product of the MGR_CLASS section of the STARTUP member, as requests for these memory elements will automatically occur at the initiation of resolution (generally, the receipt of the ZMASTER object). Special attention should be given to the pools that will be identified by the product of the third and fourth values specified in MGR_CLASS, as in Y,N,3072,500 for the MGR_CLASS entry for SOFTWARE.FILE.
- The product of the third and fourth values of this is a value exactly equal to 1.5 MB, and one of these will be allocated at the initiation of each resolution. Additional storage is required for storage management of these queues, so a storage pool of elements size (3072) * (500) + 500 = 1536500 should be created. The number of elements to assign to this pool is dependent on the MGR_TASK_LIMIT values specified (for example, one element for each concurrent task), and the number of SOFTWARE.FILE instances resolved for each HPCA agent.
- When using the Distributed Configuration Server, the default setting of ALLOCATION_SIZE_ERROR_THRESHOLD must be changed in order to prevent a destination CSDB being only partially updated. If the Distributed Configuration Server transfers a resource file that is larger than the default (4 MB), and the setting has not been changed, the 'commit' operation will halt, leaving the destination CSDB only partially updated. See the examples below for completing this:
  - If you use memory pooling, set ALLOCATION_SIZE_ERROR_THRESHOLD to zero, as below:

    ```
    [MGR_POOLS]
    ALLOCATION_SIZE_ERROR_THRESHOLD = 0
    ```

    Here, 0 will disable the memory allocation limit.
  - If the MGR_POOLS section does not exist in the `edmprof` file, there are no issues and no changes are required.

Table 40 Pool Values

Size	64	400	632	2048	4120	6504	8200	12000

Number	100	100	100	60	60	30	15	20
Waste %	100	100	100	100	100	89	65	75
InUse	21	2	12	0	0	0	1	0
HighWM	21	15	12	1	1	0	1	4
Allocs	30	656	19	1	5	0	1	218
Empty	0	0	0	0	0	0	0	0
Waste	0	0	0	0	0	0	0	0

- **Size** is the size of the elements of the pool.
- **Number** is the number of elements currently in the pool.
- **Waste %** is the percentage of waste tolerated at storage element allocation time.
- **InUse** is the number of elements that were in use when the stats call was made.
- **HighWM** is the high watermark that shows the maximum number of elements that have been allocated at any one time since startup or a clear command.
- **Allocs** is the total number of elements that were allocated since startup or since the last clear command on that pool.
- **Empty** is the number of times we failed to get an element because there were no free elements available.
- **Waste** is the number of times we failed to get an element because the waste was higher than the tolerated waste percent.

In the example in Table 40 on page 81, the pools of 64, 400, 632, 2048, and 4120 do not have a specified waste tolerance. This is because these pool sizes are so small that the waste in them will not be an issue.

There is a DISABLE command that looks like:

```
F  jobname,DISABLE,2048
```

or just:

```
F  jobname,D,2048
```

This would disable pool 2048, that is, it would prevent new allocations from using that pool. Allocations between 633 and 4120 bytes would then come from the 4120 pool, provided the tolerated waste percentage is met.

A disabled pool will show up on the command with a “D” after the size. A disabled pool can be re-enabled with the ENABLE command, as follows:

```
F  jobname,E,2048
```

The pool counts can be cleared with the CLEAR command:

```
F  jobname,C,2048
```

Note: The HighWM, Allocs, Empty, and Waste counters are cleared by the above command.

Lastly, there is an ADJUST command, which looks like:

```
F  jobname,A,2048,80,95
```

This command would add 20 free elements to the 2048 pool (60 + 20 = 80) and would set its waste tolerated percentage to 95. The last parameter (percentage of waste tolerated) is optional. The “A” denoting the ADJUST subcommand can be replaced with ADJUST, ADJUS, ADJU, ADJ, or AD. The Enable, Disable, and Clear commands can also be specified in a longer form.

If you use the ADJUST command to set the number of elements to 0, then the pool is completely deleted if all the elements can be freed. However, the pool count will not go to 0 as long as there are allocated elements. New pools can be added on the fly with the ADJUST command.

Finally, storage trace (STORAGE=YES) can be used to produce a message in the log each time a storage allocation is made and freed. This can be used to tune the pool, and to understand the Configuration Server’s use of dynamic memory.

MGR_RESOLUTION_FILTERS

This section defines filtering rules for resolution, based on connection type.

This section is not included in the `edmprof` file at installation—it must be manually added.

Table 41 MGR_RESOLUTION_FILTERS Settings

Setting	Description
DOMAIN.CLASS	Specify the domain and class of the CSDB for which to define filtering rules for resolution.

Valid values for MGR_RESOLUTION_FILTERS are:

- RADIA – Allow Client Automation resolution only.
- EDM – Allow EDM resolution only.
- ANY – Allow all resolutions. (This is the default.)

Example

```
[MGR_RESOLUTION_FILTERS]

SOFTWARE.ZSERVICE   = RADIA

SYSTEMX.ZSERVICE    = EDM

SYSTEMX.ZRSOURCE    = EDM

POLICY.WORKGROUP    = RADIA

POLICY.*            = RADIA
```

Table 42 MGR_RESOLUTION_FILTERS Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
DOMAIN.CLASS	N/A	N/A	N/A	N/A

Performance and Usage Considerations

- CLASS can be specified as a valid CSDB class, or with a wildcard (*) to specify all classes in a domain.

MGR_RETRY

This section specifies how soon (in minutes) an HPCA agent can attempt another connection to the Configuration Server, after being rejected due to an exceeded task limit or a disabled connection.

Table 43 MGR_RETRY Settings

Setting	Description
BUSY_RETRY	Number of minutes for an HPCA agent to wait before reconnecting when the Configuration Server is at its task limit (TASK_LIMIT).
DISA_RETRY	Number of minutes for an HPCA agent to wait before reconnecting when the Configuration Server has logons halted.

Example

```
[MGR_RETRY]

BUSY_RETRY  = 1

DISA_RETRY  = 999
```

HP recommends values of at least 1 for these settings in order to avoid unnecessarily tying up the Configuration Server.

Table 44 MGR_RETRY Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
BUSY_RETRY	7 minutes	0 (allow connect now)	0 (allow connect now)	999 (do not retry)
DISA_RETRY	999 (do not retry)	999 (do not retry)	0 (allow connect now)	999 (do not retry)

Performance and Usage Considerations

- You can raise these values if processing resources are critical. Lowering these values will provide greater assurance that connections will be re-established if broken during HPCA agent connects.

- The MGR_RETRY settings should be coordinated with values in the MGR_NOTIFY and MGR_TASK_LIMIT sections.

MGR_RIM

This section specifies the IP address/name and port of the HP Client Automation Inventory Manager (Inventory Manager) if it has been enabled.

This section will be present only if the Inventory Manager option was selected during the Configuration Server installation.

Table 45 MGR_RIM Settings

Setting	Description
HTTP_HOST	The IP address of the Inventory Manager. If the Inventory Manager is co-located with the Configuration Server, specify **`localhost`**.
HTTP_PORT	The port of the Inventory Manager. The default is **3466**.

Example

```
[MGR_RIM]
HTTP_HOST = localhost
HTTP_PORT = 3466
```

Table 46 MGR_RIM Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
HTTP_HOST	None	N/A	N/A	N/A
HTTP_PORT	N/A	3466	N/A	N/A

MGR_RMP

This section specifies the IP address/name and port of the HP Client Automation Portal (Portal), if it has been enabled.

This section will be present only if the Portal option was selected during the Configuration Server installation.

Table 47 MGR_RMP Settings

Setting	Description
HTTP_HOST	The IP address of the Portal. If the Portal is co-located with the Configuration Server, specify **`localhost`**.
HTTP_PORT	The port of the Portal. The default is **3466**.

Example

```
[MGR_RMP]
HTTP_HOST = localhost
HTTP_PORT = 3466
```

Table 48 MGR_RMP Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
HTTP_HOST	None	N/A	N/A	N/A
HTTP_PORT	N/A	3466	N/A	N/A

MGR_ROM

This section specifies the IP address/name and port of the HP Client Automation Information Base, if it has been enabled.

Table 49 MGR_ROM Settings

Setting	Description
DSML_HOST	The IP address of the Information Base. If the Information Base is co-located with the Configuration Server, specify **`localhost`**.
DSML_PORT	The port of the Information Base. The default is **3468**.
BASEDN	The domain name of the root for the computer class.

Example

```
[MGR_ROM]
DSML_HOST = localhost
DSML_PORT = 3468
BASEDN    = cn=machine
```

Table 50 MGR_ROM Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
HTTP_HOST	None	N/A	N/A	N/A
HTTP_PORT	N/A	3468	N/A	N/A
BASEDN	N/A	N/A	N/A	N/A

MGR_SMTP_MAIL

This section specifies SMTP-related parameters, including the ID of the Configuration Server and the TCP port number of the Configuration Server to be used.

Table 51 MGR_SMTP_MAIL Settings

Setting	Description
DNS_SERVER	The Domain Name Service (**DNS**) server that is used to query the mail server address. Note: Specify a value for this setting to ensure that mail is delivered.
MAIL_DIR	Directory to spool and queue outgoing mail from the SMTP send Manager.
MAIL_TIMEOUT	Timeout interval (in seconds) for establishing communications with the mail server.
MAX_TIME_IN_SPOOL	The interval (in minutes) to wait before deleting undelivered mail in the spool. The default is **4320** minutes (3 days).
MGR_MAIL_ID	The mail ID for the Configuration Server. This setting takes the form of a fully qualified address (for example, **`ConfigServer@HP.com`**) and has a maximum length of 255 bytes. The mail-receiving Configuration Server will reject mail that is addressed to any other user ID.
RETRY_INTERVAL	The interval (in seconds) to wait before re-attempting to deliver mail in the spool. The default is **300** seconds (5 minutes).
SMTP_PORT	The port on which the Configuration Server's SNMP Manager *send* and *receive* tasks (ZSMTSMGR and ZSMTRMGR, respectively) will listen for incoming mail.

Examples

Windows Example:

```
[MGR_SMTP_MAIL]

DNS_SERVER          = 192.168.1.20

MAIL_DIR            = D:\MGR\MAIL

MAIL_TIMEOUT        = 60
```

```
MAX_TIME_IN_SPOOL   = 4320
MGR_MAIL_ID         = ConfigServer@HP.com
RETRY_INTERVAL      = 300
SMTP_PORT           = 25
```

UNIX Example:

```
[MGR_SMTP_MAIL]
DNS_SERVER          = 192.168.1.20
MAIL_DIR            = /opt/cmconfigsrvr/MAIL
MAIL_TIMEOUT        = 60
MAX_TIME_IN_SPOOL   = 4320
MGR_MAIL_ID         = config_server@hp.com
RETRY_INTERVAL      = 300
SMTP_PORT           = 25
```

Table 52 MGR_SMTP_MAIL Values

Setting	Value as Installed	Default Value
DNS_SERVER	N/A	NONE
MAIL_DIR	as specified during installation	*current_directory*
MAIL_TIMEOUT	N/A	60
MAX_TIME_IN_SPOOL	4320 minutes (3 days)	4320 minutes (3 days)
MGR_MAIL_ID	as specified during installation	*sending_address*
RETRY_INTERVAL	300 seconds (5 minutes)	300 seconds (5 minutes)
SMTP_PORT	as specified during installation	25

Performance and Usage Considerations

- If storage capacity is an issue, decrease the MAX_TIME_IN_SPOOL value. This will decrease the length of time messages are retained.
- Increase the RETRY_INTERVAL value to use fewer system processing resources.
- DNS_SERVER: For cross-platform compatibility, operating system network settings for DNS servers are not used by the Configuration Server mail delivery. Therefore, in order to ensure delivery of all e-mail

(including license warning messages) that are sent by the Configuration Server, DNS_SERVER must be defined.

MGR_SNMP

This section contains SNMP-related parameters that include where SNMP traps are to be sent and how to control the behavior of the built-in SNMP agent.

Table 53 MGR_SNMP Settings

Setting	Description
RUN_AS_EXTENSION	• If YES, the Windows SNMP service is the primary SNMP agent, and HP SNMP transactions are processed by a HP SNMP extension DLL. If so, SNMP_PORT and SNMP_IP_ADDR are not used because SNMP port access is handled by the Windows SNMP service. The value of SNMP_COMMUNITY will be used for insertion into traps that are issued by the Configuration Server, but will not be used to authenticate GET and SET commands. • If NO, the Configuration Server will act as the primary SNMP agent, and SNMP_COMMUNITY should be specified, while SNMP_IP_ADDR and SNMP_PORT can be specified to override their defaults.
SNMP_COMMUNITY	This is a password that incoming SNMP transactions must match. It should be set to a character string. The string will be used as the SNMP community name by the agent. The default is **public**. Note: This keyword is effective only if **`RUN_AS_EXTENSION=NO`**.
SNMP_IP_ADDR	The TCP/IP address of the local network adapter card on which the agent is to receive SNMP transactions. The default is **0.0.0.0**, meaning any adapter on the machine can be used. Note: This keyword is effective only if **`RUN_AS_EXTENSION=NO`** and there are several adapters on the machine, and a specific adapter is to receive SNMP transactions.

Setting	Description
SNMP_MANAGER_IP _ADDR SNMP_MANAGER_IP _ADDR2 SNMP_MANAGER_IP _ADDR3	The SNMP Managers at the IP addresses specified here are authorized to issue GET and SET commands for variables supported by the agent. The SNMP Manager specified for SNMP_MANAGER_IP_ADDR is considered the primary SNMP Manager. This field is required because it specifies two things: 1) the receiving location of traps generated by the Configuration Server, and 2) the address of the authorized source for SNMP commands.
SNMP_MANAGER _PORT	This parameter is used to specify the remote TCP/IP port to which the Configuration Server sends its traps. The default is port **162**.
SNMP_PORT	This parameter is used to specify the TCP/IP port on which the agent receives SNMP transactions. The default is port **161**. Note: This keyword is effective only if **RUN_AS_EXTENSION=NO**.
SNMP_SET _COMMUNITY	This parameter can be set to a character string. The agent will use this string as the SNMP community name when it is attempting to authorize SET commands. If this keyword is not specified, the community name given by SNMP_COMMUNITY is used for SET commands. Note: This keyword is effective only if **RUN_AS_EXTENSION=NO**.
SNMP_ZERROR _SEVERITY	This parameter is used to specify the severity of ZERROR instances to send as SNMP traps. The trap is sent when the Configuration Server adds an error instance to its ZERRORM for an error whose severity is greater than or equal to the value specified by this parameter. The parameter can be set to a positive value between 0 and 99; the default is **12**.

Example

```
[MGR_SNMP]

RUN_AS_EXTENSION        = NO

SNMP_COMMUNITY          = public

SNMP_IP_ADDR            = 0.0.0.0
```

```
SNMP_PORT               = 162
SNMP_MANAGER_IP_ADDR    = 183.235.246.32
SNMP_ZERROR_SEVERITY    = 12
```

Table 54 MGR_SNMP Values

Setting	Value as Installed	Default Value
RUN_AS_EXTENSION	YES	NO
SNMP_COMMUNITY	public	public
SNMP_IP_ADDR	0.0.0.0	0.0.0.0
SNMP_MANAGER_IP_ADDR	N/A	N/A
SNMP_MANAGER_PORT	N/A	162
SNMP_PORT	161	161
SNMP_SET_COMMUNITY	N/A	N/A
SNMP_ZERROR_SEVERITY	12	12

Performance and Usage Considerations

There are no performance or usage issues with any of the SNMP parameters. If you do not start zsnmpmgr, you are not starting the HPCA agent, and are running one less task in the Configuration Server.

MGR_SSL

This section specifies the operational settings for an SSL Manager. For more information on configuring and using an SSL Manager, see Chapter 11, SSL Managers.

Table 55 MGR_SSL Settings

Setting	Description
CA_FILE	Sets the Certificate Authority's certificate. The CA certificate is usually stored in a file in Privacy Enhanced Mail (PEM) format. The SSL Manager needs a CA certificate to start up. If it's expired or corrupt it prevents the SSL Manager from starting up.
CERTIFICATE_FILE	Sets the Configuration Server or the server certificate. The certificate is usually stored in a file in PEM format. This value must be a valid and existing certificate file. The SSL Manager needs a certificate to start up. An expired or corrupt certificate will prevent the SSL Manager from starting up.
KEY_FILE	Sets the private key. The private key is usually stored in a file in PEM format. This value must be a valid and existing key file. The private key is usually stored in the same file as the server certificate, in which case, you don't have to specify any value for the key file.
KEY_PASSWORD	The password that is used to encrypt the private key, the one specified in the KEY_FILE keyword. This is usually needed if the private key is encoded. If the private key is not encoded, you don't need to specify this parameter. Note: This setting is not automatically added to the `edmprof` file by the installation; it must be manually added by an HPCA administrator.
SSL_PORT	The port on which the SSL Manager will listen for HPCA agent connects.
VERIFY_CLIENT	Specifies whether the Configuration Server should verify the HPCA agent by requesting a certificate from it. If the HPCA agent doesn't have a certificate, the connection will be dropped. Note: This setting is not automatically added to the `edmprof` file by the installation; it must be manually added by an HPCA administrator.

Example

```
[MGR_SSL]

CA_FILE           = w:\openssl\ms\cacert.pem
CERTIFICATE_FILE  = w:\openssl\ms\srvcert.pem
KEY_FILE          = w:\openssl\ms\srvprvk.pem
KEY_PASSWORD      = violin
SSL_PORT          = 3456
VERIFY_CLIENT     = Y
```

Performance and Usage Considerations

- In order for an SSL Manager to function, **`CMD_LINE=(zsslmgr) RESTART=YES`** must be specified in the MGR_ATTACH_LIST section.
- The settings are placeholders and, as such, are not used until an SSL add-on is installed.

MGR_STARTUP

This section specifies startup information for the Configuration Server. In addition, if EDM clients and HPCA agents are being processed with a single Configuration Server (Configuration Server in multi-mode, see Chapter 10, Configuration Servers in Multiple Mode, starting on page 385), an administrator can define a different resolution starting point for each type of agent.

Use the EDM_STARTUP (on page 103) and RADIA_STARTUP (on page 104) sections for EDM clients and HPCA agents, respectively.

After a successful installation:

DO NOT change MANAGER_TYPE, MEMORY_TYPE, MGR_ID, MGR_NAME, or TASK_TYPE, unless advised to do so by HP Technical Support.

DO NOT change or delete MGR_UUID unless instructed to do so by HP Technical Support.

Table 56 MGR_STARTUP Settings

Setting	Description
ALLOW_DUPLICATE_IP_ADDRESS	NO will cause the Configuration Server to reject a second log on if one from the same IP address is already active. YES will allow multiple concurrent IP connections from the same HPCA agent IP address.
BYTE_LEVEL_DIFF	Turns on byte-level differencing during resolution.
MANAGER_TYPE	Type of Configuration Server; valid values are DISTRIBUTED (the default), SERVER, and STANDALONE. For more information on this setting, see MANAGER_TYPE Values on page 102. Note: If the Configuration Server is going to participate in Distributed Configuration Server operations, its type must be DISTRIBUTED or SERVER. Important Note: Do not alter this setting unless instructed to do so by HP Technical Support.
MEMORY_TYPE	Reserved for future development. Important Note: Do not alter this setting unless instructed to do so by HP Technical Support.

Setting	Description
MGR_ID	A three-byte, hexadecimal identifier for the Configuration Server log file. This ID is used in the CSDB to identify Configuration Servers in a Distributed Configuration Server environment, and is passed to the HPCA agent as the ZOBJMID variable. Valid values are any combination of 001 to EFF. Important Note: Do not alter this setting unless instructed to do so by HP Technical Support.
MGR_NAME	Configuration Server name. Important Note: Do not alter this setting unless instructed to do so by HP Technical Support.
MGR_UUID	The Universal Unique Identification Number (UUID) of the Configuration Server. This 32-byte ID is generated automatically during the installation and is used exclusively for licensing. Important Note: Do not change or delete this value.
OBJECTID_ FORMAT	This setting determines which format will be used for generating object IDs. • Specify `1` to use the established algorithm. • Specify `2` to use the new algorithm. • If the value is absent or invalid, the default of **1** is assumed and the established algorithm is used. Note: For more information on this setting, see the section, OBJECTID_FORMAT, on page 101.
SHOW_VERINFO	Displays version information in the Configuration Server log at startup.
TASK_TYPE	Reserved for future development. Important Note: Do not alter this setting unless instructed to do so by HP Technical Support.
TCP_PORT	Port on which to listen for TCP/IP HPCA agent connects. The default is **3464**. Note: This setting will be overridden by specifying a TCP/IP port in the MGR_ATTACH_LIST section. See MGR_ATTACH_LIST on page 39 for more details.

Setting	Description
VERBOSE	Sends messages to the screen (stderr) when the Configuration Server starts up, verifies the license, verifies the CSDB, loads cache, and readies IP Managers (TCP and SSL) for processing and when shutting down.

Example

```
[MGR_STARTUP]
BYTE_LEVEL_DIFF       = NO
MANAGER_TYPE          = DISTRIBUTED
MGR_ID                = 001
MGR_NAME              = RCS
MGR_UUID              = ssed111454d6kgh4eh7g3md90f94d6k8
OBJECTID_FORMAT       = 2
SHOW_VERINFO          = YES
TASK_TYPE             = THREAD
TCP_PORT              = 3464
VERBOSE               = NO
```

Table 57 MGR_STARTUP Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
ALLOW_DUPLICATE_IP_ADDRESS	YES	NO	N/A	N/A
BYTE_LEVEL_DIFF	N/A	NO	N/A	N/A
MANAGER_TYPE	DISTRIBUTED	DISTRIBUTED	N/A	N/A
MEMORY_TYPE	SHARED	SHARED	N/A	N/A
MGR_ID	As specified	001	000	EFF (F00-FFF are reserved)
MGR_NAME	As specified	EDM	N/A	N/A
MGR_UUID	N/A	N/A	N/A	N/A
OBJECTID_FORMAT	2	1	N/A	N/A

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
SHOW_VERINFO	N/A	YES	N/A	N/A
TASK_TYPE	THREAD	THREAD	N/A	N/A
TCP_PORT	3464	1029	N/A	N/A
VERBOSE	N/A	NO	N/A	N/A

Performance and Usage Considerations

- If MANAGER_TYPE is set to STANDALONE, the Configuration Server will not be eligible for Distributed Configuration Server functionality. (See the section, MANAGER_TYPE Values on page 102.)
- MGR_ID must be a three-character, alphanumeric, hexadecimal string. (Valid values are 001 to EFF.)
- If running the Configuration Server as a Windows Service, VERBOSE will be disabled.

OBJECTID_FORMAT

A CSDB object's ID is a unique, 12-character, hexadecimal identifier that is automatically generated and assigned when a CSDB object is created.

The time-based format of object ID generation eliminates the possibility of randomly generating a duplicate object ID because each object ID begins with the letter A, B, C, E, or F—differing from the old format, which used only the letter D as a prefix.

The format of CSDB object IDs is A*mmmXXXXXXXX*, where:

A = the new prefix letter (A, B, C, E, or F)

mmm = the Configuration Server ID (see MGR_ID on page 99)

XXXXXXXX = the unique value in hexadecimal format

Specifying the object ID generation format affects new object ID generation only; it has no impact on existing object IDs.

When the time-based generator counter wraps, this format will automatically start prefixing the object IDs with the next sequential letter.

MANAGER_TYPE Values

The values for the MANAGER_TYPE settings are described in more detail below.

- **DISTRIBUTED**: The CSDB is read- and write-enabled and can be updated by various means; this CSDB can participate in HPCA-DCS operations in which it can function as Source, Destination, or both.

  This is the MANAGER_TYPE **external default**.

- **SERVER**: The CSDB is read-only; it cannot be updated; in order to run, it requires that OBJECTID_FORMAT=2 and object ID cache be disabled; this CSDB can participate in HPCA-DCS operations, but only as Destination or middle-tier.

- **STANDALONE**: The CSDB is read- and write-enabled for the Administrator and Configuration Server methods from HPCA agent connects; this CSDB cannot participate in DCS operations.

  This is the MANAGER_TYPE **internal default**.

  If the value of the MANAGER_TYPE setting is anything other than DISTRIBUTED or SERVER (including no value and invalid values), it will assume the MANAGER_TYPE internal default of STANDALONE.

MANAGER_TYPE=SERVER

If MANAGER_TYPE=SERVER then, by default, two subsequent conditions will exist:

- the OBJECTID_FORMAT=2 algorithm will be used for object ID generation, and
- object ID caching will be disabled.

For more information about how this setting affects DCS operations, refer to the *HP Client Automation Distributed Configuration Server Guide*.

EDM_STARTUP

This section specifies the resolution starting point for EDM clients in a "multi-mode" Configuration Server environment.

For more information on using a Configuration Server as multi-mode, see Chapter 10, Configuration Servers in Multiple Mode, starting on page 385.

Table 58 EDM_STARTUP Settings

Setting	Description
START_CLASS	The class starting point of resolution for EDM clients.
START_DOMAIN	The domain starting point of resolution for EDM clients.

Example

```
[EDM_STARTUP]
START_DOMAIN = ZSYSTEM
START_CLASS  = ZPROCESS
```

Table 59 EDM_STARTUP Values

Setting	Value as Installed	Default Value
START_DOMAIN	N/A	ZSYSTEM
START_CLASS	N/A	ZPROCESS

RADIA_STARTUP

This section specifies the resolution starting point for HPCA agents in a "multi-mode" Configuration Server environment.

For more information on using a Configuration Server as multi-mode, see Chapter 10, Configuration Servers in Multiple Mode, starting on page 385.

Table 60 RADIA_STARTUP Settings

Setting	Description
START_CLASS	The class starting point of resolution for HPCA agents.
START_DOMAIN	The domain starting point of resolution for HPCA agents.

Example

```
[RADIA_STARTUP]
START_DOMAIN = SYSTEM
START_CLASS  = PROCESS
```

Table 61 RADIA_STARTUP Values

Setting	Value as Installed	Default Value
START_DOMAIN	N/A	SYSTEM
START_CLASS	N/A	PROCESS

MGR_TASK_LIMIT

An HPCA administrator can use this section of the edmprof file to specify the various settings that are related to Configuration Server tasks.

Table 62 MGR_TASK_LIMIT Settings

Setting	Description
TASK_HEAP_SIZE	This setting controls the heap size of a task (used in conjunction with MGR_POOLS). Note: This setting is not applicable to the current release of the Configuration Server.
TASKLIM	The maximum number of HPCA agent tasks allowed to concurrently run on the Configuration Server.
TASK_LOG_LIM	The maximum number of lines, per HPCA agent, that can be written to the Configuration Server log.
TASK_RESO_LIM	The maximum number of resolutions allowed per HPCA agent.
TASK_STACK_SIZE	This setting defines how many variables can be used per task.

Example

```
[MGR_TASK_LIMIT]

TASK_HEAP_SIZE   = 0

TASKLIM          = 20

TASK_LOG_LIM     = 0

TASK_RESO_LIM    = 64000

TASK_STACK_SIZE  = 64000
```

Table 63 MGR_TASK_LIMIT Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
TASK_HEAP_SIZE	0	0	0	4 GB
TASKLIM	50	0	0	32 KB
TASK_LOG_LIM	0	100000 Lines	0	N/A

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
TASK_RESO_LIM	64000	64000 Resolutions	1	64000
TASK_STACK_SIZE	64000	64000	16384	64000

Do not change the TASK_STACK_SIZE setting in this section unless advised to do so by a member of HP Technical Support.

Performance and Usage Considerations

- The MGR_TASK_LIMIT settings should be coordinated with values in the MGR_NOTIFY and MGR_RETRY sections.
- TASK_STACK_SIZE will affect the depth of resolution. Higher values will result in deeper resolution.

MGR_TIMEOUT

This section specifies how long the Configuration Server will wait for a request from a connected HPCA agent before disconnecting that HPCA agent due to inactivity (no requests/responses from the HPCA agent).

Table 64 MGR_TIMEOUT Settings

Setting	Description
ADMIN_TIMEOUT	Timeout (in seconds) for administrator functions.
SEND_THROTTLE	Timeout (in milliseconds) before each send.
TIMEOUT_COMM	Communications (receive) timeout (in seconds).

Example

```
[MGR_TIMEOUT]
ADMIN_TIMEOUT= 0
SEND_THROTTLE= 0
TIMEOUT_COMM    = 1800
```

Table 65 MGR_TIMEOUT Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
ADMIN_TIMEOUT	0 (never time out)	0 (never time out)	0	32767
SEND_THROTTLE	N/A	0	0	4 GB
TIMEOUT_COMM	1800 (seconds)	0 (never time out)	0	32767

Performance and Usage Considerations

- If processing resources are critical, increase these MGR_TIMEOUT values.
- The MGR_TIMEOUT settings should be coordinated with values in the MGR_RETRY section.
- The SEND_THROTTLE value can be overridden by bandwidth throttling variables sent up in an HPCA agent object.

- TIMEOUT_COMM is the Configuration Server analog to the HPCA agent ZTIMEO. If a connect is active and the Configuration Server has not received any data from an HPCA agent for the TIMEOUT_COMM value, the Configuration Server will terminate the session.

MGR_TPINIT

This section specifies packet sizes to send to HPCA agents.

Table 66 MGR_TPINIT Settings

Setting	Description
BUFTCP	TCP buffer size used for send/receive.
GET_REMOTE _HOST_NAME	Controls the Configuration Server's attempt to obtain the *host_name* from the DNS server. The default is **NO**. Note: Do not set to YES if the Configuration Server is not in a dynamic TCP/IP environment (such as DNS and DHCP).
MAXREC	Maximum record size.

Do not change any settings in this section unless advised to do so by a member of HP Technical Support.

Example

```
[MGR_TPINIT]

BUFTCP                = 12288

GET_REMOTE_HOST_NAME  = NO

MAXREC                = 6144
```

Table 67 MGR_TPINIT Values

Setting	Value as Installed	Default Value
BUFTCP	12288	12288
GET_REMOTE_HOST_NAME	NO	NO
MAXREC	6144	6144

Performance and Usage Considerations

- The buffer size reflected in the MGR_TPINIT settings should be the same for the Configuration Server and HPCA agents.

- Any buffer size setting in the MGR_TPINIT section should only be changed in coordination with equivalent changes to HPCA agents and after having been directed to do so by a member of HP Technical Support.
- Do not use GET_REMOTE_HOST_NAME if the Configuration Server is not in a dynamic TCP/IP environment. This will cause the Configuration Server to expend unnecessary processing time attempting to associate the remote host name.

  If GET_REMOTE_HOST_NAME=YES, the Configuration Server obtains the remote host name using standard library calls. The IPNAME is received on the Configuration Server (via DNS) and stored in ZMASTER.ZIPNAME, which is stored in the appropriate domain of the PROFILE File.

  The remote host name will appear in each associated line of the Configuration Server log in place of the IP address.

MGR_TRACE

This section contains a list of keywords (settings) that you can specify in order to control and influence diagnostic logging for the Configuration Server. All diagnostic output produced by TRACE settings is written to the active Configuration Server log. To activate a TRACE keyword, specify YES. To de-activate a TRACE keyword, specify NO.

TRACE keywords specified in this section are invoked at Configuration Server initialization, and remain in effect:

- until they are changed by altering the MGR_TRACE setting and restarting the Configuration Server.
- while the Configuration Server is running, using the Console.
- until a specified REXX overrides the setting.
- unless a ZCVT value overrides the setting.

The trace settings that are in effect at Configuration Server initialization are displayed at the beginning of the log.

The value for each setting is evaluated in the order in which it is presented in the `edmprof` file. The results can be non-intuitive. For example:

- If ALL=YES is the first setting specified, and each following settings are specified as NO, the effect is to turn off *tracing*.
- If ALL=YES is the last setting specified, all tracing will be active.
- If ALL=NO is the last setting, all tracing is turned off.

Table 68 MGR_TRACE Settings

Setting	Description
ADMIN	Traces ADMIN transaction flow.
ADMPROM	Not used.
ALL	Turns on all other traces.
ALLOC	Traces file allocations.
AUDIT	Traces audit file activity.
BUFF	Traces data buffers (without transformation).
CMPR	Traces data compression.

Setting	Description
COMM	Traces data stream buffers.
COMMCBS	Traces communications control block (CCB) activity.
COMMDATA	Traces data communications.
COMMRPLS	Traces communications control blocks (CCBS).
CONFIG	Traces configuration file activities.
DATA	Traces data buffers to or from the HPCA agent.
DES	Traces encryption/decryption.
DMA	Traces Distributed Configuration Server activity.
ENQDEQ	Traces serialization activity (enqueues/dequeues).
EXPL	Traces data transformation (explode).
FILE	Traces file I/O.
IMPL	Traces data transformation (implode).
LOOKASID	Traces cache activity for classes/instances.
METHOD	Traces Configuration Server method execution/return codes.
NOTIFY	Traces notify processing.
OBJCRC	Traces object CRC processing.
OBJRES	Traces object resolution (very detailed).
OBJRES1	Traces object resolution (medium detail).
OBJRESO	Traces high-level object resolution flow (light detail).
OBJXFER	Traces object transfer.
PASSWORD	Traces passwords.
POOLMISS	Traces memory pool allocation.
PROFILE	Traces profile database activity.
PROMOTE	Traces file promotion.
RESOURCE	Traces resource file activity.
REXX	Traces REXX environment.
REXXOFF	Suppresses all REXX activity.

Setting	Description
STORAGE	Traces storage in conjunction with the MGR_LOG's STORAGE_INTERVAL setting.
STATS	Traces statistics.
SUBST	Traces variable substitution.
TCP	Traces TCP/IP activity.
TEST	Reserved.
VAR	Traces the variable references.
VARSTG	Traces variable processing storage usage.
VARSUB	Traces variable substitution activity.
YEAR2000	Traces a database's Year-2000 compliance.

Example

```
[MGR_TRACE]

ADMIN       = NO
ADMPROM     = NO
ALLOC       = NO
AUDIT       = NO
BUFF        = NO
CMPR        = NO
COMM        = NO
COMMCBS     = NO
COMMDATA    = NO
COMMRPLS    = NO
CONFIG      = NO
DATA        = NO
DES         = NO
DMA         = NO
ENQDEQ      = NO
EXPL        = NO
FILE        = NO
```

```
IMPL        = NO
LOOKASID    = NO
METHOD      = NO
NOTIFY      = NO
OBJCRC      = NO
OBJRES      = NO
OBJRES0     = NO
OBJRES1     = NO
OBJXFER     = NO
PASSWORD    = NO
POOLMISS    = NO
PROFILE     = NO
PROMOTE     = NO
RESOURCE    = NO
REXX        = NO
REXXOFF     = NO
STATS       = YES
STORAGE     = NO
SUBST       = NO
TCP         = NO
TEST        = NO
VAR         = NO
VARSTG      = NO
YEAR2000    = NO
ALL         = YES
```

Performance and Usage Considerations

- Turning on trace flags generates a large number of Configuration Server log messages. This will degrade the performance of the Configuration Server due to the disk I/O load. However, this might be necessary at times for problem resolution. Ensure that the Configuration Server log is properly configured.

- Tracing can be clustered in order to troubleshoot a particular aspect of Configuration Server operations, while simultaneously preserving an appropriate level of logging activity. For example, turning on flags, such as OBJCRC, OBJRES, OBJRES1, OBJRES0, and OBJXFER, can help identify problems that might be occurring during object resolution. Likewise, CPIC, DATA, and TCP focus on communications activities. (Note that some of these traces pertain to specific protocols.) Special purpose trace flags include DMA, NOTIFY, REXX, and METHOD.
- STORAGE=YES can be used to produce a message in the log each time a storage allocation is made and freed. This can be used to tune the pool and to understand the Configuration Server's use of dynamic memory.
- ALL=YES does not affect the REXXOFF trace settings.

MGR_USERLOG

This section specifies the logging directory and logging options for the user logging facility.

Table 69 MGR_USERLOG Settings

Setting	Description
ACTIVATE	Activate user log at Configuration Server startup. Values are YES and NO.
DIRECTORY	Fully qualified directory path where the user log is written.
FLUSH_SIZE	The number of bytes between automatic flushes of operating system buffers for Configuration Server log file.
MESSAGE_WIDTH	The maximum width (in bytes) of the messages in the user log.
PIPE_SIZE	The maximum amount (in bytes) of log messages that can be queued by the Configuration Server logging facility while the log file is busy. When this value is reached, any task that issues a log message will freeze until the pipe starts emptying.
THRESHOLD THRESHHOLD (both spellings accepted)	Maximum number of messages that will be written to a log before automatically switching to the next log. When the limit is reached, new log files are created. Specify a negative number to overwrite the log file when the limit is reached.

Examples

UNIX Example

```
[MGR_USERLOG]

ACTIVATE        = NO
DIRECTORY       = /opt/HP/HPCA/ConfigurationServer/log
FLUSH_SIZE      = 256
MESSAGE_WIDTH   = 256
PIPE_SIZE       = 1000000
THRESHOLD       = 5000000
```

Windows Example

```
[MGR_USERLOG]
```

```
ACTIVATE        = NO
DIRECTORY       = C:\Program Files\Hewlett-Packard\HPCA\
                  ConfigurationServer\log
FLUSH_SIZE      = 256
MESSAGE_WIDTH   = 256
PIPE_SIZE       = 1000000
THRESHOLD       = 5000000
```

Table 70 MGR_USERLOG Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
ACTIVATE	NO	NO	N/A	N/A
DIRECTORY	/edmmgr/log	*current_directory*	N/A	N/A
FLUSH_SIZE	256 bytes	100000 bytes	1	N/A
MESSAGE_WIDTH	256 bytes	90	80	N/A
PIPE_SIZE	1000000 bytes	65535 bytes	1	N/A
THRESHHOLD	-5000000 bytes	5000 bytes	1	N/A

Performance and Usage Considerations

- Increasing the FLUSH_SIZE will enhance performance, but will delay messages flushed to the log file.
- Increase MESSAGE_WIDTH if log messages are being truncated.
- When modifying parameters in this section as they relate to memory or disk use, be sure that the maximum amount of memory or storage space is available.

User Log Naming Conventions

The user log names conform to the following operating system specific conventions.

ISO is the International Standards Organization.

Configuration Server ID is the value of the `edmprof` file's setting MGR_STARTUP.MGR_NAME.

Windows

— The *standard* log naming format is the user log prefix (nvd), followed the user designation (ur), and the Configuration Server ID:

```
nvdur001.log
```

— The *log switch* format is similar to the standard but an **us** (rather than ur) is added to the prefix, and the ISO-formatted date and time (each preceded by an underscore) appended:

```
nvdus001_20050427_083357.log
```

— The *log wrap* (dump) format is similar to the standard but sees the **r** being replaced by a **d**:

```
nvdud001.log
```

UNIX

— The *standard* log naming format is the user log prefix (nvd), followed by the Configuration Server ID, then an underscore, and the user designation:

```
nvd001_user.log
```

— The *log switch* format is similar to the standard but an **s** is added to the prefix, and the ISO-formatted date and time (each preceded by an underscore) appended:

```
nvds001_user_20050427_075835.log
```

— The *log wrap* (dump) format sees dump being added to the user designation:

```
nvd001_userdump.log
```

OBJECT_SIZES

The OBJECT_SIZES section must be manually added to the `edmprof` file.

Additionally, this section must be added to the `edmprof` file in order for the Configuration Server self-tuning tool to operate properly.

This section accommodates specifying the number of heaps and the heap size for CSDB objects that are being created on the Configuration Server as in-storage CSDB objects.

- These values affect only the Configuration Server self-tuning tool; they have no impact on other Configuration Server processing.
- The format for specifying these values is:

  OBJECT_NAME = *heap_size*,*number_of_heaps*

For example:

ZCONTROL = 512,100000

In this example, whenever an object named ZCONTROL is created in the Configuration Server as an in-storage object, its initial allocation will be for 100,000 heaps of 512 bytes each.

ZERROR = 400,1000

In this example, whenever an object named ZERROR is created in the Configuration Server as an in-storage object, its initial allocation will be for 1000 heaps of 400 bytes each.

For a detailed description of how these settings affect the Configuration Server self-tuning tool, see Configuration Server Self-Tuning Tool on page 131.

Example

```
[OBJECT_SIZES]

FILE      = 1536,2000
RELEASE   = 420,1536
WBEMAUDT  = 6000,100
MSIFEATS  = 512,100
ZOBJSTAT  = 512,270
PRODUCT   = 1024,200
ZREQDATA  = 200,100
ASERVICE  = 3000,60
```

```
ZSERVICE  = 4000,60
ZREQNEWI  = 150,15
MSIPROPS  = 1024,30
ZERROR    = 512,10
UMFLTCRI  = 1536,23
WBEM      = 1024,20
APPEVENT  = 1024,5
SAPSTATS  = 1024,10
SAP       = 1024,10
CLISTATS  = 512,5
UMFLTRUL  = 600,4
DESKTOP   = 2000,3
MSI       = 2000,5
REGISTRY  = 1536,5
PATH      = 1024,3
ZCONFIG   = 4000,1
ZMASTER   = 3000,1
TIMER     = 1536,2
```

RCS_TUNING_CONTROL

The RCS_TUNING_CONTROL section must be manually added to the `edmprof` file.

Additionally, this section must be added to the `edmprof` file in order for the Configuration Server self-tuning tool to operate properly.

This section provides a mechanism to override the default values that are specified in the Configuration Server self-tuning tool and these are described in the following table. (For a look at the Configuration Server self-tuning tool, see Configuration Server Self-Tuning Tool on page 131.)

Table 71 RCS_TUNING_CONTROL Settings

Setting	Description
MAXIMUM_MEG_ CACHE	A four-digit integer value that specifies the maximum number of MBs that are to be allocated to CONTENT CACHE. Note: This setting provides protection when the size of a class (or classes) would exceed the virtual storage of the process space. In the case that one class exceeds this value, that class is forced to be cached on first reference (=Y,N).
MINIMUM_MEG_ CACHE	A four-digit integer value that specifies the minimum number of MBs that are to be allocated for CONTENT CACHE.
MAXIMUM_SHARED _MEMORY_SEGMENTS	A two-digit integer value that specifies the *`maximum_number_of_segments`* times the *`largest_shared_memory_size`*. Note: This value must be less than 15 because the value cannot exceed the size of the process space (generally, 2 GB [2*1024*1024*1024]).
MAXIMUM_SHARED _MEMORY_SIZE	A four-digit integer value that specifies the maximum number of MBs that are be allocated to any single CONTENT CACHE segment. Notes: If the aggregate size of CONTENT CACHE exceeds this value, it should be allocated as multiple segments—each less than this value in size. This value anticipates the UNIX requirements for tuning where shared memory sizes are a kernel parameter and not easily changed.

Setting	Description
MAXIMUM_CLASS_ INSTANCES	A ten-digit integer value that specifies the maximum number of instance elements that can exist in a class that might be cached at startup. Note: Any class with more instances will be marked (=Y,N) as “cache on first reference.”
MINIMUM_ INSTANCES	A five-digit integer value that specifies the minimum number of instance elements for which ICACHE and CONTENT CACHE are intended to be sized.
UPDATE_RCS_ STARTUP	A YES-NO toggle for updating the startup of the Configuration Server. The default (**NO**) leaves the `edmprof` file unchanged and creates the file `EDMPROF_TUNED.DAT_`.

Example

```
[RCS_TUNING_CONTROL]

MAXIMUM_MEG_CACHE      = 1500
MINIMUM_MEG_CACHE      = 50
MAXIMUM_SHARED_MEMORY_SEGMENTS = 6
MAXIMUM_SHARED_MEMORY_SIZE = 32
MAXIMUM_CLASS_INSTANCES= 100000
MINIMUM_INSTANCES      = 10000
UPDATE_RCS_STARTUP     = YES
```

Table 72 RCS_TUNING_CONTROL Values

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
MAXIMUM_MEG _CACHE	None	1500	None	None
MINIMUM_MEG _CACHE	None	200	None	None
MAXIMUM_SHARED _MEMORY_SEGMENTS	None	6	None	None
MAXIMUM_SHARED _MEMORY_SIZE	None	384	None	None
MAXIMUM_CLASS _INSTANCES	None	100000	None	None

Setting	Value as Installed	Default Value	Minimum Value	Maximum Value
MINIMUM_INSTANCES	None	50000	None	None
UPDATE_RCS_STARTUP	None	NO	None	None

SECTION_DELIMITERS

This section is not a true section of the Configuration Server `edmprof` file. It is used only to specify the symbols that will be used to delimit section names in the `edmprof` file.

If used, SECTION_DELIMITERS must be the very first entry and the first non-blank line in the `edmprof` file. If it is not, the Configuration Server will not be able to read-in the license string and will not start up.

Table 73 SECTION_DELIMITERS Settings

Setting	Description
SECTION_ DELIMITERS	The character set that is to be used to enclose the section headings of the `edmprof` file. The format is SECTION_DELIMITERS = *xy*, where *x* and *y* are the left and right delimiters. The options are: **[]**, **()**, **<>**, and **{}**.

Examples

```
SECTION_DELIMITERS = <>

<MGR_LICENSE>
LICENSE_STRING = FFCDAB


SECTION_DELIMITERS = []

[MGR_LICENSE]
LICENSE_STRING = FFCDAB
```

Table 74 SECTION_DELIMITERS Values

Setting	Value as Installed	Default Value
SECTION_DELIMITERS	N/A	[ ]

3 Managing Configuration Server Processing

At the end of this chapter, you will:

- Have a better understanding of the HP Client Automation Configuration Server (Configuration Server) processing.
- Know how to customize the processing flow using REXX programs and methods.

Configuration Server Operations

Configuration Server operations has three basic phases:

- Startup
- Processing Requests
- Shutdown

Configuration Server startup is initiated by icon, command line, console, or control panel, depending on the platform and installation. In the Startup phase, the Configuration Server initializes ZTOPTASK. Using the Configuration Server `edmprof` file to provide the working parameters for configuring the Configuration Server, ZTOPTASK then starts the Task Manager. After the various tasks specified in MGR_ATTACH_LIST are activated, the Configuration Server is ready to process requests.

A request can be sent to the Configuration Server as a system command, an HPCA agent connect, an administrative transaction, or a Distributed Configuration Server command. During the Processing Requests phase, the Configuration Server performs the requests (tasks) that are submitted to it. There are four types of tasks.

- **System**
  These tasks pertain to Configuration Server functions.
- **Client**
  These tasks pertain to HPCA agent requests.
- **Admin**
  These tasks pertain to HPCA Admin CSDB Editor and Publisher operations.
- **Distributed Configuration Server**
  These tasks pertain to Distributed Configuration Server functions.

The type of task is shown in each line of the Configuration Server log, as shown in the following example.

```
NVD1069I 13:49:52 [208.244.225.166 /16B] Radia Client
Max size of local memory allocated         : 230805

NVD8115I 13:50:30 [ztoptask/17B]   System Task
REXX Method <D:\DEV\MGR\REXX\ZSHUTDWN> with parms <%s> started at
<13:50:30:574>
```

Like startup, Configuration Server shutdown can be initiated in a number of ways. In the Shutdown phase, the Configuration Server performs some basic housekeeping, then essentially reverses the startup flow. The Configuration

Server is now down, allowing you to run a backup, use the database utilities, apply maintenance, or perform other operating system tasks.

Customizing Configuration Server Processing

The values in your Configuration Server `edmprof` file allow you to customize its overall configuration. There are two main ways of customizing the flow of Configuration Server processing:

- Configuration Server REXX programs and
- Configuration Server methods.

The primary difference is that REXX programs are preconfigured, while the methods can be inserted anywhere in the processing flow.

This chapter describes the Configuration Server REXX programs and Configuration Server methods. An overview of the methods is presented in Configuration Server Methods, on page 160. Also Appendix A, Configuration Server Methods, details each method, providing an example of its use, a description, its associated parameters, and possible return codes.

Configuration Server REXX Programs

REXX Directories

The Configuration Server installation creates two REXX-related directories,

UNIX	Windows
`/opt/HP/CM/Configuration Server/rexx`	*`System Drive`*`:\Program Files\Hewlett-Packard\CM\ConfigurationServer\rexx`
`/opt/HP/CM/Configuration Server/rexx/NOVADIGM`	*`System Drive`*`:\Program Files\Hewlett-Packard\CM\ConfigurationServer\rexx\NOVADIGM`

The `rexx` directory is empty, and the `rexx/NOVADIGM` (`rexx\NOVADIGM`) directory contains all the HP-related REXX programs.

The `ConfigurationServer/rexx` (`ConfigurationServer\rexx`) directory can be renamed to further distinguish it from the HP REXX directory.

Customizing the HP REXX Programs

The HP REXX programs can be customized in order to adapt to, and enhance, various computing environments. To customize any of these REXX programs, copy them from the `rexx\NOVADIGM` (`rexx/NOVADIGM`) directory to the `rexx` directory, then modify them as needed.

Do not make any changes to the REXX programs in the `rexx\NOVADIGM` (`rexx/NOVADIGM`) directory.

Doing so will adversely affect the performance of the CSDB.

There are two reasons that HP REXX programs have to be copied to the `rexx` directory prior to being modified:

- If a REXX is customized and left in the `\rexx\NOVADIGM` directory, the customizations could be lost (overwritten) if a database update is applied, thereby affecting the behavior and execution of the database operations.
- During processing, the database reads the `\rexx` directory first. Therefore, place any customized REXXs in that directory.

Event Points

There are eight event points at which the Configuration Server issues calls to ten major REXX programs. Table 75 below lists these REXX programs and the points at which they are called.

Table 75 Configuration Server REXX Programs

REXX Name	When Called (Event Point)
ZSTARTUP	Configuration Server Startup
ZPCACHE	Configuration Server Startup
ZINIT	Configuration Server Startup
ZTASKSTA	Task Start
ZTASKEND	Task End
ZNFYxSTA	Notify Start
ZNFYxEND	Notify End
ZLOGSWCH	Log Switch
ZLOGWRAP	Log Wrap
ZSHUTDOWN	Configuration Server Shutdown

REXX Programs

ZSTARTUP

This is called just before the Configuration Server is enabled to accept and process HPCA agent connections. ZSTARTUP does not pass any parameters to the REXX, nor does it accept any information from this REXX. It can be used to perform user-defined specific processing prior to allowing connections to be initiated.

ZPCACHE

This can be called after cache is loaded during Configuration Server startup.

ZINIT

This is called during Configuration Server startup. It runs REXXs and tests for certain conditions. If the conditions are not met (return code = 16), Configuration Server startup will be halted.

This is not configurable. Consult HP Technical Support before using this REXX.

ZTASKSTA

This is called when each connection is first accepted. It is passed a single parameter that contains the protocol level identifier for the HPCA agent.

ZTASKEND

This is called when each connection has ended, while storage and objects associated with the connection are still available. It is passed a single parameter that contains multiple subparameters that can be parsed and that are position dependent.

- Connect termination reason.
- User ID of the current connection.
- Total number of object instances, of any type, processed during this connection.
- Total number of object instances, of any type, resulting from resolution.

- The maximum depth of transient objects processed in any single instance resolution.
- Count of communications protocol sends and receives originating from this connection.
- Total number of bytes transmitted from the Configuration Server to the HPCA agent during this connection (non-compressed count).
- Total number of files transferred from the Configuration Server to the HPCA agent during this connection.

ZNFYxSTA

This is called at the beginning of Notify processing for each HPCA agent that is being notified. The x defines the type of Notify (T for TCP/IP and D for Dial-up). The set of parameters passed includes:

- UINF=<value1>
  user info passed via EDMMPUSH method. If no information is provided, COMMON will be set as a value.
- RETRS=<value2>
  number of retries for this destination.
- STATUS=<value3>
  RETRY, SUCCESS, FAILURE.
- MSG=<value4>
  message describing the result of notification.

ZNFYxSTA can generate a return code that controls the execution of the Notify, RC value 1956 (RC_SKIP_NOTIFY). If this is set, it will cause the Notify request to be written for retry without execution of current notification.

ZNFYxEND

This is called at the end of Notify processing for each HPCA agent being notified. The x defines the type of Notify (T for TCP/IP and D for Dial-up). The set of parameters passed includes:

- UINF=<value1>
  user info passed via EDMMPUSH method. If no information is provided, COMMON will be set as a value.
- RETRS=<value2>
  number of retries for this destination.

- STATUS=<value3>
  RETRY, SUCCESS, FAILURE.
- MSG=<value4>
  message describing the result of notification.

ZNFYxEND can generate a return code that controls the execution of the Notify, RC value 1955 (RC_NEVER_RETRY). If this is set, it will prevent the Notify request from being rescheduled for retry.

ZLOGSWCH

This can be called when log switch occurs (a new log file is created) to insert a user-defined command (for example, zip the old log file and save it).

ZLOGWRAP

This can be called when log wrap occurs (the log file is reused) to insert a user-defined command (for example, zip the old log file and save it).

ZSHUTDWN

This is called just before the Configuration Server shuts down.

Configuration Server Self-Tuning Tool

The Configuration Server self-tuning tool enables Configuration Server instances to automate the tuning of the `edmprof` file's MGR_CACHE and MGR_CLASS sections.

Two `edmprof` file sections, OBJECT_SIZES (see page 119) and RCS_TUNING_CONTROL (see page 121), are needed in order for this tool to function properly.

This tool does not dynamically alter the MGR_CACHE and MGR_CLASS sections while the Configuration Server is active; rather, while the Configuration Server is shutdown, it examines the database and creates an updated dataset that can be compared to the existing (master) `edmprof` file, and possibly used to automatically replace it.

The self-tuning tool can be configured to rename the master `edmprof` file and replace it with the newly generated one, although this is not the default behavior (which is to overwrite the master `edmprof` file). If the non-default (rename-and-replace) option is selected, the only active `edmprof` file settings that should differ between the two `edmprof` files are those in the

MGR_CACHE and MGR_CLASS sections (because these settings are generated at shutdown and are based on the size of the database and the number of instances).

The MGR_CLASS Section

If the master `edmprof` file does not have a MGR_CLASS section, the self-tuning tool attempts to content cache all the database instances. It does this by calculating the amount of space that will be necessary to support content caching all the instances, and by generating the caching directives for each class that is to be set for caching in its entirety at Configuration Server initiation and/or cache refresh.

If the MGR_CLASS section in the master `edmprof` file has caching directives for individual classes, they will be preserved. However, if these caching directives are intended for internally generated objects, or are received by the Configuration Server from a session partner, they will not be preserved in the automatically generated values because the new MGR_CLASS section is based on the CSDB.

OBJECT_SIZES

The OBJECT_SIZES section will be preserved (as it was in the master `edmprof` file) in the new `edmprof` file, and will result in additional MGR_CLASS section entries, in the form of:

```
"NONDB." OBJECT_NAME = N,N,heap_size,number_of_heaps
```

These entries will be listed first in the updated MGR_CLASS section.

They are followed by the MGR_CLASS entries from the master `edmprof` file, which are listed based on the HP Client Automation processing preference in which priority is placed on processing the ZSERVICE and PACKAGE instances in order to facilitate the initial catalog resolution, followed by component instances, and then non-component instances.

Revise and Overwrite

The default behavior for the Configuration Server self-tuning tool is to create a new `edmprof` file in the directory that contains the master (or original) `edmprof` file. That format for naming the file is:

```
EDMPROF_TUNED.DAT_REVISED_YYYYMMDD_HH_MM_SS_uuuuuu
```

Where:

- `EDMPROF_TUNED.DAT_REVISED_` is a literal value,
- *`YYYYMMDD`* is the year, month, and date of the revise action, and

- *HH_MM_SS_uuuuuu* is the local hour, minute, second, and microsecond at which the new file is established.

Only one file matching the filter EDMPROF_TUNED.DAT_REVISED_* will be retained in the directory—that file will be the most recent one that was created by this tool.

Rename and Replace

If the non-default behavior of replacing the master `edmprof` file with the newly created one is selected, the `edmprof` file that existed when the Configuration Server was started will be renamed to:

EDMPROF.DAT_REPLACED_*YYYYMMDD_HH_MM_SS_uuuuuu*

Where:

- *YYYYMMDD* is the year, month, and date of the replace action, and
- *HH_MM_SS_uuuuuu* is the local hour, minute, second, and microsecond at which the file is replaced.

Up to 15 files matching the filter EDMPROF.DAT_REPLACED_* will be retained in the directory that contains the `edmprof` file.

The 15 files are the 14 most recent datasets, and the oldest `edmprof` file (so that an original `edmprof` file is retained for reference).

All of these files will be in the directory in which the original `edmprof` file was found. Therefore, the account under which the Configuration Server is executing must have update and create authority for that directory.

The MGR_CACHE Section

In addition to the updated MGR_CLASS section, a new MGR_CACHE section gets generated and replaces the section in the input `edmprof` file.

While processing the original input `edmprof` file, the existing MGR_CLASS and MGR_CACHE sections are ignored, while all other sections are copied in their entirety. The newly created MGR_CACHE and MGR_CLASS sections will be appended to the end of the copied input `edmprof` file.

If, in the original `edmprof` file, there are comments preceding the MGR_CLASS and/or MGR_CACHE sections, then, in the newly generated `edmprof` file, the comments might appear to be dislocated. However, since these are comments, their position does not impact the Configuration Server startup.

Reporting Files

A reporting file (`DB_EDMPROF_REPORT.TXT`) will be created in the Configuration Server log directory. It documents the MGR_CACHE and MGR_CLASS settings and the fact that the newly created values represent the actual amount of required storage. Only the most recent copy of each file will be retained, and each execution of the self-tuning tool will delete prior copies.

The self-tuning tool will attempt to allocate enough ICACHE and CONTENT CACHE in order to accommodate a database growth of 30%. However, the results might change due to default sizes for minimum number of database instances, maximum amount of virtual storage to commit to content cache, and the impact of very large classes.

- A file named `EDMPROF_SECTION.DAT` is also created. It contains a replica of the MGR_CLASS and MGR_CACHE sections that were merged into the master `edmprof` file and replaced the existing MGR_CACHE and MGR_CLASS sections when the self-tuning tool started.
- A file (`LIST_PREFIX.CSV`) is created, but currently not used. When implemented, this will contain a snapshot of database domain and class information, including the size and number of instances in each class at shutdown.

To implement the Configuration Server self-tuning tool

1 Install the new ZSHUTDWN REXX method into the `rexx` directory.

If a previous, customized version of ZSHUTDWN REXX exists in the `rexx` directory, be sure to copy any customizations from it to the new one. Then delete the previous one, or move it down to the `rexx\NOVADIGM` directory.

2 Shutdown the Configuration Server.

(After the Configuration Server has shutdown, in the location that housed the `edmprof` file when the Configuration Server was started, there should be either: an updated `edmprof` file along with the original (but now renamed) `edmprof` file, or the revised `edmprof` file that overwrote the original.)

3 Restart the Configuration Server.

HP REXX Functions

Ten HP REXX functions perform specific actions. These actions encompass the getting and setting of objects and variables; object resolution; retrieving object names and properties; and UTF-8 and local code page strings.

Knowledge of REXX operators and word lists is assumed.

The REXX extensions are:

- EDMGET (objects)
- EDMGETV
- EDMSET (objects)
- EDMSETV
- EDMRESO
- NvdCurrentObjects
- NvdObjectInfo
- NvdObjectInfoEX
- NvdL2U
- NvdU2L

EDMGET

(*object*,*heapnumber*)

- *object* is the Configuration Server in-storage object that is to be processed.

  Object names are usually specified in uppercase; EDMGET will uppercase the value that is specified for *object*.

- *heapnumber* is the heap—of the above-referenced object—that is to be processed.

  If *heapnumber* is not specified, it defaults to zero (**0**), meaning the current heap. The *heapnumber* can range from one (**1**) to *the number heaps in the object*.

On the Configuration Server, the numbering of heaps starts at **1**, whereas on an HPCA agent the numbering of heaps starts at **0**.

EDMGET is used to retrieve the contents of a CSDB object, one heap at a time, into a REXX's variable pool. In addition to returning a return code, EDMGET will set the REXX variables to contain the object's heap and variable count, the attribute names that are saved in the object, and their "as-is" and "resolved" ("indirect") values. The clause

```
rcode = EDMGET("zmaster")
```

will copy the contents of the first heap of the ZMASTER object into REXX variables. The REXX variable names that are created are in the following form.

```
object.attribute
```

```
object
```

```
objectvars
```

```
object.resolved.attribute
```

`object1` ... `object`*`n`*

For example, to check the value of the ZUSER attribute in the ZMASTER object, use the REXX name

```
zmaster.zuser.
```

For additional information on using REXX stem variables that are in this form, refer to the section on *Symbols* in the *REXX Programming Guide*.

For example, the clause

```
Say zmaster.zuserid /* might return Fred */
```

- If the value of `zmaster.zuserid` was `&(object.attribute)`, its syntax is known as substitution, which is a form of value indirection.
- If the value of `zmaster.zuserid` was `&(SESSION.USERID)`, the USERID attribute in the SESSION object can be checked for the value. However, the SESSION object does not have to be opened in order to check the value because it is saved in the REXX variable

  ```
  zmaster.resolved.zuser.
  ```

- If the value of `zmaster.zuserid` was not indirected, the value of `zmaster.resolved.zuserid` is the same.

In addition to the attributes in the object, two other REXX variables are created. The first has the same name as the object that is being processed; the second is the *`objectname`* with `vars` appended to the end of it.

Therefore, if the object that is being processed is ZMASTER, then:

```
say zmaster /* is the number of heaps in the object */
say zmastervars  /* is the count of attributes in the object */
```

The variables *<object>1* ... *<object>n* contain the name of the attribute that is in the object. For example,

```
say zmaster1  /* might be ZUSERID */
```

To get all the attributes in an object, code the following.

```
object = "zmaster"
heaps = value(object)
vars = value(object"vars")
vnames = ""
do vv = 1 to vars
vnames = vnames value(object || vv)
end vv
```

If *heapnumber* is not specified, it defaults to zero (0), meaning the current heap. The heapnumber can range from one (1) to *the number heaps in the object*.

On the Configuration Server, the numbering of heaps starts at 1, whereas on an HPCA agent the numbering of heaps starts at 0.

The return value is:

- 0 if the object was copied to REXX storage
- Ø if it failed; the Configuration Server log will indicate the exact error.

EDMGET has a high cost to process a CSDB object, because each call to EDMGET will return all of the attributes in the object, thus creating all of the REXX variables that are noted above. If the intent (in the REXX code) is to get the value of some of the attributes that are defined in the object, then use EDMGETV, which is discussed in the next section

EDMGETV

(*object,attribute,heapnumber,resolve*)

- *object* is the CSDB object that is to be processed.

  The value that is specified will be automatically uppercased. Valid syntax for object names is 1 to 8 bytes; invalid names will generate a REXX syntax error.

- *attribute* is the attribute—of the above-referenced object—that is to be read.

  The value that is specified will be automatically uppercased. Valid syntax for attribute names is 1 to 8 bytes; invalid names will generate a REXX syntax error.

- *heapnumber* is the heap—of the above-referenced object—that is to be processed.

  The *heapnumber* can range from one (**1**) to *the number heaps in the object*.

  — If *heapnumber* is not specified, it defaults to zero (**0**), meaning the current heap.

  — If the value that is specified is out of range, a REXX syntax error is generated.

- **resolve** is a flag that can accept the values of **0**, **1**, **Y**, and **N**.

  — If **resolve** is not specified, it defaults to **0** (**N**), and the value that is returned is the contents of the object and attribute that are specified in arguments 1 and 2.

  — If **1** (**Y**) and the contents of the object and attribute that are specified in arguments 1 and 2 are in the form of `&(object.attribute)`, the value that is returned is an "indirect" value.

  If the contents are not in the form of `&(object.attribute)`, the contents are returned "as-is."

For additional information on REXX operators, refer to the *REXX Programming Guide*.

EDMGETV will return the null string (`""`) if either the object or the attribute does not exist.

Use the REXX "strictly equal" operator, consecutive equals signs (**==**), to check for the null string (`""`).

For additional information on signal instruction, refer to the *REXX Programming Guide*.

For example:

```
thisuser = edmgetv("zmaster", "zuserid") /* such as FRED */
this_data = edmgetv("zmaster", "mydata")
if "" == this_data
```

```
      then say "The attribute mydata does not exist"
else say "The attribute mydata is" this_data
```

EDMSET

(*object,heapnumber*)

EDMSET is used to migrate the value of REXX variables into the specified object at the specified heap. Attributes that are not defined in the object are added; existing attributes are updated. To add a new heap to an existing object, set the value of *heapnumber* to one more than the current number of heaps in the object (that is, *the current number heaps in the object* + 1). The variables that are migrated to the object are in the following form.

object.attribute

The process scans all of the currently allocated (REXX) variables, looking for names that start with the value that is specified for *object*, such as **zmaster**. When a match is found, it is checked to determine whether the second part of the argument (*attribute*) conforms to an attribute name (1 to 8 bytes in length).

If so, it is checked to determine whether it fits the size restrictions (no more than 255 bytes) of an attribute.

If it passes this check, the REXX variable is migrated to the object.

- If either of these format checks fails, the REXX variable is skipped.

The return value is:

- 0 if no errors were encountered during the migration.
- Ø if errors were generated; the Configuration Server log will indicate the exact error.

As noted with EDMGET, EDMSET is a costly process to save one or two attributes. For this processing, it would be better to use EDMSETV, which is discussed in the next section.

EDMSETV

(*object,attribute,value,heapnumber*)

- *object* is the CSDB object that is to be processed.

  The value that is specified must be from 1 to 8 bytes in length; this value will be automatically uppercased.

- *attribute* is the attribute—of the above-referenced object—that is to be written.

  The value that is specified must be from 1 to 8 bytes in length; this value will be automatically uppercased.

- *value* is the text to be saved to the attribute.

- *heapnumber* is the heap—of the above-referenced object—that is to be processed.

  If *heapnumber* is not specified, it defaults to zero (0), meaning the current heap. The *heapnumber* can range from one (1) to *the number heaps in the object*.

  If the specified arguments do not conform to the syntax, a REXX syntax error is generated with the error text being written to the Configuration Server log.

  For additional information on signal instruction, refer to the *REXX Programming Guide*.

If EDMSETV completes (without a syntax error), a return value of:

- 0 indicates that the was saved in the specified object/attribute.
- Ø indicates that it failed; the Configuration Server log will indicate the exact error.

EDMRESO

EDMRESO runs a “secondary” resolution on the instance name that is specified by

```
rcode = EDMRESO(f.d.c.i).
```

The `f.d.c.i` indicates the CSDB tree structure, FILE.DOMAIN.CLASS.INSTANCE.

EDMRESO status is indicated by return codes of:

- 0 indicates that the process started
- Ø indicates that the process did not start; check the Configuration Server log for details.

Configuration Server Database Object and non-ASCII Object Names

For REXX variables to be created by EDMGET, their names need to consist of characters that are valid REXX variable names. (Refer to the *REXX Programming Guide*.) Such is not the case for CSDB object names that consist of multi-byte UTF-8 sequences.

Objects can still be processed via EDMGETV and EDMSETV because all of the arguments to these functions are (REXX) strings, as in:

```
say EDMGETV("zmaster", "zos")
```

All object processing can be done with EDMGETV and EDMSETV, but the numbers of heaps and attributes, which are set by the EDMGET call, would not be known.

Additional Functions

Three additional REXX functions retrieve object names and properties.

- NvdCurrentObjects
  returns information pertaining to the current Configuration Server session.
- NvdObjectInfo
  returns information pertaining to heap counts and attributes.
- NvdObjectInfoEX
  is similar to NvdObjectInfo but includes attribute-property information.

These functions are valid on Windows and UNIX operating systems.

NvdCurrentObjects

```
Objectlist = NvdCurrentObjects() /* no arguments */
```

NvdCurrentObjects returns a list of words that contains the names of the objects that exist in the current Configuration Server session. So,

```
AllObjects = NvdCurrentObjects()
```

returns a list of all object names that are allocated in the current Configuration Server-HPCA agent connection. Use this information to check the availability of, for example, ZMASTER, as in:

```
Objects = NvdCurrentObjects()

If wordpos("ZMASTER", Objects) > 0  /* Note that object names are
case sensitive */
```

```
   then say "zmaster exists"
   else say "Can't find ZMASTER"
```

NvdObjectInfo

```
Infolist = NvdObjectInfo(object)
```

- *object* is the CSDB object that is to be processed.

  The value that is specified will be automatically uppercased. The name that is specified has to be from 1 to 8 bytes; invalid names will generate a REXX syntax error.

Returns

NvdObjectInfo returns a list of words in which

- the first word is the heap count for the specified object,
- the second word is the total size of all the attributes in the specified object, and
- the rest of the list contains the names of the attributes that are in the specified object.

Encrypted attributes are not returned.

So, the above-mentioned information can be determined by using the following REXX code.

```
Object = "zmaster"
Parse value NvdObjectInfo(Object) With Heaps TotalSize
AttributeNames
AttributeCount = words(AttributeNames)
```

If there are any errors, only the heap count is returned, and is so as a negative number.

```
if heaps > 0
   then nop
   else exit 16
```

To get the attribute names:

```
Do nn = 1 to AttributeCount
   say word(AttributeNames, nn)
End nn
```

NvdObjectInfoEX

```
Infolist = NvdObjectInfoEX(object)
```

- *object* is the CSDB object that is to be processed.

  The value that is specified will be automatically uppercased. The name that is specified has to be from 1 to 8 bytes; invalid names will generate a REXX syntax error.

Returns

NvdObjectInfoEX returns "property" information for each of the attributes that is returned—including encrypted attributes.

```
ObjectInfo = NvdObjectInfoEX(objectname)
```

The property information is returned in the following form, with the last four values returned as numerals.

```
attributename:size:mflags:cflags:vtype
```

- *size*
  "size" is a decimal numeric value from 1 to 255
- *mflags*
  "manager flags" is a decimal numeric value from 0 to 255.
- *cflags*
  "client flags" is a decimal numeric value from 0 to 255.
- *vtype*
  "attribute type" is a single ASCII character that describes the attribute "type." Valid values are **C** (connection), **V** (variable), and **M** (method).

  This is a decimal numeric value, so **V** would be specified as **86**.

For additional information on attribute properties, refer to the *Admin User Guide*.

To access this information, use the following REXX code.

```
parse value nvdobjectinfoex("zmaster") with heaps totalsize
attributes


do aa = 1 to words(attributes)

parse value word(attributes, aa) with attribute ":", maxlen
            ":" mflags ":" cflags ":" vtype .

wstr = d2c(vtype)
```

```
if datatype(wstr, 'm')
   then vtype = wstr
   else vtype = d2x(vtype)

mflags = x2b( d2x(mflags, 2))
cflags = x2b( d2x(mflags, 2))
say attribute mflags cflags vtype
end aa
```

Lastly, two utility functions to convert between local code page (LCP) and UTF-8 strings.

NvdL2U

```
UTF8Value = NvdL2U(LCPVALUE)
```

NvdU2L

```
LCPValue = NvdU2L(UTF8Value)
```

The REXX functions **stream**, **linein**, **lineout**, **charin**, **charout**, and **lines** reference external files. The filename and path that are specified must be in LCP. These functions can be used to convert the value. For example, to read a file that has been saved in the Configuration Server's method path, use:

```
wstr = edmgetv("ZCVT","MTHPATH")
if right(wstr, 1) = rxxospathseparator()
   then nop
   else wstr = wstr || rxxospathseparator()

mydata = nvdu2l(wstr || "mydata.file")

info = stream(mydata, 'c', 'query exists')

:
:
:
```

In this case, *mydata* will contain LCP characters that are the value needed for the REXX stream function.

ZCVT and ZTCBG

These two objects assist you in determining current values for CSDB tasks and connects, whether or not they are running. ZCVT performs a global function—determining values of tasks and connects for the entire CSDB, whereas ZTCBG determines the values that are relevant to the specified task or connect.

The ZCVT and ZTCBG objects (`objname`) work with the EDMGET, EDMGETV, EDMSET, and EDMSETV REXX extensions, as described in the previous section.

Table 76 below and Table 77 (on page 156) present the variables associated with ZCVT and ZTCBG, respectively.

ZCVT Table of Variables

Table 76 ZCVT Variables

Variable Name	Variable Type	Description
VERMAJ	USHORT	Configuration Server major version number
VERMIN	USHORT	Configuration Server minor version number
VERREVNO	USHORT	Configuration Server revision number
VERREVLE	UCHAR	Configuration Server revision letter
VERBLDNO	ULONG	Configuration Server build number
OSNAME	STR	Configuration Server's operating system
TOLOGONS	LONG	Total number of logons to the Configuration Server
TRCOMMCB	FLAG	COMM Trace value
TRCOMDAT	FLAG	COMM trace value
TRDSCOMP	FLAG	DSCOMP trace value
TRTEST	FLAG	TEST trace value

Variable Name	Variable Type	Description
TRDYNALO	FLAG	ALLOC trace value
TRVARSTG	FLAG	VARSTG trace value
TRDBCB	FLAG	ODBCBS trace value
TRDBDATA	FLAG	ODBDATA trace value
TRAUDIT	FLAG	AUDIT trace value
TRPROFIL	FLAG	PROFLE trace value
TRRESRCE	FLAG	RESOURCE trace value
TRPROMOT	FLAG	PROMOTE trace value
TRCONFIG	FLAG	CONFIG trace value
TRMETHOD	FLAG	METHOD trace value
TRCPIC	FLAG	CPIC trace value
TRADMIN	FLAG	ADMIN trace value
TRRESLV0	FLAG	OBJRES0 trace value
TRBINDFL	FLAG	DATA trace value
TRDAXFRM	FLAG	TRAN trace value
TR3270BU	FLAG	BUFF trace value
TRCOMM	FLAG	COMM trace value
TRFILPRO	FLAG	FILE trace value
TROBJXFR	FLAG	OBJXFER trace value
TROBJCRC	FLAG	OBJCRC trace value
TRREXX	FLAG	REXX trace value
TRVARS	FLAG	VAR trace value
TRSUBST	FLAG	SUBST trace value
TRDESENC	FLAG	DES trace value
TRCOMPR	FLAG	CMPR trace value
TROBJRES	FLAG	OBJRES trace value

Variable Name	Variable Type	Description
TRIMPLOD	FLAG	IMPL trace value
TREXPLOD	FLAG	EXPL trace value
TRLASIDE	FLAG	LOOKASID trace value
TRENQUE	FLAG	ENQDEQ trace value
TRSTATS	FLAG	STATS trace value
TRRESLV1	FLAG	OBJRES1 trace value
TRTCPIP	FLAG	TCP trace value
TRADMPRM	FLAG	ADMPROM trace value
TRNOTIFY	FLAG	NOTIFY trace value
TRSESBLK	FLAG	SESSBLK trace value
TRSTORAG	FLAG	Storage trace value
TRY2K	FLAG	YEAR2000 trace value
TRDMA	FLAG	DMA trace value
TRVSAPI	FLAG	VSAM trace value
TRVSCB	FLAG	VSAMRPL trace value
TRVSDATA	FLAG	VSAMDATA trace value
TRREXOFF	FLAG	REXXOFF trace value
SHTINDIC	UCHAR	Shutdown indicator
SHTLGMGR	UCHAR	Log Configuration Server shutdown indicator
REXALLOC	LONG	REXX allocate count
TOPTSKID	LONG	ZTOPTASK ID
LOGMGRID	LONG	ZLOGMGR ID
ULGMGRID	LONG	ZULOGMGR ID
CLKMGRID	LONG	ZCLKMGR ID
TSKMGRID	LONG	ZTASKMGR ID
MGRTYPE	UCHAR	MANAGER_TYPE value

Variable Name	Variable Type	Description
TASKTYPE	UCHAR	TASK_TYPE value
MEMTYPE	UCHAR	MEMORY_TYPE value
DBLUDATE	STR	Date of last CSDB update
DBLUTIME	STR	Time of last CSDB update
DBLCKCNT	USHORT	CSDB lock count
DBSTATUS	UCHAR	CSDB status
BYTELEVD	UCHAR	Byte level differencing on value
DNYDUPIP	FLAG	ALLOW_DUPLICATE_IP_ADDRESS value
TRUSTEDP	FLAG	Authorized trusted partner value
TSOSRVCE	FLAG	TSO service value
LICERROR	FLAG	License violation error value
ACALLADM	FLAG	ALWAYS_CALL_ZADMIN value
OKDUPINS	FLAG	ALLOW_DUPLICATE_INSTANCES value
QUITASKS	FLAG	Quiesce task
QUITRANS	FLAG	Quiesce transaction
LALLTCP	FLAG	TCP/IP logons allowed value
REXDISAB	FLAG	REXX off
MODNAMLO	FLAG	SHOW_MODULE value
MODVERLO	FLAG	SHOW_VERINFO value
TCPRHNAM	FLAG	GET_REMOTE_HOST_NAME value
HISTORY	UCHAR	History file value
ACCESSA	UCHAR	MGR_ACCESS ADMIN value
ACCESSC	UCHAR	MGR_ACCESS CONSOLE value
ZTIME	STR	Time in HH:MM
ZTIME24	STR	Time in HH:MM on 24-hour clock
ZAMPM	STR	AM or PM value

Variable Name	Variable Type	Description
ZDATE	STR	MM/DD/YYYY date form
ZDATEDMY	STR	DD/MM/YYY date form
ZMONTH	STR	Short value for month (e.g., Jan)
ZMONTHLNG	STR	Long value for month (e.g., January)
ZDATEJUL	STR	Julian date
ZDATEYMD	STR	YYYY/MM/DD form for sorting
ZDAT2YMD	STR	YYYY/MM/DD form for sorting – full MM, DD value
MGRID	STR	Configuration Server ID (MGR_ID)
MGRNAME	STR	Configuration Server name (MGR_NAME)
DOMAIN	STR	Configuration Server domain name (DOMAIN)
STDOMANE	STR	EDM client start domain (START_DOMAIN)
STCLASSE	STR	EDM client start class (START_CLASS)
STDOMANR	STR	HPCA agent start domain (START_DOMAIN)
STCLASSR	STR	HPCA agent start class (START_CLASS)
STDOMANA	STR	ATM start domain (START_DOMAIN)
STCLASSA	STR	ATM start class (START_CLASS)
DBASE	STR	CSDB used at startup (DBASE)
AGENT	STR	Agent ACB (AGENT)
TCPPORT	STR	TCP PORT value (TCP_PORT)
TCPUSRID	STR	USERID of TCP/IP address space
TORESO	LONG	Number of object resolutions
DEEPRESO	LONG	Deepest object resolution
TOOBJI	LONG	Number of inbound objects
TOOBJO	LONG	Number of outbound objects
ZERMXWRN	SHORT	Max number of warnings heaps
ZERMXERR	SHORT	Max number of error heaps

Variable Name	Variable Type	Description
TOCOMP	LONG	Number of times compression done
TOCOMPI	LONG	Compression total bytes in
TOCOMPO	LONG	Compression total bytes out
TODCMPI	LONG	Decompression total bytes in
TODCMPO	LONG	Decompression total bytes out
TODCMP	LONG	Number to times decompression done
COMPSEED	LONG	Compression seed
TODBGETS	LONG	Number of GET operations
TODBPUTS	LONG	Number of PUT operations
TODBADDS	LONG	Number of ADD operations
TODBDELE	LONG	Number of DELETE operations
TOFILEIO	LONG	Global file i/o counts
TOFALLOC	LONG	Global file allocations
TSKLIMAX	SHORT	Max TASKLIM
TSKLIMIT	SHORT	TASKLIM (TASKLIM)
TSKLHARD	SHORT	HARD TASKLIM (TASKLIM_HARD)
TSKLSOFT	SHORT	SOFT TASKLIM
TSKLDLTA	SHORT	TASKLIM Delta
MAXRESCL	LONG	Max number of resource per HPCA agent
MAXRESAL	LONG	Max number of resource all HPCA agents
TOMETBIN	LONG	Number of methods run – ASM and C
TOMETREX	LONG	Number of methods run – REXX
TOXNRCVD	LONG	Number of transaction received
TOXNRJCT	LONG	Number of transaction rejected
PLSTATUS	PTR	Pointer to disable Pools heap
PLGLBHEP	FLAG	Global/local pools in used flag

Variable Name	Variable Type	Description
PLCONTIG	FLAG	Pools are allocated contiguous flag
PLEXPSIZ	ULONG	Pool expansion size
PLCSCRED	ULONG	Current storage credit
PLPSGUAR	ULONG	Percent Storage Guard
PLCSCUSH	ULONG	Current storage cushion
PLMSCUSH	ULONG	Minimum storage cushion
PLPOLHWM	ULONG	Largest polar bytes used
TSKPRIV	ULONG	Task private size
TSKSTSIZ	ULONG	Task stack size
TSKSTHWM	ULONG	Task stack size overuse HWM
TSKHPSIZ	ULONG	Task heap size
TSKHPHWM	ULONG	Task heap size overuse HWM
TIMEOCOM	LONG	TIMEOUT_COMM
TIMEONCM	LONG	TIMEOUT_NCOMM
TIMEOADM	LONG	ADMIN_TIMEOUT
TIMEODMA	LONG	DMA_TIMEOUT
RETRYBUS	LONG	BUSY_RETRY
RETRYDIS	LONG	DISABLE_RETRY
DSCOMPI	LONG	Data stream compression total bytes in
DSCOMPO	LONG	Data stream compression total bytes out
DSCOMPT	LONG	Number of times data stream compression done
SNDTHRTL	ULONG	SEND_THROTTLE
TIMEONFT	SHORT	NFYT_TIMEOUT
TIMEONFS	SHORT	NFYS_TIMEOUT
TIMEONFD	SHORT	NFYD_TIMEOUT
OBJNMASK	STR	Object name mask for traces

Variable Name	Variable Type	Description
VARNMASK	STR	Variable name mask for trace
LOGLNTSK	ULONG	TASK_LOG_LIM
MAXRSTSK	ULONG	TASK_RESO_LIM
MAXREC	LONG	MAXREC
BUFTCP	LONG	BUFTCP
LOGDIR	STR	DIRECTORY
LOGTHRES	LONG	THRESHOLD
LOGLNCNT	LONG	Log file line count
LOGSTINT	LONG	STORAGE_INTERVAL
LOGFSIZE	LONG	FLUSH_SIZE
LOGMWIDT	USHORT	MESSAGE_WIDTH
LOGMPREF	STR	MESSAGE_PREFIX
LOGMDATE	UCHAR	MESSAGE_DATE
LOGMLDEL	UCHAR	MESSAGE_DELIMITER
LOGMRDEL	UCHAR	MESSAGE_DELIMITER
LOGPSIZE	LONG	PIPE_SIZE
LOGFLUSH	FLAG	Log flush
LOGSWITC	FLAG	Log switch
LOGELOFF	FLAG	DISABLE_NT_EVENT_LOGGING
LOGSLOFF	FLAG	DISABLE_SNMP_TRAP_LOGGING
LOGSFREQ	STR	SWITCH_TOD
LOGFFREQ	STR	FLUSH_INTERVAL
LOGBPIPE	LONG	Log bytes in pipe
ULGDIR	STR	USERLOG DIRECTORY
ULGTHRES	LONG	USERLOG THRESHOLD
ULGLNCNT	LONG	USERLOG LINECOUNT

Variable Name	Variable Type	Description
ULGFSIZE	LONG	USERLOG FLUSH_SIZE
ULGMWIDT	USHORT	USERLOG MESSAGE_WIDTH
ULGACTIV	FLAG	USERLOG ACTIVATE
ULGPSIZE	LONG	USERLOG PIPE_SIZE
ULGFLUSH	FLAG	USERLOG flush
ULGSWITC	FLAG	USERLOG switch
SIMTSKPC	LONG	Simulation TASKS_PER_CONNECT
STATPATH	STR	Stats path
STATINTV	LONG	Stats interval
MTHPATH	STR	METHOD_PATH
MTHMLIMI	LONG	LOG_LIMIT
MTHTIMEO	LONG	TIMEOUT
DBPATH	STR	DBPATH
DBPPRIM	STR	PRIMARY DB path
DBPSECO	STR	SECONDARY DB path
DBPPROF	STR	PROFILE DB path
DBPRESO	STR	RESOURCE DB path
DBPHIST	STR	HISTORY DB path
DBPNOTI	STR	NOTIFY DB path
REXXPATH	STR	REXX_PATH
SYSPATH	STR	System path
DMASPATH	STR	DMA_STAGE_PATH
MGRSETFI	STR	PROFILE path
EXPTPATH	STR	EXPORT_PATH
USRPATH1	STR	USER_PATH1
USRPATH2	STR	USER_PATH2

Variable Name	Variable Type	Description
USRPATH3	STR	USER_PATH3
USRPATH4	STR	USER_PATH4
USRPATH5	STR	USER_PATH5
USZTCBGS	SHORT	Number of used ZTCBGs
CACSEGS	USHORT	CACHE_SEGMENTS
CACSIZE	ULONG	CACHE_SIZE
CACMAXE	ULONG	Max cache entries
CACSTATS	USHORT	CACHE_STATS
CACFULL	USHORT	CACHE full
CACCLOSE	USHORT	CACHE closed
ICASIZE	ULONG	ICACHE_SIZE
ICACLOSE	UCHAR	ICACHE closed
SMMAILDR	STR	MAIL_DIR
SMMGRMID	STR	MGR_MAIL_ID
SMLOCHST	STR	Local host NAME
SMDNSSRV	STR	DNS_SERVER
SMSMTPRT	USHORT	SMTP_PORT
SMSPLCNT	ULONG	Spooled mail count
SMTIMEO	USHORT	MAIL_TIMEOUT
SMMAXSPL	USHORT	MAX_TIME_IN_SPOOL
SMRETRYI	USHORT	RETRY_INTERVAL
SNPORT	USHORT	SNMP_PORT
SNLOGPRT	USHORT	SNMP_LOGGER_PORT
SNMGRPRT	USHORT	SNMP_MANAGER_PORT
SNRUNEXT	FLAG	RUN_AS_EXTENSION
SNIPADD	STR	SNMP_IP_ADDR

Variable Name	Variable Type	Description
SNMIPAD	STR	SNMP_MANAGER_IP_ADDR
SNMIPAD2	STR	SNMP_MANAGER_IP_ADDR2
SNMIPAD3	STR	SNMP_MANAGER_IP_ADDR3
SNCMNT	STR	SNMP_COMMUNITY
SNSTCMNT	STR	SNMP_SET_COMMUNITY
SNZERSEV	SHORT	SNMP_ZERROR_SEVERITY
ALSLOTS	LONG	ATTACH_LIST_SLOTS
ALVINTVL	LONG	VERIFY_INTERVAL
ALRLIMIT	LONG	RESTART_LIMIT
DMSECMTH	STR	SECURITY_METHOD
DIAINTVL	ULONG	DIAGNOSTIC_INTERVAL
DIADBYTE	ULONG	DIAGNOSTIC_MIN_DB_BYTES
DIALBYTE	ULONG	DIAGNOSTIC_MIN_LOG_BYTES
DBVERIFY	STR	VERIFY_DEPTH
DBAUTOFIX	FLAG	DB_AUTOFIX
METHDLLS	FLAG	Run methods as DLLS
ACTSKMON	ULONG	Number of monitors
ACTSKCON	ULONG	Number of consoles
ERREMAIL	STR	UserEmailErrorsTo
DBEEMAIL	FLAG	DBERROR e-mail
DBESHTDN	FLAG	DBERROR SHUTDOWN
DBESNMP	FLAG	DBERROR SNMP
POLCYSVR	STR	Status of the Policy Server (enabled/disabled)
RIM	STR	Status of the Inventory Manager (enabled/disabled)
RMP	STR	Status of the Portal (enabled/disabled)

ZTCBG Table of Variables

Table 77 ZTCBG Variables

Variable Name	Variable Type	Description
AUDFLAG	FLAG	Audit trace flag
TSKNAME	STR	Name of this task or HPCA agent
TSKSTTIM	STR	Time when task started
TSKSTDAT	STR	Date when task started
TSKLSTCO	STR	Time of last communication transaction
FREEMAIN	FLAG	Return storage on last free call
SHORTSTO	FLAG	Retry due to Short on storage
ZTERMINI	FLAG	Terminal task initiated
STOCRCUR	ULONG	Current storage credit
STOCRHEP	ULONG	Heap credit
STOCRSTK	ULONG	Stack credit
STOCRPVT	UONG	Private credit
STOCRPOO	ULONG	Zpools credit
STOCRCUS	ULONG	Credit cushion
MTHNAME	STR	Child name
MTHLIBNA	STR	Method library name
MTHLIBHA	ULONG	Method library handle
MTHLIBEN	ULONG	Method library entry point
MTHTHPRM	PTR	Method thread parameter pointer
TASKID	ULONG	Unique ID of this task
TASKPAR	ULONG	Unique ID of the parent task
USERID	STR	Task's user ID
TASKTYPE	STR	TASK TYPE
DEEPRESO	LONG	DEEPSET OBJECT RESOLUTION

Variable Name	Variable Type	Description
OBJSRESO	LONG	NUMBER OF OBJECTS RECEIVED
OBJSRECV	LONG	NUMBER OF OBJECTS RECEIVED
OBJSSENT	LONG	NUMBER OF OBJECTS SENT
TRCOMDAT	FLAG	COMM TRACE FLAG
TRDSCOMP	FLAG	DSCOMP TRACE FLAG
TRTEST	FLAG	TEST TRACE FLAG
TRDYNALO	FLAG	ALLOC TRACE FLAG
TRVARSTG	FLAG	VARSTG TRACE FLAG
TRAUDIT	FLAG	AUDIT TRACE FLAG
TRPROFIL	FLAG	PROFILE TRACE FLAG
TRRESRCE	FLAG	RESOURCE TRACE FLAG
TRPROMOT	FLAG	PROMOTE TRACE FLAG
TRCONFIG	FLAG	CONFIG TRACE FLAG
TRMETHOD	FLAG	METHOD TRACE FLAG
TRCPIC	FLAG	CPIC TRACE FLAG
TRADMIN	FLAG	ADMIN TRACE FLAG
TRRESLVL	FLAG	OBJRES0 TRACE FLAG
TRBINDFL	FLAG	DATA TRACE FLAG
TRDAXFRM	FLAG	TRAN TRACE FLAG
TR3270BU	FLAG	BUFF TRACE FLAG
TRCOMM	FLAG	COMM TRACE FLAG
TRFILPRO	FLAG	FILE TRACE FLAG
TROBJXFR	FLAG	OBJXFER TRACE FLAG
TROBJCRC	FLAG	OBJCRC TRACE FLAG
TRREXX	FLAG	REXX TRACE FLAG
TRVARS	FLAG	VAR TRACE FLAG

Variable Name	Variable Type	Description
TRSUBST	FLAG	SUBST TRACE FLAG
TRDESENC	FLAG	DES TRACE FLAG
TRCOMP	FLAG	CMPR TRACE FLAG
TROBJRES	FLAG	OBJRES TRACE FLAG
TRIMPLOD	FLAG	IMPL TRACE FLAG
TREXPLOD	FLAG	EXPL TRACE FLAG
TRLASIDE	FLAG	LOOKASID TRACE FLAG
TRENQUE	FLAG	ENQDEQ TRACE FLAG
TRSTATS	FLAG	STATS FLAG
TRRESOL1	FLAG	OJBRES1 TRACE FLAG
TRTCPIP	FLAG	TCP TRACE FLAG
TRADMPRM	FLAG	ADMPROM TRACE FLAG
TRNOTIFY	FLAG	NOTIFY TRACE FLAG
TRSESBLK	FLAG	SESSBLK TRACE FLAG
TRSTORAG	FLAG	STORAGE TRACE FLAG
TRY2K	FLAG	YEAR2000 TRACE FLAG
TRDMA	FLAG	DMA TRACE FLAG
TRVSAPI	FLAG	VSAM TRACE FLAG
TRVSCB	FLAG	VSAMRPLS TRACE FLAG
TRVSDATA	FLAG	VSAMDATA TRACE FLAG
TRREXOFF	FLAG	REXXOFF TRACE FLAG
STBBSENT	FLAG	BB SENT FLAG
STNOSNAP	FLAG	NO SNAP FLAG
STCOWAIT	FLAG	WAIT FOR COMM OP FLAG
STPWDVER	FLAG	EDATS SF ORDERS OK FLAG
STTIMOUT	FLAG	TIMEOUT IN PROGRESS FLAG

Variable Name	Variable Type	Description
STFORTER	FLAG	FORCED TREMINATION FLAG
STPARSES	FLAG	PAR SESS PARTNER FLAG
STSESEST	FLAG	SESSION ESTABLISHED FLAG
STSESTER	FLAG	SESSION TERMINATED FLAG
STSESLST	FLAG	SESSION LOST FLAG
STTSKABN	FLAG	TASK ABENDED FLAG
STSESSND	FLAG	SEND FLAG
STNOPDS	FLAG	NO PARSE R/S DATA STREAM FLAG
STTSKINA	FLAG	TASK BEING INACTIVATED FLAG
STTIMSND	FLAG	TIME SENT FLAG
STNODSCO	FLAG	NO DS COMPRESSION FLAG
STABTRES	FLAG	ABORT OBJECT RESOLUTION FLAG
STABTLEG	FLAG	ABORT OBJECT RESOLUTION FLAG
STSTRLOG	FLAG	IN LOGGER FLAG
STEOT	FLAG	EOT FLAG
STNOSUB	FLAG	NO SUBSTITUTION FLAG
STDRAINS	FLAG	DRAIN FLAG
STCONSOL	FLAG	CONSOLE IS RUNNING
STHRDLCK	FLAG	SYSTEM HARDLOCKED FLAG
STSSRESO	FLAG	SINGEL SERVICE RESOLUTION FLAG
STUSEMET	FLAG	USER METHOD RUNNING FLAG
STMSGLIM	FLAG	LOG MSG LIMIT REACHED FLAG
STMETMES	FLAG	METHOD MSG LIMIT REACHED FLAG
STREXMET	FLAG	REXX METHOD RUNNING FLAG
TOCOMP	LONG	NUMBER OF TIMES COMPRESSION DONE
TOCOMPI	LONG	COMPRESSION TOTAL BYTES IN

Variable Name	Variable Type	Description
TOCOMPO	LONG	COMPRESSION TOTAL BYTES OUT
TODCOMPI	LONG	DECOMPRESSION TOTAL BYTES IN
TODCOMPO	LONG	DECOMPRESSION TOTAL BYTES OUT
TODCOMP	LONG	NUMBER OF TIME DECOMPRESSION DONE
TODBGETS	LONG	NUMBER OF GETS
TODBPUTS	LONG	NUMBER OF PUTS
TODBADDS	LONG	NUMBER OF ADDS
TODBDELE	LONG	NUMBER OF DELETES
TOFILEIO	LONG	FILE I/O COUNT
TOFALLOC	LONG	FILE ALLOCATION COUNT
TOMTHBIN	LONG	NUMBER OF METHODS RUNA – ASM AND C
TOMTHREX	LONG	NUMBER OF METHOS RUN – REXX
REMIPNAM	STR	IP NAME OF REMOTE CLIENT

Configuration Server Methods

Overview

A method is a program or procedure that can be packaged and exchanged as an object, specifically as an instance of the METHOD Class (ZMETHOD Class in EDM). By connecting an instance of this class to another class instance, an HPCA administrator can specify where and when that program/procedure will run. An HPCA administrator can also run a method from a REXX script, thereby enabling the execution of methods outside of the object resolution process. The following is an example of the format that is used to execute a method in this way.

Comment [JGM1]: Do you think we can remove references like this?

```
ADDRESS EDMLINK ZOBJCMPR 'ZTEST'
```

EDMLINK is a method that allows an HPCA administrator to process other methods. It returns the return code of the invoked method. The format for EDMLINK is:

```
ADDRESS EDMLINK methodname 'Parameter associated with
Method'
```

Configuration Server methods allow an HPCA administrator to manipulate in-storage objects and database entities (database components) at the system (Configuration Server) level as opposed to the HPCA agent or workstation objects.

- *Configuration Server Database components* are the entities (files, domains, classes, instances, and variables) that reside in the CSDB.
- *In-storage objects* are used or created during object resolution.

Appendix A, Configuration Server Methods on page 397, describes each method with parameters, examples, and return codes.

The Affects of Configuration Server Methods

Table 78 below lists the Configuration Server methods that affect in-storage objects and database entities.

Table 78 lists only those Configuration Server methods that affect in-storage objects and database entities. Configuration Server methods that affect neither are not listed in this table.

Table 78 Methods affecting in-storage objects or CSDB entities

Method	Affects
EDMMAILQ	In-storage objects
EDMMCACH	In-storage objects
EDMMDB	CSDB entities
EDMMRPRO	CSDB entities
ZDCLASS	CSDB entities
ZDELINS	CSDB entities
ZDELOBJS	In-storage objects
ZDELPROF	CSDB entities
ZEXIST	CSDB entities

Method	Affects
ZGETPROF	CSDB entities
ZOBJCMPR	In-storage objects
ZOBJCOPY	In-storage objects
ZOBJDELI	In-storage objects
ZOBJDELV	In-storage objects
ZOBJSORT	In-storage objects
ZPROMANY	CSDB entities
ZPUTHIST	In-storage objects
ZPUTPROF	In-storage objects
ZSIMRESO	In-storage objects
ZTOUCH	CSDB entities
ZVARDEL	In-storage objects
ZVARGBL	In-storage objects
ZVARLOG	In-storage objects
ZXREF	In-storage objects

Methods are often used in conjunction with one another to achieve a purpose. For example, you can use the ZDELOBJS method to delete an in-storage object, and then execute ZOBJCOPY to copy an object, giving it the original object name.

Methods must be connected to other class instances at an appropriate point to achieve a desired result. For example, you do not want to delete an instance before it is used in object resolution, or create an instance if it will be immediately overwritten.

The default file and domain used by some methods can be specified in the DBASE and DOMAIN values of the MGR_STARTUP setting of the Configuration Server `edmprof` file.

Method Naming Standards

The standard that is used to name the methods is dissectible, enabling you to ascertain the method's use. All method names are structured as detailed in Table 79.

Table 79 Configuration Server Methods Naming Standard

Symbol	Definition
EDM	Identifies the method as an HP method.
M	Identifies the method as a Configuration Server method.
DOBJ	Represents an abbreviation of the function for which the method can be used, in this case, Delete Object.

"Must Run" Methods

When you configure methods to run during the resolution process, you expect specific outcomes. If one method is intended to work in conjunction with another, or have a direct effect on the correct outcome of the resolution, the entire resolution process might depend on, first the existence of, then the successful launching of, this method.

You can designate a method as "must run," which means that, before continuing with the resolution process, the Configuration Server will determine if the method exists and can be run. If it is not found or cannot be launched, the return code for the method will be set to 16 (Abort Resolution). The resolution will then be halted.

If you do not designate a method as "must run," the Configuration Server does not recognize it as being essential to the outcome of the resolution and will continue processing based on the resulting return code. The only indications that the method was not processed are the return codes (as shown in messages in the log) and the result of the resolution path.

To configure a method as "must run," insert the ZMUSTRUN variable in the METHOD instance and set the value to YES. (The default value for ZMUSTRUN is **NO**.) You can also establish a specific message to be returned by inserting the MSGONERR variable in the ZMETHOD instance.

If no value is specified for MSGONERR, the following message will appear:

```
"CONFIGURATION UNCHANGED! UNABLE TO DETERMINE NEW
CONFIGURATION."
```

4 Notifying HPCA Agents

At the end of this chapter, you will:

- Know about the different ways to invoke the Notify function.
- Know how to configure multiple Notify Managers.
- Know how notification retries are established.

An Overview of Notify

The notify function enables the initiation and execution of programs on an HPCA agent device from another location, and is usually, initiated by the Configuration Server. However, an HPCA agent that is configured as an administrator can also initiate notify processing requests.

The uses of the notify function vary from initiating HPCA agent connections via notify to ad-hoc notifies to reboot a single machine. It is a powerful, flexible tool that can be used for starting non Client Automation-specific processes (such as, restart and backup) on HPCA-managed devices.

In a typical manual connect scenario, the HPCA agent initiates the connect process to receive the resources configured for that device. By using notify, the Configuration Server can contact an HPCA agent and request that it connect or, alternately, accomplish some other task defined for that device, at any time.

Generally, this process depends on the Configuration Server having a reliable method by which to identify and contact each HPCA agent. This method of contact might the IP address that was used at the last HPCA agent-Configuration Server connect in a static IP address environment, or the host name of the HPCA agent device in a DHCP environment. Any of these methods can be used to identify the HPCA agent as the target of a Configuration Server initiated notify. It is by this identifier, as well as the communications environment being used, that the Configuration Server knows how to contact the HPCA agent. Once communication is established with the HPCA agent, the Configuration Server can initiate processes to perform a variety of functions. The HPCA agent identifier must be unique and reliable in order to predict which HPCA agent will receive the notify.

In order for TCP/IP to receive notify messages from the Configuration Server, the receiving HPCA agent devices must have a notify receive daemon running. The Macintosh, UNIX, and Windows platforms must run the notify receive daemon and the HPCA agent notify receive programs in order to receive any incoming messages.

The EDM client and HPCA agent notify receive programs are EDMEXECD and RADEXECD, respectively.

Comment [JGM2]: Can we remove references like this?

Notify currently supports TCP/IP and e-mail. The sender and receiver must be using the same communications protocol if the program is to execute properly.

The following section describes how the Configuration Server can notify HPCA agents to initiate the HPCA agent connect process.

Notify and the HPCA Agent Connect Process

Software distribution is typically discussed in terms of push and pull. This refers to the concepts of pushing software out from a central location to an HPCA agent, or the HPCA agent pulling software in from a central location. The major difference between the push and pull scenarios is the point at which the distribution activity is initiated—the server or the HPCA agent. HP supports both models by offering numerous options that are used to define how, when, and where the distribution process is initiated. Notify provides users with the means to configure and implement a push scenario.

The HP distribution process—the HPCA agent connect process—is part of an entire configuration process during which the HPCA agent connects to the Configuration Server to determine what its configuration should be. This connection process is comprised of a series of programs that execute on the HPCA agent to perform comprehensive, continuous configuration management. Many of these programs communicate with the Configuration Server to obtain required information, while other programs perform strictly local processing.

HP Client Automation supports three basic connect types, as follows:

- **Manual Connect**
  The user invokes the HPCA agent connect process by choosing the appropriate icon. This process can be defined as a pull.
- **Timed Connect**
  A timer process that runs on the HPCA agent executes the connect process at a predetermined date and time. This operation can also be defined as a pull.

  For more information on these HPCA agent initiated connects, refer to the *Application Manager and Application Self-service Manager Guide*.
- **Notify Connect**
  The HPCA agent is notified from a central control point to perform the connection. The notify process is a push.

  Notify can be executed only if the “notifier” (usually the Configuration Server) and the “notifyee” support the same communications protocol.

When to Use Notify

In addition to forcing an HPCA agent to connect to a Configuration Server, the notify function can be used in the following ways:

- Using notification for other purposes
  The notify functionality can be used for emergency distribution of files outside of an HPCA agent connect process; for initiating some event on the HPCA agent (such as switching versions); and for collecting debugging information about a connect failure.
- Instead of EDMTIMER
  EDMTIMER is used to deploy applications at specific time intervals. It is often set to execute during non-peak hours. Initiating a large number of simultaneous connects in large network environments can slow down deployment by overburdening the source. Notify can be used in place of EDMTIMER to force smaller groups of users to receive information at staggered time intervals.

Types of Notify

There are three ways in which to invoke the notify function, as described in the following sections:

- Simple Notify (starting below)
- GUI-Configured Notify (starting on page 170)
- EDMMPUSH (starting on page 409)

Simple Notify

The ZNFYT method is for a TCP/IP environment. It enables a remote HPCA agent notification, instructing the HPCA agent to initiate the connect. To execute a Simple Notify, RADEXECD must be running on the HPCA agents on which a push is being executed.

The ZNFYT method stores the results of the notification in the Configuration Server's NOTIFY File, producing an instance for each HPCA agent that is notified. This Configuration Server method works on all HP supported Configuration Server platforms. Table 80 presents the parameters for ZNFYT, along with a description of each.

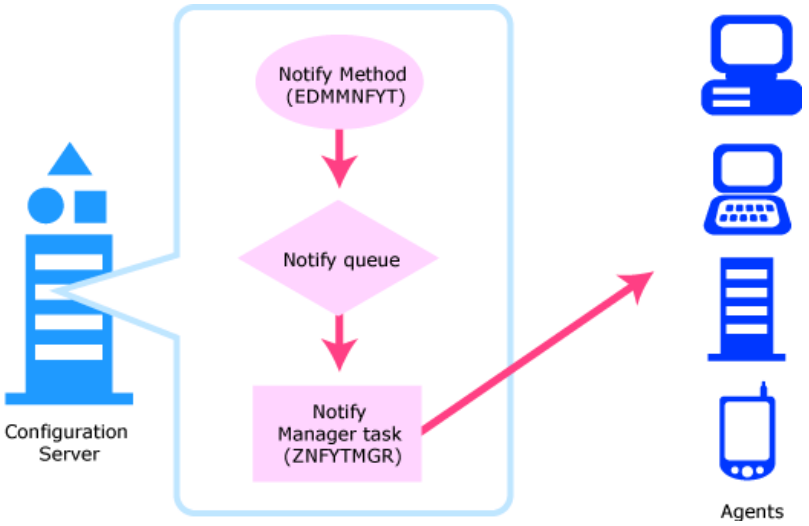
Table 80 ZNFYT Parameters

Parameter	Description
domain	Name of the domain where notification results are stored. If this parameter is not specified, the domain name will be automatically generated as a function of date/time.
instance	Instance name containing results of the single notification. If this parameter is not specified, instance name will be automatically generated as an eight-digit number. Default is **00000001**.
password	ZNFYPWD for the ZMASTER object of the target terminal.
port	Port number. This should have the same value as the ZMASTER port number.
“process to run”	Application you are forcing the HPCA agent to execute.
target IP address	IP address of the HPCA agent to which you are executing a push.
user ID	HPCA agent user ID.

Newer notify features, such as Wake-On-LAN and Scheduling for Notifies are not supported by Simple Notify. To take advantage of these features, you must use the EDMMPUSH form of notify.

Figure 1 on page 170 presents an overview of the Simple Notify process.

Figure 1 Overview of the Simple Notify process



For information on how to configure multiple Notify Manager tasks, see Multiple Notify Managers on page 180.

For a look at how to retry failed notifications, see Retrying Failed Notifies on page 182.

For information on how to schedule an HPCA agent notification, see Scheduling for Notify on page 184.

GUI-Configured Notify

The Configuration Server supports a method for establishing notifies using a standard graphical user interface. This easy-to-use process is called drag-and-drop notification (DDN). The Admin CSDB Editor provides the support for drag-and-drop notification on the administrator side. The drag-and-drop notification feature was incorporated to make it easier to notify large groups of users. Presently, this feature allows for the notification of all the users of the department, user group, single user, or all the users of the service. It is very important to understand that the destination information is searched for in the PROFILE File—specifically, in `PROFILE.USER_ID.ZMASTER.OBJECT`.

In order for DDN to work, all the necessary information should be written to the PROFILE File during the HPCA agent resolution process before DDN. If the necessary information is not in the PROFILE File, DDN will not be possible. DDN is not designed to notify new users whose destination information is not yet in the PROFILE File of the CSDB.

There are two aspects to DDN: the source icon and the destination icon. The source icon is that which is dragged and dropped onto the destination icon.

The source instance must belong to the USER, WORKGRP, DEPT of the POLICY Domain, or ZSERVICE Class of the SOFTWARE Domain.

The destination instance must be a member of the ZCOMMAND Class found in PRIMARY.SYSTEM Domain.

To perform drag-and-drop notification (DDN)

1. In the Admin CSDB Editor, expand the CSDB tree to the icon that represents the source instance (for example, PRIMARY.POLICY.WORKGRP.PROD_USERS).
2. Click the instance.
3. While holding down the left mouse button, drag the instance to the icon that represents the destination instance (for example, SYSTEM.ZCOMMAND.NOTIFY).

   An icon, resembling a magic wand will appear, indicating that you are in the COMMAND Class.
4. Release the mouse button, thereby associating the source icon (instance) with the destination icon (instance).

   The result is that all instances belonging to WORKGRP.PROD_USERS will be notified.

The response message from the Configuration Server will indicate the number of users were found in this group and how many were scheduled for notification. Again, if the information about the selected users is not in the PROFILE File, no notification will occur.

As usual, all the results of the notification can be found in the Configuration Server log. Additionally, the notification results will be written to the NOTIFY File with a domain name created dynamically for each DDN action. The name of the domain will be returned to the HPCA agent in the ZADMNHNL attribute of the ZADMIN object. To see the results, right-click

on the domain and, from the popup menu, select **Status Display**. Another option, **Status Delete**, will delete the domain when you do not need it.

Types of Notifications Supported

It is important to note that a COMMAND Class instance is a special type of instance that is used to define a command to be executed. Table 81 lists the ZCOMMAND class variables that are used for DDN.

Table 81 ZCOMMAND Class Variables Used for DDN

Variable	Description	Length
ZCMDNAME	Command name (NOTIFY, EMAIL).	8
ZCMDPATH	Location of the command. Used only for EXEs that are not pre-established (NOTIFY, EMAIL).	255
ZCMDPRMS	Parameters passed to the command.	255
ZCMDSEP	Separator used for parameters in user-defined commands.	1
ZCMDSYNC	A synchronization flag that defines whether to wait until the user command executes and ends, or to return control immediately (Y/N).	1
ZCMDUCLS	USER Class name. This is the name of the class in which to look for users connected to the droppee. For example, if the value is set to COMPUTERS and the droppee is WORKGROP.ACCOUNTING, instances of the COMPUTERS class that are members of WORKGROP.ACCOUNTING will be the selected audience for the notification. If ZCMDUCLS is not specified, then (using the above example) the audience will be created by instances of the COMPUTERS class that are members of WORKGROP.ACCOUNTING. The default for ZCMDUCLS is **USER**.	8
ZCMDTYPE	Type of command to be executed (REXX, EXE).	8
ZCMDHNDL	Notify handle is a domain name created/reused in a NOTIFY File to store the information about notification results. The class name is created depending on the type of notification, and an instance name is generated as a sequential number (for first request it's 00000001, for next 00000002, and so on). If the handle is not specified, the name will be generated as a function of date/time to make it unique.	32

Variable	Description	Length
ZCMDUINF	User information passed to notify start and end methods. If not specified, ZCMDHNDL in combination with instance name (heap number) will be used. For example, if handle was specified as **USERS_DEFERRED_NOTIFY.** For the first request, user info will be USERS_DEFERRED_NOTIFY_00000001. For the second, USERS_DEFERRED_NOTIFY_00000002, and so forth.	128
ZCMDRMAX	Maximum number of retries in case of notify failure.	3
ZCMDDLAY	In case of failure, the interval (in seconds) to wait before a retry will be scheduled. The default is **300** (5 minutes).	4
ZCMDNFYD	Date when the notify request should be executed the first time. The format is YYYY/MM/DD. The default is the current date.	10
ZCMDNFYT	Time when the notify request should be executed the first time. The format is HH:MM:SS. The default is the current time.	8

The user information in ZCMDUINF can be used as a key to write the information to an SQL database. The key would be unique. It is recommended that you do not specify the value, rather, let it be generated as described above. However, if the value is used in some other fashion in notify methods, it can be defined and then further processed in any way in notify methods (for instance, combine the handle and IP address for TCP/IP).

Currently, two types of notify operations are supported in the COMMAND Class: NOTIFY and EMAIL. This means that you can choose between TCP/IP and e-mail for the notification.

You can also use the ZNFYTSTA REXX in conjunction with all types of Notifies. For more information, see Chapter 3, Managing Configuration Server Processing.

The notification command, specified as the ZCMDPRMS variable, is the text that is sent to the HPCA agent as either the command line in a TCP/IP Notify, or the message and subject in an e-mail notify. (See Scheduling for Notify on page 184 for information on configuring the COMMAND Class for deferred notification.)

The source instance must belong to the USER, WORKGRP, DEPT of the POLICY Domain, or ZSERVICE Class of the SOFTWARE Domain.

The destination instance must be a member of the ZCOMMAND Class found in PRIMARY.SYSTEM Domain.

It is also important to understand that before the COMMAND Class instance is taken for processing, the secondary resolution is done, and all the variables of the instance will be substituted. This will allow a partial or complete change of the command line and/or the notification type.

Necessary Profile Information

In order for the DDN to work, the following information must be in the source instance's PROFILE.userid.ZMASTER.OBJECT.

Table 82 Drag-and-Drop Profile Information

Variable	Description	e-mail	TCP/IP
ZUSERID	At the time of notification, the target user ID must match the one in the ZMASTER object.	N/A	•
ZNFYPWD	Password. If there is a ZNFYPWD in the ZMASTER object of the PROFILE File, notify will use it. Otherwise, the default, **EDMPASS**, will be used.	N/A	•
ZNTFPORT	Port number for notify daemon (The default is **512**).	N/A	•
ZCIPADDR	IP address of the HPCA agent device.	N/A	•
ZIPNAME	Fully qualified host name of the HPCA agent device. If ZCIPADDR is not specified, this variable can be used instead.	N/A	•
EMAIL	Fully qualified e-mail address of the destination.	•	N/A

There are two ways of specifying an HPCA agent IP address:

- **ZCIPADDR**
  This variable can be used to point to a specific host name/address; it is not resolved by the Configuration Server.
- **IPNAME**
  This variable contains the fully qualified symbolic host name of the connecting HPCA agent and is resolved by the Configuration Server.

The order of precedence for the sources of HPCA agent IP addresses is ZCIPADDR, then ZIPNAME.

In a case when the source is an instance of the SERVICE class, the service instance should be generated for each user of the service and this instance should be written to either the ZSVCSTAT or ZERVICE class. The ZSRCDOMN and ZSRCCLAS variables of this instance should specify the domain and class names of the service. The instance name has to match the name of the service itself.

Programmatically Configuring Notifies

Drag-and-drop was initially designed and implemented to support the Admin CSDB Editor. However, it can be used separately in a well established infrastructure for mass notification controlled by a timer on the HPCA agent. The only input that is necessary for the back end is a ZADMIN object that has all the variables in it defining the source and destination instances.

Table 83 lists and describes the ZADMIN object variable names, and offers a sample value.

Table 83 Variables of the ZADMIN Object

Variable Name	Description	Sample Value
ZADMFILE	Destination file name	PRIMARY
ZADMDOMN	Destination domain name	SYSTEM
ZADMCLAS	Destination class name	ZCOMMAND
ZADMINST	Destination instance name	NOTIFY
ZADMDFIL	Source file name	PRIMARY
ZADMDDOM	Source domain name	POLICY
ZADMDCLS	Source class name	WORKGRP
ZADMDINS	Source instance name	PROD_USERS
ZADMFUNC	Function name for DDN	EXECUTE

Variable Name	Description	Sample Value
ZUSERID	Administrator user ID	Vladimir
ZNFYPWD	Password	nvdm123

An operation based on the above specifications would cause all the users of the PRIMARY.POLICY.WORKGRP.PROD_USERS to be notified with the command defined in PRIMARY.SYSTEM.ZCOMMAND.NOTIFY. All the source information will be retrieved from the PROFILE File.

EDMMPUSH

The EDMMPUSH method is another way to implement the existing Configuration Server-HPCA agent notification procedures. In fact, EDMMPUSH enhances the process, rather than acting as a substitute for any of the existing notify methods; and it might support future notify features that other types of notify do not.

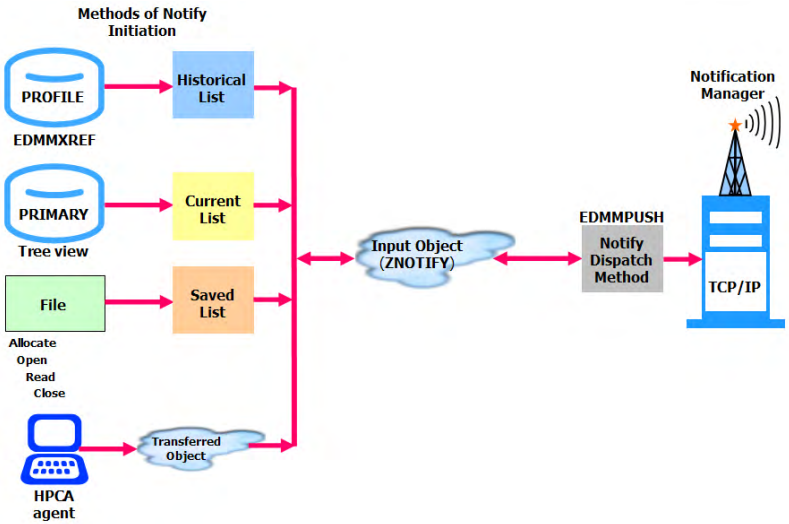
The major advantage of EDMMPUSH is that it is not dependent on any one communications protocol, largely because it does not do the notification. Rather, it:

- receives the input requests,
- gets the required parameters, and
- puts the requests to the correct queues for subsequent processing by the appropriate Notify Manager.

This way, configuring the CSDB is simplified because all notify requests, of all notification types, can be concentrated in a single input object. This object, or even a dynamic object that was created because of object resolution, can be used to deliver notification requests to the EDMMPUSH method. This object might require different types of notification for each heap (request).

The HPCA administrator can create a single multi-heap object that will notify all the HPCA agents, regardless of notification type, and then send the object to the Configuration Server to accomplish the notification.

Figure 2 Input-object creation methods for EDMMPUSH



The left side of Figure 2 shows the various methods of building the HPCA agent notification list that are put into an input object for EDMMPUSH. Each method can input various types of requests. The methods write the notify requests into input objects that will later be processed by EDMMPUSH because of object resolution. These various notify requests will be processed by a single method that will route them into the right queues for processing.

Input Object Used by EDMMPUSH

The EDMMPUSH method receives all the information about the notify requests from the input object. The name of the input object is defined in the CSDB, specifically in the PRIMARY.SYSTEM.ZMETHOD.EDMMPUSH instance field named “Parameters passed to Method.” If this field does not specify an input object name, ZNOTIFY (the default) will be used. Each communications protocol that is used to execute a notification requires a specific set of variables. However, there are control variables that must be specified for every heap of the input object.

The following sections discuss these common control variables and describe specific protocol-dependent variables for each.

Common Control Variables

Common Input Variables

You must specify the following input variables.

Table 84 EDMMPUSH Input Variables

Variable	Description
NFYDELAY	Specifies the delay interval for trying to re-notify an HPCA agent. If no value is entered, the default value is the value specified in the NFYT_TIMEOUT setting of the MGR_NOTIFY section of the `edmprof` file.
NFYHNDL	Specifies the domain name of the NOTIFY File where the results of notifications will be stored. The heap number of the request object will become the instance name.
NFYMRTRY	Specifies the maximum number of retries. If no value is entered, the default is the value specified in NFY_RETRY of the MGR_NOTIFY section of the `edmprof` file.
NTFYRTIM	HP timestamp that defines the time after which the notification should occur.
NFYPROC	Controls processing of the current heap request. If Y, the heap will be processed. If N, the request for the current heap will be ignored. The default is **Y**.
NFYTYPE	Defines the type of notify requested. The following values are allowed: • TCP • EMAIL The first three bytes of the type are used for the identification, so EMAIL and EMA are treated the same. There is no default value for this variable. If it is not defined, the current heap of the object will be ignored.
NFYUINFO	Allows you to enter user information.

Common Variables Set by EDMMPUSH

Due to the input request processing, the following variables are set in the input object.

Table 85 Variables Set by EDMMPUSH

Variable	Description or Setting
ZMMSG	Message regarding success status of required notification scheduling.
ZMRC	Return code (0 – success, 4 – warning, 16 – failure).
ZOBJCDEL	Set to Y in order to enforce control object deletion after object transfer is done.
ZOBJRDEL	Set to Y in order to enforce response object deletion after object transfer is done.

Protocol Dependent Input Variables

TCP/IP

The TCP/IP Notify uses REXEC protocol to deliver notification to the HPCA agent. Therefore, a user ID and password are required for this type of notification. After the connection is established and the user ID-password combination is verified, the command line that was sent with the request will be executed on the remote (destination) machine. This command line should initiate the HPCA agent connect process. It is the administrator's responsibility to make sure that the command line contains the call that will be executed on the HPCA agent and will initiate the HPCA agent connect to the Configuration Server.

Table 86 TCP/IP Variables and Descriptions

Variable	Description
NFYCMD	Command line to be executed on the destination machine. This command line should initiate the connect on the HPCA agent.
NFYIPADR	TCP/IP address of the destination HPCA agent.
NFYIPORT	Listening port number on the destination machine.
NFYPASSW	Password acceptable with user ID specified in NFYUSER.
NFYUSER	User ID acceptable on the destination system (used by native operating system security system).
NFYMAC	Mac address of the destination machine will be used for Wake-On-LAN. If NFYMAC is not specified, Wake-On-LAN cannot be used.

Table 87 EMAIL Variables and Descriptions

Variable	Description
EMAILATT	Attachment to send in an e-mail (optional) message. User can specify multiple attachments by separating them with semicolons (;).
EMAILFRM	E-mail address of the sender (mandatory).
EMAILMFN	Message file name, in case message is greater than 255 bytes (mandatory, if EMAILMSG is not used).
EMAILMSG	Message that is restricted to 255 bytes (mandatory, if EMAILMFN is not used). To send a message with spaces, follow the directions as in EMAILATT.
EMAILSUB	The subject of the e-mail (optional) message. The subject must be enclosed in quotation marks if a space is used (as in “Hello Test”). If the quotation mark is not inserted at the end of the message, the text up to first space will be sent as a subject (“Hello” in this case).
EMAILTO	E-mail address to which the message is being sent (mandatory).

For information on how to configure multiple Notify Manager tasks, see the following section, Multiple Notify Managers.

For a look at how to retry failed notifications, see Retrying Failed Notifies, starting on page 182.

For information on how to schedule an HPCA agent notification, see Scheduling for Notify, starting on page 184.

Multiple Notify Managers

In order to speed up the processing of a large number of notification requests, multiple Notify Manager tasks (of the same communications type) can be configured. When multiple Notify Managers are used, a single notification pipeline is substituted by as many lines as there are Notify Managers configured. This approach is based on a single request queue, resource-protected by a read mutex semaphore, with multiple Notify Managers reading from it.

Each Notify Manager waits for the semaphore. The Notify Manager that owns the semaphore reads it from the queue, and then immediately releases

it and continues the notification process for the request it currently has. Once a Notify Manager releases the semaphore, other Notify Managers can start processing their queued requests.

Configuring Multiple Notify Managers

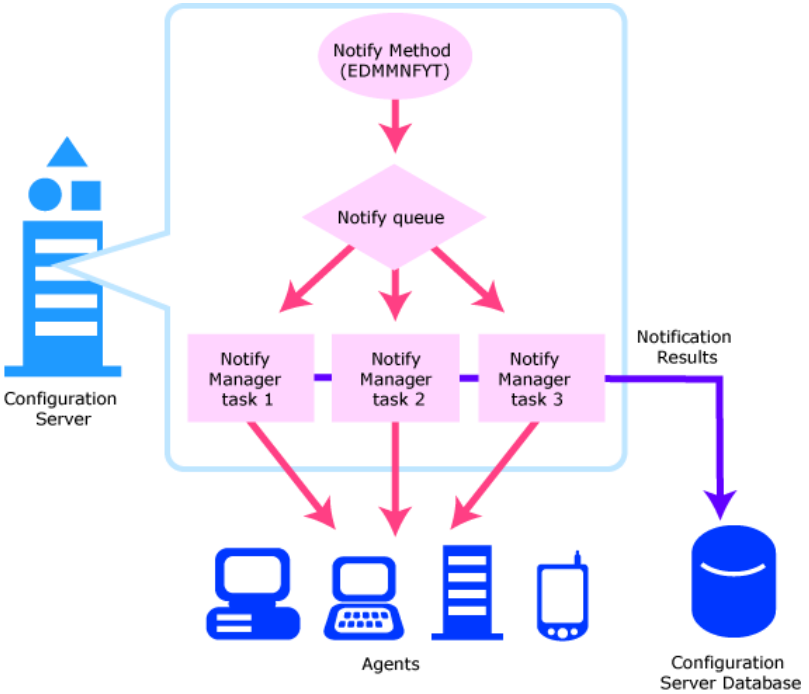
Multiple Notify Managers should be started in the same way a single Notify Manager is started—specified as a Configuration Server task in the MGR_ATTACH_LIST section of the `edmprof` file. Sequentially specify as many Notify Managers as necessary. Additional parameters and values (such as NAME=ZNFYTM*nnn*) can be added to the CMD_LINE settings in order to uniquely identify each of the Notify Managers. For example:

```
CMD_LINE=(znfytmgr NAME=ZNFYTM001)…
CMD_LINE=(znfytmgr NAME=ZNFYTM002)…
CMD_LINE=(znfytmgr NAME=ZNFYTM003)…
```

This will cause the Task Manager to start and maintain three tasks: ZNFYTM001, ZNFYTM002, and ZNFYTM003.

An overview of the notify process with multiple Notify Manager tasks is illustrated in Figure 3 on page 182.

Figure 3 Notify process with multiple Notify Manager tasks



For information on how to retry failed notifications, see the following section, Retrying Failed Notifies.

For information on how to schedule an HPCA agent notification, see Scheduling for Notify, starting on page 184.

Retrying Failed Notifies

Prior to the release of the version 4.1 Configuration Server, the notification process included the three ways of invoking HPCA agent notification that have been previously described. These types of notification put notification requests into a notify queue. The Notify Manager task would take one request from the queue, process it, and write the results to the CSDB

NOTIFY File. The Notify Manager would then sequentially process the remaining requests, until all requests were processed.

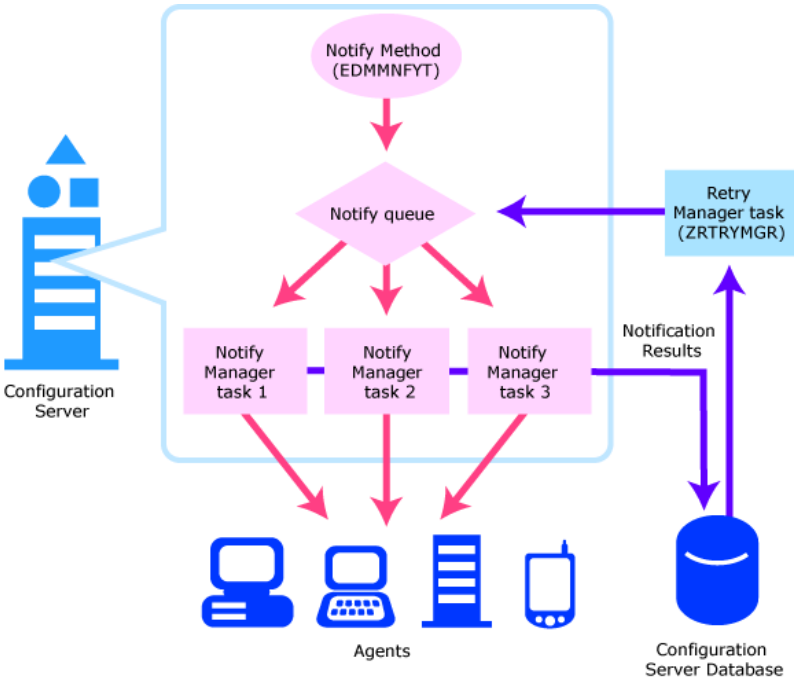
If, for some reason, one of the notifications takes an inordinate amount of time, all queued requests would be delayed. In the case of an error, the Notify Manager does not retry the notification.

To enable the retrying of notifications, the Notify Manager stores failed-request information in the RETRY Domain of the NOTIFY File. The suitable time for retrying the notification is set in the request. The Retry Manager wakes up every minute and checks all instances of all classes in the RETRY Domain. If failed requests exist, the Retry Manager compares the scheduled renotification time with the current time and, if the time is right, requeues the request. The Retry Manager processes failed notifications for all types of communications Managers and requeues them accordingly.

To configure for the Retry Manager, add zrtrymgr to the MGR_ATTACH_LIST section of the `edmprof` file.

Figure 4 on page 184 illustrates the Notify Retry process.

Figure 4 Notify Retry process



Scheduling an HPCA agent notification is covered in the next section, Scheduling for Notify.

Scheduling for Notify

You can use, in combination, the EDMMPUSH method and the Retry Manager to schedule delayed executions of notify. To configure this scheduling feature, add an NTFYRTIM variable to the in-bound EDMMPUSH object, and have the zrtrymgr task included in the MGR_ATTACH_LIST section of the `edmprof` file.

NTFYRTIM

The NTFYRTIM variable is used to schedule the time at which a notify event should occur. If NTFYRTIM is specified, EDMMPUSH does not put the request in the notify queue. Rather, the request is written to the RETRY Domain of the NOTIFY File. The zrtrymgr task checks the RETRY Domain every minute, and when the date and time specified by NTFYRTIM is reached, it puts the notify request into the queue for the Notify Manager to process. The scheduling function allows you to retry failed notifications also. Additionally, you can recover those notifications that were scheduled, but where the Configuration Server was stopped and restarted.

Table 88 NTFYRTIM Settings

Variable	Description		
NTFYRTIM	Time (in the format of EDM_TIMESTAMP) at which the notification should execute. If this variable is absent or blank, EDMMPUSH will presume that the request should be executed immediately. This value must be exactly 22 characters and cannot contain commas or spaces. The format of the time stamp is:		
	Parameter	**Length**	**Options**
	Year	4	*YYYY*
	Month	2	01-12 (where 01=January)
	Weekday	1	0-6 (where 0=Sunday)
	Date	2	01-31
	Hour	2	00-23
	Minute	2	00-59
	Second	2	00-59
	Millisecond	3	000-999
	Time zone adjustment		This is the adjustment according to the location of the Configuration Server. This setting must start with **+** or **–**, followed by a three-digit (number of minutes) adjustment.
	NTFYRTIM Time Zone Adjustments details how to configure NTFYRTIM.		

NTFYRTIM Time Zone Adjustments

In order for NTFYRTIM to function properly, time-zone adjustments must be configured correctly. Since the Configuration Server uses the operating system's clock (which might have an automatic Daylight Saving Time (DST) adjustment feature), it is important that the NTFYRTIM setting be properly set, using Greenwich Mean Time (GMT), with DST accounted for, when necessary. Additionally, when configuring this setting, 24-hour clock (a.k.a. military) time must be used.

GMT is a constant; it does not adjust for Daylight Saving Time.

The first eight values in the table are the date and time (in GMT) that the notify event is scheduled to execute. The last setting, time zone adjustment, represents the adjustment (to the physical time of the Configuration Server machine) necessary to synchronize it with GMT.

Therefore, a Configuration Server in NY, USA, which is 5 hours behind GMT during standard time (and 4 hours behind during DST), would need the proper number of adjustment minutes (300) added, to be synchronized with GMT. The follow examples offer several sample NTFYRTIM settings.

Example A

To schedule a notify event for Wednesday July 09, 2001 at 2:35:15:000 (P.M.) GMT, specify:

- on a Configuration Server in New York, USA (GMT -4 hours, since DST is in effect)

  ```
  2001 07 3 09 14 35 15 000 +240 = 200107309143515000+240.
  ```

- on a Configuration Server in Paris, France (GMT +2 hour, since DST is in effect)

  ```
  2001 07 3 09 14 35 15 000 -120 = 200107309143515000-120.
  ```

Example B

To schedule a notify event for Friday November 09, 2001 at 2:35:15:000 (A.M.) GMT, specify:

- on a Configuration Server in Seattle, USA (GMT -8 hours, since DST is not in effect)

  ```
  2001 11 5 09 02 35 15 000 +480 = 200111509023515000+480.
  ```

- on a Configuration Server in Tokyo, Japan (GMT +9 hours, since DST is not in effect)

```
2001 11 5 09 02 35 15 000 -540 = 200111509023515000-540.
```

In Example B, a Configuration Server located in Seattle, WA, USA would actually be on a different date (the previous day), November 08, 2001. This is irrelevant because the task is scheduled using GMT.

Another way to specify this, is to make the adjustment in the four time values (hour, minute, second, and millisecond) of NTFYRTIM, and specify (+ / –) 000 for the time zone adjustment. Re-using the parameters from Example A, Example C makes the adjustment in the time values.

Example C

To schedule a notify event for Wednesday July 09, 2001 at 2:35:15:000 (P.M.) GMT, specify:

- on a Configuration Server in New York, USA (GMT -4 hours, since DST is in effect)

  ```
  2001 07 3 09 10 35 15 000 +000 = 200107309103515000+000.
  ```

- on a Configuration Server in Paris, France (GMT +2 hour, since DST is in effect)

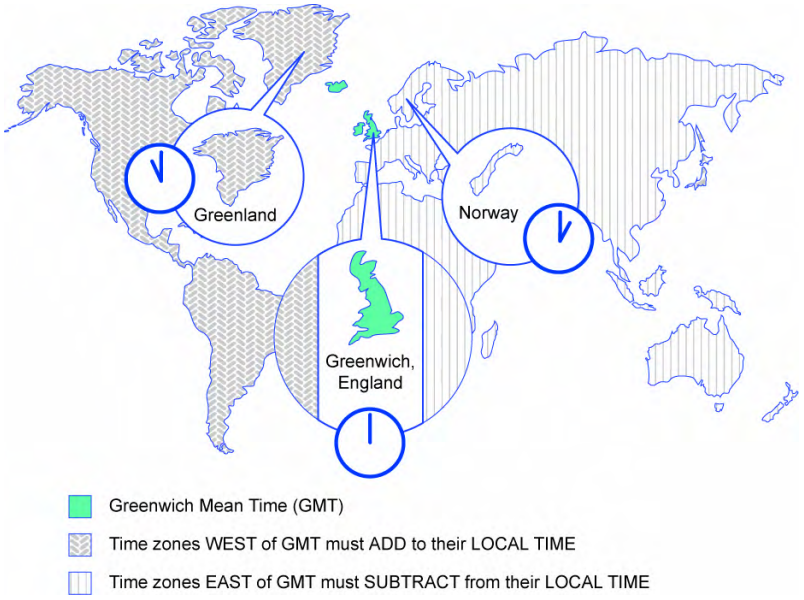
  ```
  2001 07 3 09 16 35 15 000 -000 = 200107309163515000-000.
  ```

In Example C, the time zone adjustment value must still be specified, but the offset symbol (+ / -) preceding 000 is irrelevant.

Time Zone Offsets

Figure 5 on page 188 has been included in order to assist in remembering whether to adjust forward or back for the various time zones, in relation to GMT.

Figure 5 Offsets for Greenwich Mean Time (GMT)



Automatic Adjustments for Daylight Saving Time

If the Configuration Server machine offers the ability to have its clock automatically adjust for Daylight Saving Time, HP recommends activating this feature.

- On a Windows machine, this is accomplished in the Control Panel area.
- On a UNIX machine, this is configured during installation. If you need further information, consult the documentation for the operating system.

Drag-and-Drop Notify

Scheduling for notify can also be configured for Drag-and-Drop Notify (DDN). To enable the scheduling function, you must add the following variables to the ZCOMMAND class:

Table 89 ZCOMMAND Variables Required for Notify

Variable Name	Description	Length
ZCMDHNDL	Domain name created/reused in the NOTIFY File to store the information about notification results. The class name will be created depending on the type of notification. Individual instance names are generated as sequential numbers (for example, 000000001 for the first request, 000000002 for the second, etc.). If ZCMNDHNDL is not specified, it will be uniquely generated as a function of date and time.	32
ZCMDUINF	User information that is passed to notify start and stop methods. If ZCMDUINF is not specified, it will be uniquely generated as a combination of ZCMNDHNDL and instance name (heap number).	128
ZCMDRMAX	Maximum number of retries in case of notify failure. The default is **7**.	3
ZCMDDLAY	Delay interval (in seconds) before the retry will be scheduled. The default is **300** (5 minutes).	4
ZCMDNFYD	Date when the notify request should be executed for the first time. The format is YYYY/MM/DD. The default is the current date.	10
ZCMDNFYT	Time when the notify request should be executed for the first time. The format is HH:MM:SS. The default is the current time.	8

Wake-On-LAN

Another notify feature that takes advantage of the Retry Manager is Wake-On-LAN (WOL). Wake-On-LAN is a management tool that enables a system to remotely power on other systems that support WOL, by simply sending a “wake up” packet. Wake-On-LAN allows the workstation to go into a sleep mode and to then wake when it is sent a specially formatted packet.

Wake-On-LAN enables an administrator to remotely upload/download data to/from systems, as well as schedule HPCA agent maintenance for off-peak hours.

The Benefits of Wake-On-LAN

Some of the advantages of Wake-On-LAN are:

- Increased flexibility for the system administrator,
- A reduction in operating costs, and
- Extended ability to perform distribution during off-peak time windows.

Components Required to Enable Wake-On-LAN

To enable the Wake-On-LAN function, your system requires:

- An Ethernet LAN-adapter card (such as the ASUS PCI-L101) that supports Wake-On-LAN,
- A motherboard that supports Wake-On-LAN,
- A jumper cable installed from the LAN adapter to the motherboard.

Configuring Wake-On-LAN

In order to enable WOL, and to have it function properly, some configuration is required on the Configuration Server, and network routers must be enabled for subnetwork broadcasts.

EDMWAKE

EDMWAKE is not a part of the standard Configuration Server product and is currently available as optional material on selected platforms. Support for EDMWAKE is now limited only to notify requests that are initiated using the EDMMPUSH method.

EDMWAKE on the Command Line

When running EDMWAKE on the command line, it requires two address parameters, separated by a blank character, and an optional parameter, TTL.

- The broadcast address of the destination machine (herein, destination broadcast address). This is required to ensure the broadcast packet traverses intermediate network routers, if any exist.
- The Media Access Control address of the destination machine (herein, MAC address). EDMWAKE issues an asynchronous data flow from which

no response is expected. The return codes that are issued are indicative of program execution only; they do not reflect the success of contacting the target device.

- The optional TTL (time to live) is the maximum number of routers to pass.

The MAC and destination broadcast addresses can be found on the destination machine by typing:

```
IPCONFIG /all
```

This will generate output to the screen. The output of a sample IPCONFIG `/all` command is shown in Table 90.

Table 90 Sample IPCONFIG /all Results

Parameter	Value
Physical Address	00-06-5B-2F-99-23 Note: This is also the MAC address.
DHCP Enabled	Yes
Auto-configuration Enabled	Yes
IP Address	192.168.102.191 Notes: This is a Class C type address. In an enterprise with the network address, 192.168.102, this machine is identified as 191.
Subnet Mask	255.255.255.0 Note: This is the Class C type address default.
Default Gateway	192.168.102.1
DHCP Server	192.168.102.70
DNS Servers	192.168.110.4 192.168.110.5
Primary WINS Server	208.244.225.122

The Physical Address that is displayed is the MAC address also.

Network Addresses

The destination broadcast address is generated by combining the network and host portions of the target device's IP address; after the host portion has been replaced by the generic broadcast address, 255.

Therefore, using the information in Table 90, the destination IP address, 192.168.102.191, is used to create a destination broadcast address of 192.168.102.255. (The Configuration Server does this transparently.) This results in the data packets being sent to all of the machines on the (192.168.102.0) network.

Again, using the sample addresses in Table 90, with the subnet mask being 255.255.255.0 (the class C default), the network address is 192.168.102.0.

For a comprehensive look at IP addresses, visit: **http://www.networkcomputing.com/netdesign/ip101.html**.

HP recommends running EDMWAKE from the command line first to make sure it works, and then configure the Configuration Server for usage via notify.

In EDMMPUSH, use the NFYMAC variable to specify the physical address of the machine and all other parameters (as specified in HP documentation).

EDMWAKE issues an asynchronous data flow from which no response is expected. The return codes issued are indicative of program execution only and do not reflect the success or failure of contacting the intended target device.

A log, `EDMWAKE.LOG`, s generated in the current directory, with the following possible return codes generated:

0 successful

32 parms invalid, or some other error encountered

Network Requirements

EDMWAKE issues a broadcast packet that traverses an IP network. In order to operate correctly, it is necessary that the IP routers and gateways be configured to allow such broadcast traffic to pass through; otherwise, the data-gram will not have the intended effect.

It might be necessary to involve the network management staff within your enterprise during the testing and extended use of this component.

Configuration Server Requirements

Add the following settings and values to the MGR_NOTIFY section of the Configuration Server `edmprof` file to enable support for WOL:

`ISSUE_WAKE_ON_LAN=YES`

The default is NO.

Wake-On-LAN can only wake up machines that have been gracefully shut down. If power has been turned off, a machine cannot be contacted.

`SUBNET_MASK = 255.255.0.0`

For more information on SUBNET_MASK, see MGR_NOTIFY on page 74.

Also, edit the Configuration Server retry variable in the MGR_ATTACH_LIST section of the Configuration Server `edmprof` file as follows:

```
[MGR_ATTACH_LIST]
CMD_LINE  =(ztcpmgr,addr=joe,port=1955,name=TCP_Mgr_1955) RESTART =YES
CMD_LINE  =(zrtrymgr) RESTART=YES
CMD_LINE  =(znfytmgr,NAME=NFYTMGR1) RESTART=YES
CMD_LINE  =(znfytmgr,NAME=NFYTMGR2) RESTART=YES
```

The Configuration Server attempts to issue a notify. If the notify fails on the Connect stage with an error other than “destination port is not active,” the machine might need to be powered up. The WAKE_ON_LAN is issued on the first failure, and must be requested in the Configuration Server `edmprof` file. The retry of the notify will be 300 seconds after Wake-On-LAN (to allow enough time to boot). For the Retry Manager, which has no knowledge of WOL, it is a normal retry operation.

HPCA Agent/PC Requirements

EDMWAKE implements a Wake-On-LAN functionality that is part of the Wired-for-Management (WfM) initiative. Only HPCA agent devices that are properly configured with appropriate motherboards, NICs, and the correct jumpers connecting the two, will work with this data flow. Additionally, there might be BIOS settings that need to be enabled in order to allow the HPCA agent device to be responsive to this data flow. Check with the hardware vendor to find out if your device is enabled for WOL.

Wake-On-LAN Supporting Remote Broadcast

In order to have the destination broadcast address included in the wake command when it is issued, make sure that the subnetwork broadcast address is specified as a parameter of EDMWAKE (see Network Addresses, on page 192). The Configuration Server formulates the subnetwork broadcast address based on the destination IP address. The destination broadcast address will be adjusted according to the type of IP address (A, B, C, D, or E). This is required to allow packets to traverse any intermediate routers.

Example

```
208.107.6.5 (subnet 208.107.6.255)
```

A specific SUBNET_MASK can be used if defined in the Configuration Server `edmprof` file. For more information on SUBNET_MASK, see MGR_NOTIFY on page 74.

5 HP SQL Methods

At the end of this chapter, you will:

- Have a better understanding of the HP Structured Query Language (SQL) methods and Open Database Connectivity (ODBC) data sources.

Overview

This chapter is divided into two primary sections:

- Data Exchange with ODBC-Compliant Databases starting below
- Using HP SQL Methods starting on page 213.

Data Exchange with ODBC-Compliant Databases discusses an ODBC data source, and details why and how to define, obtain, and configure an ODBC data source. Also covered is how to configure an ODBC connection to a SQL Server (on Windows and UNIX).

Using HP SQL Methods details the HP SQL methods (EDMMSQLG and EDMMSQLP), including:

- How to invoke HP SQL methods,
- The WHERE clause (which identifies the rows in the SQL database table that are to be replaced), and
- Usage considerations and examples.

The HP SQL methods support only the following ODBC-compliant databases:

- MS SQL
- Oracle
- Sybase

Data Exchange with ODBC-Compliant Databases

Introduction

Before using the HP SQL methods, configure an ODBC data source. ODBC is a platform independent Application Program Interface (**API**) specification that allows SQL statements to be submitted from programs external to the database system, and then be processed by the database system over the ODBC connection. A database system exposes its ODBC interface to external programs through ODBC data source definitions.

An ODBC Data Source: Prerequisites

The HP SQL methods are HPCA agent programs that are external to the back-end database, which acts as a server.

The ODBC data source definition identifies the location of the ODBC-compliant database's tables for EDMMSQLG and EDMMSQLP. It also specifies any options regarding how the back-end database system services the ODBC connection. These options will vary from one back-end database to another and, in order to set them properly, you will need to be familiar with the back-end databases.

Many database systems are ODBC-compliant, and the specifics of configuring an ODBC data source for a particular database system are described in the database system's documentation. In this section, several examples are presented.

Defining an ODBC Data Source

The ODBC data source must be defined on the machine that is running the Configuration Server, but the database tables can be located on any machine that is accessible to the Configuration Server.

On Windows machines, a data source can be defined as either a **User DSN** or a **System DSN** (**Data Source Name**).

- A User DSN is visible only to the user that defines it.
- A System DSN is visible to any user on the machine.

Since the Configuration Server normally runs as a service in the system context, define the data source as a System DSN so that the Configuration Server can use it.

ODBC Data Source Drivers

To configure an ODBC data source, the ODBC driver for the database system must be installed on the machine on which the ODBC data source will be defined. The ODBC driver typically ships with the database system, or can be obtained from the database system vendor. Windows "server" operating systems ship with a set of ODBC drivers.

The Configuration Server supports the HP Branded DataDirect ODBC drivers.

In some cases, additional software will be needed to completely configure an ODBC connection. This is true, for example, when the Configuration Server is running on a UNIX platform, and the ODBC-compliant database is Microsoft SQL Server running on Windows. See Microsoft SQL Server with UNIX Configuration Server, starting on page 205.

Configuring an ODBC Data Source

For many ODBC-compliant, desktop computer database systems (such as Access and FoxPro), configuring an ODBC data source is no more complicated than making up a name for the data source, then specifying a path to the folder that contains the database tables, and perhaps specifying a small number of database-specific settings. The following examples show this process.

To configure an ODBC data source with Microsoft FoxPro 2.6

This example illustrates configuring the ODBC data source that is used in some of the examples in this section. The ODBC-compliant database system is Microsoft FoxPro 2.6 for Windows. The Configuration Server is running under Windows NT 4.0.

1. Go to **Start** → **Settings** → **Control Panel** to open the Control Panel folder.
2. Double-click the **ODBC** icon to launch the ODBC Data Source Administrator.
3. Click the **System DSN** tab.

   The ODBC Data Source Administrator dialog box opens.

   When the Configuration Server is running as a Windows service, be sure to configure a System DSN rather than a User DSN. Be sure to click on the **System DSN** tab to open the System Data Sources panel.

4. Click **Add** to configure a new ODBC data source.

   The Create New Data Source dialog box opens.

5. Click on the driver for the database you intend to use, and click **Finish**.

   The ODBC Microsoft FoxPro Setup dialog box opens.

Table 91 Microsoft FoxPro 2.6 ODBC Specifications

Setting	Description
Data Source Name	A name that you make up to identify this ODBC data source to external programs, such as EDMMSQLG and EDMMSQLP. You will supply this DSN as a parameter to EDMMSQLG/EDMMSQLP, as described later in this document.
Description	This is also a free text field. Make up a description that denotes the purpose or use of the data source definition. It identifies this data source when navigating the Control Panel ODBC applet.
Database	• Version – This identifies the version of FoxPro. This setting pertains only to FoxPro, you will not see this in dialog boxes that configure ODBC data sources for other back-end databases. • Directory – This identifies a folder where the ODBC-accessible FoxPro data tables are located. • Select Directory – This setting defines a directory for the ODBC data source. Note: To enable the **Select Directory** button, clear the **Use Current Directory** check box. Then click **Select Directory**, and use the resulting dialog box to select the correct folder. Click **OK**, and the ODBC data source definition is compete, and added to the system. • Select Indexes – This option isn't applicable.
Driver	This setting is specific to FoxPro. It appears only when you click **Options**. When you first open this dialog box, the **Options** button is enabled, and its settings are hidden. *Do not alter these settings.*

To configure an ODBC data source with Microsoft Visual FoxPro

The following example illustrates how to configure the ODBC data source used in some of the examples later in this document. The back-end database system is Microsoft Visual FoxPro. The Configuration Server is running under Windows NT.

1. Go to **Start** → **Settings** → **Control Panel** to open the Control Panel folder.
2. Double-click the **ODBC** icon to launch the ODBC Data Source Administrator.
3. Click the **System DSN** tab, and click **Add**.

   The Create New Data Source dialog box opens.

4 Click on the driver for the database that you intend to use, and click **Finish**.

A dialog box for the selected database will open.

Table 92 Microsoft Visual FoxPro ODBC Specifications

Data Source Name	Type a name to identify this ODBC data source to external programs, such as EDMMSQLG and EDMMSQLP. You will supply this DSN as a parameter to EDMMSQLG/EDMMSQLP, as described later in this document.
Description	Type a description that denotes the purpose or use of the data source definition. It identifies this data source when navigating the Control Panel ODBC applet.
Database type	This setting pertains to Visual FoxPro only; you will not see this in dialog boxes to configure ODBC data sources for other back-end databases.
Path	This setting identifies a folder where the ODBC-accessible Visual FoxPro data tables are located. You can type the path to this folder into the text box, or click **Browse** to open a dialog box that enables you to select the path from a list.
Driver	This setting is specific to FoxPro. It appears only when you click **Options**. When you first open this dialog box, the **Options** button is enabled, and its settings are hidden. In this area, select the following: **Null**, **Deleted**, and **Fetch data in background**. From the **Collating sequence** drop-down list box, select **Machine**.

5 Specify the required parameters.

6 Click **OK** to save the ODBC data source definition, and add it to the system.

To configure an ODBC data source with Microsoft Access

The following example illustrates configuring an ODBC data source where Microsoft Access is the back-end database. The Configuration Server is running under Windows NT.

1 Go to **Start → Settings → Control Panel** to open the Control Panel folder.

2 Double-click the **ODBC** icon to launch the ODBC Data Source Administrator.

3 Click the **System DSN** tab, and click **Add**.

The Create New Data Source dialog box opens.

4 Click on the driver for the database you intend to use, and click **Finish**.

A dialog box for the selected database will open.

Table 93 Microsoft Access ODBC Specifications

Setting	Description
Data Source Name	Type a name to identify this ODBC data source to external programs, such as EDMMSQLG and EDMMSQLP. You will supply this DSN as a parameter to EDMMSQLG/EDMMSQLP, as described later in this document.
Description	Type a description that denotes the purpose or use of the data source definition. It identifies this data source when navigating the Control Panel ODBC applet.
Database	This setting pertains to Microsoft Access only; you will not see this in dialog boxes to configure ODBC data sources for other back-end databases. These settings enable you to Select or Create a database, or perform maintenance functions (Repair and Compact). Typically, you would click **Select** and use the resulting file-selection dialog box to locate and choose the Microsoft Access database with which you want to exchange data.
System Database	This setting identifies a folder where the ODBC-accessible Visual FoxPro data tables are located. You can type the path to this folder into the text box, or click **Browse** to open a dialog box that enables you to select the path from a list.
Driver	This setting is specific to FoxPro. It appears only when you click **Options**. When you first open this dialog box, the **Options** button is enabled, and its settings are hidden. In this area, specify the settings as shown in the previous figure.

5 Specify the required parameters.

6 Click **OK** to save your ODBC data source definition and add it to the system.

SQL Servers

ODBC data sources for server based database systems such as Microsoft SQL Server, Oracle, and Sybase, are more complex to configure. Since these are

generally password protected, authorization rights need to be configured in the back-end database. Also, when the database is running on a machine other than that which houses the Configuration Server, the ODBC connection will operate over a communications link, which will require some configuration. Typically, your organization's database systems administrator and/or network administrator handles these jobs.

Additional software might need to be installed and configured. You will need to consult your database systems administrator to have the ODBC data source properly established in these cases. For additional information, see the following examples for setting up an ODBC Data Source for Microsoft SQL Server under Windows and UNIX.

Microsoft SQL Server with a Windows Configuration Server

Configuring an ODBC connection with Microsoft SQL Server is more complex than setting up an ODBC connection to desktop databases such as Microsoft Access and FoxPro.

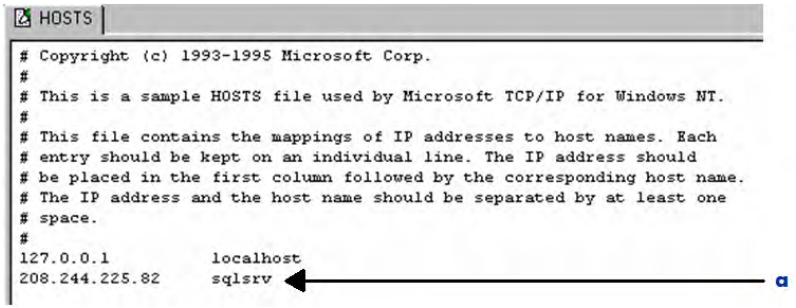
Gather Information

First, the administrator of the SQL Server database must provide a user ID and password for the ODBC connection to use when it logs on to SQL Server. You will provide these to EDMMSQLG/EDMMSQLP as parameters at run time.

Second, since SQL Server is server based, you are required to specify the communication link for accessing the data. For desktop databases, the data tables are located within the file system space of the Configuration Server, either on the same machine or via a mapped drive on a LAN. You can communicate with a machine running SQL Server using one of a number of communications protocols. In this example, we used a TCP/IP connection. You must know the SQL Server machine's IP address and port number for SQL Server HPCA agent communications.

To facilitate any future change in the IP address of the SQL Server machine, define a name for the SQL Server machine's IP address in the Configuration Server machine's HOSTS file, `C:\WINNT\SYSTEM32\DRIVERS\ETC\HOSTS`, as in the following:

Figure 6 Sample Configuration Server HOSTS file



Legend

a SQL Server machine's entry in the HOSTS file

Third, you will need to have the name of the SQL Server database with which the Configuration Server will exchange data, the tables within that database to be used, and within those tables, the names of the fields that will participate in the data exchange.

Install Necessary Software

In order to configure an HPCA agent machine (in this case, the machine on which the Configuration Server is running) for connection to the machine running SQL Server, the SQL Server Client Utilities must be installed on the Configuration Server machine.

To configure the Configuration Server as an SQL server client

After installing the SQL Server Client Utilities, run the SQL Server Client Configuration Utility.

1. Select the **Net Library** tab.
2. Set **Default Network** to **TCP/IP Sockets**.
3. Select the **Advanced** tab.
4. In the **Client Configuration** area:
   - From the **Server** drop-down list, select **SQLSRV**.
   - From the **DLL Name** drop-down list, select **TCP/IP Sockets**.

— Enter the SQL Server machine's IP address and port number (separated by a comma) in the **Connection String** text box. Since we have designated **sqlsrv** as the IP address of the Configuration Server (in the HOSTS file), we can refer to the IP address by that name.

5 Click **Add/Modify** to save the settings in the **Current Entries** list.

6 Click **Done** to exit the utility.

Create the SQL Server ODBC Data Source

1 Go to **Start** → **Settings** → **Control Panel** to open the Control Panel folder.

2 Double-click the **ODBC** icon to launch the ODBC Data Source Administrator.

3 If the Configuration Server is running as a Windows service, click the **System DSN** tab, and click **Add**.

The Create New Data Source dialog box opens.

4 Select the driver for the database you intend to use, and click **Finish**.

This invokes a wizard that leads you through the process of defining the ODBC data source.

5 Progress through the various dialog boxes that are presented by the wizard.

Table 94 Microsoft SQL Server DSN Specifications

Setting	Description
Data Source Name	Type a name to identify this ODBC data source to external programs, such as EDMMSQLG and EDMMSQLP. You will supply this **DSN** as a parameter to EDMMSQLG/EDMMSQLP, as described later in this document.
Description	Type a description that denotes the purpose or use of the data source definition. It identifies this data source when navigating the Control Panel ODBC applet.
Server	From the drop-down list, select the SQL Server with which the Configuration Server will exchange data.

6 Review the settings and click **Test Data Source** to perform a test of your ODBC data source definition.

If you have correctly entered the information that is necessary to define the ODBC data source, the system will display a “TESTS COMPLETED SUCCESSFULLY” message.

7 Click **OK** to save the data source definition and close the dialog box.

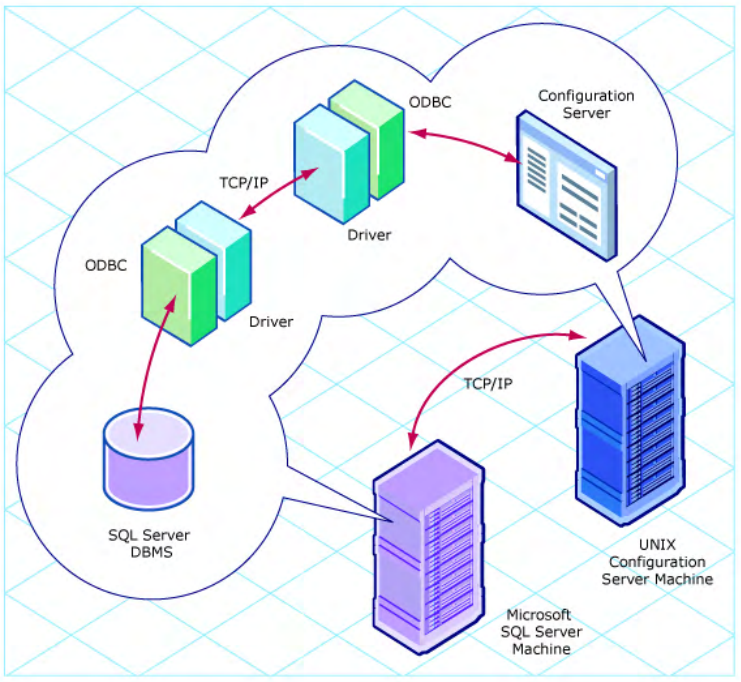
Microsoft SQL Server with UNIX Configuration Server

This section provides information about setting up ODBC on UNIX. Note that because installation directories vary from system to system, you must substitute the name of the installation directory on your system, where noted in the instructions that follow.

Install the Necessary Software

To build an interface to a Microsoft SQL Server database from the UNIX machine that is running the Configuration Server, install HP DataDirect ODBC drivers on the SQL Server host. HP DataDirect ODBC drivers are the interface between the UNIX machine and the ODBC interface of the Microsoft SQL Server machine, as shown in the following figure.

Figure 7 HP DataDirect ODBC drivers as the interface



Configure the Configuration Server machine as a SQL Server client by following the steps that are outlined below.

1 On the UNIX host, a shell script has to be run prior to using the HP DataDirect ODBC driver. This shell script is located in the directory in which the HP DataDirect ODBC driver is installed.

For the Bourne or Korn Shell, issue the command:

```
prompt> . <installation directory>/.sqlnk.sh
```

There is a <space><period><space> before `<installation directory>/.sqlnk.sh`.

For the C-Shell, issue the command:

```
prompt> source <installation directory>/.sqlnk.csh
```

This shell script will set several environmental variables that are needed in order to run the HP DataDirect ODBC interface.

2 Use the SQLNKCAU utility to create a Data Source definition on the UNIX machine. This is required in order to access a database.

3 Create a new definition by changing to the Configuration Server `bin` directory under the installation directory and entering the following command sequence.

```
Prompt> sqlnkcau
SequeLink Connect Administration Tool on HP-UX (ANSI)
(c)Copyright 1995-1998 INTERSOLV, Inc., All rights reserved
The following Data Source is selected:
        [1] Select a Data Source
        [2] New
        [7] About
        [0] Cancel
        Select an action [2]:           ← Select: New (2)
Name[]:                                 ← Enter the Data Source Name (e.g., QASQL)
*Description[]:                         ← Enter a description (e.g., Sample QA SQL Data Source)
*Transliteration[]:                     ← Leave blank
The following network types are available:
        [1] TCP/IP
        Select a network []:            ← Select: TCP/IP (1)
Host[]:                                 ← Enter host name or IP Address (SQLSRV)
The following server types are available:
        [1] AS/400
        [2] OS/390
        [3] UNIX
        [4] Windows NT
        Select a server []:             ← Select: Windows NT (4)
*User[]:                                ← Enter the Windows NT user ID
*Password[*****]:                       ← Enter the Windows NT Password for the user ID
The following service types are available:
        [1] DB2 on AS/400
        [2] DB2 on OS/390
        [3] DB2 on NT
        [4] DB2 on UNIX
        [5] INFORMIX on NT
        [6] INFORMIX on UNIX
        [7] Microsoft SQL Server
        [8] ODBC Btrieve
        [9] ODBC dBase
        [10] ODBC Excel
        [11] ODBC FoxPro
        [12] ODBC MS Access
        [13] ODBC Paradox
        [14] ODBC Socket
        [15] ODBC Text
```

```
        [16] OpenIngres
        [17] ORACLE
        [18] Progress
        [19] Sybase
        Select a service []:          ← Select: Microsoft SQL Server (7)
Name[]:                               ← Enter the default port number (4006) or the name 'SQLSRV'
*Database[]:                          ← Enter the Database name (e.g., PUBS)
User[]:                               ← Enter the SQL Server user ID
Password[*****]:                      ← Enter the SQL Server user ID password
```

4 Once the data source has been defined, test the access by using the Test command. The Data Source **QASQL** is used in this example:

```
The following Data Source is selected:
        [1] Select a Data Source
        [2] New
        [7] About
        [0] Cancel
        Select an action [1]:         ← Select: Select a Data Source (1)
The following SequeLink Data Sources are available:
        [1] QASQL
        [0] Cancel
        Select a SequeLink Data Source [1]   ← Select: QASQL (1)
The following Data Source is selected: QASQL.
        [1] Select a Data Source
        [2] New
        [3] Duplicate
        [4] Edit
        [5] Delete
        [6] Test
        [7] About
        [0] Cancel
        Select an action [0]:                ← Select: Test (6)
Test passed: connection to 'QASQL' made.
```

— If all the parameters are properly set and a connection can be made to the database, the response shown above will be received.

— If there is a problem, an error code and message will be displayed.

Refer to the Microsoft SQL Server documentation for an explanation of the error codes. If a different database server is used, refer to the respective documentation.

5 Once the connection to the database has been established, it is necessary to define an ODBC source that points to the Data Source. This definition has to be made in the `ini` file for the interface.

This is a hidden file that is located in:

`<installation directory>/ini/.odbc.ini`.

To see a directory listing that includes this file, issue the command:

```
ls -a
```

6 The following example shows the changes that must be applied to the `ini` file. Copy the template entry, and edit it to reflect your Data Source.

```
[ODBC Data Sources
        DataSourceName=INTERSOLV 3.10 SequeLink
        VFHSQL=INTERSOLV 3.10 SequeLink
[DataSourceName]
        Driver=/work/sqlnk/4_51_00/lib/ivslk13.sl
        Description=INTERSOLV 3.10 SequeLink
        SqlnkDSN=RADIA_DATA_SOURCE
        LogonID=
        Database=
        AllowBatchStatements=0
        UidPwdMapping=0
        PreFetchRows=30
        EnableWarnings=0
        EnableScrollableCursors=0
        DataDictionary=(Default
        DataDictionaryCatalog
        DataDictionarySchema=
[RADIA]                                          ← ODBC Name
        Driver=/work/sqlnk/4_51_00/lib/ivslk13.sl ← Leave as default
        Description=Sample Radia Data Source      ← Database Description
        SqlnkDSN=Radia                            ← Data Source Name
        LogonID=                                  ← Leave as default
        Database=pubs                             ← Database name
        AllowBatchStatements=0                    ← Leave as default
        UidPwdMapping=0                           ← Leave as default
        PreFetchRows=30                           ← Leave as default
        EnableWarnings=0                          ← Leave as default
        EnableScrollableCursors=0                 ← Leave as default
        DataDictionary=(Default)                  ← Leave as default
        DataDictionaryCatalog=                    ← Leave as default
        DataDictionarySchema=                     ← Leave as default
[ODBC]
        Trace=0
        TraceFile=odbctrace.out
        TraceDll=/work/sqlnk/4_51_00/lib/odbctrac.sl
        InstallDir=/work/sqlnk/4_51_00
```

Template entry

ODBC Reserved Words

ODBC reserved words are part of the ODBC syntax, and are poor choices for column names in the back-end databases tables. Table 95 on page 210 lists ODBC reserved words.

Table 95 ODBC Reserved Words

ABSOLUTE	ADA	ADA	ALL
ALLOCATE	ALTER	AND	ANY
ARE	AS	ASC	ASSERTION
AT	AUTHORIZATION	AVG	BEGIN
BETWEEN	BIT	BIT_LENGTH	BY
CASCADE	CASCADED	CASE	CAST
CATALOG	CHAR	CHAR_LENGTH	CHARACTER
CHARACTER_LENGTH	CHECK	CLOSE	COALESCE
COBOL	COLLATE	COLLATION	COLUMN
COMMIT	CONNECT	CONNECTION	CONSTRAINT
CONSTRAINTS	CONTINUE	CONVERT	CORRESPONDING
COUNT	CREATE	CURRENT	CURRENT_DATE
CURRENT_TIME	CURRENT_TIMESTAMP	CURSOR	DATE
DAY	DEALLOCATE	DEC	DECIMAL
DECLARE	DEFERRABLE	DEFERRED	DELETE
DESC	DESCRIBE	DESCRIPTOR	DIAGNOSTICS
DICTIONARY	DISCONNECT	DISPLACEMENT	DISTINCT
DOMAIN	DOUBLE	DROP	ELSE
END	END-EXEC	ESCAPE	EXCEPT
EXCEPTION	EXEC	EXECUTE	EXISTS
EXTERNAL	EXTRACT	FALSE	FETCH
FIRST	FLOAT	FOR	FOREIGN
FORTRAN	FOUND	FROM	FULL
GET	GLOBAL	GO	GOTO
GRANT	GROUP	HAVING	HOUR
IDENTITY	IGNORE	IMMEDIATE	IN

INCLUDE	INDEX	INDICATOR	INITIALLY
INNER INPUT	INSENSITIVE	INSERT	INTEGER
INTERSECT	INTERVAL	INTO	IS
ISOLATION	JOIN	KEY	LANGUAGE
LAST	LEFT	LEVEL	LIKE
LOCAL	LOWER	MATCH	MAX
MIN	MINUTE	MODULE	MONTH
MUMPS	NAMES	NATIONAL	NCHAR
NEXT	NONE	NOT	NULL
NULLIF	NUMERIC	OCTET_LENGTH	OF
OFF	ON	ONLY	OPEN
OPTION	OR	ORDER	OUTER
OUTPUT	OVERLAPS	PARTIAL	PASCAL
PLI	POSITION	PRECISION	PREPARE
PRESERVE	PRIMARY	PRIOR	PRIVILEGES
PROCEDURE	PUBLIC	RESTRICT	REVOKE
RIGHT	ROLLBACK	ROWS	SCHEMA
SCROLL	SECOND	SECTION	SELECT
SEQUENCE	SET	SIZE	SMALLINT
SOME	SQL	SQLCA	SQLCODE
SQLERROR	SQLSTATE	SQLWARNING	SUB-STRING
SUM	SYSTEM	TABLE	TEMPORARY
THEN	TIME	TIMESTAMP	TIMEZONE_HOUR
TIMEZONE_MINUTE	TO	TRANSACTION	TRANSLATE
TRANSLATION	TRUE	UNION	UNIQUE
UNKNOWN	UPDATE	UPPER	USAGE
USER	USING	VALUE	VALUES
VARCHAR	VARYING	VIEW	WHEN

WHENEVER	WHERE	WITH	WORK
YEAR			

Using HP SQL Methods

Overview

This section provides the information needed to enable the Configuration Server to exchange data with an ODBC-compliant foreign SQL database, using HP SQL methods. A foreign SQL database is one that is used by the HP SQL methods, but is neither created, supported, nor maintained by HP.

The HP SQL methods support only the following ODBC-compliant databases:

- MS SQL
- Oracle
- Sybase

The HP SQL Methods

- Are tools with which you can add, update, and retrieve SQL database information.
- Work with single- and multi-heap objects, updating and inserting an equivalent number of rows for as many heaps exist in the source object.
- Recognize and sort character strings, integers, decimals, and date/time input.
- Are sensitive to column data types in an SQL database.

The EDMMSQL**G** (get) method imports data from an external database to an in-storage object and is useful for influencing the Configuration Server resolution process with data from an external source. See Figure 8 on page 215.

The EDMMSQL**P** (put) method exports data to an external database and is useful for delivering data to an external subsystem for reporting and other purposes. See Figure 8 on page 215.

Additionally, this section details the proper use of the WHERE clause within control objects.

EDMMSQLG Method

The EDMMSQLG method provides users with a tool to extract data from a customer specified SQL database table, and import it, via an ODBC

connection, to an in-storage object, at a point in the Configuration Server resolution process that has been defined by the administrator. The data to be imported can be contained in any ODBC-compliant database.

EDMMSQLG is a Configuration Server method. Therefore, by establishing a connection to this method in the distribution model for one or more devices under management, an administrator can have it invoked during the HPCA agent connect process.

Each invocation of EDMMSQLG executes an SQL SELECT statement that retrieves data from the ODBC-compliant database, and stores the result in an in-storage object. There will be one heap in the resulting in-storage object for each row in the resulting set.

EDMMSQLP Method

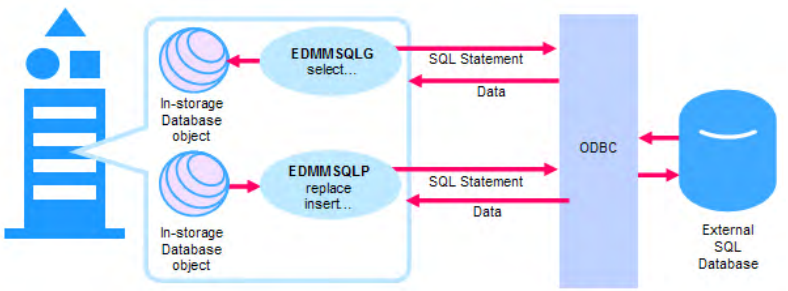
The EDMMSQLP method provides users with a tool to extract data from the Configuration Server Database and store it in an external database table, at a point in the resolution process that has been defined by the administrator. The exported data can be stored in any ODBC-compliant database.

EDMMSQLP is a Configuration Server method. Therefore, by establishing a connection to this method in the distribution model for one or more devices under management, an administrator can have it invoked during the HPCA agent connect.

Each invocation of EDMMSQLP executes an SQL INSERT or UPDATE statement to insert (or replace) data in the ODBC-compliant database. The data is taken from an in-storage object. In the external database table, there will be one row inserted (or replaced) for each heap in the in-storage data source object.

Figure 8 on page 215 presents a graphical overview of the HP SQL methods processes.

Figure 8 EDMMSQLG and EDMMSQLP methods processes



EDMMSQLG retrieves (*gets*) data from the SQL table and writes it to variables of the destination object. The mapping relationships between the columns of the table and the variables of the destination object are defined in the control information.

EDMMSQLP takes specified variables from the source object and writes them (*puts*) into the SQL database. It works with the keywords REPLACE and INSERT, as described in the parameter PUTTYPE in Table 96 below.

Because EDMMSQLG and EDMMSQLP are generic tools for transferring data between an in-storage object and a back-end database, you can make creative use of their capabilities in order to meet your organization's unique requirements.

The following table defines the keywords that are accepted by the HP SQL methods.

Table 96 Keywords Accepted by the HP SQL Methods

Keyword	Description	Method Put / Get
CTRLFILE	Name of the file that contains the control information. If this parameter is found, the parsing of the parameter string stops, and all the control information will be read from the specified file.	Put and Get
CTRLOBJ	Name of the HP object that contains the control information. If this parameter is found, the parsing of the parameter string stops, and all the control information will be received from the specified object.	Put and Get

Keyword	Description	Method Put / Get
SRCOBJ	Name of the HP source object.	Put
DESTOBJ	Name of the HP destination object. This object is used in read type methods.	Get
SQLDSN	*Data Source Name* (DSN) used on the Configuration Server to connect to the user database.	Put and Get
SQLTABLE	The name of the SQL table to deal with in the method.	Put and Get
SQLUSER	The user ID to use in the database connect process.	Put and Get
SQLPASSW	The password to use in the database connect process.	Put and Get
SQLTOUT	Timeout value for the SQL connect operation.	Put and Get
VC	Defines one VARIABLE-COLUMN (VC) pair. There might be more than one VC keyword in the parameter string. One VC value must be specified for each VARIABLE-COLUMN pair participating in the operation. For more information, refer to the section, VARIABLE-COLUMN Pairs, on page 241.	Put and Get
WHERE	This defines the search criteria for the WHERE clause. The format is COLUMN_NAME=value, COLUMN_NAME=value, etc. For more information, refer to the section, The WHERE Clause, on page 247.	Put and Get
PUTTYPE	{R, I} Type of Put operation requested, REPLACE or INSERT. When REPLACE is specified, the method will try to update the existing row first. If the row does not exist, the method will attempt to INSERT it. When INSERT is specified, the method will try to insert the row. If this operation fails, no other action is taken. The default is **R**.	Put

In order for the HP SQL methods to work, they must be configured for execution in the CSDB. During the resolution process, the method is executed and the control information is passed as a parameter string. Generally, the HP SQL methods deals with three types of information:

- control information,
- source (or destination) object information, and

- SQL database information.

Defining EDMMSQLG and EDMMSQLP as Configuration Server Methods

Before you can create a connection to the EDMMSQLG and EDMMSQLP methods, you must define an instance—in the ZMETHOD class of the SYSTEM domain—for each SQL method. The instance will contain the information that is needed in order to execute the method.

You can name the instances whatever you want, but it is recommended that the naming be consistent with the instance naming conventions of your organization.

All of the variables in the instance should appear as shown here, except for ZMTHPRMS, the variable that contains or identifies the control information passed to the EDMMSQLG/EDMMSQLP method when it executes. There are a number of ways to pass control information to EDMMSQLG/EDMMSQLP. They are described in the next section.

Invoking EDMMSQLG

This section provides information needed to invoke EDMMSQLG, and provides some examples.

Refer to the instructions for creating an instance in the *Admin User Guide*. Before invoking the method, at least one instance must be defined in the CSDB. You can define multiple instances to invoke EDMMSQLG, where each instance (with its unique name) refers to a different set of control information in its ZMTHPRMS variable.

To provide policy data from an external database

In this example, an external database contains information defining what type of user the HPCA agent is, and therefore, what set of applications the user should receive. For example, an insurance company might have hundreds of claims adjusters for whom Client Automation manages a suite of identical applications. Rather than define an instance for each claims adjuster in the CSDB USER Class, a generic USER instance will serve to link all adjusters to their appropriate application suite, based on the type of claims they adjust. An external database is used to look up the HPCA agent's identity, and return an identifier that is then used to select the appropriate generic USER instance for the HPCA agent.

The back-end database is Microsoft Access, and the Configuration Server is running under Windows NT.

The Microsoft Access database is named `PERSONNEL.MDB`. It contains a table (EMPLOYEES) that contains the data to be extracted by EDMMSQLG. The EMPLOYEES table looks like this:

Figure 9 Employees table of the Microsoft Access database

Employees : Table

Employee_ID	RADIA_Client_ID	First_Name	Last_Name	Department_ID	Job_Class
1	DGray	David	Gray	HOMEOWN	ADJ
2	DKitt	David	Kitt	AUTO	ADJ
3	JManning	Jane	Manning	AUTO	ADJ
4	KStrummer	Kathy	Strummer	HOMEOWN	MGR

We'll use EDMMSQLG to look up, in the EMPLOYEES table's **RADIA_Client_ID** column, the user ID provided by the user in the HPCA agent connect login. If it exists in a record who's **Job_Class** is equal to ADJ, we'll extract the **Department_ID** field. **Department_ID** will then be used in the Configuration Server resolution process to select a generic USER instance to provide the appropriate set of applications for the end user.

The generic USER instance will be named **AUTO** for automobile insurance adjusters and **HOMEOWN** for homeowner's insurance adjusters.

We've defined an ODBC Data Source named Radia Policy to specify an ODBC connection to this database. Once the ODBC Data Source exists, create an instance of the SQLTABLE class to provide a control object for EDMMSQLG, as in Figure 10 on page 219.

Figure 10 SQLTABLE Class POLICY2 instance attributes

SQLTABLE Class "POLICY2" Instance Attributes:

Name	Attribute Description	Value
SQLTABLE	Table Name	Employees
SQLUSER	User Name	
SQLPASSW	Password	
SQLTOUT	Time Out in Seconds	30
SQLDSN	DSN name	Radia Policy
PUTTYE	Insert(I)/Replace(R)	
SRCOBJ	RDM object containing information	&(ZCURPCLS)
DSTOBJ	Destination object	POLICY
WHERE	WHERE clause for SQL statement	RADIA_Client_ID = '&(ZMASTER.ZUSERID)' AND Job_Class = 'ADJ'
VC000	Column 1	GENUSER,Department_ID
VC001	Column 2	GENJOB,Job_Class
VC002	Column 3	
VC003	Column 4	
VC004	Column 5	
VC005	Column 6	
VC006	Column 7	
VC007	Column 8	
VC008	Column 9	
VC009	Column 10	
VC010	Column 11	
VC011	Column 12	
VC012	Column 13	
VC013	Column 14	
VC014	Column 15	
GET	Run EDMMSQLG to GET data	SYSTEM.ZMETHOD.SQLGET
PUT	Run EDMMSQLP to PUT data	SYSTEM.ZMETHOD.SQLPUT
ALWAYS	RDM method	SYSTEM.ZMETHOD.PUT_SQL_OBJECT

We've named this instance POLICY2. This instance should be named in accordance with your organization's convention for naming Client Automation product instances.

- The SQLTABLE variable identifies the database table that EDMMSQLG will access (in this example, Employees).
- The SQLDSN variable specifies which ODBC Data Source to use (in this example, Radia Policy).
- As a result of its query, EDMMSQLG will produce an in-storage object (in this example, POLICY) as specified in the DESTOBJ variable.

Examine the WHERE variable. Note the symbolic substitution using &(ZMASTER.ZUSERID). At logon, the end user provides a user ID (and, optionally, a password) in the logon dialog box. The user ID is transmitted to

the Configuration Server in the ZMASTER object ZUSERID attribute at the beginning of the HPCA agent connect.

This example uses this user ID to retrieve a record from the Microsoft Access Personnel database EMPLOYEES table, identifying the type of user. The WHERE clause retrieves any record whose RADIA_Client_ID is equal to the user ID supplied by the end user, and whose Job_Class is ADJ.

The specifications for RADIA_Client_ID and Job_Class must be enclosed in single quotes (**‘ ’**). This is an ODBC requirement.

Note: Quotation marks (**“ ”**) will not work.

Some databases do not permit embedded spaces in column names, while others (like Microsoft Access) do. Notice (in Figure 10 on page 219) that the names of the columns from which EDMMSQLG retrieves data have no embedded spaces.

EDMMSQLG is limited to retrieving data from columns with a name that does not contain embedded spaces.

Connect the SYSTEM.PROCESS.ZMASTER instance to this SQLTABLE instance.

The connection is SYSTEM.SQLTABLE.POLICY2(GET). It sets the system message value to GET, so that the POLICY2 instance will execute EDMMSQLG, not EDMMSQLP.

The POLICY object GENUSER attribute contains the value that EDMMSQLG retrieved from the **Department_ID** column for the user who signed on to the HPCA agent connect: either **AUTO** or **HOMEOWN.** This value is then substituted into the USER Class connection that immediately follows, connecting to either USER.AUTO or USER.HOMEOWN, depending on what type of adjuster the end user is.

This example would require only two USER Class instances in order to service all (auto and homeowner’s) adjusters. Since ZMASTER.ZUSERID is not affected by the design of this example, individual PROFILE File Domains are stored for each user who connects, despite the fact that a generic set of applications is being supplied.

We’ve modified the ZPROCESS (PROCESS) class to include a TRIMUSER variable. We need to do this because we intend to use symbolic substitution to refer to a variable in the object created by EDMMSQLG. EDMMSQLG stores data retrieved from a text field in a back-end database, in an object variable

whose length is 255, regardless of the size defined for the field in the back-end database. If we tried to symbolically substitute a 255-byte field into part of another attribute, symbolic substitution would fail with a buffer overflow. Thus, the purpose of the TRIMUSER attribute is to reduce the length of the data retrieved from the back-end database to a size that can be successfully symbolically substituted in the following attribute.

Two examples from the Configuration Server log illustrate this. First, the sample code below contains an excerpt from the log showing the buffer overflow that occurs when we try to symbolically substitute the object value that was created from the back-end database.

```
Radia Client     ---RESOLUTION ENDS:  SQLTABLE.POLICY   CRC:00000000
Radia Client     ---Substituting POLICY.USER.&(POLICY.GENUSER)(EDMSETUP)
Radia Client     ---Passing to Substitution ...: [&(POLICY.GENUSER)]
Radia Client     ---PASSED TO SUBSTITUTION..: &(POLICY.GENUSER)
Radia Client     ---GET POLICY  .GENUSER  (1) (255) 'AUTO'
Radia Client     ---BACK FROM SUBSTITUTION...: 255 [AUTO]
Radia Client     --! Substitution buffer overflow

Radia Client     --! SUBSTITUION FAILURE
Radia Client     ---Substitution Failed [POLICY.USER.&(POLICY.GENUSER)(EDMSETUP)
```

The sample of code below presents an excerpt from the Configuration Server log showing successful symbolic substitution of the data obtained from the Microsoft Access database, when we trim its length first in the TRIMUSER variable:

```
Radia Client     --- RESOLUTION ENDS: SQLTABLE.POLICY
Radia Client     --- Passing to Substitution ...: [&(POLICY.GENUSER)]
Radia Client     --- PASSED TO SUBSTITUTION..: &(POLICY.GENUSER)]
Radia Client     --- GET POLICY  .GENUSER  (1) (255) 'AUTO'
Radia Client     --- BACK FROM SUBSTITUTION...: 255 [AUTO]
Radia Client     --- AFTER SUBSTITUTION [AUTO]
Radia Client     --! Subst. Value Truncated ZPROCESS.TRIMUSER (1) Actual (255)
Allocated (50) 'AUTO'
Radia Client     --- ADD ZPROCESS.TRIMUSER  (1) (50) 'AUTO'
Radia Client     --- Substituting POLICY.USER.&TRIMUSER(EDMSETUP)
Radia Client     --- Passing to Substitution ...: [&TRIMUSER]
Radia Client     --- PASSED TO SUBSTITUTION..: &TRIMUSER
Radia Client     --- GET ZPROCESS.TRIMUSER (1) (50) 'AUTO'
Radia Client     --- BACK FROM SUBSTITUTION...: 50 [AUTO]
Radia Client     --- AFTER SUBSTITUTION [POLICY.USER.AUTO]
Radia Client     --- SUBSTITUTION VALUE [POLICY.USER.AUTO]
Radia Client     --- Substituted value POLICY.USER.AUTO
Radia Client     --- MESSAGE CHANGES USER     AUTO (        ) (EDMSETUP)
Radia Client     --- RESOLUTION BEGINS USER    .AUTO (EDMSETUP)
```

In the ZPROCESS class template, the Manager: Global property is not selected for the TRIMUSER variable. There is no need to preserve the TRIMUSER variable in a parent persistent object because it is used only as temporary storage to reduce the length of the data that is retrieved from the back-end database.

Also note that the Manager: Resolve property is selected. This ensures that symbolic substitution will occur.

To extract pricing data from an external database

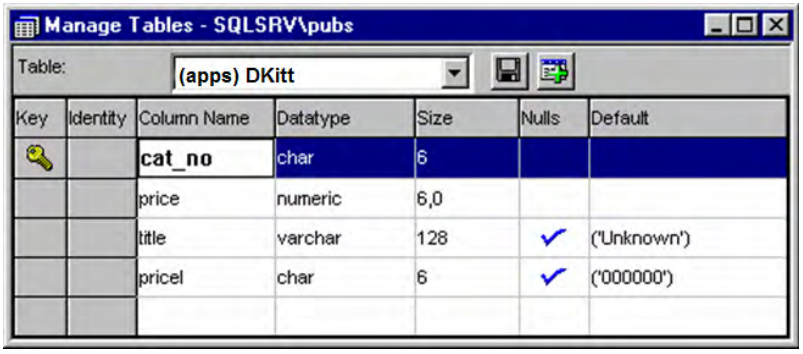
This example illustrates pricing content that is distributed by Client Automation according to pricing records that are maintained in an external database. EDMMSQLG is used to price each unit of content that Client Automation distributes. Client Automation totals the prices for all content that is delivered during an HPCA agent connect, and EDMMSQLP reports the results to an external billing system.

The pricing data are kept in a Microsoft SQL Server database table, the Configuration Server is running Windows NT, and Client Automation stores the billing data in a Microsoft FoxPro table.

For this example, we will use the Radia data source for Microsoft SQL Server as described beginning on page 202, and the Radia data source for Microsoft FoxPro as described beginning on page 199.

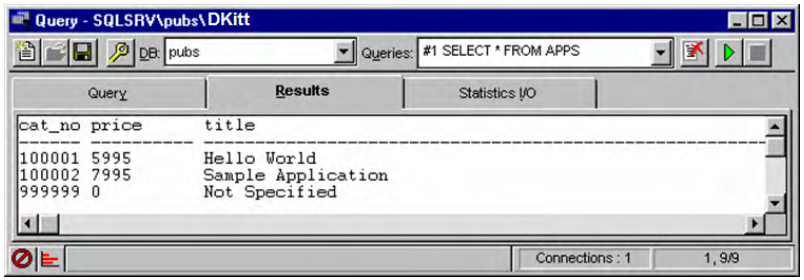
The Microsoft SQL Server pubs database table (apps) holds the pricing data. The format of this table is shown in Figure 11 below.

Figure 11 Microsoft SQL Server – SQLSRV\pubs



This table contains the following data:

Figure 12 Microsoft SQL Server – SQLSRV\pubs\DKitt



For this example, each service that Client Automation manages has a catalog number (CAT_NO). We will use EDMMSQLG to look up the service's catalog number in the apps table and extract the price into a Client Automation object.

To implement this design, we added three attributes to the ZSERVICE Class template:

- The CAT_NO attribute holds the catalog number for the service. EDMMSQLG will look up this value in the SQL Server database.
- The EDMSETUP connection attribute (Pricing connection) holds a connection to the SQLTABLE instance that invokes EDMMSQLG.
- The PRICE attribute stores, for this service, the price value that EDMMSQLG extracts from the SQL Server database.

  The PRICE attribute should have the Global, Manager, Resolve, and Counter properties selected.

  — Resolve enables symbolic substitution of the price, by reference to the object that EDMMSQLG creates to contain the price value extracted from the SQL Server database.

  — Counter indicates that the PRICE attribute's value will be accumulated in an attribute named PRICE in all parent persistent objects. This accomplishes summation of the price of all services managed for each user into a PRICE variable in each user's ZMASTER object. Client Automation automatically creates the PRICE attribute in ZMASTER (parent persistent) object when a child object (in this case, ZSERVICE) contains a PRICE attribute with the Counter property.

Client Automation counter fields are treated as integers. Therefore, the price in the SQL database must be expressed in cents.

The Pricing connection EDMSETUP attribute connects to `SQLTABLE.PRICE`.

EDMMSQLG looks up the ZSERVICE instance CAT_NO value in the SQL Server database and creates a PROBJ object that contains a PRICE variable in which is stored the price of the service, as retrieved from the SQL Server database.

To implement this design, we modify the _BASE_INSTANCE_ of the ZSERVICE Class as follows.

- If no value is provided for CAT_NO in a ZSERVICE instance, the base instance CAT_NO will default to **999999**.
- The EDMSETUP attribute, Pricing connection, with a value of **`ZSYSTEM.SQLTABLE.PRICE(GET)`**, is set to connect to the SQLTABLE.PRICE instance, thereby providing a control object for EDMMSQLG and invoking the method by setting the system message to GET.
- The PRICE attribute, with a value of `&(PROBJ.PRICE)`, retrieves the service's price from the PROBJ object by symbolic substitution.

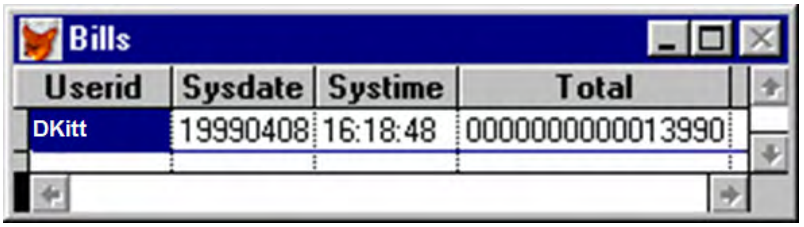
During an HPCA agent connect, as each of the user's services is resolved, EDMMSQLG is invoked to retrieve the price from the SQL Server database. HPCA accumulates the prices of all of the user's services in the user's ZMASTER object. To write the totaled price for the user to the FoxPro database, invoke EDMMSQLP using the SQLTABLE.BILLING instance.

The user ID, connection date and time, and totaled price will be written from the ZMASTER object to the `BILLS.DBF` FoxPro table.

To invoke the EDMMSQLP method, we modify the _BASE_INSTANCE_ of the USER Class by making `ZSYSTEM.SQLTABLE.BILLING(PUT)` the last step in the resolution of the USER instance. This connection provides a control object for EDMMSQLP and invokes the method by setting the system message to PUT. It also assures that all services have been resolved and their prices totaled in the ZMASTER object at the point where we invoke EDMMSQLP.

As a result of the HPCA agent connect for user DKitt, the following record is inserted in the `FoxPro BILLS.DBF` table:

Figure 13 Microsoft FoxPro BILLS.DBF table



The Total (13990) is the sum of the prices of the two services that Client Automation manages for this user (DKitt).

Destination Object (DESTOBJ Parameter) Considerations

EDMMSQLG creates the object identified in the DESTOBJ parameter. The attributes of the object appear in the same order in which they are defined in the VC pairs of the control information. One heap is created in the destination object for each row retrieved from the back-end database. To limit the number of rows retrieved from the back-end database, code an appropriate WHERE clause in the control information.

Invoking EDMMSQLP

This section provides information needed to invoke EDMMSQLP, and some examples.

Refer to the instructions for creating an instance in the *Admin User Guide*. Before invoking the method, at least one instance must be defined in the CSDB. You can define multiple instances to invoke EDMMSQLP, where each instance (with its unique name) refers to a different set of control information in its ZMTHPRMS variable.

Mimicking the PROFILE File

In this example, the HPCA agent connect will store information about its hardware configuration in the back-end database. The information will be extracted from the ZCONFIG object, and transferred to a back-end Visual FoxPro table according to control information contained in a text file.

Here is the PRIMARY.SYSTEM.ZMETHOD instance created to invoke EDMMSQLP:

Figure 14 Methods Class SQLTEST instance attributes

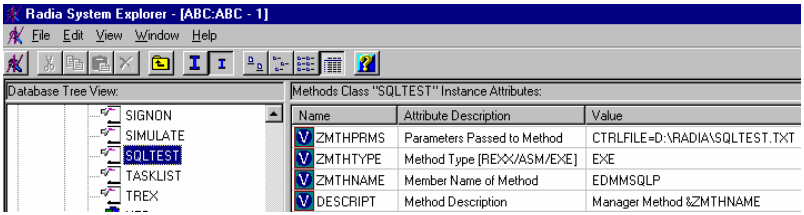


Figure 15 below presents the control information text file.

Figure 15 SQLTEST control information file

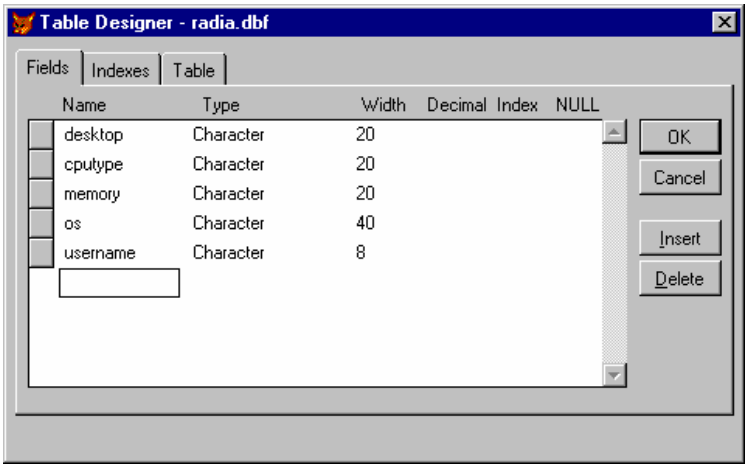
SQLTEST3.TXT

```
SQLTABLE=MULTI.DBF,SQLUSER=Ed,SQLPASSW=password,SQLTOUT=15,
VC="ZUSERID,USER,U",VC="LOCATION,DIRECTORY",VC="ZRSCCFIL,FILENAME,U",
VC="ZRSCCSTA,STATUS",SQLDSN=Radia_Demo,SRCOBJ="FILE     ",PUTTYPE=R
```

The third subparameter, U, is coded on the DESKTOP, CPUTYPE, and USERNAME VC parameters, because the concatenation of these fields is required to uniquely specify an HPCA agent in the back-end database.

The structure of the Visual FoxPro `radia.dbf` table is as follows.

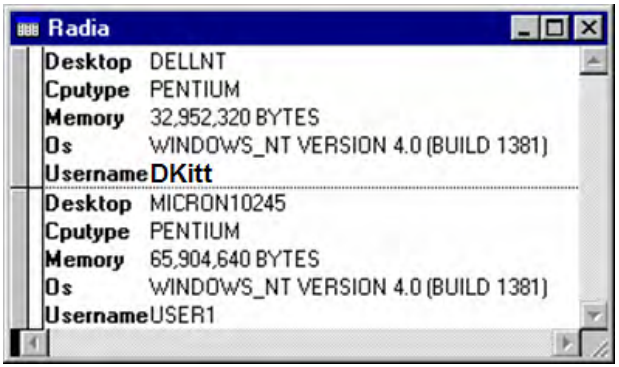
Figure 16 Visual FoxPro radia.dbf table



To invoke the EDMMSQLP method, a connection to the PRIMARY.SYSTEM.ZMETHOD instance named SQLTEST is added to the PRIMARY.SYSTEM.PROCESS.ZMASTER instance, which is processed when the HPCA agent connect sends its ZMASTER object to the Configuration Server.

As each HPCA agent connects to the Configuration Server, the pertinent fields are extracted from the its ZCONFIG object and stored in the Visual FoxPro `radia.dbf` table.

Figure 17 Visual FoxPro radia.dbf table



Examine how this example mimics Client Automation's saving of the ZCONFIG object in the PROFILE File, which is accomplished via a connection to SYSTEM.ZMETHOD.PUTPROF_ZCONFIG in the ZMASTER instance, above.

Extracting from Multiple Objects

By design, EDMMSQLP extracts data from a single database object each time it is invoked. If you need to extract data from multiple objects, you must either:

- invoke EDMMSQLP multiple times (once for each object), or
- write a custom Configuration Server method to compile data from multiple objects into a single object prior to invoking EDMMSQLP.

The following example demonstrates the latter method with a custom REXX method named SQLPHDW.

```
********************Put   SQL************************/
/* will format and PUT a ZCONFIG object into an     */
/* ODBC compliant database                          */
/**************************************************/

/**************************************************/
/*                                                  */
```

```
/* COPYRIGHT HP INC. 2000                          */
/* LICENSED MATERIAL PROPERTY OF HP          .     */
/* HP Radia(tm)                                    */
/*                                                 */
/*************************************************/
/*********************************/
/* get the ZCONFIG object        */
/*********************************/
address cmd
RC = EDMGET('ZCONFIG',1);  /* Get the ZCONFIG object  */
if RC <> 0 then exit
RC = EDMGET('ZMASTER',1);
ZCONFIG.ZOS = ZMASTER.ZOS || ' ' || ZCONFIG.ZHDWOSDB;
ZCONFIG.ZUSERID = ZMASTER.ZUSERID;
RC = EDMSET('ZCONFIG',1);

/*********************************/
/* the main function             */
/*********************************/
RC = EDMGET('SQLCNTRL',1);
SQLCNTRL.PUTTYPE = 'R';
SQLCNTRL.SQLDSN = 'Radia_Demo';
SQLCNTRL.SQLTABLE = 'RADIA.DBF';
SQLCNTRL.SQLTOUT = '10';
SQLCNTRL.SQLUSER = 'David';
SQLCNTRL.SQLPASSW = 'password';
SQLCNTRL.SRCOBJ = 'ZCONFIG';
SQLCNTRL.VC000 = 'ZHDWCOMP,DESKTOP,U';
SQLCNTRL.VC001 = 'ZHDWCPU,CPUTYPE';
SQLCNTRL.VC002 = 'ZHDWMEM,MEMORY';
SQLCNTRL.VC003 = 'ZOS,OS';
SQLCNTRL.VC004 = 'ZUSERID,USERNAME,U';
```

```
RC = EDMSET('SQLCNTRL',1);
params =  " CTRLOBJ=SQLCNTRL"
address edmlink EDMMSQLP params
/return;
```

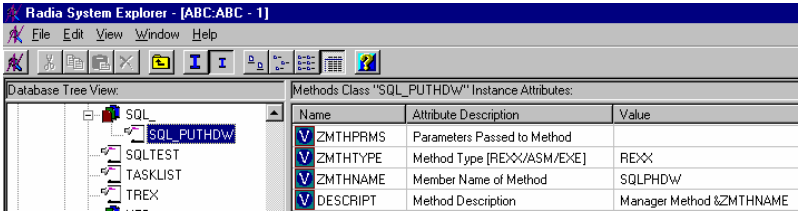
This method executes the following process.

1. It combines variables (ZOS, ZUSERID) from the ZMASTER object with the variables in the ZCONFIG object.
2. It then builds an object (SQCNTRL) to contain the control information for a call to EDMMSQLP.
3. Lastly, it invokes EDMMSQLP, and passes the control object via the CTRLOBJ=SQLCNTRL parameter.

For further information on constructing custom methods in the REXX programming language, refer to the *REXX Programming Guide*.

To invoke the SQLPHDW method, you must create an instance (for example, SQL_PUTHDW) of the PRIMARY.SYSTEM.ZMETHOD class, which, in this example, looks like:

Figure 18 Methods class SQL_PUTHDW instance attributes



Notice that the ZMTHPRMS variable is empty. The control information for EDMMSQLP is built within the SQLPHDW method and will be passed to the EDMMSQLP method in a control object.

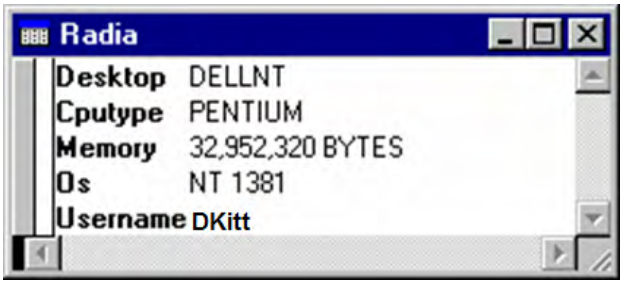
- The SQLPHDW file (without a file extension) must be located in the `Manager\Rexx` directory.
- For methods written in the REXX programming language, the ZMTHTYPE variable must be **REXX**.

To have the HPCA agent connect invoke the SQLPHDW method, the SYSTEM.PROCESS.ZMASTER instance has been changed from the previous

example to include an _ALWAYS_ connection to SYSTEM.ZMETHOD.SQL_PUTHDW.

As a result of the HPCA agent connect, its data is transferred to the back-end database.

Figure 19 Visual FoxPro radia.dbf table



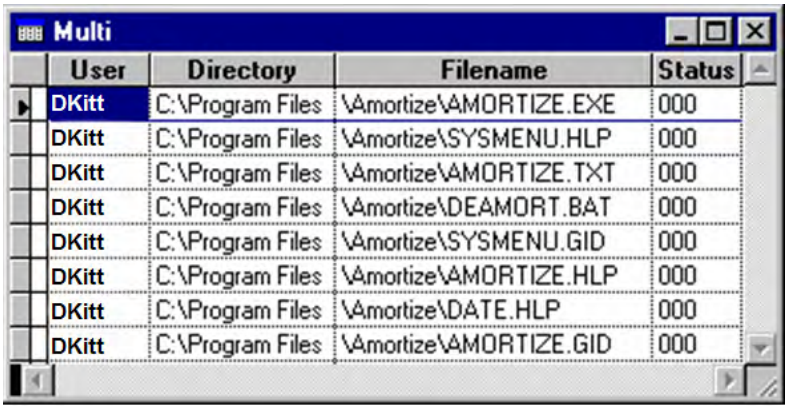
To transfer data from a multiple heap object

In this example, data is transferred from a FILE object. The FILE object has a heap for each file that is transferred to the HPCA agent during the deployment of an application.

1. Create a Visual FoxPro table to receive the data.
2. Create `SQLTEST3.TXT`, a control file for EDMMSQLP.
3. Create a SYSTEM.ZMETHOD instance named SQLTEST3 to invoke the EDMMSQLP method with the SQLTEST3.TXT control file.
4. Modify SYSTEM.PROCESS.ZMASTER to connect to SYSTEM.ZMETHOD.SQLTEST3.
5. Run the HPCA agent connect.

   The following figure shows the result in the Visual FoxPro table for one user with a SOFTWARE.FILE object containing eight heaps.

Figure 20 Visual FoxPro table for user DKitt



Source Object (SRCOBJ Parameter) Considerations

Any CSDB object can be used as a source for EDMMSQLP. In the source object, EDMMSQLP expects to find all the variables as defined in VC keywords in the control information parameter string, or in VCnnn variables in the control object.

Then, for each heap of the source object, EDMMSQLP reads the values of the requested variables and writes them into the SQL table's columns that are defined in the corresponding VC pair. All other variables in the source object that are not defined in any of the VC pairs of the control information are ignored. All the requested variables from a single source object heap will be put in one row of the SQL table. The next heap of the source object will provide values for the next row of the SQL table, and the process will continue until all the heaps of the source object are processed.

Passing Control Information to EDMMSQLG and EDMMSQLP

The EDMMSQLG and EDMMSQLP methods require a set of control information to perform their function. Control information is passed to EDMMSQLG and EDMMSQLP as a parameter (or set of parameters) at execution time in one of the following ways:

- As a parameter string passed on the command line (such as, in the ZMTHPRMS variable of the PRIMARY.SYSTEM.ZMETHOD instance

used to invoke EDMMSQLG/EDMMSQLP). The maximum length of the command line parameter string is 255 bytes. If the control information you need to pass to the method is longer than 255 bytes, you must use one of the other options.

- In a text file (identified by the CTRLFILE=<file_name> parameter).
- In a control object (identified by the CTRLOBJ=<object_name> parameter)

Control Parameters

Table 97 below identifies the control information required by EDMMSQLG and EDMMSQLP.

Table 97 EDMMSQLG/EDMMSQLP Control Information

Keyword	Description
CTRLFILE	The fully qualified name of a text file that contains the control information. If this parameter is present on the command line, the parsing of the parameter string stops, and all the control information will be taken from the specified file. Required only if the control information is supplied in the specified file.
CTRLOBJ	The name of the object that contains the control information. If this parameter is present in the command line, the parsing of the parameter string stops, and all the control information will be taken from the specified object. Required only if the control information is supplied in the specified object.
SRCOBJ	EDMMSQLP only. The name of the source object (right-padded with blanks to eight bytes and enclosed in quotation marks when specified in a text file or on the command line). The source object contains the data to be transferred to the back-end SQL database.
DESTOBJ	EDMMSQLG only. The name of the destination object (right-padded with blanks to eight bytes and enclosed in quotation marks when specified in a text file or on the command line). The destination object contains the data to be received from the back-end SQL database. EDMMSQLG will create this object when it is executed.
SQLDSN	The ODBC data source name (DSN) to be used to connect to the back-end SQL database. See Configuring an ODBC Data Source on page 198, for details.

Keyword	Description
SQLTABLE	The fully qualified file name of the file containing the SQL table, or simply the name of the table (depending on which the back-end database requires the ODBC data source to supply). EDMMSQLP will store the data into this table. EDMMSQLG will extract the data from this table.
SQLUSER	User ID to use in the CSDB connect process. Some back-end databases ignore this information; others require and verify it. See the database administrator of the back-end database in your organization for details.
SQLPASSW	The password to use in the CSDB connect process. Some back-end databases ignore this information; others require and verify it. See the database administrator of the back-end database in your organization for details.
SQLTOUT	Timeout value (in seconds) for the SQL connect operation. If a connection to the back-end database cannot be established within this time, the connection attempt will be terminated and an error logged in the Configuration Server log.
VC, or VCnnn (where nnn is a sequential 3-digit number from 000 to the total number of variables to be transferred to the back-end database; used when control information is passed in an object)	Defines the correspondence between a variable in the source or destination object and the column in the back-end database table where it will be stored (EDMMSQLP), or from which it will be extracted (EDMMSQLG). One VC value must be specified for each variable-column pair participating in the operation. Specify: **"VARNAME [,COLUMN_NAME][,U]"** (include the quotation marks in a text file or on a command line, omit them in an object) • VARNAME is the name of the variable in the object whose value will be set (EDMMSQLG), or transferred to (EDMMSQLP), the back-end database. • COLUMN_NAME is the name of the column in the back-end database table that will supply (EDMMSQLG), or receive (EDMMSQLP), the data. If COLUMN_NAME is omitted, VARNAME will be used; this assumes that the back-end database table's column name is the same as the object variable receiving (EDMMSQLG), or supplying (EDMMSQLP), its data. • The third subparameter, U, identifies the key fields used to locate the row to be replaced in the back-end database. If PUTTYPE=R, at least one VC value must have the third subparameter coded.

Keyword	Description
PUTTYPE	EDMMSQLP only. Indicator for type of operation to be performed on the back-end database, either R (Replace) or I (Insert). When R is specified, EDMMSQLP will try to update the identified row. If the row does not exist, EDMMSQLP will try to insert it. When I is specified, EDMMSQLP will try to insert the row. If this operation fails, no other action is taken. The default is **R**.
WHERE	Contains a WHERE clause for the SQL statement that EDMMSQLG builds to extract data from the back-end database, or which EDMMSQLP constructs to update data in the back-end database. Use this to limit the result set to records that meet a specific condition. Do not code the word WHERE in this parameter; only code the clause that would follow the WHERE keyword in the SQL SELECT statement that retrieves the data from the back-end database, or the SQL UPDATE statement that stores data in the back-end database.

PUTTYPE

If, during an execution of EDMMSQLP, PUTTYPE=R, the following are applicable:

- It generates a REPLACE statement using VC groups specified in the control information provided. Typically, this will do a direct update for all the rows that were found according to the search criteria in the WHERE clause. The WHERE clause uses the WHERE variable content from the control information (version 4.4 CM Configuration Server), or built as a combination of unique fields, marked as such in VC variables (pre-version 4.4 CM Configuration Servers).

  In a case where the WHERE variable exists, EDMMSQLP will ignore all unique keys specified in VC variables. However, since various Database Management Systems (**DBMS**) can use different implementations for this operation, consult the documentation for your particular DBMS for implementation issues.

- If the REPLACE operation fails due to SQL errors, nothing else is done and an error is reported in the Configuration Server log.

- If the REPLACE does not fail, but the number_of_affected_rows=0 (meaning there were no rows found that meet the criteria), EDMMSQLP will generate an INSERT and attempt to create a new row in the database table.

Generally, PUTTYPE=I should be used only when the key part of the row is always different (for example, date and time plus user ID are used as a combined key). For all other cases, PUTTYPE=R will handle initial inserts as well as updates.

The U Subparameter

The U subparameter is used to identify one or more fields which EDMMSQLP builds into a WHERE clause for the REPLACE SQL statement it generates. The U subparameter is recognized by EDMMSQLP only, and only when PUTTYPE=R (replace). If these two conditions are not met, it is ignored.

- If one VC pair has the U subparameter coded, the WHERE clause generated will resemble:

```
WHERE fieldname = current source object corresponding
variable value
```

The current source object corresponding variable value is the value currently (at the time of the call to EDMMSQLP) held in the source object variable, coded in the control information's VC pair that links the variable with the back-end database.

- If more than one VC pair has the U subparameter coded, the WHERE clause 'ANDS' them together, as in:

```
WHERE fieldname1 = value1 AND fieldname2 = value2…
```

- If the result of executing the REPLACE statement with the WHERE clause yields zero matching records, EDMMSQLP regenerates the SQL statement as an insert, and inserts the record.
- If the result of executing the REPLACE statement with the WHERE clause finds exactly one record in the database, the record is replaced with the information contained in the source object.
- If the result of executing the REPLACE statement with the WHERE clause finds more than one record in the database, all the records are replaced with the information contained in the source object.
- If PUTTYPE=R and no VC pairs in the control input have the U subparameter coded, EDMMSQLP terminates and logs the following error message:

```
NO UNIQUE COLUMNS WERE FOUND FOR WHERE CLAUSE. TERMINATING.
```

Configuring the Configuration Server Database SQLTABLE Class

The easiest way to provide the necessary control information to EDMMSQLG and EDMMSQLP is to use a control object instantiated from a class in the CSDB. This can be provided by an instance of a CSDB class, such as the SQLTABLE class in the SYSTEM domain of the PRIMARY file. If your CSDB does not contain this class, use the HPCA Admin CSDB Editor to add it.

Be sure that, in the **Properties** area, under **Manager**, the **Global** check box is cleared for all variables in the SQLTABLE class template. This will prevent unnecessary storage of the variables of the control object instantiated from an instance of the SQLTABLE class from being stored in parent persistent objects, such as ZSERVICE or ZMASTER (depending on where in the resolution process the EDMMSQLP or EDMMSQLG method is invoked).

There are 15 VC*nnn* fields (VC000 – VC014) in the sample class template; define as many as necessary for your template.

The GET and PUT method variables should connect to ZMETHOD instances in order to run the EDMMSQLG and EDMMSQLP methods, so that if the value of the system message is **GET**, EDMMSQLG is run; if the value of the system message is **PUT**, EDMMSQLP is run. If the value of the system message is something other than GET or PUT, neither method is run.

Control Information

Control information includes:

- how the method knows which database object to use as a source,
- which variables of that object to write to which columns of the destination table,
- how to connect to the database,
- which table of the database to use in the operation, and
- what the user ID, password, and timeout are.

All this control information must be passed to the method.

Content

The following control information is required:

- The name of the object that contains the source data (SRCOBJ) for the SQL put request. Or the name of the object in which to store the information (DESTOBJ) retrieved from the SQL database.
- Data Source Name - the logical name used to connect to the specific SQL database.
- The fully qualified name of the table to access in the <SQLDSN> database.
- The user ID and password to use for connecting to the database.
- VARNAME [,COLUMN_NAME][,U], which describes the relationship between a variable of the (source or destination) object and the corresponding column of the database table. For more information on this, refer to the section, VARIABLE-COLUMN Pairs, on page 241.
- REPLACE (UPDATE) or INSERT as the type of Put operation requested. (put method only)
- Number of seconds to wait on the SQL-connect operation.
- (Optional) The WHERE clause to use in the selected statement. The method will substitute the WHERE, so that if USER=JANE is specified, then in the select statement it will be WHERE (USER=JANE). The variable WHERE is optional, and in cases where it is omitted in the control object, it will be generated by the method, with the help of variables with the U suffix. For more information on the WHERE clause, refer to The WHERE Clause, on page 247.

Delivery

The control information can be delivered to the HP SQL method in one of the following ways:

- via a parameter string,
- via a text file (CTRLFILE=<file_name>), or
- via a control object (CTRLOBJ=<object_name>).

Regardless of the selected delivery method, the parameter string must be passed to the HP SQL method. If the substring CTRLFILE=<file_name> is found in the parameter string, the control information will be retrieved from file file_name. If the substring CTRLOBJ=<object_name> is found in the parameter string, the control information will be retrieved from the object_name. If neither substring is found, the method assumes that all the control information is passed in the parameter string. Your system

administrator will determine which method will be used to pass the control information to the HP SQL method.

CTRLFILE always takes precedence over CTRLOBJ. Therefore, if both are specified, regardless of their order, the control information will be retrieved from the file that is specified by CTRLFILE.

Control Information Passed via a Parameter String

The parameter string has the comma-separated key-value format. The maximum length of the parameter string is 255 bytes. If the control information you need to pass to the method exceeds the maximum, use either the CTRLFILE or the CTRLOBJ option and put all the control information in the control file (or the control object).

Examples of the parameter string:

Example 1 – Text File

In the following example, all the control information will be read from the file `C:\Radia\SQLCNTL.TXT`. All other information specified in the parameter string will be ignored.

```
CTRLFILE=C:\Radia\SQLCNTL.TXT, SQLDSN=CUST_DB,
SQLTABLE=joe.USERS, SQLUSER=smith, SQLPASSW=Rabbit,
SQLTOUT=15, VC="ZUSERID,USER", VC="ZBIOS,BIOS", VC="ZOS,OS",
VC="ZOSVER,OS_VERSION"
```

If you remove the CTRLFILE parameter, the remaining parameters on the command line would control the execution of the method.

Example 2 – Control Object

In the following example, all the control information will be retrieved from the SQLCNTL object, while all the other command line information will be ignored.

```
CTRLOBJ=SQLCNTL, SQLDSN=CUST_DB, SQLTABLE=joe.USERS,
SQLUSER=smith, SQLPASSW=Rabbit, SQLTOUT=15, VC="ZUSERID,USER",
VC="ZBIOS,BIOS", VC="ZOS,OS", VC="ZOSVER,OS_VER"
```

If you remove the CTRLOBJ parameter, the remaining parameters on the command line would control the execution of the method.

Example 3 – Precedence of CTRLOBJ over CTRLFILE

In the following example, all the control information will be retrieved from the `C:\Radia\SQLCNTL.TXT` file, and the information in the SQLCNTL object

will be ignored. This does not allow combinations of sources of the control information.

```
CTRLOBJ=SQLCNTL,CTRLFILE=C:\Radia\SQLCNTL.TXT
```

As previously noted, CTRLFILE always supercedes CTRLOBJ, regardless of the order in which they are specified on the command line.

Example 4 – Command Line Control String

In the following example, all the control information is received from the parameter strings on the command line.

```
SQLTABLE=RADIA.DBF, SQLUSER=joedoe, SQLPASSW=password,
SQLTOUT=15, VC="ZHDWCOMP,DESKTOP,U", VC="ZHDWCPU,CPUTYPE",
VC="ZHDWMEM,MEMORY", VC="ZHDWOS,OS", VC="ZUSERID,USERNAME,U",
SRCOBJ=ZCONFIG, SQLDSN=Radia_Demo, PUTTYPE=R
```

Control Information Passed via a Text File

All control information can be optionally passed to EDMMSQLG and EDMMSQLP in a text file. In general, use a text file to pass the control information when the length of the parameter string exceeds 255 bytes, or if you need to make multiple references to the same set of control information.

The format of the control information passed in a text file is identical to that of the parameter string passed on the command line. However, CTRLOBJ and CTRLFILE parameters will be ignored if found in the text file.

Control Information Passed via a Control Object

All control information can be optionally passed to EDMMSQLG and EDMMSQLP in a control object. In this case, keywords that were defined in previous sections will become variable names in the object. Additionally, the group of non-unique VC variables must be converted to unique variable names. In order to create unique variable names, a three-digit index is appended to VC, so that variable names will be VC000, VC001, …VCnnn.

The three-digit indexes that are appended to VC in forming the variable name *must* start with 000, and subsequent variable names must be created from an index value one greater than the previous one. No numbers can be skipped.

The command line control string that was presented in Example 4 can be implemented in a control object, SQLPARMS, with the variables that are shown in Table 98.

Table 98 SQLPARMS Values

Variable Name	Variable Value
SRCOBJ	ZCONFIG
SQLDSN	Radia_Demo
SQLTABLE	RADIA.DBF
SQLUSER	joedoe
SQLPASSW	password
SQLTOUT	15
VC000	ZHDWCOMP,DESKTOP,U
VC001	ZHDWCPU,CPUTYPE
VC002	ZHDWMEM,MEMORY
VC003	ZHDWOS,OS
VC004	ZUSERID,USERNAME,U
PUTTYPE	R

In this case CTRLOBJ=SQLPARMS is the only parameter passed to the EDMMSQLP method on the command line.

VARIABLE-COLUMN Pairs

A VARIABLE-COLUMN (VC) pair is the designation of one set of information location data participating in a get or put operation. The VARIABLE is the database object that is being received or transferred in the method. The COLUMN is the category in the SQL database table that is being accessed to receive or supply the data. The following rules apply to the use and execution of VC pairings.

- There might be more than one VC keyword in a parameter string. However, one VC value must be specified for each VARIABLE-COLUMN pair participating in the operation.
- The VC can be specified as VCnnn, where nnn is a sequential, three-digit number from 000 to the total number of variables to be transferred to the back-end database. This is used when control information that is passed in an object defines the correspondence between a variable in the HP (source or destination) object, and the column in the back-end database

table. That is, to where it will be stored (EDMMSQLP), or from where it will be extracted (EDMMSQLG).

- Specify as “VARNAME [,COLUMN_NAME][,U]” (include the quotation marks when using a text file or on the command line, but omit them in an object). Here, VARNAME is the name of a variable in the source object.
- In order to be transferable, the value of a source object variable should correspond to that of an SQL-table date type. Therefore,

  VARNAME, “number”

  should be in the source object.

“Transferable” means having the following information in the control object: integers for number type columns, date information for date type columns, and COLUMN_NAME for the name of the column, in the SQL table.

If, in the source object, there is not a variable type that corresponds to an SQL column type, the method might fail or produce unexpected results in the database.

Table 99 on page 245 contains a complete list of the SQL column data types that HP supports.

- VARNAME is the name of the variable in the object whose value will be set from (EDMMSQLG), or transferred to (EDMMSQLP), the back-end database.
- COLUMN_NAME is the name of the column in the back-end database table that will supply (EDMMSQLG) or receive (EDMMSQLP) the data.

  If COLUMN_NAME is omitted, VARNAME will be used (provided the column of the back-end database table has the same name as the object variable supplying or receiving the data).
- The third subparameter, U, means that this COLUMN_NAME is the Unique Primary Key (PK) for the table; and therefore, identifies it as the key fields to use to locate the back-end database column to be replaced.

  The U subparameter is recognized by EDMMSQLP only, and only when PUTTYPE=R. If coded in other situations, it is ignored.

  The U subparameter is used to identify one or more fields that EDMMSQLP builds into a WHERE clause for the REPLACE statement that SQL generates. For more information on the impact of the U

subparameter in the WHERE clause, see The WHERE Clause on page 247.

- If PUTTYPE=R (see Table 96 on page 215), at least one VC value must have the third subparameter coded.

HP Object Information

Any database object can be used as a source or destination object for an SQL method. For the source object, the method expects to find all the variables defined in VC keywords in the object. For each heap of the object, the requested variables are read and then written into the SQL table's columns as defined in the corresponding VC pair. Any variables that are not defined in a VC pair are ignored. Generally, all the requested variables from a heap will be put in one row of the SQL table. The next heap will be a source for the next row of the SQL table, and so on until all the heaps of the source object are processed.

By having the value in the WHERE clause substituted from the source object variable, the substitution capability of EDMMSQLP can be used to make the various heaps responsible for updating the rows of the SQL table.

SQL Database Information

To connect the user to the SQL database, follow the steps in To configure DSN.

Data Source Name

The EDMMSQL methods use Open Database Connectivity (ODBC) to connect to the database. Therefore, you must configure a Data Source Name (DSN) for your system.

Using the steps outlined in the following example, you can create or choose any DSN as long as it is available in your environment and is supported by ODBC.

To configure DSN

1 Go to **Start→Settings→Control Panel**.

2 Double-click **ODBC Data Sources**.

The ODBC Data Source Administrator dialog box opens.

3 Select the **System DSN** tab.

You have the option to select **User DSN**, however, if the Configuration Server runs as a service, User DSNs are not accessible to it and database connects will fail.

The System DSN window opens.

4 Choose Data Source Name and use it in the SQLDSN keyword.

5 If Data Source Name does not exist, as in the figure above, click **Add** to create a new DSN.

You might want to configure the new DSN exclusively for HP. Generally, any DBMS supported by ODBC is supported by HP.

The Create New Data Source dialog box opens.

6 Select the driver for which you want to set up a data source, and click **Finish**.

The Create New Data Source to SQL Server dialog box opens.

7 From this point, continue with the wizard, specifying information that pertains to your environment.

Table Name, User ID, and Password

The table name is the fully qualified name of the existing table in the database defined by the DSN. The table name, as well as the names of its columns, the user ID, and the password should be obtained from the administrator responsible for the database.

SQL Column Data Types

The EDMMSQLP and EDMMSQLG methods support the following SQL-column data types:

CHAR	VARCHAR	LONGVARCHAR	SMALLINT
INTEGER	TINYINT	REAL	DOUBLE
FLOAT	DECIMAL	NUMERIC	DATE/TIME (TIMESTAMP)

All numeric types go into the EDMMSQLP method through the variable's character strings. They are handled by the methods in the same way that character strings are. The column name that is provided by the input object (control object or control file) should have the appropriate SQL type in order to ensure that the data is inserted properly.

Table 99 SQL Column Data Types and their Definitions

SQL Column Data Type	Description
CHAR	array of character
VARCHAR	array of character
LONGVARCHAR	array of character
SMALLINT	short integer
INTEGER	long integer
TINYINT	signed INT8
REAL	float
DOUBLE	double

SQL Column Data Type	Description
FLOAT	double
DECIMAL	long float
NUMERIC	long float
DATE/TIME (TIMESTAMP)	this data type is dependent on the database being used

This setting has different (short and long) date/time-stamp formats in different databases. For example, in Microsoft Access, it has the Date/Time name, but has “General Date” “Long Date” in Microsoft SQL Server database.

The EDMMSQLP and EDMMSQLG methods use only full timestamps to store the date and time in one column variable.

Depending on the default settings of the database in use, the date and/or time will be stamped by the database when the user fails to provide the full DATE/TIME value for the EDMMSQLG and/or EDMMSQLP methods.

For *decimal* and *numeric* SQL column types, the ODBC standard uses a default placeholder (of an array of characters) to transfer data back and forth, though the suitable program data type is “double.”

Client Automation objects used to have character variables as placeholders of these types also, so the variables naturally fit ODBC. Extracting the numeric and decimal fields into the program variable from the object is beyond the capability of these methods. Therefore, we recommend that you have the “double” type in the program in order to store the real value, in case the program needs it for arithmetic manipulation.

The lengths of variables provided for the EDMMSQLP method depend on the conversion, like the ftoa() function for the FLOAT type in the calling program. For the DATE/TIME (TIMESTAMP) type in the SQL database, we use the variable, EDM_TIMESTAMP for the put and get methods. This means the source object should have a value specified for this variable type for the put method, and should have a variable placeholder of the same type for the get method.

The same EDM_TIMESTAMP variable in the object can be used to save the date and time in CHARACTER-type columns of the SQL database. However, it will be a simple string, without some specific helpful features provided for SQL-DATE/TIME-timestamps by the database.

The WHERE Clause

The WHERE clause in the control object for EDMMSQLP identifies the rows of the SQL table that are to be replaced by using the literal string of the WHERE variable value as the body of the WHERE clause and ignoring any variables with a U specified. If the optional WHERE variable is not specified in the control object, and some of the variables are specified with U, the method will work transparently (as it is fully compatible with previous implementations of the U subparameter), and generate the WHERE clause using variables specified with U.

Having the WHERE clause in place in the control object, the method does not generate the WHERE, but rather, uses the provided string from the WHERE variable of the control object.

The WHERE clause, if defined, will be used and is taken as the only one having priority, and the internal WHERE is not generated as described in the VC keyword. The clause can have a substitution in standard notation.

Considerations

- If one VC pair has the U subparameter coded, the WHERE clause that is generated will be in the form:

  WHERE fieldname = current source object corresponding variable value

  The current source object corresponding variable value is the value currently held (at the time of the call to EDMMSQLP) in the source object variable that is coded in the control information's VC pair (that links the variable with the back-end database fieldname).

- If more than one VC pair has the U subparameter coded, the WHERE clause will join them with an "AND", as below:

  WHERE *`fieldname1 = value1`* AND *`fieldname2 = value2`*

- If executing the REPLACE statement (PUTTYPE=R) with the WHERE clause yields zero matching records, EDMMSQLP will regenerate the SQL statement as an INSERT, and insert the record.
- If executing the REPLACE statement (PUTTYPE=R) with the WHERE clause finds exactly one record in the database, it is replaced with the source-object information.
- If executing the REPLACE statement (PUTTYPE=R) with the WHERE clause finds more than one record in the database, all database records are replaced with the source-object information.
- If executing the REPLACE statement (PUTTYPE=R) and no VC pairs in the control input have the U subparameter coded, EDMMSQLP terminates and logs the following error message:

```
NO UNIQUE COLUMNS FOUND FOR WHERE CLAUSE. TERMINATING.
```

Usage

There are two ways to use the WHERE parameter in the control object.

- Specify the WHERE clause in the control object, as in the example in Table 100 below.

Table 100 Simple WHERE Clause Use

Variable Name	Variable Value
SQLTABLE	joe.USERS
SQLUSER	Vladimir
SQLPASSW	Rabbit
SQLTOUT	15
VC000	ZUSERID,USER,U
VC001	ZBIOS,BIOS
VC002	ZOS,OS
VC003	ZOSVER,OS_VERSION
WHERE	BIOS='V2.0'
SRCOBJ	SQLSRC
SQLDSN	SQLSVR01

The generated UPDATE statement for the EDMMSQLP method will have the WHERE clause as in the following:

```
UPDATE joe.USERS  SET joe.USERS.USER
='Value_For_USER_From_SRCOBJ',

joe.USERS.BIOS ='Value_For_BIOS_From_SRCOBJ',…… WHERE
BIOS='V2.0'
```

Here, the first variable (VC000) is not used as a key in the WHERE clause, even though it has a U. This U is ignored due to the presence of the WHERE variable. On the contrary, in the example in Table 101, we see the same control object, without the WHERE clause, and the subsequent UPDATE statement that is generated.

Table 101 Control Object without WHERE Clause

Variable Name	Variable Value
SQLTABLE	joe.USERS
SQLUSER	Vladimir
SQLPASSW	Rabbit
SQLTOUT	15
VC000	ZUSERID,USER,U
VC001	ZBIOS,BIOS
VC002	ZOS,OS
VC003	ZOSVER,OS_VERSION
SRCOBJ	SQLSRC
SQLDSN	SQLSVR01

The generated UPDATE statement for the EDMMSQLP method will have the WHERE clause as in the following:

```
UPDATE joe.USERS  SET joe.USERS.USER
='Value_For_USER_From_SRCOBJ',

joe.USERS.BIOS ='Value_For_BIOS_From_SRCOBJ',

joe.USERS.OS ='Value_For_OS_From_SRCOBJ',

WHERE USER='Value_For_USERS_From_SRCOBJ'
```

- This method of WHERE clause usage actually requires a substitution (in the clause) with the help of the source object variables. Therefore, assuming the source object has the variable ZSOURCE1, the WHERE

parameter can be present in the control object, and specified as shown in Table 102.

Table 102 Substitution use with WHERE Clause

Variable Name	Variable Value
SQLTABLE	joe.USERS
SQLUSER	Vladimir
SQLPASSW	Rabbit
SQLTOUT	15
VC000	ZUSERID,USER,U
VC001	ZBIOS,BIOS
VC002	ZOS,OS
VC003	ZOSVER,OS_VERSION
WHERE	BIOS='&(ZSOURCE1)'
SRCOBJ	SQLSRC
SQLDSN	SQLSVR01

The generated UPDATE statement for the EDMMSQLP method will have the WHERE clause as in the following:

```
UPDATE joe.USERS SET joe.USERS.USER
='Value_For_USER_From_SRCOBJ',

joe.USERS.BIOS ='Value_For_BIOS_From_SRCOBJ',……

WHERE BIOS='Value_Substituted_From_SRCOBJ_For_ZSOURCE1'
```

Additionally, the WHERE clause simplifies multi-heap substitution. The processing is the same, but there are multiple updates to the SQL table as the result of a single EDMMSQLP occurrence. Each heap from the source object is transferred to the rows of the SQL database table, thereby satisfying the WHERE condition.

This substitution takes the values from the source object provided for this operation only.

For the following example, we will re-use the control object from the previous example, and assume that the source object is a two-heap object. The following tables show the source object heaps.

Table 103 Multi-Heap Source Object: HEAP1

Variable Name	Variable Value
ZBIOS	“R5”
ZOS	“NT”
ZSOURCE1	“R4”

Table 104 Multi-Heap Source Object: HEAP2

Variable Name	Variable Value
ZOSVER	7
ZSOURCE1	“R5”

The UPDATE statements that are generated for the EDMMSQLP method will have the WHERE clauses specified as in the following:

HEAP1:

```
UPDATE joe.USERS  SET BIOS = “R5”, OS = “NT”
WHERE BIOS = “R4”
```

HEAP2:

```
UPDATE joe.USERS  SET OS_VERSION = 7
WHERE BIOS = “R5”
```

Design Considerations

Keep in mind these points when designing data exchange solutions using EDMMSQLG and EDMMSQLP.

1. EDMMSQLG and EDMMSQLP do not process back-end database column names that contain embedded spaces.
2. EDMMSQLG creates an object to receive data from the back-end database. The variables that are created in this object to hold text fields from the back-end database will be 255 bytes in length, regardless of the length that is defined for the field in the back-end database. You might need to trim the length of these variables before using them in symbolic

substitution. Invoking EDMMSQLG on page 217 provides an example of this.

Troubleshooting

If data does not transfer successfully to the back-end database tables or to the in-storage object as expected, the first place to look is in the Configuration Server log.

The Configuration Server Log

Here is an SQL example from the Configuration Server log:

```
EDM0532I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---EDMGET 0[SQLTABLE] VN[VC015     ]
        (L)255 V[]
EDM0999I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---GET ZMASTER .ZUSERID  (1) (5) 'jsmith'
EDM0532I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---EDMGET 0[ZMASTER ] VN[ZUSERID ] (L)5 V
        [jsmith
EDM0999I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---GET ZMASTER .ZSYSDATE (1) (8)
        '19990408'
EDM0532I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---EDMGET 0[ZMASTER ] VN[ZSYSDATE] (L)8
        V[19990408
EDM0999I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---GET ZMASTER .ZSYSTIME (1) (8)
        '16:20:54'
EDM0532I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---EDMGET 0[ZMASTER ] VN[ZSYSTIME] (L)8
        V[16:20:54
EDM0999I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---GET ZMASTER .PRICE    (1) (16)
        '0000000000013990'
EDM0532I 16:28 [208.244.225.133 /278]  EDMV4 Client   ---EDMGET 0[ZMASTER ] VN[PRICE   ] (L)16
        V[0000000000013990
EDM0000E 16:28 [208.244.225.133 /278]  EDMV4 Client   --![Microsoft][ODBC FoxPro Driver] The
        Microsoft Jet database engine cannot open the file 'C:\Data\BILLS.DBF'. It is already
        opened exclusively by another user, or you need permission to view its data.
EDM0000E 16:28 [208.244.225.133 /278]  EDMV4 Client   --!ODBC execute error, DSN=[EDM Data],
        RC=[-8], SQLState=[S1000]
EDM2500E 16:25 [208.244.225.133 /278]  EDMV4 Client   --!Failed to execute INSERT statement for
        object [ZMASTER ] heap [1]
```

In this example, the ODBC FoxPro driver was unable to store the APPEVENT object in the FoxPro table because another user concurrently opened the table. When designing solutions using ODBC-compliant back-end databases, you must take into account when, and how the data will be shared.

In this case, none of the VC pairs in the control information had the third subparameter (U) coded, so EDMMSQLP was unable to identify a key field to use in a WHERE clause, which specifies which record in the back-end data table to update.

The data extraction process is sensitive to typing errors. Check all typing carefully, and trace through all connections. Most of the time, your problem will be typographical.

The WHERE clause you provide to EDMMSQLG must comply syntactically with ODBC requirements for quotation mark usage when specifying literals, and any syntactical requirements imposed by your back-end database.

ODBC Tracing

If the error is not immediately apparent from the Configuration Server log, it is often helpful to repeat the operation with ODBC tracing enabled. ODBC tracing is very detailed and can generate a large log very quickly, so only enable ODBC tracing while you are actively debugging a problem.

One benefit of ODBC tracing is that its log shows the SQL statement that was generated by EDMMSQLP and EDMMSQLG, and what ODBC and the back-end database driver did with it.

To enable ODBC tracing, open the Control Panel ODBC applet, and click the **Tracing** tab. Then:

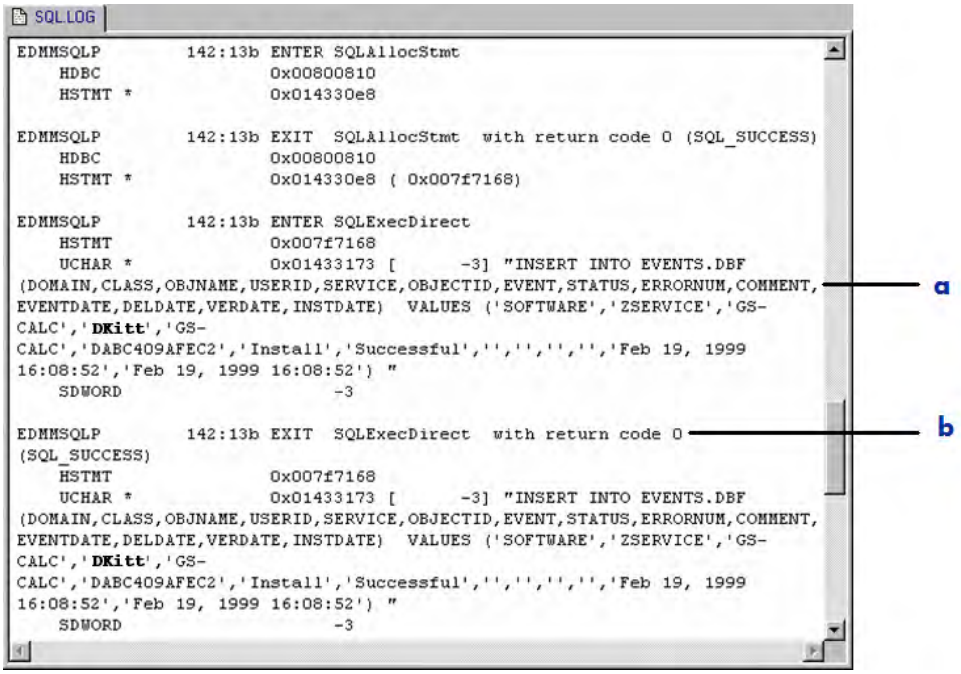
1. In the **When to trace** area, select **All the time**.
2. Set the **Log file Path** to identify the ODBC log file.
3. Then, the **When to trace** area, click **Start Tracing Now**.

   The button face changes to **Stop Tracing Now**. All ODBC operations from this point forward will be logged in the log file that was specified in the previous step.

To turn off ODBC tracing, return to the **Tracing** tab and click **Stop Tracing Now**.

Figure 21 on page 254 presents a sample of the log file (`SQL.LOG`) for a successfully processed SQL statement generated by EDMMSQLP.

Figure 21 SQL.LOG file with processed SQL statement



Legend

b SQL statement generated by EDMMSQLP

b SQL statement was processed successfully

Iterative Simplification

Finally, a productive way to isolate a failure is to iteratively simplify the connection until the problem disappears. The last simplifying change you make before a successful connection locates the error.

6 EDM Access Method Services (EDMAMS)

At the end of this chapter, you will:

- Be able to use the EDMAMS verbs to manage the Configuration Server Database.

HP recommends shutting down the Configuration Server in order to ensure that the CSDB contents are not changing during the execution of the EDMAMS utilities.

However, ZEDMAMS can be run as a method, in which case the Configuration Server must be running.

Furthermore, HP recommends backing up the CSDB prior to running any of the EDMAMS utilities that will update it.

Overview

EDMAMS is a core set of utilities that can be used to create, delete, copy, change, and list objects in the Configuration Server Database. The functionality of these utilities is invoked using one of the EDMAMS verbs, which are called by the module, ZEDMAMS. The ZEDMAMS module is located in the directory in which the Configuration Server was installed.

- On a Windows system, the default is:

  System_Drive:\Program Files\Hewlett-Packard\CM\ConfigurationServer\bin

- On a UNIX system, the default is:

  /opt/HP/CM/ConfigurationServer/exe

Terminology

Table 105 below lists terms that will be encountered in this chapter.

Table 105 EDMAMS Verb Terminology

Term	Definition
Verb	The action to be performed on the database object. For example: DELETE_INSTANCE, EXPORT_CLASS, and SYNC_CLASS.
Keyword	The (required and optional) predefined database location or object designators, such as: FILE, DOMAIN, FROMDOMA, and TOINST. Also, a predefined instruction to be considered during the action. For example: KEEPDATE, PREVIEW, and HEADER.

Term	Definition
Value	The user-specified database location or object upon which the verb will act, such as: `POLICY`, `USER`, `RAD*`, and `EXPC.DAT`. Also, a user-specified consideration that accompanies the action. For example: • Retaining an object's creation date and time (**`KEEPDATE=YES`**), • Applying a comment to a copied object (**`COMMENT=`***`copied_object`*), and • Replacing all existing data in the target object (**`REPLACE=YES`**)
Unmated Instance	An instance that does not have a resource.
Orphaned Resource	A resource that does not have a parent instance.
Component Orphans	A component instance that does not have a parent (for example, a package instance).

Invoking the EDMAMS Verbs

For a list of the EDMAMS verbs that are available with the version of the CSDB running in an environment, on the command line, type:

```
ZEDMAMS VERB=
```

The ZEDMAMS module is subject to continuous development. Due to this ongoing development, some of the verbs detailed in this chapter might not be applicable to the CSDB version that is running in your environment.

Subsequent printings of this guide will document enhancements to the EDMAMS functionality.

To display a verb's (required and optional) keywords, type:

`ZEDMAMS VERB=`*`VERB_NAME`*

For example, typing,

```
ZEDMAMS VERB=DELETE_INSTANCE
```

on the command line, yields the following:

Figure 22 Keywords and conditions for the DELETE_INSTANCE verb

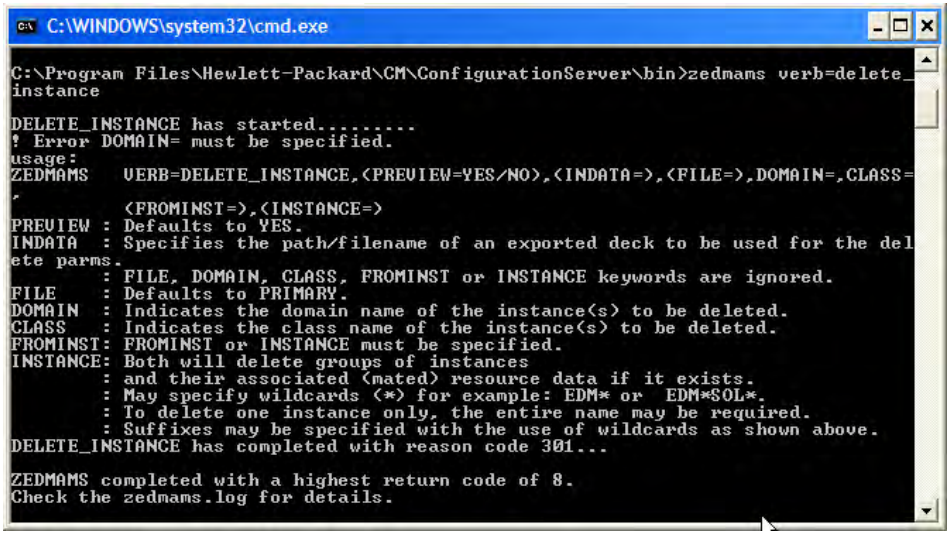


Figure 22 above shows the results of invoking the verb, DELETE_INSTANCE. The keywords are listed, as well as an explanation of each, with examples and applicable defaults.

Note that in Figure 22 above, some of the keywords are in parentheses; these keywords are optional.

For more information on using the verbs, see the sections, Using the EDMAMS Verbs and Usage Considerations.

Using the EDMAMS Verbs

All of the EDMAMS verbs are specified in the following format:

ZEDMAMS VERB=*VERB_NAME*,*KEYWORD*=*VALUE*,*KEYWORD*=*VALUE*

For example,

ZEDMAMS VERB=DELETE_INSTANCE,CLASS=USER,INSTANCE=SALES

There are no rules governing the order in which the keyword-value combinations are specified.

Usage Considerations

UNIX: Important Notes

On the command line, "ZEDMAMS" must be specified in uppercase. The verbs, keywords, and values, however, are not case sensitive.

When specifying values for CSDB locations and objects such as, FILE=, CLASS=, FROMDOMA=, and TOINST=, the value must exactly match the location/object, as it is labeled in the CSDB. If it doesn't, the verb will fail. For example, to act on the instance, **JohnDoe**, in the USER Class of the POLICY Domain, specifying:

```
DOMAIN=POLICY,CLASS=USER,INSTANCE=johndoe
```

will result in a fail, because the value of INSTANCE=, as specified, does not exist in the CSDB. Rather, the following must be specified.

```
DOMAIN=POLICY,CLASS=USER,INSTANCE=JohnDoe
```

- Optional keywords are enclosed in parentheses **( )**.
- Verbs, keywords, and data can be typed in UPPERCASE, lowercase, and a coMbinATioN.

  However, the value of string keywords, such as FROMDATA=, TODATA=, and STRING= are case-sensitive, where indicated.
- A comma (without a space) must follow each keyword-value combination, with the exception of the last keyword-value combination, which must be followed by a space.
- An asterisk (*) is not required for those values that recognize partial specification.
- For all of the EDMAMS verbs, the default value of FILE is **PRIMARY**.
- The EDMAMS verbs act on one database object per execution, unless otherwise noted.

  For example, to change the names of the instances, **East_Sales** and **North_Sales** to **US_Sales**, the verb RENAME_INSTANCE would have to be run once for each of these instances.
- Output is written to `zedmams.log`, unless a different log is specified for **`LOGFILE=`**.

  Error conditions are written to STDERR.

Input Files

Another way to run the EDMAMS utilities is to contain the commands in an input file—a file that has been edited by a text editor. This file can then be run to successively execute several EDMAMS verb functions.

- In an input file, the keywords can be specified on one or more lines for a single function.
- Like the command line method, a comma must follow each keyword-value combination, with the last keyword-value combination followed by a space.

EXPORT Verbs

Input files are very useful when using the exporting EDMAMS verbs (EXPORT_CLASS, EXPORT_INSTANCE, and EXPORT_RESOURCE) because they allow multiple domain-class combinations to be exported during a single export function.

The section, Internationalization Considerations for Exporting/Importing Database Decks (on page 262) contains important information regarding the use of the EXPORT verbs.

Multiple Verbs

More than one verb can be specified in an input file. For example, the COPY_DOMAIN verb can be followed by the verbs, DELETE_CLASS and LIST_CONS_VARS. Any combination of verbs can be included in one run, as long as the data sets being accessed do not conflict. If an asterisk (*) is placed in the first column, it is considered a comment and no action is taken.

To execute commands that are contained in an input file, enter the following on the command line:

```
ZEDMAMS ZFILE "DRIVE:\FILE_PATH\FILE_NAME"
```

ZEDMAMS is the executable. ZFILE is the second argument and must be in uppercase.

Example of multiple VERBS executed from one file:

```
VERB=COPY_DOMAIN,FROMDOMA=POLICY,TODOMAIN=SYSTEMA,
REPLACE=NO

*
```

```
VERB=DELETE_CLASS,DOMAIN=SYSTEMA,CLASS=TESTCLAS
*
VERB=LIST_CONS_VARS,DOMAIN=SOFTWARE,CLASS=FILE,INSTANCE=*
```

Wildcards

EDMAMS supports two types of wildcards: *implicit* and *explicit*.

- **Implicit wildcards**
  are available for the COPY_INSTANCE, DELETE_INSTANCE, and LIST_INSTANCE verbs. Specify any portion of the value to select all occurrences that contain that portion of the value. Implicit wildcards do not require an asterisk, and are expressed as follows:

  KEYWORD=<wildcard_string>.

  For example, specify FROMINST=RAD to include all the fields that contain RAD as any part of the string.

- **Explicit wildcards**
  are available for the CHANGE_INS_FIELD, COPY_NEW_SUFFIX, COPY_RESOURCE, LIST_CONS_VARS, LIST_INST_DATA, LIST_ZRSC_FIELDS, and SEARCH_INSTANCES verbs. Explicit wildcards require an asterisk, and are expressed as follows:

  KEYWORD=<wildcard_string>.*

  For example, specify FROMINST=RAD* to select all the instances that contain RAD as the first part of the string.

LOGFILE

This keyword can be used with all of the EDMAMS verbs. Specify the fully qualified path to, and name of, the log file to which the information is to be reported. The default log file name is **ZEDMAMS.LOG**.

If this keyword is not specified, or specified without a value, the following default locations are assumed:

- Windows: the `bin` folder in which the `zedmams.exe` utility is running.
- UNIX: the `home` directory of the user ID that installed the Configuration Server.

To send the information to a location\file other than the default, specify:

LOGFILE=*FILE_PATH**FILE_NAME*

HP recommends that if LOGFILE is specified as a path other than the default, that its existence be verified. If the directory does not exist, the log creation process will fail, and the command will not execute.

Internationalization Considerations for Exporting/Importing Database Decks

This section details the conditions under which database decks can be exported/imported using the ZEDMAMS EXPORT and IMPORT verbs. Table 108, in the section, Codepage and Locale Defaults, on page 263, is a supplement to this information; it lists the defaults of the new keywords for the EXPORT and IMPORT verbs.

Table 106 EXPORT_CLASS, EXPORT_INSTANCE, and EXPORT_RESOURCE

Source Database Format	Acceptable Target Database Formats
UTF-8	UTF-8 and Basic ASCII
Other Locale or Codepage	UTF-8
Basic ASCII	UTF-8 and Basic ASCII
Extended ASCII	UTF-8 and Extended ASCII

EXPORT Verb Considerations

- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

- If TO_LOCALE=LEGACY is specified, XPR headers will be automatically converted to EBCDIC.
- If TO_LOCALE=UTF8 is specified, an internationalized ZEDMAMS UTF-8 export deck is produced.

Table 107 IMPORT_CLASS, IMPORT_INSTANCE, and IMPORT_RESOURCE

Target Database Format	Source Database Format Must Be
UTF-8	UTF-8 or Basic ASCII or Extended ASCII
Other Locale or Codepage	UTF-8
Basic ASCII	Basic ASCII
Extended ASCII	Extended ASCII

IMPORT Verb Considerations

- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.
- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.
- Translated data must fit the field size limits.
- Legacy XPR headers in EBCDIC are automatically converted to ASCII.

Codepage and Locale Defaults

The following table lists the defaults for the IMPORT and EXPORT *codepage* and *locale* keywords.

Table 108 Codepage and Locale Defaults

Keywords	Default
FROM_CODEPAGE	If the deck is encoded in UTF8, the default is **UTF8 codepage 65001**; otherwise, the default is the current system codepage.
TO_CODEPAGE	If the database is encoded in UTF8, the default is **UTF8 codepage 65001**; otherwise, the default is the current system codepage.
FROM_LOCALE	If the deck is encoded in UTF8, the default is **Locale country_region.UTF8**; otherwise, the default is the current process locale.
TO_LOCALE	If the database is encoded in UTF8, the default is **Locale country_region.UTF8**; otherwise, the default is the current process locale.

If the command line options are omitted, ZEDMAMS will open the import decks, look for the indicator and, if not found, will assume locale code page; it will then examine the database and look for the indicator and, if found, will treat as UTF8, but if not found, will treat as locale code page.

Specifying the ZEDMAMS Utility

Table 109 below lists and describes the verbs for the ZEDMAMS utility.

Table 109 ZEDMAMS Verbs

Verb	Description
ADD_FIELD	Adds a variable at the end of a template, including an automatic README file.
BUILD_PATCH	Builds a PATCH file in a CSDB, or a file from two Configuration Server Databases.
BUILD_STAGING_POINT	Creates a staging point, as needed, on the hard drive, and allows the resources (represented as an export deck) to be converted into a tree of files located in a stager style directory.

Verb	Description
CHANGE_FIELDNAME	Changes variable names in class templates.
CHANGE_FLD_VALUE	Changes a template's variable length, type, Configuration Server, and HPCA agent flags.
CHANGE_INST_DATA	Globally changes data in instance records, by class.
CHANGE_INS_FIELD	Changes one field in each instance of a class and verifies connects.
CHECK_RESOURCES	Verifies the size of resources against ZRSCSIZE and ZCMPSIZE.
CLONE_INSTANCE	Clones an instance with a four-digit suffix (max. 2000).
COPY_CLASS	Copies a class, its instances, and, if it exists, its resource data.
COPY_DATA	Copies only resource data from one *domain.class.instance* to another.
COPY_DOMAIN	Copies domains.
COPY_FIELD	Copies attribute data to a new attribute or to an existing attribute.
COPY_INSTANCE	Copies an instance or a range of instances and associated resource records.
COPY_NEW_SUFFIX	Copies and renames the suffixes for the FILE class and its mated instances.
COPY_RESOURCE	See COPY_INSTANCE.
CREATE_INSTANCES	Writes and populates instances from data in an edited text file.
DELETE_CLASS	Deletes a class and its instances.
DELETE_COMP_ORPHS	Deletes component orphans from the PACKAGE class.
DELETE_DOMAIN	Deletes one, or a range of, domains.
DELETE_FIELD	Deletes an attribute from a template.
DELETE_INSTANCE	Deletes/displays a range of instances within a class and, if it exists, its resource data.
DELETE_ORPHANS	Deletes unmated resource records (orphans) from the RESOURCE file.

Verb	Description
EDIT_CLASS_PREFIX	Updates the fields in the first 60 bytes of the prefix.
EXPORT_CLASS	Exports classes to an output file or data set for import to another file or data set.
EXPORT_INSTANCE	Exports instances to an output file or data set for import to another file or data set for reporting.
EXPORT_RESOURCE	Exports resource data to an output file or data set for import to another file or data set.
IMPORT_CLASS	Imports classes from an exported output file or data set to a PRIMARY file specified in the `edmprof` file.
IMPORT_INSTANCE	Imports instances from an exported output file or data set to a PRIMARY file specified in the `edmprof` file.
IMPORT_RESOURCE	Imports resource data from an exported output file or data set to a RESOURCE file specified in the `edmprof` file.
LIST_CLASSES	Displays a list of classes with the class names, object IDs, ZOBJDATE, ZOBJTIME, persistence flag, sequence sensitive flag, Distributed Configuration Server flag, database type, and count totals. Note: If DOMAIN=* is specified, all classes in the domain will be listed.
LIST_CONS_VARS	Displays connect and variable field (types C and V) values from instance records and stores output in `zedmams.log`.
LIST_DOMAINS	Display a list of domains in the log of a specified file.
LIST_FLAGS	Lists Configuration Server and HPCA agent flags in selected class record.
LIST_INST_DATA	Lists instance data including variable names to `zedmams.log`.
LIST_INSTANCE	Lists instance names by domain, class, and instance (prefix).
LIST_PACKAGE	List PACKAGE class instances and all mated components.
LIST_PREFIX	Lists the Distributed Configuration Servers prefix by file, domain, and class.
LIST_RESOURCES	Lists resource prefix information (promote date, instance, and so forth).

Verb	Description
LIST_ZRSC_FIELDS	Lists field values of fields beginning with ZRSC.
MATCH_RESOURCES	Matches resource records against data-bearing instances for the specified class.
PACKAGE_UNMATES	List all PACKAGE class instances without mated components.
REFRESH_DMA	Recounts the instances and classes in a file and updates the Distributed Configuration Server prefix.
RENAME_INSTANCE	Renames or displays instances by full name or prefix.
SEARCH_INSTANCES	Searches selected instances by domain and class for specified string
SORT_OBJECT_ID	Sorts object IDs in ascending or descending order by file or domain.
SYNC_CLASS	Synchronizes an existing class with a newly formatted class, and re-organizes all (existing class) instances according to the mapping in the newly formatted class. All existing class attributes that have a match in the new template will adopt the characteristics of the new template attribute, whereas any existing class attributes that do not have a match in the new template will be deleted.
UPDATE_INSTANCES	Updates the existing instance fields from data in an edited text file.
UPDATE_MGRIDS	Updates the Configuration Server ID and name by file, domain, and class.
VERIFY_CLASS	Verifies class templates for gaps, overlaps, and other anomalies.
VERIFY_DATABASE	Verifies the integrity of a CSDB.
ZRSOURCE_UNMATES	Matches data-bearing instances with the appropriate resources for the specified class.

The sections that follow describe each ZEDMAMS verb.

In the **Syntax** for each verb, the default values are presented in **bold**.

ADD_FIELD

This verb adds a variable (attribute) to the end of a class template and unconditionally includes a README attribute.

- The README attribute is 35 bytes long.
- The LENGTH of the specified attribute cannot be greater than 255 bytes, or less than one byte.
- The Configuration Server and HPCA agent flags (MFLAGS and CFLAGS) are optional and will default according to the attribute TYPE. The default flags are presented when requesting a usage display.
- The FLDNAME can be any one- to eight-byte name and can be changed with the CHANGE_FIELDNAME function.

Syntax:	`(FILE=,)DOMAIN=,CLASS=,FLDNAME=,LENGTH=,TYPE=(,MFLAGS=)(,CFLAGS=)(,KEEPDATE=YES/`**`NO`**`)(,README=)(,DEFAULT=)`
Example:	Add an **M** type attribute, NEWFIELD, to the specified class, giving it a length of 165 bytes, assigning default Configuration Server and HPCA agent flags, and updating the object date and time: **`DOMAIN=SOFTWARE,CLASS=USER,FLDNAME=NEWFIELD, LENGTH=165,TYPE=M`**
Tip:	Run LIST_FLAGS against the class before and after running this to view the old and new template.

BUILD_PATCH

The functionality of this verb has been replaced with the **Service Optimization** feature of the HPCA Admin CSDB Editor. For more information, refer to the *Admin User Guide*.

BUILD_STAGING_POINT

This verb allows resources (represented as an export deck) to be converted into a tree of files located in a stager style directory. It creates, on the hard drive, a staging point at a location designated by OUTFILE, then the data can be transferred to a CD using standard CD-writing software. This verb checks for the staging point and, if it does not exist, creates it.

- Specify PREVIEW=YES to see the expected results of running the verb with specific parameters.
- INFILE is the fully qualified path and filename of an exported resource (XPR) file.
- OUTFILE is the destination directory location of the staging files.

  OUTFILE defaults to the *`location_of_edmprof`*`\`*`staging_point`*. Therefore, if `edmprof` is located in `C:\HP\configserver\bin`, the default staging point is `C:\HP\configserver\bin\`*`staging_point`*.

  If PREVIEW=YES, OUTFILE is ignored.
- XPI is an exported instance deck that is used to timestamp the staged resources.

  This setting's value must be specified as the fully qualified path and filename of an exported instance deck.

  If XPI is not specified, or if the specified deck does not contain instance data for the staged resource, the timestamp will be determined using the date and time from the input deck resource header.
- REPLACE=YES replaces the existing same-named file at the specified staging point.
- MULTICAST=YES specifies that the OUTFILE will contain the name of a directory where resource data will be stored in File.Domain.Class.Instance format, and each file will contain an embedded 60-byte prefix, identical to the prefix saved in the RESOURCE file.

Syntax:	`(PREVIEW=`**`YES`**`/NO,)INFILE=(,OUTFILE=)(,XPI=)` `(,REPLACE=`**`YES`**`/NO)(,MULTICAST=YES/`**`NO`**`)`

Example:	Accept the default staging point on the hard drive as the destination for files from `C:\NovaFiles\NewCD`: **`INFILE=C:\NovaFiles\NewCD`**
Tip:	To see what would be the result of running the verb (without actually doing so), specify PREVIEW=YES.

Resource Naming

BUILD_STAGING_POINT will remove the 60-byte prefix from each resource that is delivered to the staging point, and rename it according to the following format:

1. The first byte of the object ID is added to the **000** string, and used as a *branch root*.
2. Bytes 2 – 9 will be used as a *name*, and followed by a period.
3. The last three bytes will be used as an *extension*.

   For example, a resource with an object ID of

   ```
   DABC12345678
   ```

   will be renamed:

   ```
   000D\ABC12345.678.
   ```

In accordance with step 1, the first byte (**D**) was added to the string **000**. The back slash (****) was automatically inserted to make **000D** a branch root. A period was placed in front of the final three bytes (**678**), making them the extension, as described in step 3. The bytes in between the branch root and the extension (**ABC12345**) become the name.

CHANGE_FIELDNAME

This verb changes the specified class template field name (FROMNAME) to a new field name (TONAME).

- If there are multiple occurrences of a field name (such as, README), all of them will be changed.

  However, README names should not be changed; only user-created variable field names should be changed.

Syntax:	`(FILE=,)DOMAIN=,CLASS=,FROMNAME=,TONAME=(,KEEPDATE=YES/`**`NO`**`)`
Example:	Change the template field name in the specified class from GROUPID to GROUP: **`DOMAIN=SOFTWARE,CLASS=USER,FROMNAME=GROUPID,TONAME=GROUP`**
Tip:	Run LIST_INST_DATA to display template field names with INSTANCE=_BASE.

CHANGE_FLD_VALUE

This verb changes a variable's length, type, and Configuration Server and HPCA agent flags by FLDNAME.

- The LENGTH must be in the range of 1 to 255 bytes.
- The Configuration Server (Manager) and HPCA agent flags (MFLAGS and CFLAGS) are optional, and will retain their current settings if omitted.
- The keyword DESC changes the DESCRIPTION field in the template for a maximum of 20 bytes. The DESCRIPTION field can be changed either alone or in addition to other fields.

  If blanks are included in the text, it must be enclosed in quotation marks (**" "**).
- The keyword TYPE is required except when DESC is the only field being changed. The values are:
  - For connect types – the characters **C**, **A**, **I**, **R**, and **O**.
  - For method types – the characters **M**, **T**, **H**, and **D**.
  - For variable types – the characters **V**, **U**, and **W**.
- INDEX changes the nth occurrence of variable FLDNAME. When omitted, the first variable with a matching fieldname will be changed.
- KEEPDATE=YES will prevent the OBJDATE and OBJTIME from being updated.
- README is the 1- to 35-byte description of the changed field that was placed in the _BASE_INSTANCE_. If blanks are included in the text, it must be enclosed in quotation marks (**" "**).
- DEFAULT the length of the default data must be less than or equal to the length specified by LENGTH.

  This value populates FLDNAME in the _BASE_INSTANCE_. If blanks are included in the text, it must be enclosed in quotation marks (**" "**).

Syntax:	`(FILE=,)DOMAIN=,CLASS=(,DESC=,)FLDNAME=`
	`(,LENGTH=,)TYPE=(,MFLAGS=)(,CFLAGS=)(,INDEX=)`
	`(,KEEPDATE=YES/`**`NO`**`)(,README=)(,DEFAULT=)`

Example:	In the template specified, change the TYPE value of the third attribute (named EDMSETUP) from V to C. (The length, and Configuration Server and HPCA agent flags retain their current value.): **DOMAIN=SOFTWARE,CLASS=ZSERVICE,FLDNAME=EDMSETUP ,TYPE=C,INDEX=3**
Tip:	Run LIST_FLAGS against the class before and after running this to view the old and new template.

CHANGE_INST_DATA

This verb changes instance data.

- A match occurs only when the value of FROMDATA begins the instance field and is not embedded, or is not part of other data in the field.
- If PREVIEW=YES, only the instances to be changed will be displayed.
- If FIELD is specified, this verb will change all instances whose FROMDATA criteria is equal to the data portion of the heap specified by FIELD.
- FROMDATA is the data, in the heap, that is to be replaced.

  All instances that meet the criteria of FIELD and FROMDATA will be changed with TODATA.

  If FROMDATA=BLANKS, the change criteria will be all blank bytes.
- Omitting TODATA will set the field to blanks.
- FROMDATA and TODATA can be entered in any case. Keep in mind that the comparison made against FROMDATA is based on the case entered.
- If either FROMDATA or TODATA contain embedded spaces, the string must be enclosed in quotation marks.
- If KEEPDATE=NO, a new ZOBJDATE and ZOBJTIME are generated.

Syntax:	`(FILE=,)DOMAIN=,CLASS=(,FIELD=,)FROMDATA=(,TODATA=)(,PREVIEW=`**`YES`**`/NO)(,KEEPDATE=YES/`**`NO`**`)`
Example:	Change all instance data in the specified class from *JohnPublic* to *John Q. Doe*: **`DOMAIN=SOFTWARE,CLASS=USER,FROMDATA=JohnPublic,TODATA="John Q. Doe"`**
Tips:	Run LIST_INST_DATA to get a display of instance data and the class field names to which the data belongs. Run first with PREVIEW=YES to display the current variable data values.

CHANGE_INS_FIELD

This verb changes the instance data of the specified field in specific instances within the same domain.

- INDEX is the relative number (1– 99) of multiple same named fields (such as, EDMSETUP or README).
- The keyword PREFIX:
  - Can be specified wildcards (*). For example, DIFF* and DIFF*SOL*.
  - If specified with just an asterisk (*), all instances in the specified class are changed.
  - To change only one instance, the entire name must be specified.
- The keyword FIELD is the name of the attribute to be changed.
- VERIFY=YES verifies that a connection value in TODATA exists. If the verify fails, the program aborts.
- KEEPDATE=YES will prevent the OBJDATE and OBJTIME from being updated.
- TODATA can be entered in any case; the data is placed in the field as entered. If TODATA contains embedded spaces, the string must be enclosed in quotation marks.

  Specify only CLASS.INSTANCE, not the domain.
- PREVIEW=YES displays instance names and the current data before the change and PREVIEW=NO displays instance names and the current data after the change.

Syntax:	`(FILE=,)DOMAIN=,CLASS=(,PREVIEW=`**`YES`**`/NO,)PREFIX=,FIELD=,TODATA=(,INDEX=)(,VERIFY=YES/`**`NO`**`)(,KEEPDATE=YES/`**`NO`**`)`
Example:	Change the third EDMSETUP field (INDEX=3) in the specified instances to ZLOCMGR.RAD_RESOURCE_FILE. Verify the existence of the connection, and update the OBJDATE and OBJTIME: **`DOMAIN=SOFTWARE,CLASS=USER,PREFIX=TSO,FIELD=EDMSETUP,TODATA=ZLOCMGR.RAD_RESOURCE_FILE,VERIFY=YES,INDEX=3`**

Tip:	This verb allows wildcards for the PREFIX parameter. Therefore, you can specify PREFIX=RAD* to view all the prefixes that contain RAD as the first part of the string.

CHECK_RESOURCES

This verb verifies the actual size of the resource data against ZRSCSIZE or ZCMPSIZE.

The entire PRIMARY file is checked for the presence of the variable field names ZRSCSIZE and ZCMPSIZE. If these fields exist, and if ZCMPSIZE contains a value, it is compared against the actual size. If ZCMPSIZE is zero or blank, the value in ZRSCSIZE is used. If there is a mismatch, the name of the resource and the appropriate sizes are listed to the log and a return code of 8 is passed.

- If LISTALL=YES, all objects checked are listed, and objects with resources are listed with their respective sizes.
- If UPDATE=YES, and if the appropriate of either ZRSCSIZE or ZCMPSIZE does not contain the correct value, the field will be updated with the correct value. In addition, the 8-byte, printable hex field in the instance prefix will be updated if in error.
- CRC is a toggle to activate/disable the Cyclical Redundancy Check.

  If CRC=YES, a CRC is calculated for each resource and if UPDATE=YES, incorrect CRCs are updated to their correct values in the OBJRCRC field.
- DOMAIN is a 1- to 32-byte (Domain) name that is to have its resources checked.
- CLASS is a 1- to 8-byte (class) name that is to have its resources checked.

  If specified, DOMAIN must be specified.
- INSTANCE is a 1- to 32-byte (Instance) name that is to have its resources checked.

  If specified, DOMAIN and CLASS must be specified.

Syntax:	`LISTALL=YES/`**`NO`**`(,UPDATE=YES/`**`NO`**`)(,CRC=YES/`**`NO`**`,)` `DOMAIN=,CLASS=,INSTANCE=`
Example:	List all the resources that have a mismatch: **`CHECK_RESOURCES,LISTALL=YES`**
Tip:	N/A

CLONE_INSTANCE

This verb clones the instance a specified number (nnnn) of times and each new instance name is suffixed with one to four digits: 0000 through nnnn-1.

The cloned instance name, plus its suffix, cannot exceed 32 bytes: 1 to 28 digits for the instance name + 1 to 4 digits for the suffix. Therefore, instance name length = 32, the length of the suffix.

- A new OBJID, OBJDATE, and OBJTIME are generated for the cloned objects.
- COUNT is the number of clones to spawn, and can range from 1 to 2000.

Syntax:	`DOMAIN=,CLASS=,INSTANCE=,COUNT=nnnn`
Example:	Clone 100 instances in the specified class, naming the cloned instances DIFF80 through DIFF899 type: **`DOMAIN=SOFTWARE,CLASS=USER,INSTANCE=DIFF8,COUNT=100`**
Tip:	Run LIST_INSTANCE to display the instance names before and after the cloning.

COPY_CLASS

This verb copies a class template, its component instances, and resource data from one domain to another.

This verb is applicable to a Client Automation environment only; it will not function in an EDM environment.

Although this verb is supported, HP recommends using the verbs EXPORT_CLASS and IMPORT_CLASS to copy a class from the CSDB.

Comment [JGM3]: Can we remove references to EDM?

As of version 4.4 of the CSDB, this verb will copy the component instances and resource data also.

- TODB specifies the path to a destination file other than the one in the `edmprof` file. If omitted, it defaults to the DBPATH specified in the `edmprof` file.
- If TOCLASS is omitted, the destination class will be assumed to be the same as the FROMCLAS. In this case, TODOMAIN and FROMDOMA must be different.
- A new object ID, ODJDATE, and OBJTIME are generated for the copied objects.
- If TODOMAIN does not exist, the ZBASE class and base instance will be copied from the source domain (FROMDOMA) in order to create a valid domain.
- If REPLACE=YES, all existing data is replaced.

Syntax:	`(TODB=)(,FILE=,)FROMDOMA=,FROMCLAS=,TODOMAIN=(,TOCLASS=)(,REPLACE=YES/`**`NO`**`)`
Example:	Copy the specified class template and only the base instance from SOFTWARE to SYSTEM: **`FROMDOMA=SOFTWARE,FROMCLAS=USER,TODOMAIN=SYSTEM`**
Tip:	Run once with REPLACE=NO to determine the preexistence of the class in the destination domain.

COPY_DATA

This verb is applicable to an EDM environment only; it will not function in a Client Automation environment.

Comment [JGM4]: Can we remove references to EDM? I am contacting Alon about this.

This verb copies only resource data, from one domain.class.instance to another. The destination instance must exist, and will inherit the CRC and printable hex size of the incoming data.

- TODB specifies the path to a destination file other than the one in the `edmprof` file. If omitted, it defaults to the DBPATH specified in the `edmprof` file.
- FROMINST (mandatory) can copy a single resource, or group of resources. For groups, wildcards (*) are accepted. For example, DIFF* or DIFF*SOL*.

  To copy a single resource, the entire name is required.

  FROMINST cannot accept a wildcard if TOINST is specified.
- TOINST specifies an existing receiving instance full name in the TOCLASS.

  TOINST is not permitted when a FROMINST wildcard is specified.
- If REPLACE=YES all existing data is replaced.

Syntax:	`(PREVIEW=`**`YES`**`/NO)(,TODB=,)FROMDOMA=,FROMCLAS= ,FROMINST=,TODOMAIN=,TOCLASS=(,TOINST=) (,REPLACE=YES/`**`NO`**`)`
Example:	Copy resource data from one domain.class.instance to another domain.class.instance: **`FROMDOMA=SOFTWARE,TODOMAIN=NEWDOM,FROMCLAS= ZSERVICE,TOCLASS=NEWCLASS,FROMINST=QA101_ ENORMAL_EXT,TOINST=NEW_QA101_ENORMAL_EXT, PREVIEW=NO`**
Tip:	N/A

COPY_DOMAIN

This verb copies only the class template and _BASE_INSTANCE_ of a domain within a database, and optionally, to a different destination database. To copy the entire contents of a domain, see the section, Copying a Domain and its Contents.

This verb is applicable to a Client Automation environment only; it will not function in an EDM environment.

Comment [JGM5]: We may have to delete this note based on Alon's resonse.

- A new object ID, OBJDATE, and OBJTIME are generated for the copied objects.
- If REPLACE=YES, all existing data is replaced.
- TODB specifies the path to a destination file other than the one in the `edmprof` file. If omitted, it defaults to the DBPATH specified in the `edmprof` file.

Syntax:	`(FILE=,)FROMDOMA=,TODOMAIN=(,REPLACE=YES/`**`NO`**`)` `(,TODB=)`
Example:	Copy the class template and _BASE_INSTANCE_ of the SOFTWARE Domain to the SYSTEM domain: **`FROMDOMA=SOFTWARE,TODOMAIN=SYSTEM`**
Tip:	Run once with REPLACE=NO to determine the preexistence of the destination domain.

Copying a Domain and its Contents

To copy a domain, run this verb with FROMDOMA and TODOMAIN specified, then use the export and import verbs as detailed below.

To copy a domain with contents

1. Run this verb with FROMDOMA and TODOMAIN specified.

   This will copy just the _BASE_INSTANCE_ and class template.

2. Verify that the new domain has been created by checking the ZEDMAMS log's return code or physically querying the CSDB using an explorer tool.

3 Use the EDMAMS verbs, EXPORT_INSTANCE (detailed on page 301) and EXPORT_RESOURCE (detailed on page 303) with **DOMAIN=<***old_domain***>** (the value of FROMDOMA).

4 Import the domain using the EDMAMS verb, IMPORT_INSTANCE (detailed starting on page 307). Be sure to specify:

— the exported instance (**FILE=**),

— the resource files (**XPR=**),

— **MAP_DOMAIN=***old_domain/new_domain*.

COPY_FIELD

This verb copies an attribute (FROMFLD) and its instance data to a new attribute (TOFLD). The length, type, and flags of the new attribute will be inherited from the existing attribute.

- INDEX is the nth occurrence of a FROMFLD multiple-named attribute.
- PREVIEW will display the value of the FROMFLD attribute before changing an existing TOFLD attribute.
- REPLACE=YES will overlay existing data in the TOFLD attribute with the values in the FROMFLD attribute.
- If KEEPDATE=NO, a new zobjdate and zobjtime are generated.

Syntax:	(FILE=,)DOMAIN=,CLASS=,FROMFLD=,TOFLD=(,INDEX=) (,PREVIEW=**YES**/NO)(,REPLACE=YES/**NO**) (,KEEPDATE=YES/**NO**)
Example:	Copy an attribute named OLDFLD (and the associated data in the specified class) to a new attribute named NEWFLD: **DOMAIN=SOFTWARE,CLASS=USER,FROMFLD=OLDFLD ,TOFLD=NEWFLD**
Tip:	Run LIST_INST_DATA against the class to view the contents of each attribute.

COPY_INSTANCE (COPY_RESOURCE)

These verbs copy a range of specified instances and resource data from one domain-class pair to another, in the PRIMARY and RESOURCE files, and optionally, to a different destination database. The function assumes that the destination class name is the same as the source, and that the templates are identical.

This verb is applicable to a Client Automation environment only; it will not function in an EDM environment.

Comment [JGM6]: another instance of EDM

Although this verb is supported, HP recommends using the verbs EXPORT_INSTANCE and IMPORT_INSTANCE to copy an instance from the CSDB.

This verb can be specified as either COPY_INSTANCE or COPY_RESOURCE, as these verbs have been combined and perform identical functions.

As of version 4.4 of the Configuration Server Database, this verb will copy the component instances and resource data also.

- TODB specifies the path to a destination file other than the one in the `edmprof` file. If omitted, it defaults to the DBPATH specified in the `edmprof` file.
- The value of FROMINST can be partially specified. For example, you can specify FROMINST=DIFF to specify all the instances that contain DIFF as any part of the string.
- A new object ID is generated for the copied objects. A new OBJDATE and OBJTIME will be generated unless KEEPDATE=YES.
- PREVIEW=YES will display a list of instance names that will be copied from the source class. PREVIEW=NO will display instances that have been copied.
- If REPLACE=NO and an existing instance is found, the function will abort, indicating the existing instance name to STDERR and the log, and listing in the log any instances that have been copied.
- The existing instance name will be written to STDERR, and instances that have been copied will be listed in the log.
- If PREVIEW=NO and the destination domain does not contain FROMCLAS, the source class (FROMCLAS) and its BASE_INSTANCE will be copied to the destination domain (TODOMAIN).
- NEWINST renames an instance (if TODB is specified).

If wildcards are used for FROMINST, NEWINST is not allowed.

Syntax:	(PREVIEW=**YES**/NO)(,TODB=)(,FILE=,)FROMDOMA= ,FROMCLASS=,TODOMAIN=,FROMINST=(,NEWINST=) (,REPLACE=YES/**NO**)(,KEEPDATE=YES/**NO**)
Example:	Copy instances and resource data from the SOFTWARE Domain to the SYSTEM domain, with the from-instance wildcard specified as CICS*ICO*: **FROMDOMA=SOFTWARE,FROMCLAS=ZSERVICE,** **TODOMAIN=SYSTEM,FROMINST=CICS*ICO***
Tips:	Run once with PREVIEW=YES to get a list of instances to be copied. Also, run LIST_RESOURCES against the source domain to display a list of existing resources and instance names that can be copied, and then against the destination domain to see what was copied. Destination domain instance names that match the new instance name will be deleted.

COPY_NEW_SUFFIX

This verb copies the specified instances and resource data from one domain to another in the PRIMARY and RESOURCE files; and adds a new suffix to the destination instance. This verb allows wildcards for FROMINST.

- The value of FROMINST can be partially specified. For example, you can specify FROMINST=DIFF to select all the instances that contain DIFF as the first part of the string.
- If the length of NEWSUFF is longer than that of OLDSUFF, the new instance name must not exceed 32 bytes. If it does, a message will be placed in the log and the instance will not be copied.
- PREVIEW=YES will display the old instance name and the new instance name and the total number of instances to be copied.
- If the class does not exist in the TODOMAIN, the class and BASE_INSTANCE will be copied from the source domain (FROMDOMA).
- Instance names must match the prefix (FROMINST) and the suffix (OLDSUFF) in order to be copied and renamed.

Syntax:	`(PREVIEW=`**`YES`**`/NO,)FROMDOMA=,FROMCLASS=,FROMINST=,TODOMAIN=,OLDSUFF=,NEWSUFF=`
Example:	From the SOFTWARE Domain, copy and re-suffix instances and resource data prefixed with TSO and suffixed with ICO, to the SYSTEM domain with the new suffix, TSO_(*)_NEW_ICO; and displaying only those that would be copied: **`FROMDOMA=SOFTWARE,FROMCLAS=ZSERVICE,TODOMAIN=SYSTEM,FROMINST=TSO,OLDSUFF=ICO,NEWSUFF=NEW_ICO`**
Tips:	Run once with PREVIEW=YES to verify that the new instance names will not exceed 32 bytes, and that the instances required will be copied. Also, run LIST_RESOURCES against the source domain to display a list of existing resources and instance names that can be copied and then against the destination domain to see what was copied. Destination domain instances that match the new instance name will be deleted.

CREATE_INSTANCES

This verb creates Instances in the specified CSDB Domain from data in an edited text file (INFILE). The INFILE must conform to the following specifications.

- The first line must contain a new Instance name starting in column 1 for a maximum of 32 bytes.
- The next line contains the variable field name, beginning in column 2, for a maximum of eight bytes; then a blank in column 10; followed by a two-byte index value (01-99) in columns 11 and 12; followed by the data to be populated beginning in column 13.
- Existing Instance names will be bypassed and the function will stop unless a **/*** (in columns 1 and 2) line follows the last data line of an Instance. In the example below, the function will continue to the next input Instance.

Column Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Line 1	U	S	E	R	_	N	A	M	E															
Line 2		N	A	M	E						J	.	A	.	D	E	V	E	L	O	P	E	R	
Line 3		E	D	M	S	E	T	U	P		D	O	M	A	I	N	.	C	L	A	S	S		
Line 4		Z	P	R	I	O	R	I	T		9	9	9											
Line 5	U	S	E	R	_	N	A	M	E		L	.	Z	I	M	M	E	R						
Line 6		N	A	M	E																			
Line 7		E	D	M	S	E	T	U	P		U	S	E	R	.	U	S	E	R	3				
Line 8		Z	T	R	A	C	E				N	N	N											

Syntax:	`INFILE=,DOMAIN=,CLASS=`
Example:	Create the instances in the specified text file in CLASS=USER: **`INFILE=MYINPUT.TXT,DOMAIN=POLICY,CLASS=USER`**
Tip:	N/A

DELETE_CLASS

This EDMAMS verb deletes a class template and all of its instances.

As of version 4.4 of the Configuration Server Database, this verb will delete the component instances and resource data also.

- If PACKAGE=YES, all component and component data is deleted.

Syntax:	(FILE=)(,PREVIEW=**YES**/NO)(,PACKAGE=YES/**NO**,)DOMAIN= ,CLASS=
Example:	Delete the class, USERTEST, from the SOFTWARE Domain: **DOMAIN=SOFTWARE,CLASS=USERTEST**
Tip:	N/A

DELETE_COMP_ORPHS

This verb deletes component orphans from the PACKAGE class. Orphans are defined as RESOURCE file data that have no mated instances in the associated PRIMARY file PACKAGE class.

- CLASS defaults to all classes of the specified domain.

Syntax:	`(FILE=)(,PREVIEW=`**`YES`**`/NO,)DOMAIN=(,CLASS=)`
Example:	Delete orphans from the TSTRESLT Class of the SOFTWARE Domain: **`DOMAIN=SOFTWARE,CLASS=TSTRESLT,PREVIEW=NO`**
Tip:	N/A

DELETE_DOMAIN

This verb deletes a domain or an alphabetical range of domains (class templates and instances) from the file that is specified.

As of version 4.4 of the Configuration Server Database, this verb will delete the component instances and resource data also.

- If TODOMAIN is omitted, only FROMDOMA will be deleted.

  If TODOMAIN is specified, the range is inclusive.

Syntax:	(FILE=)(,PREVIEW=**YES**/NO,)FROMDOMA=(,TODOMAIN=)
Example:	From the PRIMARY file, delete only SOFTWARE: **FILE=PRIMARY,FROMDOMA=SOFTWARE** From the PROFILE File, delete USERA through USERF: **FILE=PROFILE,FROMDOMA=USERA,TODOMAIN=USERF**
Tip:	Run with PREVIEW=YES first.

Use caution when specifying a range of domains. Be certain of the range specified, because there is no confirmation request.

DELETE_FIELD

This verb deletes an attribute from a template along with its README field, and reorganizes the class accordingly.

- FILE will default to **PRIMARY** if it is omitted or if no value is specified.
- DOMAIN specifies the name of the CSDB Domain.
- CLASS specifies the name of the CSDB Class.
- FIELD must refer to an attribute, not a README (description) field.
- INDEX refers to multiple occurrences of the same attribute name. For example, if there were three occurrences of EDMSETUP, the third would be INDEX=3. Index deletes the *n*th occurrence of a multiple named variable.

  Values for INDEX are the numbers 1 through 99.

  The default is **1**.

Syntax:	`(FILE=,)DOMAIN=,CLASS=,FIELD=(,INDEX=)`
Example:	Delete the attribute USERATTR from the USER Class: **`DOMAIN=POLICY,CLASS=USER,FIELD=USERATTR`**
Tip:	Use with discretion because deletion of an attribute causes a restructuring and rewrite of all the instances in the class.

DELETE_INSTANCE

This verb deletes an Instance or an alphabetical range of Instances within a specified Class of the CSDB.

The keywords, TOINST and SUFFIX, were deleted from this verb's functionality with version 4.3 of the Configuration Server Database.

As of version 4.4 of the Configuration Server Database, this verb will delete the component instances and resource data also.

- FROMINST and INSTANCE perform the same function; either one must be used. Both will delete groups of instances and any existing, associated resource data. To delete only one instance, the entire name must be specified.

  FROMINST and INSTANCE can specify wildcards (*). For example, DIFF* and DIFF*SOL*.

- PREVIEW=YES displays a list of instances that would be deleted with PREVIEW=NO.

- INDATA specifies the fully qualified path to, and name of, a file that contains the delete parameters. This file can be either an exported instance deck (.XPI), or a manually created file that contains the FILE, DOMAIN, CLASS, and INSTANCE values.

  If using INDATA, the values that are specified for FILE, DOMAIN, CLASS, FROMINST, and INSTANCE on the command line are ignored because these values are extracted from the INDATA file.

  When not using INDATA, either FROMINST or INSTANCE *must* be specified. Both can delete groups of instances.

  FROMINST (instead of INSTANCE) can be specified inside the INDATA file in order to define a group of instances to be deleted.

Syntax:	`(PREVIEW=`**`YES`**`/NO)(,INDATA=)(,FILE=,)DOMAIN=,CLASS=(,FROMINST=)(,INSTANCE=)`
Example:	Delete all USER Class instances, beginning with the instance prefix name of **`OLD_USER:DOMAIN=POLICY,CLASS=USER,FROMINST=OLD_USER`**

Tip:	Run once with PREVIEW=YES to view which instances will be deleted. Also, run LIST_INSTANCES against the class to display a list of instance names that might be deleted.

Use caution when specifying a range of domains. Be certain of the range specified, because there is no confirmation request.

DELETE_ORPHANS

This verb will delete all orphans in all domains. Orphans are defined as RESOURCE file data that have no mated instance in the associated PRIMARY file.

- TRACE=YES provides additional diagnostic (tracing) confirmation in the log.

Syntax:	(PREVIEW=**YES**/NO)(,TRACE=YES/**NO**)
Example:	Delete all orphans: **PREVIEW=NO**
Tip:	N/A

DELETE_RESOURCE

This verb deletes the specified resource from the RESOURCE File of the CSDB.

The keyword, DELETE_RESOURCE, was deleted from the Configuration Server as of version 4.2. Its functionality is handled by the verb, DELETE_INSTANCE (on page 293).

EDIT_CLASS_PREFIX

This verb enables you to edit the first 60 bytes of the template's prefix.

- FIELD is the name of the class prefix field, such as the priority of the class, CLASSPRI.
- VALUE will not be read if FIELD is not specified.

  Refer to the **Values** column in Table 110 below for the valid values for each FIELD type.
- If KEEPDATE=NO, a new OBJDATE and OBJTIME are generated.

Table 110 Changeable Fields

Field	Values
CLASTYPE	**P** (POLICY_CLASS_TYPE) **C** (CONFIGURATION_CLASS_TYPE) **T** (COMPONENT_CLASS_TYPE) **B** (CLASS_TYPE_BLANK)
CLASSPRI	**5** (PATH), **10** (METACLAS), **50** (FILE), **50** (ZSERVICE), **60** (DESKTOP), **70** (MACALIAS),**70** (REGISTRY), **50** (DEFAULT_PRIORITY), **B** (Blank)
DBTYPE	**U** (UNICODE) **A** (ASCII) Note: A third value (**E**) is not applicable to the current release of the Configuration Server.
OBJDM	**D** (DISTRIBUTED_MANAGER)
OBJTYPE	**S** (SINGLE_DIMENSIONAL_OBJECT) **M** (MULTIPLE_DIMENSIONAL_OBJECT)
SEQ_SENS	**S** (SEQUENCE_SENSITIVE) **I** (SEQUENCE_INSENSITIVE) Note: Specifies whether to process variables in the order in which they occur in the class template (**S**), or in order of attribute type (**I**)—that is, VARs then CONNs, and so on.
OBJNAME	Any text up to 20 bytes in length. If there are embedded spaces in the text, enclose the text with quotation marks (**" "**), as in the example.

Syntax:	DOMAIN=,CLASS=,FIELD=,VALUE=(,PREVIEW=YES/NO) (,KEEPDATE=YES/**NO**)
Example:	**DOMAIN=POLICY,CLASS=USER,FIELD=OBJNAME, VALUE="User names",PREVIEW=NO**
Tip:	N/A

EXPORT_CLASS

This verb enables the exporting of class template data from a file or data set for importing to another file or data set.

- If PREVIEW=YES, OUTPUT is ignored.
- OUTPUT is the name of the destination output file (with extension) where the exported data is to reside.
- INPUT references a predefined input file, which enables multiple FILE.DOMAIN.CLASS combinations to be specified.

  The input file must be specified in the following format.

  FILE=*file_name*,**DOMAIN=***domain_name*,**CLASS=***class_name*,
  INSTANCE=*instance_name*

- HEADER=YES produces an output header file.
- COMMENT=YES adds a comment to the optional output file header.
- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.
- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.
- If TO_LOCALE=

— LEGACY: XPR headers will be automatically converted to EBCDIC.

— UTF8: an internationalized ZEDMAMS UTF-8 export deck is produced.

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

Syntax:	`FILE=(,DOMAIN=)(,CLASS=)(,PREVIEW=`**`YES`**`/NO,)OUTPUT=(,COMMENT=)(,INPUT=)(,HEADER=YES/`**`NO`**`)`
Example:	Export all the classes (templates) in the PRIMARY file to a file named `EXPC.DAT`: **`FILE=PRIMARY,PREVIEW=NO,OUTPUT=C:\EXPC.DAT`**
Tip:	N/A

EXPORT_INSTANCE

This verb enables the exporting of instances to an output file or data set for importing to another file or data set or for reporting purposes.

- If PREVIEW=YES, OUTPUT is ignored.
- OUTPUT is the name of the destination output file (with extension) where the exported data is to reside.
- KEEP specifies a text file that contains a list of the instance attributes to be retained in the resulting output file. These names are case-sensitive.
- DROP specifies the instance attributes that are not to be retained in the output file.
- If ORDER=YES, the resulting file will be ordered by attribute name.
- COMMENT=YES adds a comment to the optional output file header.
- Specify REPORT=YES to export instances to third-party vendor software.
- CSVL=YES produces a Comma Separated Variable listing for all attribute values. Currently, the output file you specify with CSVL=YES is created in a subdirectory of the current working directory.
- If BASE=YES, the values of the _BASE_INSTANCE_ will be inherited.
- INPUT references a predefined input file, which enables multiple FILE.DOMAIN.CLASS.INSTANCE combinations to be specified.

  The input file must be specified in the following format.

  FILE=*file_name*,**DOMAIN=***domain_name*,**CLASS=***class_name*,
  INSTANCE=*instance_name*

- HEADER=YES produces an output header file.
- If SKIP_ERRORS=YES and database or consistency errors are encountered in the PROFILE File, a “bad object” event (return code=4) will be recorded in the log, but processing will continue.

  If SKIP_ERRORS=NO (the default) and errors are encountered, the exporting will stop.
- PHEX=YES outputs the data portion of variables in printable hex format.
- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.

- If TO_LOCALE=

  — LEGACY: XPR headers will be automatically converted to EBCDIC.

  — UTF8: an internationalized ZEDMAMS UTF-8 export deck is produced.

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

Syntax:	FILE=(,DOMAIN=)(,CLASS=)(,INSTANCE=)(,FROMINST=)(,TOINST=)(,FROMDATE=)(,PREVIEW=**YES**/NO)(,TODATE=)(,FROMTIME=)(,TOTIME=,)OUTPUT=(,KEEP=YES/**NO**)(,DROP=)(,ORDER=)(,COMMENT=)(,CSVL=YES/**NO**)(,PHEX=YES/**NO**)(,BASE=YES/**NO**)(,INPUT=)(,HEADER=YES/**NO**)(,REPORT=YES/**NO**)(,SKIP_ERRORS=YES/**NO**)
Example:	Export all the instances in the PRIMARY file to a file named EXPI.DAT: **FILE=PRIMARY,PREVIEW=NO,OUTPUT=C:\EXPI.DAT**
Tip:	N/A

EXPORT_RESOURCE

This verb enables the exporting of resource data to an output file or data set for importing to another file or data set.

- If PREVIEW=YES, OUTPUT is ignored.
- OUTPUT is the name of the destination output file (with extension) where the exported data is to reside.
- Specify COMMENT=YES to add a comment to the optional output file header.
- INPUT references a predefined input file, which enables multiple FILE.DOMAIN.CLASS.INSTANCE combinations to be specified.

  The input file must be specified in the following format.

  ```
  FILE=file_name,DOMAIN=domain_name,CLASS=class_name,
  INSTANCE=instance_name
  ```

- HEADER=YES produces an output header file.
- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.
- If the deck is being exported from a database with a *locale* or *codepage* that differs from the database into which it is being imported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the source database's *locale* or *codepage* is the same as the database into which it is being imported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.

- If TO_LOCALE=
  - LEGACY: XPR headers will be automatically converted to EBCDIC.
  - UTF8: an internationalized ZEDMAMS UTF-8 export deck is produced.

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

Syntax:	`FILE=(,DOMAIN=)(,CLASS=)(,INSTANCE=)(,FROMINST=)(,TOINST=)(,PREVIEW=`**`YES`**`/NO)(,FROMDATE=)(,TODATE=)(,FROMTIME=)(,TOTIME=,)OUTPUT=(,COMMENT=YES/`**`NO`**`)(,INPUT=)(,HEADER=YES/`**`NO`**`)`
Example:	Export all resources in the RESOURCE file to a file named EXPR.DAT: **`FILE=PRIMARY,PREVIEW=NO,OUTPUT=C:\EXPR.DAT`**
Tip:	N/A

IMPORT_CLASS

This verb allows you to import template data from an exported data set or output file to a PRIMARY File specified in the `edmprof` file.

- FILE is the name of the file or data set that contains the import class data..
- TIME=NEW – generates a new OBJDATE, OBJTIME, and OBJID.

  TIME=OLD – retains the original OBJDATE, OBJTIME, and OBJID.

  TIME=MOD – generates a new OBJDATE and OBJTIME, but retains the original OBJID.
- TODOMA is the domain with which matching source domains are replaced.
- If the FROMDOMA domain exists in the destination database, specify TIME=NEW to avoid duplicate object IDs.

  If FROMDOMA is specified, TODOMA must also be specified.
- If REPLACE=NO, the class template will not be replaced.
- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.
- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.

- Translated data must fit the field size limits.
- Legacy XPR headers in EBCDIC are automatically converted to ASCII.

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

Syntax:	`FILE=(,PREVIEW=`**`YES`**`/NO)(,TIME=`**`OLD`**`/NEW/MOD)(,REPLACE=YES/`**`NO`**`)(,FROMDOMA=)(,TODOMA=)`
Example:	Import all the classes in the file specified by FILE to a PRIMARY file specified in the `edmprof` file: **`FILE=`***`input_file`***`,PREVIEW=NO`**
Tip:	N/A

IMPORT_INSTANCE

The IMPORT_INSTANCE verb enables an administrator to import instance and resource data from an exported data set or output file (an *import deck*) to a location in the CSDB. The import deck will be imported to the CSDB PRIMARY File that is specified for the DBPATH setting in the MGR_DIRECTORIES section of the `edmprof` file, such as:

```
[MGR_DIRECTORIES]
DBPATH = C:\Program Files\Hewlett-Packard\CM\
ConfigurationServer\DB
```

The entire process is compromised of the following phases.

Verify the Import Deck
This verification checks the internal integrity (such as, size, referential integrity, and validity of data) of the incoming deck.

Preview the Import Deck
This phase is a comprehensive *analysis* that scans the database and the entire import deck, and reports the results, detailing differences that are relevant to this import session. This analysis checks for duplicate object IDs (OIDs), determines if fixes are possible, and determines if a new deck is required. The entire import deck is analyzed before this phase completes.

For the import deck, an *all-or-nothing* rule applies. Therefore, if an error condition is realized for one instance of the import deck, the entire deck is invalid.

When OIDs in the deck are the same as OIDs in the database, this verb's behavior is dictated by the keywords REPLACE and CONTINUE. These keywords are discussed in detail on page 310.

Import the Instances and Resources
The instances and resources from the deck will be imported only if the integrity check (performed during the **Preview the Import Deck** phase) is free of errors.

The IMPORT_INSTANCE information is presented as follows:

- Verb History (starting on page 308) describes when the keywords were introduced or discontinued.
- Syntax (starting on page 308) details all the keywords that are associated with this verb. This includes their expected behavior, and their interactions with, and dependencies on, one another.

- Retired Syntax (starting on page 313) covers the keywords that have been retired from use in this version, and includes information about which new keywords have replaced them.
- Usage Considerations (starting on page 314) addresses some of the more noticeable and critical effects that might result from using this verb, as well as some of the **new features.**
- Examples (starting on page 315) presents a few examples of how to express the keywords.

Verb History

This verb was introduced with version 4.3 of the CM Configuration Server to manage its database.

- The keywords, VERIFY and LOGFILE, were added to this verb's functionality in version 4.4 of the CM Configuration Server.
- In version 4.5.2 of the CM Configuration Server:
  - The keywords, FROMDOMA, TODOMA, TIME, CHGCONS, FORCE, Y2K, and IMPORT_RESOURCE were removed from this verb's functionality—but continue to be supported. See the section, Retired Syntax, on page 313.
  - The keywords, XPR, DUPLICATES, FORCE, CONTINUE, NEW, AUTOFIX, MAP_DOMAIN, and COMMIT_CHANGES were added in order to provide enhanced behavior management in the event of duplicate object IDs, multiple domains, and import decks from older systems and databases.

Syntax

This section details the syntax (**keywords** and **values**) that is associated with this verb, including the most efficient and effective ways to use it.

```
FILE=(,PREVIEW=YES/NO)(,DUPLICATES=STOP/MANAGE)(,XPR=)
(,NEW=)(,REPLACE=YES/NO)(,VERIFY=YES/NO)(,AUTOFIX=YES/NO)
(,MAP_DOMAIN=)(,CONTINUE=YES/NO)(,COMMIT_CHANGES=YES/NO)
(,LOGFILE=)
```

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.

- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.

- Translated data must fit the field size limits.
- Legacy XPR headers in EBCDIC are automatically converted to ASCII.

FILE is the only keyword that must be specified on the command line in order for this verb to execute.

The other keywords are optional (as denoted by their inclusion in parentheses); if they are not specified, their defaults will be assumed and they will effect the processing of this verb.

- PREVIEW creates a preview listing of the input file contents, the expected results, and its ability to be imported. The results are written to the log file. The default is **YES**.

To better understand the functionality of this keyword, think of it as asking, “Preview *only*?”

If PREVIEW=NO, the processing will run and the import deck data *can* be written to the database—depending on the other keywords and the results of the comparison.

If PREVIEW=YES (the default), the only result is a log file being generated—no action is taken on the database.

If PREVIEW=NO, the processing will run and, provided there are no errors, the import deck can be written to the database.

- FILE is the fully qualified path and filename of the file that contains the collection of instances for the import deck. This file is commonly suffixed with the extension **XPI**, as shown in the examples starting on page 315.

If a fully qualified path is not specified (as shown below), the location of the import file is assumed to be that from which ZEDMAMS is running.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI
,PREVIEW=YES
```

- DUPLICATES enables an administrator to indicate the action to be taken when duplicate OIDs of instances are encountered (in the import deck and the database). The default is **STOP**.

  DUPLICATES=STOP (the default) will result in this operation stopping. The return code **8** will be reported.

  DUPLICATES=MANAGE will result in a new deck being created in order to avoid the re-use of a previously allocated OID. If the instance is data bearing, it can be corrected only if the resource is available, in which case, XPR must be specified.

A new deck could be created for any of the following reasons: duplicate OIDs; domain change; OBJRCRC is NULL; duplication, re-mapping or OID difference between source decks and target database.

- XPR is the fully qualified path and filename of the resource deck.
- REPLACE dictates the behavior of the process (as defined in the following conditions) when identical instances are discovered in the database and the deck. The default is **NO**.

  If REPLACE=YES, the data in the import deck can be written to the database.

If REPLACE=NO (the default), the database and import deck will be queried for differences, and the following logic will apply.

- If no differences are found, processing will continue with the next instance in the import deck.
- If differences are found, the value of CONTINUE is checked.
  - If CONTINUE=NO, each instance with a difference will be ignored and processing will continue with the next instance in the import deck, but the process will not proceed to the next phase. A return code of **8** will be returned.
  - If CONTINUE=YES, each instance with a difference will be ignored and processing will continue with the next instance in the import deck.

- CONTINUE dictates the behavior of the process when matching records are discovered. The default is **NO**.

  If CONTINUE=YES:

  - For any class attribute found in the target class template, the import will continue as long as it doesn't result in the truncating of any significant (non-blank) data. In this case, the process will continue and an error will be reported.
  - For any class attribute found in the target class template, but the import cannot import the data without truncating significant (non-blank) data, the process will continue, an error will be reported, and the import will fail.
  - For any class attribute not found in the target class template, the field will be dropped—even if it contains significant (non-blank) instance data. (A warning or error message will be issued, indicating this occurrence.)

    Fields and data that are dropped will be documented in the log file.

  If CONTINUE=NO (the default) *and*…

  - the class attribute is not defined in the target class template, the import will fail.

- VERIFY compares the date (ZOBJDATE) and time (ZOBJTIME) of incoming files with those of the database files, if specified as YES. The default is **NO**.

  If VERIFY=YES and…

— the dates and times do not match (**rc=8**), a warning message is issued, and processing will continue with the next instance in the import deck.

— the dates and times match and XPR was specified (with a valid value), the VERIFY_IMPORT verb will run in order to check the integrity of the decks.

— the dates and times match, but XPR has not been specified (or its value is invalid), verification is not possible.

The results are reported to ZEDMAMS.LOG (the default), unless a different log has been specified for LOGFILE.

If the dates and times match, the ZEDMAMS.LOG will report a successful verify; if not, the ZEDMAMS.LOG will report a failed verify. These verifications are done on a per-instance basis and reported at the end of the process.

If VERIFY=YES, PREVIEW=YES and REPLACE=YES are assumed—but nothing is imported to the database.

If VERIFY=NO, no verification is done.

- NEW is the fully qualified path and filename prefix of the new decks that will be created.

  Optionally, just the filename prefix can be specified, in which case the new decks will be created in the current directory (by default, the `bin` directory).

  This keyword is applicable only if DUPLICATES=MANAGE.

  — If either the filename prefix or the fully qualified path have embedded blanks, the entire string must be enclosed in quotation marks (**“ “**).

  — The decks will have the suffixes `.MPI` and `.MPR`.

  — The defaults are the fully qualified paths of **XPI** (as specified by the keyword, FILE) and **XPR** (as specified by the keyword, XPR), respectively.

- AUTOFIX dictates whether to delete orphaned resources. If importing a data bearing instance and the resource file exists in the database, the existing resource will be deleted and the incoming resource will be written to the database. The default is **NO**.

  This keyword should be used with extreme caution and only by

an experienced administrator in a controlled manner. Incorrect use could result in the accidental removal of database elements that are critical to performance and operation.

If AUTOFIX=YES, orphaned resources will be deleted.

- MAP_DOMAIN enables an administrator to import all instances from one domain into a different domain, thereby facilitating application management.

  Use MAP_DOMAIN=*source_domain*/*target_domain* to import all instances that originated in one domain, *source_domain*, into a domain with a different name, *target_domain*. Doing so triggers the creation of a new deck. All object IDs from a domain that matches *source_domain* are placed in the new deck. In the new deck, their domain value is replaced by that of *target_domain*.

  For example, import all instances of the SOFTWARE Domain to the domain, SOFTBACK, by specifying,

  ```
  MAP_DOMAIN=SOFTWARE/SOFTBACK
  ```

  The new domain must exist in the database. If it doesn't, the process will stop.

- COMMIT_CHANGES dictates whether to commit to the database, the data in the import deck. The default is **YES**.

  COMMIT_CHANGES=**YES** (the default) will write the changes to the database.

  If COMMIT_CHANGES=NO, the changes will not be written to the database, but new **.MPI** and **.MPR** decks will be produced (if required).

  If there are no changes, this keyword is ignored.

- LOGFILE (see the section, LOGFILE, on page 261).

Retired Syntax

As the EDMAMS verbs have evolved, changes have been made in order to enhance their processing. Because of this, and in order to maintain logic for the user, there have been changes to the syntax of some of the verbs.

This section details the keywords that have been retired from use for the IMPORT_INSTANCE verb.

Although retired, these keywords are still supported.

These are superseded by new keywords where indicated.

- TIME=OLD (the default) retains the original OBJDATE, OBJTIME, and OBJID. (This is superseded by DUPLICATES=STOP.)

  TIME=NEW generates a new OBJDATE, OBJTIME, and OBJID. (This is superseded by DUPLICATES=MANAGE.)

  TIME=MOD generates a new OBJDATE and OBJTIME, but retains the original OBJID.

- FROMDOMA=<source_domain> and TODOMA=*target_domain* have been replaced by MAP_DOMAIN.
- FORCE=YES/NO. (This is superseded by CONTINUE.)
- CHGCONS specifies whether any embedded references to the name specified by FROMDOMA should be changed to the name specified by TODOMA.
- IMPORT_RESOURCE dictates whether this operation should import resources.

Usage Considerations

This section addresses some of the more noticeable and critical effects that might result from using this verb, as well as some of the new features.

- Once the data from an import deck has been written to the CSDB, the changes are considered permanent. Therefore, it is imperative that a CSDB administrator using this verb be certain of the changes that are being considered.

  HP Recommendations

  - Shut down the Configuration Server to ensure that the CSDB contents are not changing during the processing.
  - Back up the CSDB prior to running this verb.
  - Specify PREVIEW=YES and check the resulting log before committing any changes to the database.

- Executing this verb might result in the creation of new decks (**MPI/MPR**). The circumstances under which this might happen are:

  — There exist duplicate object IDs (ZOBJID) in the database instances and the import deck instances, and DUPLICATES=MANAGE.

  — There is a domain name change for the imported data (using the MAP_DOMAIN keyword).

— The ZOBJRCRC (the object resource CRC) is NULL or empty and the value can be calculated and assigned in the process.

All of these occur in conjunction with the existence of the XPR deck, it being specified on the command line, and the values of the CONTINUE and REPLACE allowing the processing to continue.

The XPR deck is necessary so that if changes are required, it is available to be updated at that time.

- This version of IMPORT_INSTANCE has more consistency checks that must be passed before the import deck is considered valid for import.
- Combining instances and resources on the same command line allows the import deck to be more thoroughly examined.
- Use the CONTINUE option to prevent data loss during import. (See the description for the keyword CONTINUE on page 311.)
- In this version, an administrator:
  - Can manage the processing behavior if an import deck OID collides with a database OID.
  - Can specify the filename prefix if a new deck is generated.
  - Has a single keyword to facilitate changing domains.
- A new time-based format of object ID generation has been introduced, thereby eliminating the chance of randomly generating a duplicate OID. For more information on this feature, consult the MGR_STARTUP section on page 98.

Examples

The following examples offer a look at the ways this verb can be used.

Even though some keywords are dependent on another, the order in which they are specified on the command line is not significant.

If a keyword is not specified on the command line, but has a default, the default will be assumed.

Some keywords, although optional, become mandatory based on the specifications of others and the results of processing. For an example, see DUPLICATES=MANAGE.

Example 1

Import the instance data that is contained in `DB_001.XPI` and `DB_001.XPR` to the PRIMARY file that is specified in the `edmprof` file. Do not write the changes to the database. Do not manage duplicate object IDs. Write the results to `C:\Temp\EDMAMS\DB001\Test01.log`.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI
,XPR=DB_001.XPR,PREVIEW=YES,LOGFILE=C:\Temp\EDMAMS
\DB001\Test01.log
```

In this run, the implied values (defaults) that affected the processing are DUPLICATES=STOP and CONTINUE=NO.

Example 2

Import the instance data that is contained in `DB_001.XPI` and `DB_001.XPR` to the PRIMARY file that is specified in the `edmprof` file. Do not write the changes to the database. Manage any duplicate object IDs that are encountered. Query the database and deck for matching records and, if any are found, continue processing. Delete any orphaned resources that are encountered. Write the results to `C:\Temp\EDMAMS\DB001\Test02.log`.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI,
XPR=DB_001.XPR,PREVIEW=YES,DUPLICATES=MANAGE,CONTINUE=YES,
AUTOFIX=YES,LOGFILE=C:\Temp\EDMAMS\DB001\Test02.log
```

In this run, the implied value (default) that affected the processing is REPLACE=NO.

Example 3

Assume that the Example 2 command line has completed as specified. Execute the same run, but this time, write the changes to the database and the results to `C:\Temp\EDMAMS\DB001\Test02.log`.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI,
XPR=DB_001.XPR,PREVIEW=NO,DUPLICATES=MANAGE,CONTINUE=YES,
AUTOFIX=YES,LOGFILE=C:\Temp\EDMAMS\DB001\Test02.log
```

In this run, the implied values (defaults) that affected the processing are: COMMIT_CHANGES=YES.

Note: The only difference between examples 2 and 3 is the value of PREVIEW=.

Example 4

Import the instance data (contained in `DB_001.XPI` and `DB_001.XPR`) from the SOFTWARE Domain to the SOFTBACK domain in the PRIMARY file in the database. Do not write the changes to the database. Do not manage duplicate object IDs. Query the database and deck for matching records and, and if any are found, continue processing. Delete any orphaned resources that are encountered. Write the results to `C:\Temp\EDMAMS\DB001\Test03.log`.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI
,XPR=DB_001.XPR,MAP_DOMAIN=SOFTWARE/SOFTBACK,PREVIEW=YES
,REPLACE=NO,CONTINUE=YES,AUTOFIX=YES,LOGFILE=C:\Temp
\EDMAMS\DB001\Test03.log
```

In this run, the implied value (default) that affected the processing is DUPLICATES=STOP.

Example 5

Import the instance data that is contained in `DB_001.XPI` and `DB_001.XPR` to the PRIMARY file that is specified in the `edmprof` file. Write the changes to the database. Do not query the database and deck for matching records. Write the results to `C:\Temp\EDMAMS\DB001\Test04.log`.

```
ZEDMAMS VERB=IMPORT_INSTANCE,FILE=DB_001.XPI
,XPR=DB_001.XPR,PREVIEW=NO,REPLACE=YES,LOGFILE=C:\Temp
\EDMAMS\DB001\Test04.log
```

In this run, the implied values (defaults) that affected the processing are COMMIT_CHANGES=YES, DUPLICATES=STOP, and CONTINUE=NO.

Import and Export Files

Table 111 below presents a list of the six default import/export files that are generated by the CSDB. Their level in the CSDB is part of the logic in their naming.

Table 111 Import and Export File Names

Database Level	Import File Name	Export File Name
Class	.MPC – modified class file	.XPC – exported class file
Instance	.MPI – modified instance file	.XPI – exported instance file
Resource	.MPR – modified resource file	.XPR – exported resource file

The export files (XPI and XPR) are the original decks that might be generated during the export process, and are the files that are imported either back into the existing database or into another database. So, each XPI and XPR file can be an export *and* import file.

The MPI and MPR files are decks that are generated during a database import that resulted in correcting duplicate OID issues, changing domains, or correcting empty or NULL OBJRCRCs.

IMPORT_RESOURCE

This verb imports resource data from an exported data set or file to a RESOURCE File as specified in the `edmprof` file.

The keyword, VERIFY, was added to this verb's functionality in version 4.4 of the Configuration Server.

- If REPLACE=NO, the class template will not be replaced.
- If VERIFY=YES, an implied PREVIEW=YES is set.

  If a resource exists, its size is compared to the size of the incoming resource to verify that they match.
- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (TO_LOCALE or TO_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.
- If the deck is being imported into a *locale* or *codepage* that differs from the database from which it was exported, the appropriate keyword (FROM_LOCALE or FROM_CODEPAGE) must be specified.

  If the target *locale* or *codepage* is the same as the database from which the deck was exported, neither keyword needs to be specified.

  — The values for the CODEPAGE keywords must be integers, such as 1252, 65001, and 936.

  — The LOCALE keywords' values will accept the following values only: **LEGACY**, **UTF8**, and **UTF-8**.

  – **LEGACY** is an alias for the local machine's code page, such as CP_ACP, 1252.

  – **UTF8** and **UTF-8** are aliases for a UTF-8 code page, such as CP_UTF8, 65001.
- Translated data must fit the field size limits.
- Legacy XPR headers in EBCDIC are automatically converted to ASCII.

The keywords FROM_LOCALE, FROM_CODEPAGE, TO_LOCALE, and TO_CODEPAGE will not show up on the command line when the syntax/usage is queried; however, they are functional and, when specified, will work as designed.

Syntax:	FILE=(,FROMDOMA=)(,TODOMA=)(,PREVIEW=**YES**/NO) (,REPLACE=YES/**NO**)(,VERIFY=YES/**NO**)
Example:	Import all resources in the file specified by FILE to a RESOURCE file specified in `edmprof`: **FILE=RESOURCE,PREVIEW=NO**
Tip:	N/A

LIST_CLASSES

This verb displays a list of class names, object IDs, and other 60-byte prefix information, such as ZOBJDATE, ZOBJTIME, persistence flag, sequence sensitive flag, Distributed Configuration Server flag and db type and count totals.

Syntax:	`FILE=,DOMAIN=`
Example:	List all classes in the PRIMARY file: **`DOMAIN=*`**
Tip:	N/A

LIST_CONNECTS

This verb displays a list of connect-to values (type C) for the specified instances.

- INSTANCE can be partially specified.

  To display only one instance, the entire name must be specified.

Syntax:	`DOMAIN=,CLASS=(,INSTANCE=)`
Example:	List all of the connect-to values in the ZSERVICE Class of the SOFTWARE Domain: **`DOMAIN=SOFTWARE,CLASS=ZSERVICE`**
Tip:	To list data for all type C values in all instances of the specified class, omit INSTANCE.

LIST_CONS_VARS

This verb automatically displays a list of connect-to data (type C) and, optionally, variable data (type V) for the specified instances.

- Wildcards (*) can be specified in INSTANCE.

  For example, specify DIFF* to select all the instances that contain DIFF as the first part of the string.

  To display only one instance, the entire name must be specified.
- If VTYPE=YES, variable data will be included in the display.

Syntax:	`(FILE=,)DOMAIN=,CLASS=(,INSTANCE=)(,VTYPE=YES/`**`NO`**`)`
Example:	From the USER Class in the SOFTWARE Domain, list the connect-to and variable values only for those instances prefixed with DIFF: **`DOMAIN=SOFTWARE,CLASS=ZSERVICE,INSTANCE=DIFF,VTYPE=YES`**
Tip:	To list all C- and V-type data in all the instances of the specified class, omit INSTANCE.

LIST_DOMAINS

This verb displays an alphabetical list of domains for a specified file (the default is the PRIMARY file).

- FROMDOMA is the domain from which to start the list of domains.

  If omitted, all the domains through the TODOMAIN will be listed.

- TODOMAIN is the domain at which to end the list of domains.

  If omitted, all the domains following FROMDOMA will be listed.

Syntax:	`FILE=(,FROMDOMA=)(,TODOMAIN=)`
Example:	In the PRIMARY file, list all of the domains that follow the domain ACCT: **`FILE=PRIMARY,FROMDOMA=ACCT`** In the PROFILE File, list the domains in the range ACCT through SALES (inclusive): **`FILE=PROFILE,FROMDOMA=ACCT,TODOMAIN=SALES`**
Tips:	To list all the domains of the selected file, simply omit FROMDOMA and TODOMAIN. To list one domain, specify it for FROMDOMA and TODOMAIN.

LIST_FLAGS

This verb displays the attribute name, length, type, and Configuration Server and HPCA agent flags for a specific class template.

- Specify README=YES to include the README attributes.

Syntax:	DOMAIN=,CLASS=(,README=YES/**NO**)
Example:	List the attribute information for the attributes of the ZSERVICE Class of the SOFTWARE Domain and omit the README attributes: **DOMAIN=SOFTWARE,CLASS=ZSERVICE**
Tip:	N/A

LIST_INST_DATA

This verb displays, in a concise format, the attribute data of the specified instances.

- Wildcards (*) can be specified for INSTANCE.

  For example, specify DIFF* to select all the instances that contain DIFF as the first part of the string.

  To display only one instance, the entire name must be specified.

- Use FIELDS to specify up to six attribute names.

  Specify the fields with a space separating each name, and the entire string enclosed in quotation marks, as in:

  "*field1 field2 field3 field4 field5 field6*"

  To list all attribute data of all instances of the specified class, omit FIELDS.

  If FIELD is omitted, all attribute data of all instances of the specified class will be displayed. This might produce a very large log, which might hinder locating data.

  If a fieldname does not exist in the template, it will be ignored.

Syntax:	DOMAIN=,CLASS=(,INSTANCE=)(,FIELDS=)
Example:	From the ZSERVICE Class in the SOFTWARE Domain, list the attribute data of all instances with the prefix, RAD: **DOMAIN=SOFTWARE,CLASS=ZSERVICE,INSTANCE=RAD***
Tip:	To list all instances of the specified class, omit INSTANCE.

LIST_INSTANCE

This verb displays a list of instance names and object IDs for the class specified. It also displays the ZOBJTIME and resource size.

- The value of FROMINST can be partially specified.

  For example, specify FROMINST=DIFF to select all the instances that contain DIFF as any part of the string.

  Use a wildcard (*) to specify this value as a prefix, as in RAD*.

- The value of SUFFIX can be partially specified.

  For example, specify SUFFIX=INT to select all the instances that have INT as a suffix.

Syntax:	`DOMAIN=,CLASS=(,FROMINST=)(,SUFFIX=)`
Example:	From the USER Class of the POLICY Domain, list the instance names and object IDs for all instances with the prefix RAD, and all instances with the suffix, PORT: **`DOMAIN=POLICY,CLASS=USER,FROMINST=RAD*,SUFFIX=PORT`**
Tip:	To list all instances, omit FROMINST.

LIST_PACKAGE

This verb lists the instances and all mated components of the PACKAGE class.

- The value of INSTANCE can be partially specified.

  For example, specify INSTANCE=DIFF to select all the instances that contain DIFF as any part of the string.

  Use a wildcard (*) to specify this value as a prefix, as in, RAD*; and as a suffix, as in, *INT.

Syntax:	`(FILE=,)DOMAIN=,INSTANCE=`
Example:	From the SOFTWARE Domain, list all instances with the prefix RAD: **`DOMAIN=SOFTWARE,INSTANCE=RAD*`**
Tip:	N/A

CLASS is not an option because this verb applies to the PACKAGE class only.

LIST_PREFIX

This verb displays data from the Distributed Configuration Server prefix.

- If CLASS is omitted, all class prefixes will be displayed.

Syntax:	`(FILE=,)DOMAIN=(,CLASS=)`
Example:	List the Distributed Configuration Server prefixes for all classes in SOFTWARE Domain of the PRIMARY file: **`DOMAIN=SOFTWARE`**
Tip:	N/A

LIST_RESOURCES

This verb displays a list of resource names (with promote dates, times, data names, data sizes, and object IDs) from the PRIMARY File.

As of version 4.3 of the Configuration Server Database, this verb was renamed. Its original name was LIST_RESOURCE.

- If there is no mated instance in the PRIMARY file, an appropriate message will be generated.
- If ORPHANS=YES, only the orphans will be listed.
- If CHKSIZE=YES, the size listed (from ZOBJRSIZ) is compared to the actual size (from the NvdDBFind).

  Only those resources that have a size anomaly will be listed.
- SIZE is the size of the resource.

  SIZE must be specified as a range (not a single byte size), and the range must be defined with a dash (**-**), as in, **100-500**.

Syntax:	DOMAIN=,CLASS=(,ORPHANS=YES/**NO**) (,CHKSIZE=YES/**NO**) (,SIZE=*nnnn-nnnn*)
Example:	From the FILE Class of the SOFTWARE Domain, list all resources that are between 64 and 1024 bytes in length, and compare this with the actual size: **DOMAIN=SOFTWARE,CLASS=FILE,CHKSIZE=YES, SIZE=64-1024**
Tip:	N/A

LIST_ZRSC_FIELDS

This verb displays the data in all fields that begin with **ZRSC**, such as ZRSCSIZE and ZRSCVRFY. This verb allows wildcards for INSTANCE.

- INSTANCE can be specified with a partial name.

  For example, specify INSTANCE=DIFF to select all the instances that contain DIFF as any part of the string.

  Use a wildcard (*) to specify this value as a prefix, as in, RAD*; and as a suffix, as in, *INT.

  To display only one instance, the entire name must be specified.

Syntax:	`DOMAIN=,CLASS=(,INSTANCE=)`
Example:	From the ZSERVICE Class of the SOFTWARE Domain, list the instances that begin with CICS: **`DOMAIN=SOFTWARE,CLASS=ZSERVICE,INSTANCE=CICS*`**
Tip:	To list all instances of the specified class, do not specify INSTANCE.

MATCH_RESOURCES

This verb will compare resource data from the RESOURCE file against instance names from the PRIMARY file to determine and display whether those resources are mated (orphaned). This comparison is made by reading the resource data, extracting the instance name from the resource prefix, and attempting to find the mated resource.

The keyword, PREVIEW, was added to this verb as of version 4.3 of the Configuration Server Database.

- If PREVIEW=NO, and there is resource data that has been determined to be orphaned, a search of the PRIMARY file instances will occur, in order to locate a matching instance object ID.

  If a match is made, the instance name is placed in the resource data prefix and the resource is updated, with the time stamp for the resource data being updated with the ZRSCDATE and ZRSCTIME.

- Totals at completion include resources found, as well as total resources (mated and orphaned).
- When using PREVIEW=NO, a great deal of I/O might occur.

Syntax:	DOMAIN=,CLASS=(,PREVIEW=**YES**/NO)
Example:	Match and display resource data names for all the SOFTWARE.FILE Instances: **DOMAIN=SOFTWARE,CLASS=FILE,PREVIEW=YES**
Tip:	N/A

If many orphans are detected with PREVIEW=YES, a more efficient way to update the resource data file is to use the verb ZRSOURCE_UNMATES, detailed on page 345.

PACKAGE_UNMATES

This verb lists all PACKAGE class instances that do not have mated components in the domain that is specified.

- DOMAIN must be one that has a PACKAGE class.
- CLASS defaults to **PACKAGE**.

Syntax:	`DOMAIN=(,CLASS=)`
Example:	From the SOFTWARE Domain, list all the PACKAGE class instances that have no mated components: **`DOMAIN=SOFTWARE`**
Tip:	N/A

REFRESH_DMA

This verb will recount all the instances, classes, and domains in the PRIMARY file and, optionally, refresh the **count** (TotalInstanceCount, TotalClassCount, and TotalDomainCount) and **date** (LastUpdateDate, LastInstanceUpdateDate, and LastClassUpdateDate) fields in the appropriate Distributed Configuration Server prefix areas. Additionally, the updated output can be displayed in the log.

This verb was introduced with version 4.2 of the CM Configuration Server. It replaced the verb, REFRESH_COUNTS.

The keywords, DOMAIN and CLASS, were added with version 4.3; and the keyword, COUNTS_ONLY, was added with version 4.5.2.

- If PREVIEW=YES, a count of instances by class, domain, and file will be listed to the log, but no data will be written.

  The log will display the actual count (as calculated by running this verb) and the current count (current values in the total count fields [mentioned in the introductory paragraph] in the database) in the Distributed Configuration Server prefix. If the actual count differs from the current count, the latter will be flagged with an asterisk (*).

- If PREVIEW=NO, the TotalInstanceCount, TotalClassCount, and TotalDomainCount (for each applicable Distributed Configuration Server prefix) will be computed and updated, in addition to updating the current counts.

- If COUNTS_ONLY=**NO** (the default) and PREVIEW=NO, the current count and date fields in the Distributed Configuration Server area for each class will be updated.

  If COUNTS_ONLY=NO and PREVIEW=YES, the current count and date fields in the Distributed Configuration Server area for each class will be displayed.

- If COUNTS_ONLY=YES and PREVIEW=NO, the current count fields only will be updated. This is effective for very large database files because, by not refreshing the date fields and not having to read every instance in the database, the function executes in less time.

  If COUNTS_ONLY=YES and PREVIEW=YES, the current count and actual count fields will be displayed, but not updated; the date fields are not touched.

- Each class for each domain will be previewed separately, and at the end of each domain, a domain summary will be presented.

- After the last domain, a file summary will be presented by listing the ZBASE.ZBASE template information.

Syntax:	PREVIEW=**YES**/NO(,DOMAIN=)(,CLASS=) (,COUNTS_ONLY=YES/**NO**)
Example:	Preview the counts and update dates in the Distributed Configuration Server prefix for the entire PRIMARY file: **PREVIEW=YES**
Tip:	N/A

RENAME_INSTANCE

This verb will rename instances and the internal name of any mated resource data.

- KEEP indicates whether the old instance will be deleted.
- OLDPREFIX specifies existing instances that are to be renamed.

  If a single instance is to be renamed, specify the entire name.

  If multiple instances are to be renamed, a wildcard (*) is required.

  For example, to change the names of the instances, **east_sales** and **north_sales** to **US_Sales**, specify **`OLDPREFIX=*_sales,NEWPREFIX=US_Sales`**.
- NEWPREFIX is that which will replace OLDPREFIX.

Syntax:	`DOMAIN=,CLASS=,OLDPREFIX=,NEWPREFIX=` `(,KEEP=YES/`**`NO`**`)(,PREVIEW=`**`YES`**`/NO)`
Example:	In the ZSERVICE Class of the SOFTWARE Domain, rename all instances prefixed with EAST to NORTH_EAST, and delete the old prefix: **`DOMAIN=SOFTWARE,CLASS=ZSERVICE,OLDPREFIX=EAST,`** **`NEWPREFIX=NORTH_EAST,PREVIEW=NO`**
Tip:	N/A

SEARCH_INSTANCES

This verb will search the specified instances for the data contained in STRING.

- The data specified is not case-sensitive; if it contains embedded spaces, it must be enclosed in quotation marks (**“ ”**).
- The output log will contain the name of the instance, attribute, and the specified STRING value.
- If the value of STRING is not found in the specified instances, this will be reported in the log.
- FROMINST can be specified with a partial name.

  For example, specify FROMINST=DIFF to select all the instances that contain DIFF as any part of the string.

  Use a wildcard (*) to specify this value as a prefix, as in, RAD*; and as a suffix, as in, *INT.

  To display only one instance, the entire name must be specified.

Syntax:	`DOMAIN=,CLASS=(,FROMINST=,)STRING=`
Example:	Search for the string “J. Q. Public” in all instances that end in EAST in the USER Class of the SOFTWARE Domain: **`DOMAIN=SOFTWARE,CLASS=USER,STRING="J. Q. Public",FROMINST=*EAST`**
Tip:	To list all instances of the specified class, omit FROMINST.

SORT_OBJECT_ID

This verb will sort object IDs within a Domain.

- FILE will default to **PRIMARY** if it is omitted or if no value is specified.
- DOMAIN can be a single Domain (*domain_name*) or all Domains (ALL) of the specified File.

  To sort the object IDs of multiple (but not all) Domains in a File, execute this verb once for each Domain.

  To sort the object IDs of multiple Domains in multiple Files, execute this verb once for each Domain.
- ORDER=NOSORT means that the object IDs will be listed in CLASS.INSTANCE groups.

  ORDER=ASCEND/DESCEND specifies the order of sorting, based on object IDs.

  Duplicate object IDs will be flagged in ascending or descending order.
- ALLIDS is valid only if ORDER=ASCEND or DESCEND.

  ALLIDS=YES will duplicate (list all object IDs) the entire File.

  ALLIDS=NO will list only duplicate object IDs.

Syntax:	`(FILE=,)DOMAIN=(ALL/DOMAIN)(,ORDER=`**`ASCEND`**`/DESCEND/NOSORT)(,ALLIDS=`**`YES`**`/NO)`
Example:	Sort, in descending order, all the object IDs of all domains, and duplicate the entire file: **`DOMAIN=ALL,ORDER=DESCEND,ALLIDS=YES`**
Tip:	All domains can be selected by specifying **`DOMAIN=ALL`**.

SYNC_CLASS

This verb will synchronize an existing (target) class with a newly formatted (source) class, and re-organize all existing class instances according to the mapping in the source class template.

- All target class attributes that have a match in the new template will adopt the characteristics of that matching attribute.

  Any target class attributes that do not have a match in the new template will be deleted.

- TODOMAIN specifies the class that contains the target class template that is to be synchronized.
- SYNCDOMA specifies the class that contains the source class template. The default is **ZEDMSYNC**.
- CLASS is the target class (within the domain that is specified by TODOMAIN *and* SYNCDOMA) that will be synchronized.

  The value of CLASS must exist in the TODOMAIN and SYNCDOMA domains; if it doesn't, the function will fail.

- CACHE=YES will update loaded cache when running as a Configuration Server method.
- If BASE=YES, this verb will copy the _BASE_INSTANCE_ from the source (SYNCDOMA) to the target (TODOMAIN).

Syntax:	TODOMAIN=(,PREVIEW=**YES**/NO)(,SYNCDOMA=**ZEDMSYNC**,) CLASS=(,CACHE=YES/**NO**)(,BASE=YES/**NO**)
Example:	In the POLICY Domain, synchronize the existing USER Class with a newly formatted USER Class, imported from ZEDMSYNC. Include the _BASE_INSTANCE_ and update the loaded cache: **TODOMAIN=POLICY,CLASS=USER,PREVIEW=NO,CACHE=YES,BASE=YES**
Tip:	N/A

UPDATE_INSTANCES

This verb will update instances in the specified domain from data in an edited text file, INFILE. INFILE must conform to the following specifications.

- The first line must contain a new instance name (max. 32 bytes) starting in column 1.

  The next line contains the variable field name (max. eight bytes) starting in column 2; then a blank in column 10; a 1-byte index value (1-9) in column 11; a blank in column 12; and the data to be populated beginning in column 13.

- REPLACE=YES specifies that an attribute that contains existing data (non-blank) be overlaid.

- Use a slash-asterisk combination (**/***) in columns 1 and 2 to denote the end of instance data (see lines 5 and 10 below).

Column Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Line 1	U	S	E	R	_	N	A	M	E															
Line 2		N	A	M	E								J	.	A	.	D	E	V	E	L	O	P	
Line 3		E	D	M	S	E	T	U	P		5		5	T	H	A	T	T	R	I	B	U	T	E
Line 4		Z	P	R	I	O	R	I	T				9	9	9									
Line 5	/	*																						
Line 6	U	S	E	R	_	N	A	M	2															
Line 7		N	A	M	E								L	.	Z	I	M	M	E	R				
Line 8		E	D	M	S	E	T	U	P		2		2	N	D	A	T	T	R	I	B	U	T	E
Line 9		E	D	M	S	E	T	U	P		3		3	R	D	A	T	T	R	I	B	U	T	E
Line 10	/	*																						
Line 11	U	S	E	R	_	N	A	M	E	_	3													
Line 12		N	A	M	E								J	I	M		D	O	E					
Line 13		E	D	M	S	E	T	U	P		4		4	T	H	A	T	T	R	I	B	U	T	E

Syntax:	INFILE=,DOMAIN=,CLASS=(,REPLACE=YES/**NO**)

Example:	Update the instances in the MYINPUT.TXT file in the POLICY Domain's USER Class: `INFILE=MYINPUT.TXT,DOMAIN=POLICY,CLASS=USER`
Tip:	Run LIST_INST_DATA or LIST_FLAGS to determine the index of a like named variable to be updated.

UPDATE_MGRIDS

This verb updates the specified Manager ID, Manager name, managing Manager ID, and managing Manager name in the Distributed Configuration Server prefix.

The Configuration Server was previously called the *Manager*. Therefore, the keywords associated with this verb retain the 'Manager' designation, as in, Manager name (MNAME).

- All keywords are optional. However, at least one keyword other than DOMAIN and CLASS must be specified in order to avoid a usage error being displayed to STDERR.

Syntax:	`(FILE=)(,DOMAIN=)(,CLASS=)(,MID=)(,MMID=)(,MNAME=)(,MMNAME=)`
Example:	Update the managing Configuration Server IDs and managing Configuration Server names in the USER Class of the POLICY Domain in the PRIMARY file: **`FILE=PRIMARY,DOMAIN=POLICY,CLASS=USER,MMID=010, MMNAME=New_Mngng_RCS`**
Tip:	To update an entire file, omit DOMAIN and CLASS.

VERIFY_CLASS

This verb will display class templates, as specified, to determine if any gaps, overlays, or other anomalies exist. The output log will consist of a template entry number, the attribute name, its length, and its displacement in the heap. If an error is found, it will be indicated in the appropriate place.

- DOMAIN must be specified.

  All domains can be selected by specifying the value as ALL.

- CLASS must be specified.

  All classes can be selected by specifying the value as ALL.

Syntax:	`(FILE=,)DOMAIN=,CLASS=`
Example:	In the POLICY Domain of the PRIMARY file, verify all the class templates: **`FILE=PRIMARY,DOMAIN=POLICY,CLASS=ALL`** Verify the ZSERVICE Class templates in the PRIMARY file: **`DOMAIN=ALL,CLASS=ZSERVICE`**
Tip:	N/A

VERIFY_DATABASE

This verb will validate the integrity of a CSDB. It can be used at any time to check database integrity, and can run standalone or as a Configuration Server method. This database validation must be done in read-only mode.

This verb was introduced with version 4.5.1 of the CM Configuration Server.

- DOMAIN can be a single domain or all domains of the CSDB.

  To verify the integrity of multiple (but not all) domains in the CSDB, execute this verb once for each domain.

  This is an exhaustive check of the database and, as such, might take a long time to run, possibly several hours.

  It makes two passes over the database – first, checking the PRIMARY file and any associated resources; and second, checking the RESOURCE file for orphans.

  As a result of the two passes, it has enough information to do a check for duplicate object IDs.

Syntax:	DOMAIN=(ALL/*any_domain*)
Example:	Verify the integrity of the CSDB SOFTWARE Domain: **DOMAIN=SOFTWARE** Verify the integrity of all domains in the database: **DOMAIN=ALL**
Tip:	Specify DOMAIN=ALL to select all domains in the CSDB.

ZRSOURCE_UNMATES

This verb will match Instances in the PRIMARY File with the resource data in the RESOURCE file, based on the specified Domain and Class, and the object ID from the PRIMARY File instances.

- If resource data is not found, the Instance is considered *unmated*.
- If resource data is found, the Instance name in the resource data prefix is compared with the Instance name from the PRIMARY File.

  If it does not match, it is reported in the log as an inconsistency.
- If PREVIEW=NO, the resource prefix is updated to reflect the true Instance name from the PRIMARY file.
- At completion, totals are listed in the log to indicate the number of unmated Instances, inconsistencies, and so forth.
- DOMAIN is that which contains resource data, usually SOFTWARE.
- If DEBUG=YES, all Instances are listed as they are verified.

Syntax:	DOMAIN=,CLASS=(,PREVIEW=**YES**/NO)(,DEBUG=YES/**NO**)
Example:	In the FILE Class of the SOFTWARE Domain in the PRIMARY File, list all unmated Instances and inconsistencies: **PREVIEW=YES,DOMAIN=SOFTWARE,CLASS=FILE,DEBUG=YES**
Tip:	N/A

7 Configuration Server Database Utility (RadDBUtil)

At the end of this chapter, you will:

- Know how to use RadDBUtil for Configuration Server Database updates, Configuration Server communications, activity logging, and version queries.

HP recommends creating a back up the Configuration Server Database prior to executing any of the commands that are shown in this chapter.

Introduction

RadDBUtil (`raddbutil.exe`) is the Configuration Server Database tool that manages:

- Configuration Server Database updates (imports, exports, and deletions),
- Configuration Server communications,
- activity logging, and
- version queries.

This chapter focuses on the functionality, syntax, and common-use attributes of this tool, and provides examples of each of these capabilities.

HP recommends creating a back up the CSDB prior to executing any of the commands that are shown in this chapter.

The Configuration Server does not need to be running in order for RadDBUtil to run.

Additional information is detailed in the section, Running RadDBUtil from a Command Line, starting on page 349.

Components & Processes

This section details the components and processes that benefit from using RadDBUtil.

Components

- Configuration Server
- Configuration Server Database
- Distributed Configuration Server

Processes

- Importing/exporting to/from the CSDB

- Output materials produced by, or during, importing and exporting
- Deleting instances and resources from the CSDB
- Querying and manipulating the Configuration Server lock status
- Version information queries
- Activity logging

Running RadDBUtil from a Command Line

This section provides information regarding running RadDBUtil from a command line.

It is important to note that RadDBUtil must be able to lock the CSDB, which it cannot do when it is run from a command line if:

- The Configuration Server is running

and

- MANAGER_TYPE=STANDALONE.

In order to run RadDBUtil from a command line, do either (or both) of the following *before* running RadDBUtil.

- Shut down the Configuration Server.
- Open the `edmprof` file and, in the MGR_STARTUP section, set MANAGER_TYPE to something other than STANDALONE—either DISTRIBUTED or SERVER.

Implementation Details

RadDBUtil has a dependency on the `edmprof` file, and should be placed in the same directory as it—typically the Configuration Server `bin` directory on Windows, and `exe` directory on UNIX. Additionally, RadDBUtil must be able to find a valid CSDB and the Configuration Server `log` directory.

HP recommends creating a back up the CSDB prior to executing any of the commands that are shown in this chapter.

HP Client Automation Patch Manager Considerations

This section contains important information and warnings about using RadDBUtil to import and export HP Client Automation Patch Manager (Patch Manager) bulletins.

Important information regarding the deleting of Patch Manager bulletins is detailed in the section, Deleting Bulletins from a Database, on page 363.

IMPORT

When using the **`-domain`** switch, all instances and resources (of the XPI file that is specified for INPUT) will be imported to the target domain. Therefore, it is imperative that the necessary domains and classes exist in the target domain.

EXPORT

In order for the RadDBUtil tool to successfully export bulletins, in the PATCHMGR.ZSERVICE Class template there must be an attribute named SYNC of the type CONNECTION with the appropriate default value.

See EXPORT on page 360 for an example of the SYNC-CONNECTION attribute being specified for a Patch Manager bulletin.

If this attribute is not present in the PATCHMGR.ZSERVICE Class template, it must be added.

EDMPROF File Settings

The following edmprof file settings affect the operation of RadDBUtil. Be sure to verify these settings and adjust them accordingly.

MGR_LOG.DIRECTORY
specifies where the activity and audit logs will be generated. For more information, see Standard Files on page 359.

MGR_DIRECTORIES.DBPATH
determines the CSDB location.

MGR_STARTUP.MGR_ID
is the unique, three-character identifier of the Configuration Server that was specified during its installation.

MGR_STARTUP.MGR_NAME
is the identifying name of the Configuration Server that was specified during its installation.

RadDBUtil Verbs

In this section, each of the six RadDBUtil verbs is detailed with syntax options, syntax descriptions, and verb-specific considerations.

UNIX Note: Using Quotation Marks
In a UNIX environment, it is important that any string that contains special characters—such as parentheses, (and)—be enclosed within quotation marks, **“ ”**.

General Syntax

- The executable, verbs, keywords, and values are not case-sensitive.

  UNIX Note: Filename Case-sensitivity
  The RadDBUtil executable, `raddbutil`, must be specified exactly as it appears; otherwise it will not work.

- The verbs are VERSION, LOG, IMPORT, EXPORT, DELETE, and RCS.
- The verbs can be specified in either of the following formats:

  `-keyword` *`value`*

  If this syntax is used, pairs of combinations must be separated by a space, as in:

  `-keyword` *`value`* **`-keyword`** *`value`* **`-keyword`** *`value`*

  or

  `keyword=`*`value`*

If this syntax is used, pairs of combinations must be separated by a space, a comma, or both, as in:

keyword=*value* **keyword=***value*,**keyword=***value*, **keyword=***value*

A double-dash (**--**) indicates the end of the options.

The acceptable Boolean values are:

TRUE: 1, YES, ON, and TRUE

FALSE: 0, NO, OFF, and FALSE

VERSION

The VERSION verb produces build information for the RadDBUtil tool and all embedded executables. For examples of the syntax, see Examples on page 365.

Syntax

The syntax of the verb, VERSION, is shown below.

```
Raddbutil version
```

LOG

This verb places RadDBUtil-specific messages in the audit log and activity log.

The audit log information is:

- BuildInfo
- CommandLine
- CompletionCode
- Timestamp (ISO)

There are two messages per command—one when RadDBUtil begins and one when it ends.

```
20050126 15:24:04 C:/RadDBUtil/raddbutil.exe 60 --> import
20050126 15:24:04 C:/RadDBUtil/raddbutil.exe 60 <-- rc=8
```

Syntax

The syntax of the LOG verb is shown below. For examples of the syntax, see Examples starting on page 365.

RadDBUtil LOG "*record this information*"

The RadDBUtil entry in the log can be accompanied by customized text.

The text must be enclosed within quotation marks, as shown above. For example, to delineate a nightly log entry for a specific date, specify:

```
RadDBUtil log "Nightly Log for June 22, 2005"
```

IMPORT

HP recommends creating a back up the CSDB prior to executing any of the commands that are shown in this section.

The IMPORT verb simplifies the importing of materials into the CSDB. It can import materials from one domain into a domain of a different name within a CSDB, and from one CSDB to another. It offers the following options in order to optimize the import operation.

- Automatically recognize and re-use the instances that exist in the target domains, and
- Import only those elements that do not exist in the target domains.

Additionally, by having a feature that allows the IMPORT verb to identify packages and dialogs that exist in the database and to dynamically adapt to them, RadDBUtil reduces the size of the targeted domain—as well as Distributed Configuration Server execution times—without impacting the integrity of the imported materials. Other features of the IMPORT verb are:

- Parameter validation
- Database receptiveness to receiving the import materials
- Deck verification (XPI and XPR)
- Attributes that are dropped from the import operation will be noted with a warning level (**--?**) in the activity log.

For the IMPORT verb, an "all-or-nothing" rule applies—that is, if RadDBUtil *cannot* do *all* of that which is requested, it will do *none* of that which is requested.

If a RadDBUtil IMPORT operation fails, the Configuration Server log will have an entry reflecting this and the return code will be rc=8.

Syntax

The syntax of the IMPORT verb is shown in this section. For examples of the syntax, see Examples on page 365.

- The keywords and values are not case-sensitive, as can be seen in the following examples.

  Optional keyword-value combinations are in parentheses. Default values are underlined.

```
Raddbutil import -input FileName (-output value)
(-domain value)(-commit false) (-root=*)  (-accept a)
(-reject u+d)  (-ignore s)

raddbutil IMPORT
INPUT=value(,OUTPUT=value)(,DOMAIN=domain_name{:REUSE})
(,COMMIT=TRUE/FALSE)(,ROOT=*)(,ACCEPT=A)(,REJECT=U+D)
(,IGNORE=S)
```

IMPORT Keywords

Table 112 below lists and defines the keywords for the verb, IMPORT.

Table 112 RadDBUtil IMPORT Keywords

Keyword	Explanation
INPUT	This is the prefix (the fully specified drive and path) of the input files. • If a fully specified drive and path is not provided with the input file name, the current directory is used. • If `.xpi` is specified, it will be stripped off. • This keyword is mandatory; it does not have a default value. • The associated resource file must be in the same location and have the same name, but with the extension `.XPR`. This is the only location that will be searched if any of the import Instances require resource data. • If the fully specified drive and path contains blanks or other special characters, it is necessary to enclose in quotation marks the entire file identifier, including the drive letter and all directories.

Keyword	Explanation
OUTPUT	This is the prefix of the output files (the merged “accepts” and “ignores”). Specify a filename to be used for the result of importing this and any modifications to the input media that were required due to events such as duplicate OIDs, different domains, different parentage, etc. • This value is required if any of the output of the modified XPI and XPR decks is required. It defines the directory and name, in XPI and XPR, of the generated, modified output. • If `.xpi` is specified, it will be stripped off.  Although this keyword is optional, there is no default—if it is omitted or specified without a valid value, no output files other than logs will be available after the completion of RadDBUtil.
COMMIT	Specifies whether the CSDB will be updated. **`-commit true`** allows those elements that meet the import criteria to be passed into the CSDB for processing. **`-commit false`** (the default) forces RadDBUtil to only scan and reconcile the input files and the database.
ROOT	Specifies the root instance of the model (either FILE.DOMAIN.CLASS .INSTANCE, DOMAIN.CLASS.INSTANCE, CLASS.INSTANCE, or CLASS). • Only matching instances and those that are referenced (directly or indirectly) by root will be processed. • The default is *. • COMPONENT classes and instances cannot be specified.

Keyword	Explanation
DOMAIN	Specifies an existing CSDB domain into which this import deck is to be placed. • If the specified value does not correctly identify an existing domain in the target database, RadDBUtil will end with an error.  If a domain is specified, the input files will be imported into that CSDB domain. However, if no domain is specified (the default), the input files will be imported into the domains that are specified in the decks. • All of the instance and resource data that are contained in the INPUT-specified decks will be examined and considered for import into the single CSDB domain that is specified by this keyword. • Domain names in the CSDB are limited to 32 bytes.  The **`-domain`** switch is designed to put the contents of the input decks into a single destination. Therefore, when importing a Patch Manager bulletin, do not use this switch because if the instances are coming from multiple domains they must be imported back into multiple domains.

Keyword	Explanation
REUSE	Specify as: **-domain** *domain_name*:**REUSE** This is an optional directive that allows RadDBUtil to compare the target database and import deck for matching package instances and, when present, re-use those that are in the database. This allows RadDBUtil to avoid creating duplicates of package instances and resources in the target domain if they already exist, in either the original source or target domain. • *For each non-root and non-component element in the deck*: the domain that is specified by the DOMAIN keyword is searched first, followed by the domain that is identified in the package instance of the import deck. — If a package instance has the *same name* as the package instance that is found in the CSDB, RadDBUtil will: – ABORT if it is determined that the contents are different from that which is in the import deck. – REUSE it if it is determined that the contents are identical to that which is in the import deck. This means that the existing database package instance will be referenced by the appropriate connection attributes in the import deck, and the matching Package Instances in the import deck will be removed.  Although the :REUSE option might remove duplicates from the import process, the output files (`INPUT.XPI` and `INPUT.XPR`) will contain the instances and resources that were in the original import deck, and which could have been used to update the database but were deferred as a result of this option.

Keyword	Explanation
ACCEPT, REJECT, and IGNORE	The instances in the import deck are compared to the instances in the database. These optional keywords dictate the action—based on that comparison—that RadDBUtil is to take on the import deck and database instances. There are four instances *types*. They are: • **Adds (A)** are instances that are in the import deck and are to be added to the database. The default behavior is to **ACCEPT** these additions. • **Deletes (D)** are instances that are to be deleted from the database. The default behavior is to **REJECT** these deletions. • **Sames (S)** are instances in the import deck that are identical to those in the database. The default behavior is to **IGNORE** these instances. • **Updates (U)** are instances in the database that will be updated by a matching instance in the import deck. The default behavior is to **ACCEPT** these instances. These actions (ACCEPT, REJECT, and IGNORE) are applicable only to these four instance types (A, D, S, and U), and act on only those instance types that have been specified for each. The following points are additional items for consideration when using these keywords. • An instance type cannot be specified for multiple actions in a single RadDBUtil execution. That is, **Adds** cannot be configured to be accepted *and* ignored. • Multiple instance types can be specified for one action (as in, **`-reject`** d+u). If multiple instance types are specified for an action, a plus sign (**+**) must separate them. • Any operations that match the REJECT parameters will cause the tool to not commit, and will return a non-zero return code when processing has completed.

MSI Files

RadDBUtil has an option that allows an import error to be overruled if inconsistent MSI files are discovered. This might occur if the package with the materials matching the IDX file has been renamed (and, as a result,

cannot be found by either import or tree export), or where the ACP file might not yet have been imported into the database, but is in a set of imports that is to be processed subsequent to the current import materials.

The command to overrule the import error is IGNORE=BADMSI.

Output Files

This section provides information about the log files that will be automatically generated by the IMPORT verb. Also, the section, Conditional Files (below), discusses additional logs and files, and the conditions under which they might be generated.

- **Standard Files**
  - **RADDBUTIL.LOG**
    located in the directory specified by DIRECTORY in the MGR_LOG section of the edmprof file. This is a text file that records the actions (activity log) taken by RadDBUtil in processing each command invocation, and the results of these actions. Each execution of RadDBUtil overwrites the previous log.

    To save the logs of previous `RADDBUTIL.EXE` executions, rename the (`RADDBUTIL.LOG`) file.

    This log queries the `edmprof` file and identifies the location of the edmprof file, the CSDB, and the Configuration Server log. It also contains return codes and summary information about execution results.
  - **RADDBUTIL.AUDIT.LOG**
    located in the directory specified by DIRECTORY in the MGR_LOG section of the `edmprof` file. This file contains a record of all RadDBUtil calls and the corresponding return codes; it is designed for archival reference only.
  - **STDERR**
    contains the same information as `RADDBUTIL.LOG` but, by default, is directed to the console. This log can be redirected as desired.
- **Conditional Files**

  XPR and **XPI** Files
  If RadDBUtil import updates the database, these two files will be created in the directory that is optionally specified by the keyword OUTPUT. The contents of these files can be returned to the customer's **Digital Source Library** (DSL) as a record of the materials as imported into the target CSDB.

EXPORT

HP recommends creating a back up the CSDB prior to executing any of the commands that are shown in this section.

The EXPORT verb allows for the simultaneous exporting of the XPC, XPI and, optionally, the XPR decks that are needed to ensure that the exported portions are accurately reproduced in another database. This includes class templates, instances and, optionally, the resources. It also allows the specifying of the entire database, or individual parts of the database (such as domain, class, instance, package, and service) to be exported. EXPORT offers the ability to:

- Perform deletions based on the results of object resolution.
- Specify multiple inputs, such as exporting four services on one export operation.

Additionally, exporting can include:

- The associated resources, and
- All required packages (similar to a client resolution).

Syntax

The syntax of the EXPORT verb is shown below. For examples of the syntax, see Examples on page 365.

Optional keyword-value combinations are in parentheses.
Default values are underlined.

```
RADDBUTIL EXPORT (,DATA=TRUE|FALSE)(,WALK=TRUE|FALSE)
(,OUTPUT=stemname)INPUT

Raddbutil export (-data 0/1)  (-walk 0/1)
(-output stemname) input

Raddbutil export (-data NO/YES)  (-walk no/yes)
(-output stemname) input

Raddbutil export (-data false/true)  (-walk FALSE/TRUE)
(-output stemname) input
```

EXPORT Keywords

Table 113 on page 361 lists and defines the keywords for the EXPORT verb.

Table 113 RadDBUtil EXPORT Keywords

Keyword	Explanation
DATA	Indicates whether to export the resource files in the CSDB. The default is **0** (**FALSE**, **NO**).
WALK	Indicates whether to do a resolution—CSDB should be traversed. The default is **1** (**TRUE**, **YES**).  INPUT is not a keyword, like the others; it is a documentation placeholder. A value must be specified without "input" being used as an indicator, as shown in this table.
OUTPUT	This is the prefix of the output files. • If `.xpi` is specified, it will be stripped off. • This keyword does not have a default value.
INPUT	This, the only mandatory parameter, indicates the CSDB Instances that are to be exported.  INPUT is not a keyword, like the others; it is a documentation placeholder. A value must be specified without "input" being used as an indicator, as shown below. **`Raddbutil export (-data 0/1) (-walk 0/1) (-output`** *`stemname`***`)`** *`file.domain.class.*`* • The format can be either: — **`FILE.*.*.*`**, — **`FILE.DOMAIN.*.*`**, — **`FILE.DOMAIN.CLASS.*`**, — **`FILE.DOMAIN.CLASS.INSTANCE`**, or — **`FILE.DOMAIN.CLASS.INSTANCE(msg)`**. • Wildcards (*) are valid values for the domain, class, and instance keywords. • More than one database instance can be specified; multiples must be separated a blank space.  The INPUT value must be specified at the end of the command line; otherwise the operation will fail.

Output Files

The EXPORT verb will always generate XPC and XPI files. If -data is specified, an XPR file will also be generated.

DELETE

HP recommends creating a back up the CSDB prior to executing any of the commands that are shown in this section.

This verb deletes instances and resources from the CSDB. It offers the ability to perform deletions based on:

- The results of object resolution.
- The contents of an XPI file.

The XPI file that is passed to RadDBUtil when using this verb must be an XPI file that was exported from the CSDB from which the instances and/or resources are to be deleted.

Syntax

The syntax of the DELETE verb is shown below. For examples of the syntax, see Examples on page 365.

Optional keyword-value combinations are in parentheses.

Default values are in underlined.

```
RADDBUTIL DELETE
INPUT=value(,PREVIEW=TRUE|FALSE)(,FILE=value)
(,WALK=TRUE|FALSE)(,IGNORE=value)

Raddbutil delete -input  (-preview value)  (-file value)
(-walk value)  (-ignore value)
```

DELETE Keywords

Table 114 below lists and defines the keywords for the verb, DELETE.

Table 114 RadDBUtil DELETE Keywords

Keyword	Explanation
PREVIEW	Indicates whether to preview the changes only, or make the deletions. The default is **0** (**FALSE**, **NO**, **OFF**).

Keyword	Explanation
FILE	The name of XPI file that specifies what to is to be deleted from the CSDB.
WALK	Indicates whether to do a resolution—CSDB should be traversed. The default is **1** (**TRUE**, **YES**, **ON**).
IGNORE	This keyword specifies (in) which CSDB instances should not be deleted. • The format can be either F.D.C.I or f.d.c.i format. • Wildcards (*) are valid in the domain, class, and instance specifications. • More than one database instance can be specified; multiples must be separated a plus sign (**+**).
INPUT	This parameter indicates which CSDB instances are to be deleted.  INPUT is not a keyword, like the others; it is a documentation placeholder. A value must be specified without “input” being used as an indicator, as shown below. **`Raddbutil delete`** *`file.domain.class.*`* **`(-walk 0/1)`** • The format can be either: — **`FILE.*.*.*`**, — **`FILE.DOMAIN.*.*`**, — **`FILE.DOMAIN.CLASS.*`**, — **`FILE.DOMAIN.CLASS.INSTANCE`**, or — **`FILE.DOMAIN.CLASS.INSTANCE(msg)`**. • Wildcards (*) are valid in the domain, class, and instance specifications. More than one database instance can be specified; multiples must be separated a blank space.

Deleting Bulletins from a Database

To permanently delete Patch Manager bulletins from the Configuration Server Database, specify the following classes with the IGNORE keyword.

- PRIMARY.PATCHMGR.CMETHOD
- PRIMARY.PATCHMGR.OPTIONS

- PRIMARY.PATCHMGR.METADATA
- PRIMARY.SYSTEM.ZMETHOD
- PRIMARY.SYSTEM.PROCESS
- PRIMARY.PATCHMGR.PRODUCT
- PRIMARY.PATCHMGR.SP
- PRIMARY.PATCHMGR.RELEASE
- PRIMARY.PATCHMGR.PATCHARG
- PRIMARY.PATCHMGR.PG2PR
- PRIMARY.PATCHMGR.PROGROUP

The following example shows these classes being included with the IGNORE option.

```
Raddbutil.exe delete -walk 1 -ignore
PRIMARY.SYSTEM.PROCESS.*+PRIMARY.SYSTEM.ZMETHOD.*
+PRIMARY.PATCHMGR.CMETHOD.*+PRIMARY.PATCHMGR.METADATA.*
+PRIMARY.PATCHMGR.OPTIONS.*+PRIMARY.PATCHMGR.PATCHARG.*
+PRIMARY.PATCHMGR.PRODUCT.*+PRIMARY.PATCHMGR.RELEASE.*
+PRIMARY.PATCHMGR.SP.*+PRIMARY.PATCHMGR.PG2PR.*
+PRIMARY.PATCHMGR.PROGROUP.*
 -preview 0 PRIMARY.PATCHMGR.ZSERVICE.MS07-042(SYNC)
```

RCS

This verb communicates with the CSDB and allows for:

- Querying of the CSDB **lock status**.
- Unlocking of the CSDB.

Syntax

The syntax of the RCS verb is shown below. For examples of the syntax, see the section, Examples starting on page 365.

```
raddbutil rcs status

raddbutil rcs unlock
```

RCS Keywords

Table 115 on page 365 lists and defines the keywords for the verb, RCS.

Table 115 RadDBUtil RCS Keywords

Keyword	Explanation
STATUS	Displays the lock status of the Configuration Server status.
UNLOCK	Unconditionally unlocks the Configuration Server.

Return Codes

Table 116 below shows the return codes that are associated with the RadDBUtil executable.

Table 116 RadDBUtil Return Codes

Return Code	Meaning
0	SUCCESS
4	WARNING
8 or 16	FAILURE • No database update occurred, or • A database update was started but not completed. Note: If the latter, the database might be in an error state.

Examples

This section presents a few examples of the simpler and more direct `RADDBUTIL.EXE` syntax.

As previously stated, the `RADDBUTIL.EXE` utility supports the following two syntax formats:

`-keyword` *`value`*

and

`keyword=`*`value`*

The examples in this section are presented in the **`-keyword`** *`value`* format.

IMPORT Examples

Example 1. Performing a simple import

Run a routine, daily import of the file, `sample.xpi` in order to add instances to the CSDB.

```
raddbutil import –input sample -commit yes
```

Abort if there are updates and/or deletes.

```
raddbutil import -input sample -accept A -reject U+D
-commit yes
```

Ignore any updates and deletes.

```
raddbutil import -input sample -accept A -ignore U+D
-commit yes
```

Results:

- The instances and resource data from the files `sample.xpi` and `sample.xpr` are imported directly into the domain and class that are specified in the input deck.
- No domain mapping is performed

Example 2. Performing a simple import and replacing the old instances

```
raddbutil import –input sample –accept A+U+D –commit yes
```

Example 3. Importing to a domain other than SOFTWARE

Import all instances from the input deck into the SOFT0002 domain. Re-use any database elements that are identical to elements of the deck, overrule the inconsistent MSI file import error, and reject any updates.

Example 3a

The syntax of the following example is fully supported by RadDBUtil.

```
Raddbutil Import -Input Sample -Domain SOFT0002:Reuse
-Commit Yes -Ignore Badmsi
```

Example 3b

The following example is the same as Example 2a, but includes the fully specified drive and path (with special characters) of the input material, and the name of the output decks.

```
RADDBUTIL IMPORT -INPUT "G:\CONTAINS BLANKS\SAMPLE"
-OUTPUT Sample_Soft_2 -DOMAIN SOFT0002:REUSE -COMMIT YES
-IGNORE BADMSI
```

EXPORT Examples

Example 4. An easy method by which to create export files

The following command will create AMORTIZE.XPC and AMORTIZE.XPI containing just the specified class and instance.

```
raddbutil export -output amortize
PRIMARY.SOFTWARE.ZSERVICE.AMORTIZE
```

Example 5. Using the -walk command

The following command will create AMORTIZE.XPC and AMORTIZE.XPI containing the classes and instances. This command will resolve the package, and include any other required packages because **-walk** is specified.

```
raddbutil export -output amortize -walk 1
PRIMARY.SOFTWARE.ZSERVICE.AMORTIZE
```

No resources will be exported.

Example 6. Using the -walk and -data commands

Example 6a

The following command will create AMORTIZE.XPC, AMORTIZE.XPI, and AMORTIZE.XPR which contain the classes, instances, and resources (because **-data** is specified), and the package will be resolved because **-walk** is specified.

```
raddbutil export -output AMORTIZE -walk 1 -data 1
PRIMARY.SOFTWARE.ZSERVICE.AMORTIZE
```

Example 6b

The following command will create ALL.XPC, ALL.XPI, and ALL.XPR containing the classes, instances, and resources of all services in the SOFTWARE Domain.

```
raddbutil export -output ALL -walk 1 -data 1
PRIMARY.SOFTWARE.ZSERVICE.*
```

Example 7. Exporting and importing the PRIMARY File (ZEDMAMS used to import the class)

The following series of commands will export and then import the entire PRIMARY file of the CSDB.

```
raddbutil export -output ALL -walk 1 -data 1
PRIMARY.*.*.*

zedmams verb=import_class,file=ALL.xpc,preview=no,
logfile=ALL_PRIMARY.log

raddbutil import -input ALL -commit yes
```

Example 8. Exporting, deleting, and importing a bulletin

The following commands will export, delete, and import (respectively) the Patch Manager bulletin, MS07-042.

In the following examples, the value of INPUT should be enclosed in quotation marks on UNIX platforms.

Export

```
./raddbutil export -walk 1 -data 1 -output ms07-042
"PRIMARY.PATCHMGR.ZSERVICE.MS07-042(SYNC)"
```

Delete

```
raddbutil.exe delete -walk 1 -ignore
PRIMARY.SYSTEM.PROCESS.*+PRIMARY.PATCHMGR.ZMETHOD.*
+PRIMARY.SYSTEM.CMETHOD.*+PRIMARY.PATCHMGR.METADATA.*
+PRIMARY.PATCHMGR.OPTIONS.*+PRIMARY.PATCHMGR.PATCHARG.*
+PRIMARY.PATCHMGR.PRODUCT.*+PRIMARY.PATCHMGR.RELEASE.*
+PRIMARY.PATCHMGR.SP.*+PRIMARY.PATCHMGR.PG2PR.*
+PRIMARY.PATCHMGR.PROGROUP.* PRIMARY.PATCHMGR.ZSERVICE.
MS07-042(SYNC)
```

Import

```
raddbutil import -input ms07-042 -commit yes
```

In the import example, the **-domain** switch was not used because the instances are coming from multiple domains.

See the warning under DOMAIN in Table 112 on page 354.

Example 9. The DELETE verb

This series of example focuses on the DELETE verb commands.

- Delete the service PRIMARY.SOFTWARE.ZSERVICE.MSOFFICE.

  ```
  raddbutil delete PRIMARY.SOFTWARE.ZSERVICE.MSOFFICE
  ```

- Delete the service PRIMARY.SOFTWARE.ZSERVICE.MSOFFICE; do not delete the methods.

  ```
  raddbutil delete -walk 1 -ignore
  PRIMARY.SYSTEM.ZMETHOD.* PRIMARY.SOFTWARE.ZSERVICE.
  MSOFFICE
  ```

- Delete the instance PRIMARY.SOFTWARE.ZSERVICE.MSOFFICE.

  ```
  raddbutil delete -walk 0 PRIMARY.SOFTWARE.ZSERVICE.
  MSOFFICE
  ```

- Delete the contents of `foo.xpi`.

  ```
  raddbutil delete -file foo.xpi
  ```

Example 10. The Configuration Server Database

The following commands pertain to the Configuration Server Database.

- Show the current status of the CSDB.

  ```
  raddbutil rcs status
  ```

- Unlock the CSDB.

  ```
  raddbutil rcs unlock
  ```

8 Configuration Server Performance

At the end of this chapter, you will:

- Have a better understanding of how CPU and network considerations can impact various performance aspects of the Configuration Server.

An Overview of Performance Issues

The purpose of this chapter is to discuss system performance issues as they relate to the Configuration Server. The next chapter, Chapter 9, Troubleshooting the Configuration Server, explores some problem determination issues.

Performance issues are associated with enhancing the efficiency of a working system, while troubleshooting deals with features, functions, and components that are not operating as expected. Taking into account performance and usage considerations prior to configuring the Configuration Server might prevent many of the conditions that require troubleshooting.

The Configuration Server is a multi-platform, multi-processing server framework for:

- Policy Management
- Component Management
- Network Management
- Version Management
- Asset Management
- State Management

There are many aspects of Configuration Server performance. In addition, there are specific phases of Configuration Server operations. Each phase has different performance characteristics and requirements. Because of these many variables, there is no easy “cook book” approach to Configuration Server performance.

General Performance and Usage Considerations

Three important performance and usage considerations must be taken into account before beginning any discussion of Configuration Server issues.

- *What is the overall system infrastructure?*
  This includes numbers, types, and speeds of processors; total size and type of memory; and network capability and configuration.
- *What are the performance benchmarks?*
  These include average performance levels, as well as the high and low levels.

- *What are the workload parameters?*
  These include average demand, peak load requirements, and idle times.

Before undertaking any further performance initiatives, become familiar with the above considerations as they apply to your Configuration Server.

How this Chapter is Organized

This chapter is divided into three areas that dramatically influence performance:

- CPU Requirements, starting below.
- Memory, starting on page 375.
- Networking, starting on page 377.

CPU Requirements

There are minimum CPU requirements specified at installation for each Configuration Server platform. It must be noted, however, that these are *minimum values*. The real requirements for CPU utilization can only be determined by workload—essentially, the number of resolutions that a Configuration Server can process.

The CPU and Object Resolution

As each HPCA agent connects to the Configuration Server, an identifier object (ZMASTER) is sent from the HPCA agent to the Configuration Server triggering the dynamic construction of an object model for that HPCA agent. This process is known as *object resolution*. The object resolution process exhausts most of the processor time required by the Configuration Server.

When trying to determine how many object resolutions can take place simultaneously, use the simple formula outlined below.

Total Number of Available CPU Seconds

x Number of CPU Seconds required (per user)

= **Total Number of Possible User Resolutions**

Total Number of Available CPU Seconds

This value is obtained by multiplying the number of CPUs by the number of seconds in the connection window of opportunity. The window of opportunity is the timeframe in which the HPCA agents need to connect.

For example: a two-processor machine with a six-hour window of opportunity (e.g., 12:00 AM - 6:00 AM) would result in a total number of available CPU seconds of 43,200. (2 processors X 6 hours (21,600 seconds) = 43,200 seconds).

Total Number of CPU Seconds Required Per User

This value is a little more complicated to obtain. Some benchmarks for object resolution speed have been determined by HP running a Configuration Server on an HP/K200 system with 85 MHz processors. We have determined that approximately 860 objects can be resolved in one second. With this benchmark, we can make an approximation of how many CPU seconds are required to resolve a user's object model.

By taking the average number of FILE objects per user (ZRSOURCE being the most common object in a user's model) and multiplying it by three (an estimate of how many objects are resolved in order to end up with a fully resolved ZRSOURCE), we get the average number of objects to be resolved per user. We then divide that by the number of objects the Configuration Server can resolve in a CPU second, and get the number of CPU seconds required to resolve the average HPCA agent's object model.

For example, let us assume that the average number of ZRSOURCE objects per user in your environment is 1000. We multiply that by 3, and get 3000 objects per user. Now divide 3000 by 860 (the average number of objects resolved per second by the Configuration Server), and you get approximately 3.5 seconds of CPU time required to resolve the average user's model.

1000 x 3 = 3000
3000/860 = ~3.5 (3.488…)

Total Number of Possible User Resolutions

This value is obtained by dividing the (*Total Number of Available CPU Seconds*) by the (*Total Number of CPU Seconds Required per User*). Using the results of our previous examples, we would divide the 43,200 (available CPU Seconds based on a two-processor machine with a six-hour window) by 3.5 (number of CPU seconds required to resolve the average user's model) resulting in a (*Total Number of Possible User Resolutions*) of approximately 12,000.

43,200/3.5 = ~12,000 (12,342.8571…)

This calculation does not mean that 12,000 users could be successfully configured in the six-hour period. Other variables must be considered, such as disk I/O for data being transferred/received to/from HPCA agents, the platform's network card capability (for concurrent communications between the Configuration Server and HPCA agents), and the system's available memory (process/memory swapping requires system overhead).

Also, note that other tasks running on the machine will be sharing system resources with the Configuration Server.

Memory

There are two features that deal with memory usage, **content caching** and **index caching**. They are established in the MGR_CACHE section of the Configuration Server `edmprof` file.

- **Content Caching**
  refers to loading a portion of the CSDB (class templates, base instances, and other instances) into memory to speed up the resolution process. This enhances performance by eliminating disk I/O. In configuring index caching, the size used for each content cache entry needs to reflect the size of the instance in the database before any resolution has been performed. This provides a resolution boost across the Configuration Server.
- **Index Caching**
  is used to keep in memory all names of the instances of the class that have been cached. Caching the names of all instances of cached classes eliminates the need to read the directory in order to determine which instances begin with the specified prefix. Index caching makes a significant performance improvement when the generic resolution feature is utilized. Generic resolutions are those that use a partially specified CLASS.INSTANCE naming format that terminates in an asterisk (*), indicating that all instances with the same prefix are to be resolved.

MGR_CACHE

The MGR_CACHE section of the Configuration Server `edmprof` file defines the values that determine how much **virtual storage** is reserved for

content cache. The two values are CACHE_SEGMENTS—which determines the number of separate memory areas—and CACHE_SIZE—which is allocated at startup and used exclusively for content cache. The product of CACHE_SEGMENTS x CACHE_SIZE is the amount of memory that will not be available for resolution purposes during connection.

In a Windows environment, the maximum virtual storage that will be available for any single process is 2 GB. If the Windows Enterprise Server is used, this is increased to 3 GB, and for Windows 2003 Server x64, up to 4 GB of virtual memory per 32-bit process, although it might be constrained by the size of real memory and the size of the page space available.

The Configuration Server process will attempt to use all of the virtual storage that is available to it and might cause all of the defined page space to be in use, so make sure that the total page file space is at least 4 GB. The value of AVERAGE_OBJECT_SIZE in this section should be set to the size of the largest Instance of the Classes being cached. The default is **2048** bytes.

A parameter called ICACHE_SIZE is available for **index caching**. It is activated by simply specifying a value for the keyword. The easiest means by which to correctly size this is to take the total of all instances to be cached, multiply by 100, and place the result as the ICACHE_SIZE value size. ICACHE_SIZE is of benefit when generic resolution is active, that is, any connection to SOFTWARE.PACKAGE.* that requires the Configuration Server to process all of the potential Instances prefixed by the string. While ICACHE is most important for SOFTWARE.FILE, the caching mechanism (described below in MGR_CLASS) uses the same criteria for selecting which DOMAIN.CLASS Instances to cache.

MGR_CLASS

The MGR_CLASS section controls two separate processes: initial Classes to be cached and the amount of storage to be used for in-storage objects during resolution of each HPCA agent (as differentiated from CSDB Classes and Instances where the Class name might be the same as the in-storage object name, as is the case of ZSERVICE). In-storage objects of interest are generally persistent and multi-heap. Controlling the storage and processing of these objects provides for performance improvements.

For index caching and content caching, the contents of MGR_CLASS are processed in the order in which they are presented, so the first DOMAIN.CLASS is processed completely (index cache is loaded and content cache is loaded) before the second, and so on.

For each DOMAIN.CLASS (for example, SOFTWARE.FILE) that is identified in this section, four parameters are specified. The first and second control the caching behavior, and the third and fourth are used exclusively for persistent object virtual storage allocation during resolution.

For a detailed explanation of the MGR_CLASS settings, including performance and usage considerations, see MGR_CLASS on page 47. The first of the four parameters (Value1) allows one to specify whether the Class template and _Base_Instance_ are to be cached. A value of Y is recommended because it is generally necessary to load the Class template and _Base_Instance_, and this eliminates a tremendous amount of disk I/O for Classes that are commonly involved in resolution.

Networking

Bandwidth Throttling

Bandwidth throttling refers to reserving a percentage of the available TCP/IP bandwidth for use by other processes on the device. It was designed to help maximize network resources while running the Configuration Server. Bandwidth throttling is configured in the Configuration Server using the SEND_THROTTLE setting of the MGR_TIMEOUT section of the `edmprof` file. It specifies the number of milliseconds that the Configuration Server will wait before sending packets. The default is **0**, meaning no delay. The range of values is 0 to 4 GB.

There are three variables in the HPCA agent's ZMASTER object that also have an impact on bandwidth throttling, ZBWMGR, ZBWMAX, and ZBWPCT.

- ZBWMGR=YES means the Configuration Server will be controlling the bandwidth.
- ZBWMAX is the maximum speed (bytes/second) of the "sends."
- ZBWPCT is the percentage of the maximum to use (0–100).

The ZBWMGR, ZBWMAX, and ZBWPCT values will override the SEND_THROTTLE setting.

9 Troubleshooting the Configuration Server

At the end of this chapter, you will:

- Have a better idea of some of the common causes of Configuration Server processing problems, and be able to quickly recognize and remedy them.

If your environment uses Core and Satellite servers, first read the *Core and Satellite Servers Getting Started Guide* as the installation, configuration, and troubleshooting information in that guide may override the information in this guide.

Troubleshooting Issues

The purpose of this chapter is to explore problem determination issues as they relate to the Configuration Server. Chapter 8, Configuration Server Performance discusses system performance issues.

Performance issues are associated with enhancing the efficiency of a working system while troubleshooting deals with features, functions, and components that are not operating satisfactorily. Before troubleshooting, see General Performance and Usage Considerations on page 372.

General Troubleshooting Considerations

There are several things that you should consider before attempting to troubleshoot a specific problem:

- *What, specifically, is the problem?*
  Sometimes, different problems have similar symptoms. For example, if an HPCA agent resolution does not complete due to timing out, the timeout could be based on either a Configuration Server value or an HPCA agent setting.
- *At what point did the problem occur?*
  If you can determine at what point a process failed, you might be able to eliminate prior steps.
- *How is the problem reflected in the Configuration Server log?*
  You can use the Configuration Server log and the search tools provided by HP Technical Support to isolate exactly where the problem is reported in the Configuration Server log.
- *Are there external causes for the problem?*
  You might be able to determine if a cause unrelated to the Configuration Server is responsible for the problem.

How this chapter is organized

This chapter is organized into three general scenarios:

- The Configuration Server Does Not Start
- The Configuration Server Does Not Process Tasks as Expected
- The Configuration Server Does Not Respond

Each scenario contains individual conditions, possible causes, and recommended actions.

The Configuration Server Does Not Start

Table 117 The Configuration Server Does Not Start

Condition	Possible Cause	Recommended Action
The Configuration Server does not start.	The CSDB did not verify correctly.	Reset VERIFY_DEPTH setting in the Configuration Server `edmprof` file.
	There is insufficient disk space.	Free up sufficient disk space.
	The Configuration Server `edmprof` file is not processed.	Ensure that the Configuration Server `edmprof` file is in the same directory as ZTOPTASK.
The Configuration Server does not start. (*NT-specific*)	The Configuration Server was installed under a user account that is not part of the Windows Admin Group.	Reinstall the Configuration Server under a user account that is part of the Windows Admin Group.
The Configuration Server does not appear in the Windows Services List. (*NT-specific*)	The Configuration Server was not installed as a Windows service.	Reinstall the Configuration Server as a Windows service.
The Configuration Server does not start automatically when rebooted. (*NT-specific*)	The Configuration Server Service in the Windows Services List is set to manual.	Set the Configuration Server Service to Automatic. Then reboot the Configuration Server.

The Configuration Server Does Not Process Tasks as Expected

There are two aspects to this scenario: either the Configuration Server does not perform the process correctly, or the data received is not correct.

Table 118 The Configuration Server Does Not Process Tasks as Expected

Condition	Possible Cause	Recommended Action
No Console or Admin	Incorrect MGR_ACCESS	Change MGR_ACCESS

Condition	Possible Cause	Recommended Action
functions.	values.	values.
Configuration Server tasks not starting.	Tasks not listed in MGR_ATTACH_LIST section.	Add slots in MGR_ATTACH_LIST section.
Configuration Server does not accept HPCA agent tasks.	No Configuration Server communications tasks specified in MGR_ATTACH_LIST section.	Specify appropriate Configuration Server communications tasks in MGR_ATTACH_LIST section.
Configuration Server does not accept additional HPCA agent tasks.	Setting in TASKLIM is too low.	Increase TASKLIM setting.
Too much processor time required to load commonly used classes.	Classes not listed in MGR_CLASS section.	Add classes to MGR_CLASS section.
Methods not executing properly.	TIMEOUT setting in MGR_METHODS section is too low.	Increase TIMEOUT setting in MGR_METHODS section.
Too many messages in Configuration Server log.	Tracing is set to YES.	Set tracing to NO for unnecessary trace settings.
Configuration Server log is slow to respond.	FLUSH_SIZE is set too low.	Increase FLUSH_SIZE in MGR_LOG section.
Lost portions of Configuration Server log.	Log has been reused.	Change THRESHOLD setting in MGR_LOG section to a positive value.

The Configuration Server Does Not Respond

Table 119 The Configuration Server Does Not Respond

Condition	Possible Cause	Recommended Action
The Configuration Server does not respond to communications requests.	Configuration Server communication tasks are not enabled.	Add appropriate Configuration Server communications tasks in MGR_ATTACH_LIST section.
The Configuration Server does not respond to HPCA agent task requests.	Other HPCA agents have a RETRY value that is too low.	Raise RETRY value to at least 1.

10 Configuration Servers in Multiple Mode

At the end of this chapter, you will:

- Be able to establish a single Configuration Server to service EDM clients and HPCA agents.

  The proper EDM and Client Automation licensing has to be acquired in order for the Configuration Server to function as "multi-mode."

Comment [JGM7]: Should we delete references to EDM clients?

Comment [JGM8]: same here.

Introduction

The Configuration Server is capable of processing EDM clients, HPCA agents, and other transactions during a single Configuration Server session. Some features in the Configuration Server apply to HPCA only, and conversely, some apply to EDM only.

Comment [JGM9]: Maybe this whole chapter needs to be reviewed for references to EDM.

- EDM could be seen as a multi-service batch type of environment, with configurations that are oriented to complicated, multi-dimensional processes that define the states of devices and/or servers.
- HPCA represents interactive, single-service processing, so the CSDB contains additional features that simplify its use.

Single Configuration Server

The Configuration Server can work in a multi-function mode; serving *agents* (EDM clients and HPCA agents) that have different settings that direct the paths of resolution that are stored in the CSDB. Generally, even the definitions can be shared as long as the resolution starting point is separately defined for each type of agent.

In previous versions of the Configuration Server, the resolution starting point was defined in the MGR_STARTUP section of the `edmprof` file (see page 98). When as a "multi-mode," the Configuration Server queries the DOMAIN.CLASS starting points that are specified in the EDM_STARTUP (see page 103) and RADIA_STARTUP (see page 104) sections of the `edmprof` file for all EDM clients and HPCA agents (respectively). This ensures that the resolution starting point will be different depending on the type of agent that is connecting.

The following examples show the old and new resolution starting points.

Example 1: Old Resolution Starting Point

```
[MGR_STARTUP]
MANAGER_TYPE     = DISTRIBUTED
MGR_ID           = 001
MGR_NAME         = EDM_001
TCP_PORT         = 3460
SHOW_VERINFO     = NO
```

```
   ...
/'Resolution start points:'/
START DOMAIN     = ZSYSTEM
START CLASS      = ZPROCESS
/'Resolution default domains and classes:'/
DOMAIN           = ZSYSTEM
CLASS            = ZPROCESS
[MGR_ACCESS]
ADMIN            = deny
CONSOLE          = deny
   ...
```

In Example 1, the resolution starting point (START DOMAIN and START CLASS) for all EDM clients is `ZSYSTEM.ZPROCESS.`*`OBJECT_NAME`*.

Example 2: New Resolution Starting Point

```
[MGR_STARTUP]
MANAGER_TYPE      = DISTRIBUTED
MGR_ID            = 001
MGR_NAME          = EDM_001
TCP_PORT          = 3460
SHOW_VERINFO      = NO
   ...
[EDM_STARTUP]
START_DOMAIN      = ZSYSTEM
START_CLASS       = ZPROCESS
[RADIA_STARTUP]
START_DOMAIN      = SYSTEM
START_CLASS       = PROCESS
   ...
[MGR_ACCESS]
ADMIN             = deny
CONSOLE           = deny
```

. . .

In Example 2:

- The resolution starting point (START_DOMAIN and START_CLASS) for EDM clients is:

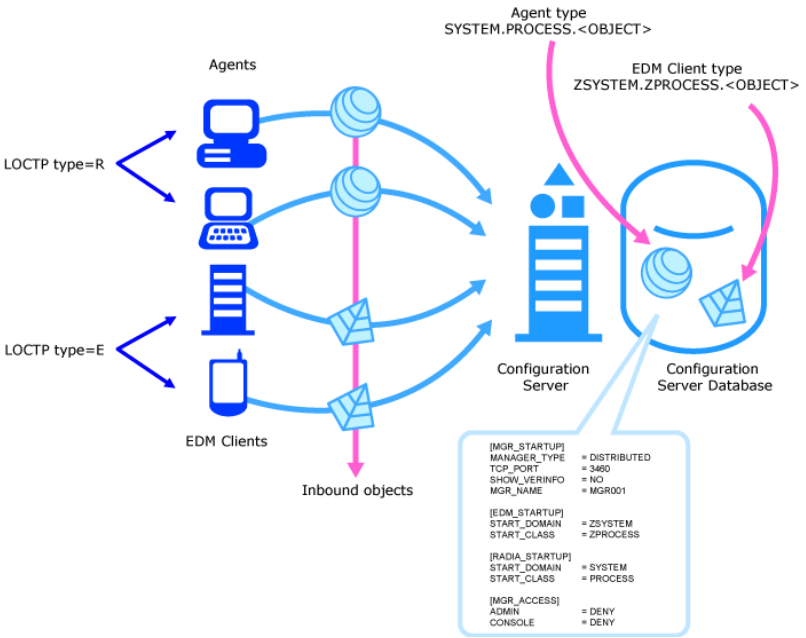
  `ZSYSTEM.ZPROCESS.`*`OBJECT_NAME`*

- The resolution starting point (START_DOMAIN and START_CLASS) for HPCA agents is:

  `SYSTEM.PROCESS.`*`OBJECT_NAME`*

Figure 23 below shows what the processing of this Configuration Server might look like.

Figure 23 Configuration Server multi-mode processing



How does the Configuration Server distinguish between EDM clients and HPCA agents?
The agent type (*EDM client* vs. *HPCA agent*) is defined in the initial

"handshake" transaction (called EDMLOCTP) that every agent sends to the Configuration Server immediately after the connection is established.

The EDMLOCTP contains the EDM client/HPCA agent product field that sets the client type—**E** (EDM client) or **R** (HPCA agent).

As mentioned, the resolution starting point for each type of agent is defined in the Configuration Server edmprof file.

Then, for any inbound object, the resolution starts in the specified domain and class.

11 SSL Managers

At the end of this chapter, you will:

- Have a better understanding of the configuration and use of the Configuration Server SSL Manager task.

The proper licensing is required in order to operate the SSL Manager.

For more information on SSL Managers, proxies, and firewalls, refer to the *SSL Implementation Guide*, which covers:

- Installing and implementing SSL in a Client Automation environment.
- SSL components and terminology.
- Configuring an HPCA agent.
- OSI and TCP/IP reference models.
- The purpose and benefits of proxies and firewalls.
- OpenSSL

Introduction

The Configuration Server is a powerful resource for the storage and dissemination of information. Its versatility is enhanced by the introduction of security in the information exchange, and enabling the Configuration Server to act as a web server.

This feature is enabled via the SSL Manager, a new task that must be entered in the MGR_ATTACH_LIST section of the Configuration Server's `edmprof` file. For instructions on how to do this, see the section, Configuration Server Changes, starting on page 394; or the MGR_ATTACH_LIST section, starting on page 39.

Virtual IP Addresses in UNIX

With virtual IP addresses, a machine with a single Network Interface Card (**NIC**) can have multiple IP addresses. This is especially useful when multiple server programs have to listen on the same port. To resolve the port conflicts, machines are set up with *virtual IP addresses*, whereby multiple IP addresses are assigned.

The ztcpmgr can support virtual IP addresses. It accepts the IP address and port number on the command line, as shown in this example MGR_ATTACH_LIST section entry:

```
CMD_LINE=(ztcpmgr addr=1.1.1.10,port=4438) RESTART=YES
```

If the **address** is not specified, the machine address is used.

To configure virtual IP addresses, use the **ifconfig** command. This command has to be run under **root** privileges, as shown in the following example.

```
/usr/sbin/ifconfig hme0:1 inet 208.244.225.163 netmask
0xffffff00 broadcast +

/usr/sbin/ifconfig hme0:2 inet 208.244.225.175 netmask
0xffffff00 broadcast +

/usr/sbin/ifconfig hme0:1 up

/usr/sbin/ifconfig hme0:2 up
```

hme0 is the device name. This can be **le0** on other systems. To get the proper device name, type:

```
ifconfig -a
```

Starting the Configuration Server with Root Privileges on UNIX Systems

When an HPCA agent has to connect to the Configuration Server using an intermediary Web server, it uses TCP/IP tunneling. The TCP/IP tunneling works by blindly funneling requests between the HPCA agent and the Configuration Server. It is important that the Configuration Server's port number be properly set.

For using ports below 1024, which are reserved ports, you would have to start the Configuration Server as root, either using the rc scripts or logging in as root. In addition, you would have to set the LD_LIBRARY_PATH to the Configuration Server executable directory before you run ZTOPTASK, as in the following example.

```
LD_LIBRARY_PATH=/mgrbuild/V4.11/exe:/usr/lib:lib
export LD_LIBRARY_PATH
./ztoptask
```

For Microsoft proxy servers, the port number has to be 443, which is the secure HTTP port. This requires that the Configuration Server run on port 443, so that the proxy can contact it; otherwise, the proxy won't let the HPCA agents establish the tunnel.

SSL Manager

Enabling SSL in Configuration Server and HPCA Agent

Secure Sockets Layer (**SSL**) capability increases security in the Configuration Server's information exchange. It is a communication DLL (shared library), similar to HP TCP/IP DLL. The SSL protocol is actually an extension of HP existing TCP/IP DLL, and is called `nvdtcps.dll`. SSL is used by the HPCA agent and the Configuration Server, and is implemented using the public domain, **OpenSSL**.

To use SSL, the HPCA agent and the Configuration Server each need a Certificate Authority root certificate (CA root certificate). These certificates enable the Configuration Server–HPCA agent handshake, so they can communicate. The Configuration Server needs a Server certificate also.

Configuration Server Changes

To enable SSL on the Configuration Server, add a task to the MGR_ATTACH_LIST section, as below.

```
[MGR_ATTACH_LIST]
CMD_LINE=(zsslmgr) RESTART=YES
```

With the SSL Manager, there are two important components: `nvdtcps.dll` (the SSL DLL) and zsslmgr (the SSL Manager Task). The MGR_SSL section of the `edmprof` file allows you to configure SSL.

HPCA Agent Changes

To enable SSL on the HPCA agent, the parameters listed in Table 120 below must be in its ZMASTER object.

Table 120 ZMASTER Object Parameters

Parameter	Function
CAFILE	Use to specify the Certificate Authority certificate file.
ZDEVICEN	Use to specify the device number for SSL (094).

Client Automation-specific Changes

The Certificate Authority root certificates are stored in the CACERTIFICATES directory. The HPCA agent should store all the CA certificates in this directory. If there are multiple CAs, they should be stored with unique names. The default certificate file is `CACERT.PEM`.

HPCA Proxy Server

The Proxy Server functions as an extension of the Configuration Server. When it is used, it becomes the primary repository for HPCA agent data. Once an HPCA agent determines which resources it needs in order to achieve its desired state, it can request the resources from the Proxy Server. This feature allows the Configuration Server to allocate more resources to other tasks.

HPCA agent requests are made using either HTTP or TCP/IP. The Proxy Server can service multiple, concurrent HPCA agent requests using both protocols simultaneously.

For extensive information on Proxy Server, refer to the *Proxy Server Guide*.

A Configuration Server Methods

This appendix is a reference for Configuration Server methods. For information on configuring and using Configuration Server methods, see Chapter 3, Managing Configuration Server Processing.

Table 121 below provides an alphabetical list of Configuration Server methods and a description of the method's use.

Table 121 Configuration Server Methods

Method	Description
EDMMAILQ	Deposits e-mail in the mail queue (outbox) so it can be sent to a remote system user.
EDMMALLO	*This method is not applicable to the current release of the Configuration Server.*
EDMMCACH	Refreshes or disables cache.
EDMMDALO	*This method is not applicable to the current release of the Configuration Server.*
EDMMDB	Locks and unlocks the database against all components except Distributed Configuration Server.
EDMMGNUG	Retrieves a list of local and global groups to which a specified user belongs.
EDMMPUSH	Puts an inbound object into a notify queue.
EDMMPUTD	Receives multiple data types that are sent by the Inventory Manager and stores the data in files on the Configuration Server (EDM only).
EDMMRPRO	Adds, updates, or deletes instances in the PRIMARY file based on the variables of an in-storage object.
EDMMSQLG	Imports data from an external SQL database.
EDMMSQLP	Exports data to an external SQL database.
EDMMULOG	Used to write to the user log file.
EDMSIGN	Authenticates users against the database.
EDMSIGNR	Authenticates users against external security systems.

Method	Description
ZDCLASS	Deletes a class from the database.
ZDELINS	Deletes an instance or instances from within a database class.
ZDELOBJS	Deletes an in-storage object.
ZDELPROF	Deletes an object in the PROFILE File.
ZEXIST	Verifies the existence of a given class or instance in the database.
ZGETPROF	Creates an in-storage object from the PROFILE File.
ZNFYT	Executes a TCP/IP notification on a HPCA agent.
ZOBJCMPR	Compresses an in-storage object.
ZOBJCOPY	Copies an in-storage object.
ZOBJDELI	Deletes an instance from an in-storage object.
ZOBJDELV	Deletes a variable from all instances of an in-storage object.
ZOBJSORT	Sorts instances, by stems, of in-storage objects.
ZPROMANY	Adds or updates an instance to the database.
ZPUTHIST	Puts an in-storage object into the HISTORY file.
ZPUTPROF	Puts an in-storage object into the PROFILE File.
ZSIMRESO	Resolves specified objects.
ZTOUCH	Updates the date/time stamp of an instance.
ZVARDEL	Deletes all in-storage objects.
ZVARGBL	Migrates values from one in-storage object to another and deletes the source object.
ZVARLOG	Displays the contents of an in-storage object.
ZUPDPROF	Updates profile information, only; it does not perform any type of deletion.
ZXREF	Cross-references class and instance usage during the object resolution process.

The following pages describe each Configuration Server method, providing examples of use, a description, its parameters, and the associated possible return codes.

All arguments are expected to be in the format, KEYWORD=VALUE, and delimited by commas.

Quotation marks (**“ ”**) are required when a value contains commas and/or embedded blanks.

EDMMAILQ

This method deposits e-mail in the mail queue (outbox). For this method to execute correctly, the MGR_SMTP_MAIL section must be added to the Configuration Server `edmprof` file.

EDMMAILQ Parameters

attach	Specifies attachment files. Multiple attachments can be listed by using a semicolon (;) delimiter between each attachment. For example, **`c:\config.sys;c:\autoexec.bat`**. Attachments are sent using MIME, and can be in binary. This parameter is optional.
from	The sender's address. This parameter is required.
mesgfile	Specifies the file that contains the message. Used in place of the parameter, message, if the message is greater than 255 bytes. This parameter is optional.
message	Specifies a brief message (limited to 255 bytes). This parameter is required.
subject	Specifies the subject of the e-mail. This parameter is optional.
to	Specifies the e-mail recipients. Multiple users can be listed by using a semicolon (**;**) delimiter between each recipient. This parameter is required.

Parameters are used like keywords and are not case-sensitive.

Example

In the example below, an e-mail with a brief message is sent from **user1@company1.com** to **user2@company2.com**.

```
EDMMAILQ from=user1@company1.com,to=user2@company2.com,
Message="This is a brief message"
```

Example

In the example below, a text file (`c:\report.txt`) with a subject (**`My report`**) is sent between the same users.

```
EDMMAILQ from=user1@company1.com,to=user2@company2.com,
Mesgfile=c:\report.txt,Subject="My report"
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

EDMMALLO

This method is not applicable to the current release of the Configuration Server.

EDMMCACH

This method refreshes or disables caching.

EDMMCACH Parameters

Parameter	Description
option	Caching option values are ENABLE or DISABLE.

Example

```
ADDRESS EDMLINK EDMMCACH 'option=ENABLE' ;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

EDMMDALO

This method is not applicable to the current release of the Configuration Server.

EDMMDB

This method locks and unlocks the CSDB to all tasks except the Distributed Configuration Server.

EDMMDB Parameter

option	LOCK locks the CSDB to any incoming tasks except Distributed Configuration Server. UNLOCK makes the CSDB accessible to all incoming tasks.

Example

```
EDMLINK EDMMDB "OPTION=LOCK"
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

EDMMGNUG

This method retrieves a list of local and global groups to which a specified user belongs.

This method is functional in a Windows network environment only.

Usage

This method is used to issue a function call to a specific server to collect information about the Windows group membership of a user. It does not provide authentication of a particular user ID. These calls are issued under security provisions of the user used to start the Configuration Server when it runs as a normal task; or under a system account when the Configuration Server runs as a service. See the Security Requirements below for security limitations as defined by Microsoft.

Security Requirements

Windows NT

No special group membership is required to successfully execute the EDMMGNUG method.

Windows 2000

If you invoke this function on a Windows 2000 domain controller that is running Active Directory, access is determined based on the access control list (**ACL**) for the securable object. The default ACL permits all authenticated users and members of the “Pre-Windows 2000 compatible access” group to view the information. By default, the “Pre-Windows 2000 compatible access” group includes everyone as a member. This enables anonymous access to the information if the system allows anonymous access.

If you invoke this function on a Windows 2000 member server or workstation, all authenticated users can view the information. Anonymous access is also permitted if the Restrict Anonymous policy setting allows anonymous access.

For more information on restricting anonymous access, go to the following web site:
http://msdn.microsoft.com/library/psdk/network/ntlmapi_13zn.htm.

Method Input Parameters

The only parameter passed to the method is the name of the object containing the request. The following table details the input parameters and defaults for the method.

ZUSERID	Required variable used as user name.
NTSRVNAM	Name of the remote server on which the function is to execute. If this parameter is NULL, the local computer is used. The default is the local server.
ZOBJREQ	Name of the response object that will contain information about local and global (network) groups to which the user specified in ZUSERID belongs. The default is **NTGROUPS**.

Method Return Values

The EDMMGNUG method returns group membership information about a user in the object specified in ZOBJREQ (usually NTGROUPS). The following are the variables delivered by the method.

NTGRP**L**CT	Number of local groups on the server to which the user belongs.
NTGRP**G**CT	Number of global (network) groups on the server to which the user belongs.
NTGRP**S**CT	Total number of groups on the server to which the user belongs. (NTGRPLCT + NTGRPGCT)
NTGRP**L**xx	There are as many of these variables as there are local groups that a user belongs to on the specified server. xx = {1, NTGRPLCT}
NTGRP**G**xx	There are as many of these variables as there are global groups that a user belongs to on the specified server. xx = {1, NTGRPGCT }

MSGGRP**L**E	An error message, returned by the Network Management Functions, for request for the local group list to which the user belongs.
MSGGRP**G**E	An error message, returned by the Network Management Functions, for request for the global group list to which the user belongs.
NTUSER	Name of the user for which the function was executed. (This is the same as ZUSERID)
NTSRVNAM	Name of the remote server on which the function was executed.
ZMRC	Return code (set in in-bound and response objects).

EDMMPUSH

This method receives input requests, gets the required parameters, and then puts the requests to the right queues for processing by a specific Notify Manager. An in-bound object, or even a dynamic object, created because of the object resolution can be used to deliver requests to EDMMPUSH. The return code associated with the in-bound object might initiate further action. (See Chapter 4, Notifying HPCA Agents for more information.)

EDMMPUSH Parameters

nfydelay	The interval for delay before trying to re-notify an HPCA agent. The default is the value specified in the NFYT_TIMEOUT setting of the MGR_NOTIFY section of the `edmprof` file.
nfyhndl	The domain name of the NOTIFY File where the results of notifications will be stored. The heap number of the request object will become the instance name.
nfymrtry	The maximum number of retries. The default is the value specified in the NFY_RETRY setting of the MGR_NOTIFY section of the `edmprof` file.
ntfyrtim	HP timestamp defining the time after which the notification should occur.
nfyproc	Controls the processing of the current heap request. If Y, the heap will be processed. If N, the request for the current heap is ignored. The default is **Y**.
nfytype	Defines the type of the notify requested. Valid values are: TCP and EMAIL. Note: Only the first three bytes of the type are used for the identification. Therefore, EMAIL and EMA will be treated as the same. There is no default for this variable. If it is not defined, the current heap of the object will be ignored.
nfyuinfo	Allows you to enter user information.

Example

```
EDMLINK EDMMPUSH ZNOTIFY
```

0	The method was successful.
8	An error was detected, the method failed.

EDMMPUTD (EDM only)

This method is called when EDMSENDF is used to send the ZTRANSF object to the Configuration Server. It closes a security loophole. EDMSENDF will not work with the version 4.4 CM Configuration Server, therefore, it is necessary to modify your CSDB by adding a new instance in ZPROCESS and linking it to a ZMETHOD object that invokes the EDMMPUTD method. This will have to be done for each object that is sent to the Configuration Server using EDMSENDF.

EDMMPUTD allows you to receive multiple data types sent by the Inventory Manager, and enables you to specify where on the Configuration Server to store this data.

- With EDMMPUTD, you can inject a REXX method before EDMMPUTD gets dispatched to alter the location of the data based on appropriate criteria or to do security validation.
- The EDMMPUTD method handles the object and data sent from the HPCA agent's EDMSENDF method. Thus, the specifications for the inbound object are the same.
- PROCESS class instances must be configured for each inbound object needing EDMMPUTD in order to receive the appended inbound data and store it in a file.

The following table lists the attributes that EDMMPUTD expects.

Table 122 Attributes Associated with EDMMPUTD

ZRSCMFIL	ZRSCMLOC	ZRSCMMEM
ZRSCRASH	ZRSCSTYP	ZOBJCLAS
ZOBJDOMN	ZOBJFILE	ZOBJID
ZOBJNAME	ZPERUID	ZPERGID
ZEDMTYPE		

The ZRSCDATE and ZRSCTIME fields are not referenced, nor are they used to update the date/time of the file received. ZRSCSIZE and ZCMPSIZE are ignored also. However, these attributes might be used in the future.

EDMMRPRO

This method allows the adding, updating, and deleting of heaps in the PRIMARY database based on the contents of the parameter object that is passed. Each heap in the object specifies an instance to be added, updated, or deleted.

EDMMRPRO Parameter

object	The name of the in-storage object. The object can have multiple heaps where each heap in the object represents a CSDB instance to be altered.

Example

```
EDMLINK EDMMRPRO 'ANYOBJECT'
```

Return Codes

0	The method was successful.
>0	An error was detected, the method failed.

The instance indicates which CSDB instance will be altered by specifying five control variables:

ZOBJCLAS	Target class, for example, ZADMIN.
ZOBJDOMN	Target domain, for example, SYSTEM.
ZOBJFILE	Target file, for example, PRIMARY.
ZOBJNAME	Target instance. This can be any valid instance name.
ZOBJFILE	Target file, for example, PRIMARY.

- On a **delete** request, only the control variables are used to identify the instance to be deleted, the remaining variables are ignored.
- On **add** and **update** requests, the variables in each instance contain the values used to update the instance in the CSDB.
- The fields that can be updated are variables, class connections, expressions, and methods.
- There are specification differences for the three field types.

However, regardless of field type, the target instances' field lengths determine the amount of data moved, and length adjustment is performed, including blank padding and truncation.

Variables

Any variable name found in the parameter object and found in the target instance will be used to update the target instance. Any variable not found in the target instance will be ignored.

Method Fields

Method fields found in the parameter object and found in the target instance will be used to update the target instance. Any method not found in the target instance will be ignored.

The string before the equals sign (**=**) must be eight bytes long.

The methods are indicated by variables in the parameter object that are named MTHD*nnnn*, where *nnnn* is 0001 to 9999. The value of the variable in the object should contain

methodfieldname=*xxxxxxxxxx*

where *methodfieldname* is used to identify the target method field. For example:

ALWAYS=SYSTEM.METHOD.SIGNON_METHOD

OR

EDMSETUP=SYSTEM.METHOD.CHECK_APPL_STATUS.*

Connection Fields

Class fields found in the parameter object and found in the target instance will be used to update the target instance. Any variable not found in the target instance will be ignored. The connections are indicated by variables in the parameter object that are named CONN*nnnn*, where *nnnn* is 0001 to 9999. Types of connection fields include CONN*nnnn* (connection), INCL*nnnn* (Includes), ALWA*nnnn* (Always), and REQU*nnnn* (Requires). The value of the variable in the object should contain

connectionfieldname=*xxxxxxxxxx*

where *connectionfieldname* is used to identify the target class field. For example,

ALWAYS=SOFTWARE.ZSERVICE.MY_SERVICE.

These variable names are the same format as object resolution with a message type = _NONE_. This is designed to allow for the output of these resolutions (sometimes referred to as reporting resolutions) to be used unchanged as input to EDMMRPRO.

You can update specific target instances while not overwriting some existing values (for example, EDMSETUP=) via EDMMRPRO in one of two ways:

- Each class named by the CONN*nnnn*, the value of the variable in the object *connectionfieldname*=*xxxxxxxx*, needs to be specified even if it is not the target of change and will be updated with the specified content. Each CONNnnnn needs to be specified for each variable in the sequence to provide a placeholder for updating the variables. For example,

  CONN0001 EDMSETUP=COUNTRY.USA_EAST_COAST

  CONN0002 EDMSETUP=ZSERVICE.XYZ

  CONN0003 EDMSETUP=ZSERVICE.ABC

- Another way of updating specific target instances while not overwriting some existing values is to specify a CSV (comma-separated variable) string for the instance. Empty values specified before a comma indicates that the connection should skip over the existing value and not update it. For example, the format for skipping over the first two variables and updating the third would appear as:

  CONN0001 “EDMSETUP=, ,ZSERVICE.ABC”

Notes on EDMMRPRO Usage

- The file, domain, and class must already exist; EDMMRPRO will not add any of these levels dynamically. In addition, any fields being processed must already be defined in the target class; ZPROMANY will not modify classes.
- Different class instances can be altered during one execution of EDMMRPRO. However, it is not advisable to do so as certain field names might overlap (particularly methods and connections).
- Different databases cannot be altered in one execution of EDMMRPRO.

EDMMSQLG

For a detailed description of this method, including usage, see Chapter 5, HP SQL Methods.

EDMMSQLP

For a detailed description of this method, including usage, see Chapter 5, HP SQL Methods.

EDMMULOG

This method writes a message returned from the execution of a REXX method to a user log file. For this method to work, the MGR_USERLOG section must be added to the `edmprof` file, and ACTIVATE= must be YES.

EDMMULOG Parameter

msg	The message that will be written to the user log file. This message is returned by a method after its execution.

Example

```
ADDRESS EDMLINK "EDMMULOG" MSG
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

Configuration Server EDMPROF File Sample

```
[MGR_USERLOG]
ACTIVATE     = YES
COLUMN_WIDTH = 128
DIRECTORY    =
FLUSH_SIZE   = 128
PIPE_SIZE    = 100000
THRESHOLD    = 500000
```

EDMSIGN

This method enables the Configuration Server to authenticate HPCA agent and HPCA administrator sessions against the CSDB. The password that is stored in the ZPWD variable in the specified object on the HPCA agent/administrator is compared to that which is stored in the user's profile in the CSDB.

- If the passwords match, the session continues.
- If the passwords do not match, the message "PASSWORD INVALID" is returned.

Changing Passwords

Passwords can be changed by either of the following methods.

- In the HPCA Admin Agent Explorer: specifying a new password in ZNEWPWD and the old password in ZPWD.
- On the HPCA Admin CSDB Editor login panel: selecting the **Change Password** option, and specifying the password information.

For information about HPCA agent and HPCA Administrator password authentication, refer to the *Admin User Guide*.

EDMSIGN Parameter

object	Specifies the name of the object from which the ZPWD variable is extracted. If no object name is specified, the ZMASTER object is used by default.

Example

```
REXX
EDMSIGN
   (Uses the ZMASTER Object)
EDMSIGN & (ZCURRENT>ZCUROBJ)
```

Return Codes

0	The method was successful.
4	New user.

8	An error was detected, the method failed.

EDMSIGNR

This method enables the Configuration Server to authenticate sessions with HPCA agent and HPCA administrator against an external security system such as Windows security. The password that is stored in the ZPWD variable in the specified object on the HPCA agent/administrator is compared to that which is stored in the native security system for that user ID.

- If the passwords match, the session continues.
- If the passwords do not match, the message “PASSWORD INVALID” is returned.

AIX User’s Note

This module must have a `root` user ID and the permissions must be modified.

Therefore, after the binaries are installed (under non-root credentials), use `root` credentials to change the ownership of this module to `root`, and modify the permissions with:

`chmod 4755 EDMSIGNR`.

Changing Passwords

Passwords can be changed by either of the following methods.

- In the HPCA Admin Agent Explorer: specifying a new password in ZNEWPWD and the old password in ZPWD.
- On the HPCA Admin CSDB Editor login panel: selecting the **Change Password** option, and specifying the password information.

For information about HPCA agent and HPCA Administrator password authentication, refer to the *Admin User Guide*.

EDMSIGNR Parameter

object	Specifies the name of the object from which the ZPWD variable is extracted. If no object name is specified, the ZMASTER object is used by default.

Example

```
/*******************REXX*****************************/
```

```
EDMSIGNR
   (Uses the ZMASTER Object)
EDMSIGNR & (ZCURRENT>ZCUROBJ)
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

Linux-specific Configuration of EDMSIGNR

This section details the configuration of EDMSIGNR for a Configuration Server that is installed on a Linux machine.

Implementation Details

During the installation of the Linux operating system, make sure that the Linux-PAM (*Pluggable Authentication Modules*) are installed (refer to sub-instructions **1.a** and **1.b** that follow).

PAM libraries are free for Linux. Usually they are included on, and installed by default from, the Linux installation CD—provided they are not disabled while the Linux installation is being performed.

In order for `ZTopTask` to be able to find security modules, manual configuration of the PAM libraries should be done in place. One of the possible working configurations is a general PAM-configuration file (for example, `other`) that is located in the directory, `/etc/pam.d/`. The fully qualified file name is:

```
/etc/pam.d/other
```

This file contains the four facilities of the PAM API as the lines:

```
auth required       /lib/security/pam_unix_auth.so
account required    /lib/security/pam_unix_acct.so
password required       /lib/security/pam_unix_passwd.so
session required    /lib/security/pam_unix_session.so
```

These lines will, by default, invoke PAM-security for `ZTopTask` and other applications if they request user authentication.

Considerations

There are three major things to consider.

1. Before installing the Configuration Server on a Linux machine, make sure that:

   a. The kernel level is 8 or higher and is compiled for an x86 32-bit architecture.

      This includes Red Hat 8, Red Hat Enterprise 3.0 and higher, and SuSE Enterprise 8 and higher.

   b. The Linux machine has PAM libraries installed at a (minimum) level of Rev0.75 in order for EDMSIGNR to work.

      The files that you should have are:

      - `/usr/lib/libpam.a`
      - `/usr/lib/libpam.so`
      - `/usr/lib/libpam_misc.a`
      - `/usr/lib/libpam_misc.so`
      - `/usr/lib/libpamc.a`
      - `/usr/lib/libpamc.so`
      - `/lib/security/pam_unix.so`
      - `/lib/security/pam_unix_acct.so`
      - `/lib/security/pam_unix_auth.so`
      - `/lib/security/pam_unix_passwd.so`
      - `/lib/security/pam_unix_session.so`

2. Depending on your Configuration Server's "task needs," follow the HP-recommended standard calculation of the UNIX kernel parameters as documented in the UNIX Kernel Tuning appendix of the *Getting Started Guide*.

3. Refer to the HP Engineering Note *OV-ENKB01156: Cache-Memory Management on a Radia Configuration Server* and verify that the total shared memory size that has been requested for total segments of the Configuration Server in cache memory does not exceed the value of the total swap file of the system. Otherwise, the Configuration Server will not start.

Everything else is similar for other UNIX configurations of the Configuration Server.

EDMSIGNR and SECSPAWN

In order for external security modules to access system information, most of the UNIX platforms require `root` credentials. The following are manual commands for the EDMSIGNR (all UNIX platforms) and **SECSPAWN** (Linux only) modules, and should be executed after the Configuration Server is installed.

To execute the following commands, use administrative credentials to log on as `root`.

EDMSIGNR & EDMMSGNR

```
chown root EDMMSGNR
chmod 4777 EDMMSGNR
chown root EDMSIGNR
chmod 4777 EDMSIGNR
```

SECSPAWN (Linux only)

```
chown root secspawn
chmod 4777 secspawn
```

Additional Reading

- HP Engineering Note: *ENKB01156: Cache-Memory Management on a Radia Configuration Server*
- A full description of the installed PAM-library can be found on a Linux computer in `/usr/share/doc/pam-0.75/`.
- A short description of Linux-PAM standards can be found at **http://www.kernel.org/pub/linux/libs/pam/pre/doc/rfc86.0.txt.gz**.

ZDCLASS

This method deletes a class and its associated instances from the database.

ZDCLASS will not delete data-bearing instances.

ZDCLASS Parameters

domain	The 32-byte (maximum) name of the domain that houses the class to be deleted.
class	The eight-byte (maximum) name of the class to be deleted.
file	The file name that contains the class to be deleted. This parameter is optional.

Example

```
/***************************** REXX ****************/
 DOMAIN  = 'SOFTWARE';
 CLASS   = 'TESTCLAS';
 PARM    = SUBSTR(DOMAIN,1,8)  ||  SUBSTR(CLASS,1,8);
 SAY 'PARM STRING IS ' PARM;
 ADDRESS EDMLINK ZDCLASS PARM;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZDELINS

This method displays or deletes (from the CSDB) an instance, or range of instances, within a class. It permits the use of wildcards (*).

Displayed instances will be written to the Configuration Server log even if all other TRACE settings are OFF.

ZDELINS Parameters

Parameter	Description
file	The file that contains the instances to be displayed or deleted.
domain	The domain that contains the instances to be displayed or deleted.
class	The class that contains the instances to be displayed or deleted.
option	DISPLAY if instances are to be displayed. DELETE if instances are to be deleted.
frominst	The name or starting name of the instance to be deleted or displayed.
toinst	The instance to be deleted or displayed. Blanks in this field indicate that it is a single instance to display or delete, not a range.

Example

```
/*********************** REXX ********************/
FILE     = 'PRIMARY'
 DOMAIN   = 'SOFTWARE'
 CLASS    = 'PACKAGE';
 FROMIN   = 'TSO_            ;
 TOINS    = '                ;
 OPTION   = 'DISPLAY';
 PARM     = FILE||DOMAIN||CLASS||OPTION||FROMIN||TOINS;
 SAY 'PARM STRING IS 'PARM;
```

```
ADDRESS EDMLINK ZDELINS PARM;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZDELOBJS

This method deletes an in-storage object.

This method supports the deletion of multiple objects in one call, without spawning additional processes.

ZDELOBJS Parameters

object	The name of the in-storage object to be deleted.

Example

```
ADDRESS EDMLINK ZDELOBJS 'ZTEST';
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZDELPROF

This method deletes a class in the PROFILE File of the CSDB.

ZDELPROF Parameters

domain	The domain that contains the object to be deleted.
class	The class that contains the object to be deleted.

Example

```
EDMLINK ZDELPROF 'TESTP1,TESTPROF'
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZEXIST

This method verifies the existence of classes and instances in the CSDB.

ZEXISTParameters

file	The file that contains the class or instance to be verified.
domain	The domain that contains the class or instance to be verified.
type	The type of file.
class	The class that contains the instance or class record to be verified.
instance	The instance to be verified.

Example

```
FILE = 'PRIMARY'
DOMAIN = 'POLICY' ;
CLASS = 'USER' ;
INST = 'USER1' ;
PARM = FILE  || '.' || DOMAIN || '.' || CLASS || '.' ||
INST ;

ADDRESS EDMLINK ZEXIST PARM ;

IF RC = 0 THEN

    SAY 'QAREXX ****** OBJECT ' INST ' EXISTS;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZGETPROF

This method accesses the PROFILE File of the CSDB, gets the *dbobject* object and puts it in storage creating an in-storage object, *inobject*. The domain in the PROFILE database is the USERID, ZUSERID, which is found in the current object or in the ZMASTER object. If ZUSERID is not found, the method will return an error message, “Profile error: user ID not found” in the log.

ZGETPROF Parameters

dbobject	The PROFILE File object name.
inobject	The name of the in-storage object to be created.
domain name	The name of the domain in the PROFILE File (usually the ZUSERID of the ZMASTER object).
instance	The name of the instance. This parameter is *optional*.

Example

```
/*************** REXX ******************************/
    PARM='ZSTATUS,ZSTATUS,'ZMASTER.ZUSERID;
    ADDRESS EDMLINK ZGETPROF PARM;
/* GET OLD PROFILE.?.ZSTATUS                        */
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZNFYT

This method enables you to initiate a PUSH notification (the execution of a program or programs on an HPCA agent from another location). To execute notify successfully, EDMEXECD must be running on the HPCA agents on which you are executing a PUSH.

ZNFYT Parameters

"process to run"	The application that you are forcing the HPCA agent to execute.
domain	The name of the domain where the notification results are stored. If not specified, this will be automatically generated as a function of date/time.
instance	The instance name containing the results of the single notification. If not specified, this will be automatically generated as an eight-digit number. The default is **00000001**. Note: Only numeric names 00000000 to 99999999 are valid. Specifying anything else will result in 00000000 replacing the erroneous name.
password	The ZNFYPWD for the target terminal's ZMASTER object.
port	The port on which the HPCA agent notify daemon is listening. This should be the same as the HPCA agent's ZMASTER.ZNTFPORT port number.
target IP address	The IP address of the HPCA agent device on which you are executing a PUSH.
user ID	The HPCA agent user ID.

If the **domain** and **instance** parameters are omitted, the resulting instance will be written as:

```
NOTIFY.mmddyyhhmmss.NOTIFY.00000001
```

This does not guarantee the uniqueness of the domain name. In addition, the instance name does not represent anything significant, other than sequence.

Example

```
/*trace i*/
RC           = EDMGET("ZNFYT",0)
NHEAPS          = ZNFYT
DO CURRHEAP     = 1 TO NHEAPS BY 1
   RC        = EDMGET("ZNFYT",CURRHEAP)
   NIPADDR      = ZNFYT.IPADDR
   NPORT     = ZNFYT.PORT
   NUSER     = ZNFYT.USER
   NPASSW       = ZNFYT.PASSW
   NCMDLINE = strip(ZNFYT.CMDLINE)
   NHANDLE      = ZNFYT.HANDLE
   /*** CALL ZNFYT TO ISSUE THE NOTIFY ***/
   ADDRESS EDMLINK "ZNFYT" NIPADDR || ',' || NPORT || ','
|| NUSER || ',' || NPASSW || ',"' || NCMDLINE || '"'|| ','
NHANDLE || ',' || CURRHEAP;
END
```

UNIX User's Note

To ensure that the UNIX process was started, type the following command at the UNIX prompt:

```
ps –u [username]
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZOBJCMPR

This method compresses an in-storage object.

ZOBJCMPR Parameter

object	The name of the in-storage object to be compressed.

Example

```
ADDRESS EDMLINK ZOBJCMPR 'ZTEST' ;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZOBJCOPY

This method copies an in-storage object. The resulting object has the same variables and number of heaps as the original object.

ZOBJCOPY Parameters

fromobject	The name of the existing in-storage object to be copied.
toobject	The name of the in-storage object to be created.

Example

```
ADDRESS EDMLINK ZOBJCOPY 'OBJECT1,OBJECT2' ;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZOBJDELI

This method deletes a heap of an in-storage object.

ZOBJDELI Parameters

object	The name of the in-storage object from which to delete a heap.
instance#	The heap number to delete.

Example

```
/*********************** REXX *********************/
DPARM = 'TESTOBJ,'||1|| ' ';
ADDRESS EDMLINK ZOBJDELI DPARM;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZOBJDELV

This method deletes a variable from all heaps of an in-storage object. It verifies the existence of the specified object and finds the specified variable in that in-storage object. The variable value is then removed from each heap of the in-storage object.

ZOBJDELV Parameters

object	The object that contains the variable to be deleted.
variable	The name of the variable to be deleted.

Example

```
/************************ REXX ********************/
ADDRESS EDMLINK ZOBJDELV 'TESTOBJ,VAR00001' ;
SAY 'QAREXX ****** VAR00001 DELETED FROM OBJECT
     TESTOBJ' ;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZOBJSORT

This method sorts the heaps of an in-storage object by the values of specified variables and according to the desired collating sequence.

ZOBJSORT Parameters

sort sequence	Ascending (SORT) or descending (SORTD).
object	The name of the object to be sorted.
variable	Up to three variable names can be specified.

Example

```
PARM1 = 'SORT,'
PARM2 = 'ZSERVICE'
PARM3 = ',ZOBJNAME,ZOBJDATE,ZOBJTIME ';
PARM  = PARM1 || PARM2 || PARM3;
ADDRESS EDMLINK ZOBJSORT PARM;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZPROMANY

This method allows the addition and updating of instances in the PRIMARY database, based on the contents of the parameter object that was passed. Each heap in the object specifies an instance to be added or updated.

ZPROMANY requires that spaces be entered after commas in order to blank out existing services in fields on the CSDB.

ZPROMANY Parameter

object	The name of the in-storage object.

Example

```
EDMLINK ZPROMANY 'ZANYOBJECT'
```

ZPUTHIST

This method puts an in-storage object into the HISTORY file. It takes the *inobject* that is in storage and puts it in the HISTORY file as *dbobject*. The domain used in the HISTORY file is the DATE/TIME stamp found in current object, or in ZMASTER object.

ZPUTHIST Parameters

dbobject	The object name that will be put in the HISTORY file. This parameter is optional.
inobject	The object name of the in-storage object.

Example

```
ADDRESS EDMLINK ZPUTHIST 'ZCOMPARE,ZCOMPARE';
ADDRESS EDMLINK ZPUTHIST 'ZSTATUS';
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZPUTPROF

This method puts an in-storage object (inobject) into the PROFILE File of the CSDB, as dbobject. The domain in the PROFILE File is the ZUSERID found in the inobject, or in the ZMASTER object. If ZUSERID is not found, the dbobject is put in the domain, _UNKNOWN.

The ZPUTPROF method allows you to specify multiple objects simultaneously.

ZPUTPROF Parameters

dbobject	The object name that will be put into the PROFILE database. The default is the object name.
domainid	The value of an optional third operand can be used to specify a domain other than ZUSERID or to eliminate the search for a ZUSERID value.
inobject	The name of the in-storage object.

Example

```
/************** REXX ***********************************/
ADDRESS EDMLINK ZPUTPROF 'OBJECTS=ZMASTER,ZCONFIG,ZUSERID'
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZSIMRESO

This method resolves the CSDB instance specified by the parameter string, and the resulting objects are left in storage. Any prerequisite objects needed for a successful resolution must already be built and in storage. For example, to resolve:

USER.&ZUSERID

an object containing the ZUSERID variable might have to be constructed. Otherwise, the resolution might not be completely successful.

ZSIMRESO Parameters

file	The file that contains the instance to resolve.
domain	The domain that contains the instance to resolve.
class	The class that contains the instance to resolve.
instance	The instance to resolve.
message	This specifies the message for conditional resolution paths.

Example

```
ADDRESS EDMLINK ZSIMRESO PRIMARY,POLICY,USER,USER1,EDMSETUP
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZTOUCH

This method updates the date/time stamp of an instance in the CSDB.

ZTOUCH Parameters

class	The name of the class that contains the instance to be updated.
domain	The name of the domain that contains the instance to be updated.
instance	The name of the instance to be updated.

Example

```
DOMAIN   = "SOFTWARE";
CLASS = "ZSERVICE";
INST  = "TEST_OBJECT";
PARM  = SUBSTR(DOMAIN,1,8)||SUBSTR
(CLASS,1,8)||SUBSTR(INST,1,32);

ADDRESS EDMLINK ZTOUCH PARM ;
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZVARDEL

This method deletes all in-storage objects. There are no parameters associated with ZVARDEL.

Example

```
ADDRESS EDMLINK "ZVARDEL"
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZVARGBL

This method migrates values from one in-storage object to another, and then deletes the source object.

ZVARGBL Parameters

destination	Object to which the values are being migrated.
source	Object from which the values are being migrated.

Only variables with appropriate flag settings will be migrated.

Example

```
EDMLINK ZVARGBL 'TESTSORT,TESTVGBL'
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZVARLOG

This method writes the contents of an in-storage object to the Configuration Server log.

EDMMOLOG will write to the Configuration Server log even if all other TRACE settings are OFF.

ZVARLOG Parameter

object	The name of the in-storage object to be displayed.

Example

```
ADDRESS EDMLINK ZVARLOG 'ZMASTER';
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZUPDPROF

This method only updates profile information. It does not perform any type of deletion.

- If toobject is not specified, the fromobject (source) name will be used.
- If user ID is not specified, the current user ID will be used.

ZUPDPROF Parameters

fromobject	The source object name.
toobject	The destination object name.
user ID	The user ID.

Example

```
ADDRESS ZUPDPROF OBJECT1,OBJECT
```

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

ZXREF

ZXREF cross references class and instance usage during object resolution, and collects information on the cross-referenced objects. It will generate objects that enable administrators to cross reference users with any, and all, Departments, Workgroups, and Services with which they are affiliated (connected).

To implement the ZXREF method

1. Add new method instances to the METHOD class. Some are methods to create the objects from the PRIMARY database and others are to write these objects to the PROFILE database.
2. Update the Configuration Server process (ZMASTER) used during the HPCA agent connect process by adding new methods to SYSTEM.PROCESS.ZMASTER.
3. Update your class templates, if necessary, to add new method attributes.
4. Update the _BASE_INSTANCE_ to specify the method instances to be executed.

ZXREF Parameter

object	The name of the object containing the cross referenced information.

Return Codes

0	The method was successful.
8	An error was detected, the method failed.

Index

C

D

E

F

G

M

N

O

P

Q

R

S

T

U

V

W