

# HP Universal CMDB

for the Windows and Solaris operating systems

Software Version: 8.03

---

## Deployment Guide

Document Release Date: September 2009

Software Release Date: September 2009



# 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

© Copyright 2005 - 2009 Hewlett-Packard Development Company, L.P.

## Trademark Notices

Adobe® and Acrobat® are trademarks of Adobe Systems Incorporated.

Intel®, Pentium®, and Intel® Xeon™ are trademarks of Intel Corporation in the U.S. and other countries.

Java™ is a US trademark of Sun Microsystems, Inc.

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

Oracle® is a registered US trademark of Oracle Corporation, Redwood City, California.

Unix® is a registered trademark of The Open Group.

## Documentation Updates

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

- Software Version number, which indicates the software version.
- 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 of a document, go to:

**<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 or new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

# Support

Visit the HP Software Support web site at:

**<http://www.hp.com/go/hpsoftwaresupport>**

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

HP Software online 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 web 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 register for an HP Passport ID, go to:

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

To find more information about access levels, go to:

**[http://h20230.www2.hp.com/new\\_access\\_levels.jsp](http://h20230.www2.hp.com/new_access_levels.jsp)**

---

# Table of Contents

<b>Welcome to This Guide .....</b>	<b>11</b>
How This Guide Is Organized .....	11
Who Should Read This Guide .....	12
HP Universal CMDB Documentation .....	13
Additional Online Resources.....	14

## **PART I: INTRODUCTION**

<b>Chapter 1: Introduction to HP Universal CMDB.....</b>	<b>19</b>
HP Universal CMDB Overview.....	20
Installation Procedure Overview .....	25
The Installation DVD .....	27
Installation Prerequisites for Windows Platform .....	27
Installation Prerequisites for Solaris Platform.....	28
HP Universal CMDB on VMware .....	29
Migrating from Previous Versions.....	30
Set Login Credentials.....	30
Change Memory Allocation for Applets .....	31
Hardware and Software Requirements .....	32
<b>Chapter 2: Licensing Models for HP Universal CMDB.....</b>	<b>39</b>
Licensing Models – Overview.....	40
Upgrade to the Standard or Advanced License .....	42
Troubleshooting and Limitations .....	43
<b>Chapter 3: HP Universal CMDB Capacity Planning .....</b>	<b>45</b>
Capacity Planning Overview.....	46
Partially and Fully Resident Modes .....	47
Configuring HP Universal CMDB to Run in Partially Resident Mode .....	48
Oracle Cache Recommendations .....	51
Managed Hosts and Host-Related CIs .....	51
Hardware Specifications .....	52

<b>Chapter 4: Getting Started with HP Universal CMDB</b> .....	<b>55</b>
Predeployment Planning .....	55
Get Started .....	58
Basic Administration Tasks .....	59
<b>Chapter 5: Viewing Server Status</b> .....	<b>61</b>
View the Status of HP Universal CMDB Services .....	61
HP Universal CMDB Services .....	63

## **PART II: INSTALLATION**

<b>Chapter 6: HP Universal CMDB Installation on a Windows Platform</b> .....	<b>67</b>
Installation Prerequisites .....	67
Install UCMDB .....	68
<b>Chapter 7: HP Universal CMDB Installation on a Solaris Platform</b> .....	<b>79</b>
Installation Prerequisites .....	79
Install UCMDB .....	80
<b>Chapter 8: UCMDB Server Configuration</b> .....	<b>91</b>
Choosing the Database or Schema.....	92
Required Information for Setting Database Parameters.....	93
Allocating Memory to Processes .....	95
Access the UCMDB Server Configuration Wizard .....	95
Create a Microsoft SQL Server Database .....	95
Create an Oracle Schema.....	108
Connect to an Existing Microsoft SQL Server Database .....	122
Connect to an Existing Oracle Schema.....	123
Upgrade Database Schemas .....	124
Restart the Server .....	128
<b>Chapter 9: Changing the HP Universal CMDB Service User</b> .....	<b>129</b>
Overview.....	129
Change the HP Universal CMDB Service User.....	130

**PART III: UPGRADING HP UNIVERSAL CMDB**

<b>Chapter 10: Upgrading HP Universal CMDB to Version 8.00 .....</b>	<b>135</b>
Upgrade Prerequisites .....	136
HP Universal CMDB and Federated CMDB Adapters Upgrade	
Notes .....	137
Upgrade to Version 8.00 from Versions 7.x.....	139
Upgrade Application View (From Version 7.x to 8.00).....	143
Upgrade Federated CMDB Adapters.....	144
Upgrade HP Business Availability Center in Staging Mode	
with an External CMDB.....	146
Upgrade Static Tables with the cmdbDbUpgrade Tool.....	147
Run the DB Delete Tool.....	151
Troubleshooting and Limitations .....	154
<b>Chapter 11: Upgrading HP Universal CMDB to Version 7.0 .....</b>	<b>161</b>
Upgrade Workflow .....	162
Version 7.0 Upgrade Tool.....	163
Upgrade Procedure .....	164
Upgrade Business Service View (from Version 6.x to 7.0) .....	166
Upgrade Contents .....	168
CMDB Deletion Utility.....	170
CIT Log Files .....	175
Large Deployments.....	179
Upgrade Limitations.....	180
<b>Chapter 12: Package Migration Utility .....</b>	<b>183</b>
Package Migration Utility – Overview.....	183
Migrate a Custom Package .....	184
Troubleshooting and Limitations .....	185
<b>Chapter 13: Class Model Changes .....</b>	<b>187</b>
Class Model Changes .....	187
Transformation of TQL Based Resources.....	194
Discovery Modules .....	198
Upgrading the DDM DomainScopeDocument File .....	199
Troubleshooting and Limitations .....	199
<b>Chapter 14: Discovery and Dependency Mapping API Changes .....</b>	<b>203</b>
Removed Methods.....	203
Import Changes.....	204
Jython Script Changes.....	206

**PART IV: HP UNIVERSAL CMDB HIGH AVAILABILITY**

**Chapter 15: HP Universal CMDB High Availability** .....211  
Best Practices for the HP Universal CMDB High Availability  
Solution.....211  
Install HP Universal CMDB in High Availability Mode.....214  
Configure Network High Availability .....216  
Configure Full Site.....217

**PART V: HARDENING HP UNIVERSAL CMDB**

**Chapter 16: Introduction to Hardening** .....221  
Hardening Overview .....222  
Hardening Preparations .....223  
Deploy HP Universal CMDB in a Secure Architecture.....224  
Limit Access to UCMDB Server from JBoss URLs.....225  
Harden Discovery and Dependency Mapping.....226  
Security Settings Configuration Instructions.....226

**Chapter 17: Enabling Secure Sockets Layer (SSL)**  
**Communication** .....227  
Enable SSL on the Tomcat Web Server .....227  
Enable SSL on the Client Machines .....230

**Chapter 18: Using a Reverse Proxy** .....231  
Reverse Proxy Overview .....232  
Security Aspects of Using a Reverse Proxy Server .....233  
Configure a Reverse Proxy Using Infrastructure Settings  
Manager .....234  
Configure a Reverse Proxy Using the JMX Console .....235  
Apache 2.0.x – Example Configuration .....236

**PART VI: DISASTER RECOVERY**

**Chapter 19: Disaster Recovery Setup**.....241  
Disaster Recovery Overview .....242  
Prepare the Disaster Recovery Environment.....242  
Prepare the HP Universal CMDB Failover Instance for Activation...245  
Perform Startup Cleanup Procedure .....246

**PART VII: ACCESSING HP UNIVERSAL CMDB**

**Chapter 20: Starting and Stopping the Server**.....251  
Start and Stop the Server on the Windows Platform .....251  
Start and Stop the Server on the Solaris Platform.....252

<b>Chapter 21: Initial Login to HP Universal CMDB .....</b>	<b>253</b>
Viewing HP Universal CMDB.....	253
Java Applets .....	254
Log In to UCMDB.....	254
Log Out of UCMDB .....	255
<b>Chapter 22: Accessing HP Universal CMDB Through the IIS Web Server .....</b>	<b>257</b>
Accessing HP Universal CMDB Through IIS Overview .....	257
Set Up IIS to Enable Access to HP Universal CMDB .....	258
<b>Index.....</b>	<b>263</b>

## Table of Contents

---

# Welcome to This Guide

Welcome to the HP Universal CMDB Deployment Guide. This guide introduces you to HP Universal CMDB, provides information on getting started, describes server installation, server hardening, and details the upgrade process.

**This chapter includes:**

- ▶ How This Guide Is Organized on page 11
- ▶ Who Should Read This Guide on page 12
- ▶ HP Universal CMDB Documentation on page 13
- ▶ Additional Online Resources on page 14

## How This Guide Is Organized

This guide contains the following parts:

**Part I Introduction**

Introduces the components that are installed during HP Universal CMDB installation, and provides the installation workflow and deployment choices. Also explains capacity planning and licensing.

**Part II Installation**

Describes the installation procedure for the HP Universal CMDB server, including database configuration.

### **Part III Upgrading HP Universal CMDB**

Explains the procedures for upgrading (migrating) HP Universal CMDB to version 8.00.

### **Part IV HP Universal CMDB High Availability**

Describes the installation, startup, and configuration procedures so that HP Universal CMDB version 8.00 can be run in a high availability environment.

### **Part V Hardening HP Universal CMDB**

Explains the procedures for hardening the HP Universal CMDB server.

### **Part VI Disaster Recovery**

Describes the basic principles and guidelines on how to set up a Disaster Recovery system.

### **Part VII Accessing HP Universal CMDB**

Includes information on logging in to HP Universal CMDB for the first time immediately following installation, and the Start menu. Also includes information on accessing UCMDB through the IIS Web server.

## **Who Should Read This Guide**

This guide is for the following users of HP Universal CMDB:

- IT administrators
- System administrators
- Database administrators

Readers of this guide should be knowledgeable about IT, system, and database administration, and should be highly knowledgeable in application installation.

## HP Universal CMDB Documentation

HP Universal CMDB documentation provides complete information on deploying, administering, and using HP Universal CMDB.

HP Universal CMDB includes the following documentation:

**Readme (including What's New).** Provides a list of new features, version limitations and last-minute updates. In HP Universal CMDB, select **Help > What's New**. You can also access the most up-to-date readme file from the Customer Support Web site.

**Online Help.** You access HP Universal CMDB Help by selecting **Help > UCMDB Help** in HP Universal CMDB. Context-sensitive help is available from specific HP Universal CMDB pages by clicking **Help > Help on this page** and from specific windows by clicking the **Help** button.

HP Universal CMDB Help includes the following online guides:

- ▶ **Documentation Updates.** Lists details of updates to the HP Universal CMDB Help.
- ▶ **Glossary.** Defines key terms used in HP Universal CMDB.
- ▶ **Discovery and Dependency Mapping.** Describes the HP Universal CMDB Discovery process that enables you to collect data about your system by discovering the IT infrastructure resources and their interdependencies.
- ▶ **Model Management.** Describes how to build and administer a CMDB-based model of your IT organization.
- ▶ **Reference Information.** Describes common user interface elements, the HP Universal CMDB API, dates and times, and troubleshooting.

**Books Online/Printer-Friendly Documentation.** All HP Universal CMDB documentation is available in PDF format. To access PDF files, in HP Universal CMDB, select **Help > UCMDB Help** and select the PDFs tab.

The following Books Online guides are only available in PDF format and can also be accessed from the Main Topic tab in the HP Universal CMDB Help:

- ▶ HP Universal CMDB Database Guide. Describes how to prepare and configure the enterprise database infrastructure to work optimally with HP Universal CMDB, including how to set up a recommended database configuration.
- ▶ HP Universal CMDB Deployment Guide (this guide). Describes how to get started with, install, and upgrade HP Universal CMDB.

Books Online can be viewed and printed using Adobe Reader 4.0 or later. Reader can be downloaded from the Adobe Web site ([www.adobe.com](http://www.adobe.com)).

## Additional Online Resources

**Troubleshooting & Knowledge Base** accesses the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. Choose **Help > Troubleshooting & Knowledge Base**. The URL for this Web site is <http://h20230.www2.hp.com/troubleshooting.jsp>.

**HP Software Support** accesses the HP Software Support Web site. This site enables you to browse the Self-solve knowledge base. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help > HP Software Support**. The URL for this Web site is [www.hp.com/go/hpsupport](http://www.hp.com/go/hpsupport).

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:

[http://h20230.www2.hp.com/new\\_access\\_levels.jsp](http://h20230.www2.hp.com/new_access_levels.jsp)

To register for an HP Passport user ID, go to:

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

**HP Software Web site** accesses the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. Choose **Help > HP Software Web site**. The URL for this Web site is [www.hp.com/go/software](http://www.hp.com/go/software).

Welcome to This Guide

# Part I

---

## Introduction



# 1

---

## Introduction to HP Universal CMDB

This chapter introduces HP Universal CMDB, the main stages of the HP Universal CMDB installation, presents the installation workflow, provides prerequisite hardware, software, and configuration information, and helps you to get started.

### **This chapter includes:**

#### **Concepts**

- ▶ HP Universal CMDB Overview on page 20
- ▶ Installation Procedure Overview on page 25
- ▶ The Installation DVD on page 27
- ▶ Installation Prerequisites for Windows Platform on page 27
- ▶ Installation Prerequisites for Solaris Platform on page 28
- ▶ HP Universal CMDB on VMware on page 29
- ▶ Migrating from Previous Versions on page 30

#### **Tasks**

- ▶ Set Login Credentials on page 30
- ▶ Change Memory Allocation for Applets on page 31

#### **Reference**

- ▶ Hardware and Software Requirements on page 32

## **HP Universal CMDB Overview**

This section includes the following topics:

- “About HP Universal CMDB” on page 20
- “HP Universal CMDB System Architecture” on page 22
- “HP Universal CMDB Deployment” on page 22
- “The Configuration Management Database (CMDB)” on page 23
- “Discovery and Dependency Mapping” on page 24
- “Topology Query Language (TQL)” on page 24

### **About HP Universal CMDB**

HP Universal CMDB consists of a rich business-service-oriented data model with built-in discovery of configuration items (CIs) and configuration item dependencies, visualization and mapping of business services, and tracking of configuration changes.

HP Universal CMDB enables you to manage all the CIs contained in a managed world. A managed world refers to any self-contained environment that can be described using a topology model (defined with HP’s Topology Query Language (TQL)). For example, the IT infrastructure of a large business represents a managed world, where the topology comprises multiple layers such as networks, protocols, databases, operating systems, and so on. You manage views to view the information in exactly the format you require.

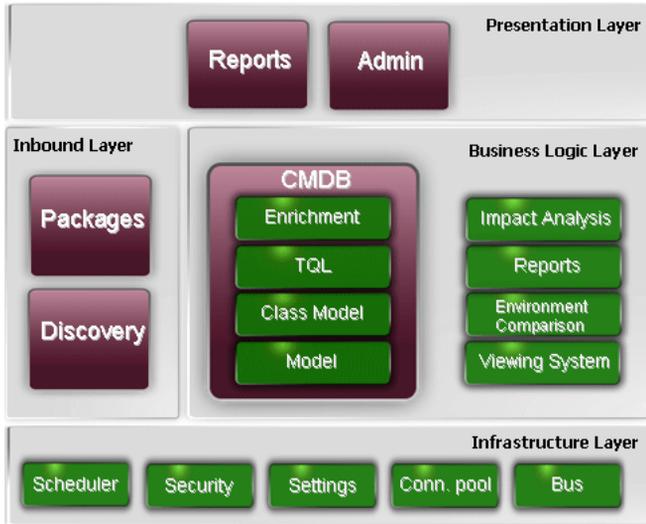
Additionally, the information contained in the results of each TQL is updated automatically with the latest data entering the configuration management database (CMDB). As a result, once a TQL and View have been defined, they continue to provide up-to-date information about the current state of your managed world. Views are displayed in multi-level maps that enable you to identify key CIs, as required. You can also create reports (in HTML, Excel or table format) about information collected by the system.

HP Universal CMDB addresses the following operational and functional needs:

- **IT resources and application alignment.** Automatic discovery of IT resources and their interdependencies from a business service perspective.
- **Problem resolution.** Understanding the causal relationships between CIs to locate and address the root cause of infrastructure problems and reduce troubleshooting time.
- **Asset and change management control.** Automatic detection of infrastructure changes, to enable automatic updating of all the relevant sub-systems.
- **Customized state management (performance, change).** Ability to define a CI management state.
- **Performance management and capacity planning.**
- **Architecture and infrastructure planning.**
- **Federation and reconciliation data.** Retrieved from existing repositories and other CMDBs.

## HP Universal CMDB System Architecture

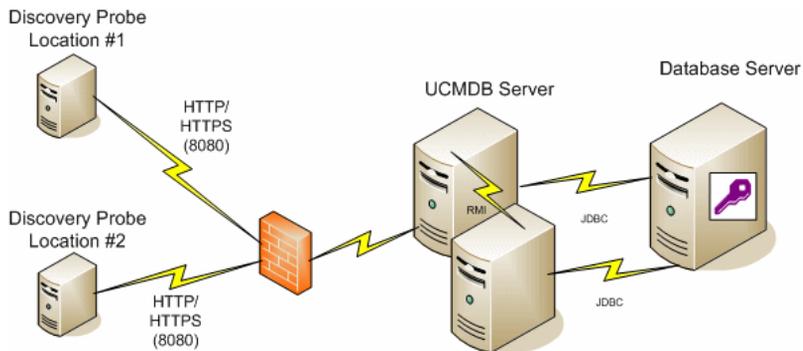
The following diagram provides a graphical overview of the HP Universal CMDB system architecture:



To set up an LDAP authentication method for logging in, see “Authentication for HP Universal CMDB Login” in *Reference Information*.

## HP Universal CMDB Deployment

The following diagram provides a graphical overview of a typical deployment of the HP Universal CMDB system.



## The Configuration Management Database (CMDB)

The CMDB is the central repository for the configuration information gathered by HP Universal CMDB and the various third-party applications and tools.

The CMDB contains CIs and relationships that are created automatically from the discovery process or inserted manually. The CIs and relationships together represent a model of the components of the IT world in which your business functions.

The CMDB also stores and handles the infrastructure data collected and updated by Discovery and Dependency Mapping.

The IT model can be very large, containing thousands of CIs. To facilitate the management of these CIs, you work with the CIs in a View that provides a subset of the overall components in the IT world.

You use views (factory views supplied with HP Universal CMDB or defined in the Topology Map), to display and manage the CIs and relationships in the CMDB. The views enable you to focus on specific IT areas.

The CMDB also contains the TQL query definitions that are used to query and retrieve data from the CMDB, for presentation in:

- pattern views (views based on TQLs)
- the configuration item type (CIT) model (a repository for all CI types and relationship definitions)

---

**Note:** You can connect to the CMDB from other HP products. For details, refer to the product's installation documentation.

---

## **Discovery and Dependency Mapping**

The discovery process is the mechanism that enables you to collect data about your system by discovering the IT infrastructure resources and their interdependencies (relationships). DDM can discover such resources as applications, databases, network devices, different types of servers, and so on. Each discovered IT resource is delivered and stored in the configuration management database (CMDB), where it is represented as a managed configuration item (CI).

## **Topology Query Language (TQL)**

TQL is a language and tool for discovering, organizing, and managing IT infrastructure data. TQL is used to create queries that retrieve specific data from the configuration management database (CMDB) and display that data.

TQL queries constantly search the CMDB for changes that occur in the state of managed resources, and inform and update the relevant subsystems.

TQL extends the traditional query languages by adding two important capabilities:

- ▶ TQL enables HP Universal CMDB to draw conceptual relationships between configuration items (CIs), which represent their actual interdependencies. Using predefined operators, the different types of interconnections that exist between CIs can be established, and consequently the infrastructure design and performance are more accurately represented. This representation serves as a basis and a model for the discovery, arrangement, query, and management of complex infrastructures.
- ▶ TQL has a graphical aspect, consisting of visual symbols and syntax that represent the resources and their interconnections. This visualization of an IT infrastructure simplifies the understanding, monitoring, and managing of the IT business operations.

## Installation Procedure Overview

During installation, the following HP Universal CMDB components are installed:

- HP Universal CMDB server
- Foundations database
- Configuration management database (CMDB)
- History database
- HP Universal CMDB packages
- Discovery and Dependency Mapping (DDM) Probe (if a suitable license is present – for details, see “Licensing Models for HP Universal CMDB” on page 39)

---

**Important:** HP Universal CMDB must **not** be installed more than once on a server even if the instances are installed in different folders or are different versions.

---

This section includes the following topics:

- “Installation Stages” on page 25
- “Launching HP Universal CMDB” on page 26

### Installation Stages

The installation workflow contains the following main stages:

- 1** Set up the Foundation, CMDB, and History databases on Microsoft SQL Server or schemas on Oracle Server, on a Windows platform.

Set up the Foundation, CMDB, and History schemas on Oracle Server, on a Solaris platform.

For details, see “Deploying and Maintaining the Microsoft SQL Server Database” and “Deploying and Maintaining the Oracle Server Database” in the *HP Universal CMDB Database Guide* PDF.

- 2 If you are installing the Standard or Advanced Edition, you must obtain the appropriate license and place it on a machine that is accessible from the machine on which you are installing HP Universal CMDB. For details, see “Licensing Models for HP Universal CMDB” on page 39.
- 3 Install the HP Universal CMDB server. For details, see Chapter 6, “HP Universal CMDB Installation on a Windows Platform” or Chapter 7, “HP Universal CMDB Installation on a Solaris Platform.”

At the end of the server installation, the installation procedure continues directly to the installation of the databases (Foundation, CMDB, and History). You can create a new database (Microsoft SQL Server) or schema (Oracle Server), or you can connect to an existing database or schema. For details, see Chapter 8, “UCMDB Server Configuration.”

---

**Note:** Factory packages are deployed automatically only once on the first server startup.

---

- 4 Install the collectors (DDM Probes). For details, see “DDM Probe Installation” in *Discovery and Dependency Mapping Guide*.

---

**Note:** For a Solaris installation, you install the DDM Probes from the Windows DVD.

---

- 5 Set the UCMDB Server Service authentication permissions. For details, see “Set Login Credentials” on page 30.

## **Launching HP Universal CMDB**

For details, see “Log In to UCMDB” on page 254.

## The Installation DVD

You install HP Universal CMDB using the Windows or Solaris DVD:

- ▶ HP Universal CMDB Windows Installation DVD
- ▶ HP Universal CMDB Solaris Installation DVD

This section lists the installation files and their descriptions.

Installation File	Description
DiscoveryProbe.exe	Installs the DDM Probe (also called a collector)
UCMDBServer.exe	Installs the HP Universal CMDB server on a Windows platform
./UCMDBServer.bin	Installs the HP Universal CMDB server on a Solaris platform

## Installation Prerequisites for Windows Platform

Consider the following issues before installing HP Universal CMDB on a Windows platform:

- ▶ Do not install HP Universal CMDB on a drive that is mapped to a network resource.
- ▶ Due to Web browser limitations, the names of server machines running the HP Universal CMDB server should consist only of alphanumeric characters (a-z, A-Z, 0-9), hyphens (-), and periods (.).

If the names of the machines running the HP Universal CMDB servers contain underscores, it may not be possible to log in to HP Universal CMDB. In this case, you should use the machine's IP address instead of the machine name.

- ▶ Database user and password names can contain alphanumeric characters from the database character set as well as the underscore sign. Names must begin with an alphabetic character and should not exceed 30 characters.
- ▶ User and Login names should not exceed 50 characters.

- ▶ Names must begin with a letter.
- ▶ The HP Universal CMDB program directory cannot contain non-English characters.

## Installation Prerequisites for Solaris Platform

Consider the following issues before installing HP Universal CMDB on a Solaris platform:

- ▶ It is recommended that you install HP Universal CMDB servers to a drive with at least 4 GB of free disk space.
- ▶ HP Universal CMDB servers must not be installed on a machine that has other HP products installed on it.
- ▶ HP Universal CMDB servers must not be installed on a drive that is mapped to a network resource.
- ▶ You must install the latest recommended Patch Cluster for the Solaris operating system version on each HP Universal CMDB server machine. Patch Cluster installation can take several hours. The Patch Cluster can be accessed from SunSolve. After installing the patches, restart the server machine.
- ▶ The following files must be located on each HP Universal CMDB server machine. If these files are missing, the installation may fail:
  - `/usr/xpg4/bin/id`
  - `/usr/openwin/bin/xdpyinfo`
- ▶ If you plan to run HP Universal CMDB servers on a hardened platform (including using the HTTPS protocol), review the hardening procedures described in Part V, “Hardening HP Universal CMDB.”
- ▶ You must be a root user to install HP Universal CMDB on the server machine.
- ▶ Database user and password names can contain alphanumeric characters from the database character set as well as the underscore sign. Names must begin with an alphabetic character and should not exceed 30 characters.

- ▶ The only supported installation method is to mount the HP Universal CMDB Setup CD-ROM on a Solaris machine with a CD-ROM device. You can then either install directly from the CD-ROM or copy the files to a directory on a Solaris machine and install from there. If you copy files from a Windows operating system to a Solaris operating system, there may be a loss of files during installation.
- ▶ You install HP Universal CMDB in UI mode. You cannot install the HP Universal CMDB server using MS-DOS Telnet or any kind of serial console connection.
- ▶ The DISPLAY environment variable must be properly configured on the HP Universal CMDB server machine. The machine you are installing from must be running an X-server.

## HP Universal CMDB on VMware

If you are deploying HP Universal CMDB on a VMware platform, the sizing guidelines for a regular installation are not applicable. The following general limitations and recommendations are applicable to a VMware installation:

- ▶ Performance of HP Universal CMDB on VMware can be expected to be slower than with a regular installation. A VMware platform is therefore not recommended for an enterprise deployment of HP Universal CMDB and is supported only for standard deployments.
- ▶ HP Universal CMDB capacities and performance vary according to the various server resources, such as CPU, memory, and network bandwidth, allocated to HP Universal CMDB components.
- ▶ ESX Server version 3.x or later should be used.
- ▶ A Gigabit network card should be used.
- ▶ It is highly recommended that you do not run a database server containing HP Universal CMDB databases on VMware if the database files reside on a VMware virtual disk.
- ▶ VMware is the only virtualization technology supported by HP Universal CMDB for Windows.

The following HP Universal CMDB components are supported on VMware ESX Server 3.0 or later:

- HP Universal CMDB
- HP Discovery and Dependency Mapping

## Migrating from Previous Versions

For details on upgrading HP Universal CMDB from version 7.0x and 7.5x to 8.00, see Chapter 10, “Upgrading HP Universal CMDB to Version 8.00.”

For details on upgrading HP Universal CMDB from version 6.x to 7.0, see Chapter 11, “Upgrading HP Universal CMDB to Version 7.0.”

## Set Login Credentials

After the database configuration process is successfully completed, you can set the login credentials for the UCMDB Server Service:

- 1** Go to **Start > Settings > Control Panel > Administrative Tools > Services**, select **UCMDB Server Service** from the Services directory, and right-click **Properties**.
- 2** Click the **Log On** tab, select **This account**, and enter the account name and password for the computer.
- 3** Start the HP Universal CMDB server.

The login credentials used by the UCMDB Server Service require the following minimum permissions:

- sufficient database permissions (as defined by the database administrator)
- sufficient network permissions (for accessing the shared adapters' folders)
- administrator permissions on the local server

---

**Note:** The authentication process is not relevant in a Solaris environment.

---

## Change Memory Allocation for Applets

---

**Note:** This section is relevant only if you are using JRE 6u9 or earlier.

---

To work correctly, the HP Universal CMDB applets may require more memory than is allocated by default, especially when you view very large topology maps or use the applet for a long time without restarting the browser.

To change the memory allocation, modify a file on the client machine (on the machine of the user who is using the applet):

- 1** On Windows machines, open the file `..\Documents and Settings\%USERPROFILE%\Application Data\Sun\Java\Deployment\deployment.properties`.
- 2** Change the line with the latest Java version by adding to the end of it the text `-XmxYYYm`, where `YYY` is the amount of memory (in megabytes) to be allocated to the Java applet. For example,

```
deployment.javapi.jre.6u10.args=-Xmx128m
```

allocates 128 megabytes of memory to the applet.

The default value (if no `-Xmx` parameter exists) is 64 MB. You can experiment with the values 128 MB and 256 MB. It is recommended that you do not use more than 256 MB. If Java is unable to acquire the specified memory, it fails to load. In this case, set the memory allocation value to a lower value.

You can also make this change by selecting **Start > Settings > Control Panel**. Double-click the Java icon and click the **Java** tab. Click the **View** button for Runtime settings are used when an applet is executed. Make changes in the Java Runtime Parameters field according to the above instructions.

---

**Note:**

- ▶ Due to a technological limitation, when switching modes (for example from Admin to Application) or managers before all applets have been downloaded to the browser, you may encounter a Fatal Error error message. In this case, clear the Java cache.
  - ▶ To view the progress of the applet jars download, in the Java Console window, enter **5**.
  - ▶ For details on installing or updating Java on the client machine, see “Java Applets” on page 254.
- 

## **Hardware and Software Requirements**

This section describes the setup needed for HP Universal CMDB.

This section includes the following topics:

- ▶ “Server Requirements” on page 33
- ▶ “Client Software Requirements” on page 36
- ▶ “Database System Requirements” on page 37

---

**Note:** For details on the DDM Probe hardware and software requirements, see “Probe Installation Requirements” in *Discovery and Dependency Mapping Guide*.

---

## Server Requirements

HP Universal CMDB is always installed in a one-machine deployment, for small, standard, and enterprise size systems.

**Support Levels:** Requirements have been tested as follows:

- **Certified:** This deployment has been completely verified.
- **Supported:** This deployment works but was not tested on this version.
- **Not supported:** This deployment has not been tested.
- **Recommended:** This is the preferred deployment for better performance.

For details on installing HP Universal CMDB on VMware, see “HP Universal CMDB on VMware” on page 29.

## Hardware Requirements

Computer/processor	<p><b>Windows:</b></p> <p>To fulfill the CPU requirements, you must have one of the following:</p> <ul style="list-style-type: none"> <li>➤ Intel Dual Core Xeon Processor 2.4 GHz or higher</li> <li>➤ AMD Opteron Dual Core Processor 2.4 GHz or higher</li> </ul> <p>In addition to the above requirements, you must have the following number of CPU Cores, depending on your deployment configuration:</p> <ul style="list-style-type: none"> <li>➤ Small deployment: 1 CPU</li> <li>➤ Standard deployment: 1 CPU (recommended: 2 CPUs)</li> <li>➤ Enterprise deployment: 2 CPUs</li> </ul> <p><b>Solaris:</b></p> <ul style="list-style-type: none"> <li>➤ Standard and enterprise deployments: Sun Fire V490 Server with 2 UltraSPARC IV 1.8 GHZ (Supported)</li> <li>➤ Sun Fire V240 machine with dual UltraSPARC-IIIi processor 1.5GHZ (Minimum requirements)</li> </ul> <p><b>Note:</b> As HP Universal CMDB performance is dependent upon processor speed, to ensure proper HP Universal CMDB performance, it is recommended that you use the fastest possible processor speed.</p>
--------------------	--

<p>Memory</p>	<p><b>Windows:</b></p> <p>Small deployment:</p> <ul style="list-style-type: none"> <li>▶ Supported: 2 GB RAM</li> </ul> <p>Standard deployment:</p> <ul style="list-style-type: none"> <li>▶ Minimum: 2 GB RAM</li> <li>▶ Recommended: 4 GB RAM</li> </ul> <p>Enterprise deployment:</p> <ul style="list-style-type: none"> <li>▶ Recommended: 8 GB RAM</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>▶ When UCMDDB is installed on a machine with a 16 GB RAM memory and a 64-bit operating system, UCMDDB runs automatically on a 64-bit JRE.</li> <li>▶ Ensure that your operating system is able to recognize all the memory. You will probably need to add the <b>/PAE</b> parameter to the <b>c:\boot.ini</b> file.</li> </ul> <p><b>Solaris:</b> Recommended: 8 GB RAM</p>
<p>Virtual memory/ Memory swap file</p>	<p><b>Windows:</b></p> <ul style="list-style-type: none"> <li>▶ Small deployment: 3 GB (Supported)</li> <li>▶ Standard deployment: 6 GB</li> <li>▶ Enterprise deployment: 12 GB</li> </ul> <p><b>Solaris:</b> Minimum 4 GB</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>▶ The virtual memory for Windows should be at least 1.5 times the physical memory size.</li> <li>▶ The memory swap space for Solaris should be at least 1 time the physical size.</li> </ul>
<p>Free hard disk space</p>	<p>Minimum 3 GB (recommended: 5 GB hard disk)</p>
<p>Display</p>	<p><b>Windows:</b> Color palette setting of at least 256 colors (recommended: 32,000 colors )</p> <p><b>Solaris:</b> X-server installed</p>

### Capacity Planning Requirements

For details, see Chapter 3, “HP Universal CMDB Capacity Planning.”

## Software Requirements

Operating system	<p><b>Windows:</b></p> <ul style="list-style-type: none"> <li>▶ Windows Server 2003 32-Bit Standard Edition, Service Pack 1 or later (Certified)</li> <li>▶ Windows Server 2003 32-Bit Enterprise Edition, Service Pack 1 or later (Certified)</li> <li>▶ Windows 2003 Enterprise Edition 64-bit (Certified)</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>▶ Windows Server 2000 32-Bit Edition, Service Pack 4 and Windows Advanced Server 2000 32-Bit Edition, Service Pack 4 are no longer supported.</li> <li>▶ It is recommended that Dr. Watson be enabled and configured in automatic mode (after running Dr. Watson, Drwtsn32.exe, at least once). To set up automatic mode, search for <code>\\HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion\AeDebug</code> in the Windows Registry and set the value of the Auto parameter to <b>1</b>.</li> </ul> <p><b>Solaris:</b></p> <ul style="list-style-type: none"> <li>▶ Sun Solaris 9 (Supported)</li> <li>▶ Sun Solaris 10 (Certified)</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>▶ Sun Solaris 8 is no longer supported</li> <li>▶ Regardless of the operating system version, the entire Distribution (with OEM support) and the latest recommended Patch Cluster are required.</li> </ul>
Web Browser	<p><b>Windows:</b></p> <p>Recommended: Microsoft Internet Explorer (IE) 6.0, Service Pack 2. Supported: Microsoft Internet Explorer (IE) 7.0</p> <p><b>Note:</b> The browser should be set to accept all cookies. If the browser is not set to accept all cookies, the application cannot function.</p>
Supported databases	<p>For information on supported and recommended database environments when working with HP Universal CMDB, see “Software Requirements” for Oracle and “Software Requirements” for Microsoft SQL Server in the <i>HP Universal CMDB Database Guide</i> PDF.</p>
Java Runtime Environment	<p>JRE 1.5.0.18 (installed with the JBoss application server)</p>

## Client Software Requirements

Supported browsers	<p>Windows: Internet Explorer (IE) 6.0, Service Pack 1 or later (including 7.0)</p> <p><b>Note:</b> The browser should be set to accept all cookies.</p>
Screen resolution	<p>Minimal resolution: 1024x768. It is recommended that you use 1280x1024. For wide screens (for example, for the 15.4" laptops) the best resolution is 1600x1050</p>
Java Runtime Environment (for applet viewing)	<ul style="list-style-type: none"> <li>▶ 1.6 family: the recommended version is 6u10 and the required version is 6u4 or later.</li> <li>▶ 1.5 family: supported.</li> </ul> <p><b>Note:</b> The recommended JRE version is 6u10, which is also included on the UCMDb server itself for local network download.</p> <p><b>To change the locally available JRE:</b></p> <ol style="list-style-type: none"> <li>1 Place a new JRE deployment executable file in: &lt;HP Universal CMDB root folder&gt;\AppServer\webapps\site.war\static\JRE</li> <li>2 In the configuration file: &lt;HP Universal CMDB root folder&gt;\AppServer\webapps\site.war\conf\CMSConfig, change the key <b>jre.for.deployment.path</b> to match the new JRE deployment executable name.</li> <li>3 Restart the server.</li> </ol> <p>For details on working with applets, see “Change Memory Allocation for Applets” on page 31.</p> <p>If you are using Microsoft Internet Explorer, you can download the Sun JRE from the Java Web site (<a href="http://java.com/">http://java.com/</a>).</p> <p>After installation, verify that the browser is using the correct Java version: Click <b>Tools &gt; Internet Options &gt; Advanced</b> tab, and select the <b>Java (Sun)</b> check box. Click <b>OK</b>, then close the browser and reopen it.</p>
Java caching	<p>Enable Java caching on the client machine: <b>Control Panel &gt; Java &gt; General tab &gt; Temporary Internet Files &gt; Settings &gt; Keep temporary files on my computer.</b></p>

Applet tag support	UCMDB applets support applet tag deployment only. To verify that the client machine supports applet tags, open the Java Control Panel. Click the <b>Advanced</b> tab and open <b>Default Java for browsers</b> . Verify that Microsoft Internet Explorer is selected.
Flash Player (to view charts in reports)	Acrobat Flash 8 or later

## Database System Requirements

### Oracle System Requirements

Refer to the Oracle installation guide for the specific Oracle platform. Additional information is available in the Oracle software distribution media as well as in the online Oracle documentation (<http://otn.oracle.com/documentation/index.html>). HP Universal CMDB supports both Solaris and Windows database servers.

For details on the certified and supported database types, see “Software Requirements” in the *HP Universal CMDB Database Guide* PDF.

### Microsoft SQL Server System Requirements

For Windows platform only.

For details on the certified and supported database types, see “Software Requirements” in the *HP Universal CMDB Database Guide* PDF.



# 2

---

## Licensing Models for HP Universal CMDB

This chapter provides information on the HP Universal CMDB licensing models.

**This chapter includes:**

**Concepts**

- ▶ Licensing Models – Overview on page 40

**Tasks**

- ▶ Upgrade to the Standard or Advanced License on page 42

**Troubleshooting and Limitations on page 43**

## Licensing Models – Overview

There are three levels of licensing. Each level includes specific packages, as follows:

License Level	Packages
Foundation	<ul style="list-style-type: none"> <li>▶ NNM_Integration</li> <li>▶ SE_Integration</li> <li>▶ Oracle</li> </ul> <p>HP Universal CMDB can work with the following packages, but they are not provided by default. For details, contact HP Software Support:</p> <ul style="list-style-type: none"> <li>▶ DDMI_Integration</li> <li>▶ SAR_Integration</li> <li>▶ SM_Integration</li> </ul>
Standard	<ul style="list-style-type: none"> <li>▶ NNM_Integration</li> <li>▶ SE_Integration</li> <li>▶ Oracle</li> <li>▶ Credential_Less_Discovery</li> <li>▶ Host_Resources_By_NT CMD</li> <li>▶ Host_Resources_By_SNMP</li> <li>▶ Host_Resources_By_TTY</li> <li>▶ Host_Resources_By_WMI</li> <li>▶ Layer2</li> <li>▶ Network</li> <li>▶ UMDB7-SCSM</li> </ul> <p>HP Universal CMDB can work with the following packages, but they are not provided by default. For details, contact HP Software Support:</p> <ul style="list-style-type: none"> <li>▶ DDMI_Integration</li> <li>▶ SAR_Integration</li> <li>▶ SM_Integration</li> </ul>
Advanced	All packages

This section includes the following topics:

- “License for HP Software-as-a-Service” on page 41
- “License for HP ServiceCenter/Service Manager and Other Integrations” on page 41
- “The DDM Probe Installation” on page 42

### **License for HP Software-as-a-Service**

All packages.

### **License for HP ServiceCenter/Service Manager and Other Integrations**

The following packages are available:

- UCMDB7-SCSM
- SAR\_Integration
- DDML\_Integration
- NNM\_Integration
- SE\_Integration
- SM\_Integration

---

#### **Note:**

- The name of the license file is `ucmdb_license.xml`.
  - You are asked for the location of the license file during installation. The default location of the Foundation license is: **C:\hp\UCMDB\UCMDBServer\root\lib\server.**
  - Two weeks before the license expires, a reminder message is displayed for you to renew the license.
-

## The DDM Probe Installation

You should install the DDM Probe, no matter which license you are running. If you have the Foundation license, the Probe is needed to run the Integration jobs (NNMi, SE, and DDMi). For details, see “DDM Probe Installation” in *Discovery and Dependency Mapping Guide*.

## Upgrade to the Standard or Advanced License

When you install HP Universal CMDB, you receive the Universal CMDB Foundation license. To obtain the file needed to upgrade to the Standard or Advanced license, contact HP Software Support, then perform the following procedure:

**To upgrade your license:**

- 1** Obtain the appropriate file (standard or advanced) from HP Software Support.
- 2** Replace the `ucmdb_license.xml` file in the `C:\hp\UCMDB\UCMDBServer\root\lib\server` folder.
- 3** Use the JMX console to force a license change:
  - a** Launch a Web browser and enter the address `http://<server_name>.<domain_name>:8080/jmx-console`, where `<server_name>` is the name of the machine on which UCMDB is installed. When prompted, enter the JMX Console authentication credentials (if you do not have these credentials, contact your system administrator).
  - b** Under MAM, click **service=UCMDB UI** to open the JMX MBEAN View page.

- c Locate `java.lang.String getLicenseForCustomer()` and enter the following information:

In the force parameter box, select **True**.

In the ParamValue box for the parameter `customerId`, enter **1**.

Click **Invoke**.

---

**Note:** To verify the type of license that is installed, select **False** and enter the customer ID. Details about the license are displayed.

---

## Troubleshooting and Limitations

This section describes troubleshooting and limitations for UCMDB licensing.

- **Problem:** When integrating UCMDB with HP Storage Essentials, unable to run the **SE Integration by SQL** job with the Foundation license.  
**Solution:** Perform the procedure in “Discover the SE Oracle Database” in *Discovery and Dependency Mapping Content Guide*.
- **Problem:** When integrating UCMDB with HP Network Node Manager i (NNMi), unable to run the **Layer2 by NNM** job with the Foundation license.  
**Solution:** For details, see “Run NNMi/Universal CMDB Integration” in *Discovery and Dependency Mapping Content Guide*.



# 3

---

## HP Universal CMDB Capacity Planning

This chapter provides information on HP Universal CMDB capacity planning.

---

**Note:** These guidelines are relevant for all versions of HP Universal CMDB from version 7.5.1.

---

### **This chapter includes:**

#### **Concepts**

- ▶ Capacity Planning Overview on page 46
- ▶ Partially and Fully Resident Modes on page 47

#### **Tasks**

- ▶ Configuring HP Universal CMDB to Run in Partially Resident Mode on page 48

#### **Reference**

- ▶ Oracle Cache Recommendations on page 51
- ▶ Managed Hosts and Host-Related CIs on page 51
- ▶ Hardware Specifications on page 52

## Capacity Planning Overview

Using the default configuration, HP Universal CMDB can work with a deployment of up to 12.5 million objects and links. To work with a larger deployment, you must implement the following configuration:

- ▶ 64-bit operating system (Windows 2003 64-bit Enterprise Edition was used for this test).
- ▶ The Oracle database is used for storing CIs and links in the CMDB.
- ▶ The HP Universal CMDB Server is configured to run in Partially Resident Mode. For details, see the next section.
- ▶ CMDB heap increased to 4 GB. For details, see "Increase the CMDB Process Heap" on page 49.
- ▶ Oracle Database SGA - 4 GB supported, 8 GB recommended. See "Oracle Cache Recommendations" on page 51.

The following table displays the maximum supported number of CIs and links for a UCMDB deployment:

Database/Operating System	Windows 32-bit	Windows 64-bit
MS SQL Server	12.5 million CIs and links	12.5 million CIs and links
Oracle	12.5 million CIs and links	In Fully Resident Mode - 12.5 million CIs and links. In Partially Resident Mode - 25 million CIs and links

Based on this, if you estimate that your system will exceed 12.5 million CIs and links in the future, you should install the UCMDB server on a Windows 64-bit platform and configure it to use the Oracle database.

## Partially and Fully Resident Modes

HP Universal CMDB can work in two modes which define how the server stores CIs and links in memory while running: **Fully Resident Mode** and **Partially Resident Mode**.

- ▶ In Fully Resident Mode, the server loads all of the CIs and links into its memory. This is the default mode.
- ▶ In Partially Resident Mode, only some of the CIs and links are stored in memory. The remaining CIs and links reside in the database and are retrieved when needed.

In general, Fully Resident Mode provides better performance, but can only operate on a system with a smaller number of CIs and links. Partially Resident Mode enables HP Universal CMDB to work with a larger system, but performance is slower.

---

### Note:

- ▶ Partially Resident Mode is only relevant for the Enterprise deployment of HP Universal CMDB. For the small or standard deployments, Fully Resident Mode is the only available option.
- ▶ Partially Resident Mode is only supported on systems working with Oracle. Systems working with Microsoft SQL only support Fully Resident Mode.

---

When the total size of your database is approaching the 12.5 million limit, it is recommended to convert the CMDB to Partially Resident Mode. This is only relevant when at least 20% of the CIs in the database are of the following types (all located under Host Resource in the CI type tree):

- ▶ **Process**
- ▶ **Service**
- ▶ **CPU**
- ▶ **Installed Software**

**To determine the percentage of relevant CIs:**

- 1** Go to the CI Type Manager and select **CI Types** as the mode of the tree.
- 2** Locate each of the relevant CI types in the CI type tree and note the number that appears next to it in parentheses.
- 3** Add the total of these numbers. Multiply by 2 to obtain the total of relevant objects and links.
- 4** Note the number appearing next to IT Universe (the root of the tree).
- 5** Select **Relationships** as the mode of the tree. Note the number that appears next to IT World Links (the root of the tree). Add these two values to obtain the total of all objects and links in the system.
- 6** Divide the first value by the second. The resulting quotient is the required percentage.

---

**Note:** When running in Partially Resident Mode, there is significant performance degradation for TQLs that use process, service, CPU, and installed software CI types. In addition, there is a certain performance degradation for the calculation of other TQLs when running in this mode.

---

## **Configuring HP Universal CMDB to Run in Partially Resident Mode**

The following procedures explain how to convert your system to Partially Resident Mode (when running on a 64-bit operating system).

This section includes the following topics:

- "Increase the CMDB Process Heap" on page 49
- "Reset Timeout Definitions" on page 49
- "Reset the Maximum Number of Objects and TQLs" on page 50

## Increase the CMDB Process Heap

- 1 Open the following file for editing: <HP Universal CMDB root directory>\UCMDBServer\j2f\bin\cmdb\_vm\_params.ini.
- 2 Change `-Xms3000m -Xmx3000m` to `-Xms4000m -Xmx4000m`.
- 3 Restart the HP Universal CMDB server.

## Reset Timeout Definitions

- 1 Open the following file for editing: <HP Universal CMDB root directory>\UCMDBServer\j2f\conf\settings\cmdb.xml.
- 2 Locate the following entry:

```
<setting name="model.topology.load.all.classes"
sectionResource="section.model"
refreshRate="Reboot"
displayInUI="false"
nameResource="model.topology.load.all.classes.name"
descResource="model.topology.load.all.classes.desc">
<value type="boolean">true</value>
</setting>
```

Change the **value type** from **true** to **false**.

- 3 Locate the following entry:

```
<setting name="server.sync.session.timeout"
sectionResource="section.general"
refreshRate="Reboot"
displayInUI="true"
nameResource="server.sync.session.timeout.name"
descResource="server.sync.session.timeout.desc">
<value type="number">600</value>
<value deployment="SMALL" type="number">600</value>
<value deployment="STANDARD" type="number">1200</value>
<value deployment="ENTERPRISE" type="number">3600</value>
</setting>
```

Change the **value type** from **600** to **7200** and change the value for **Enterprise deployment** from **3600** to **7200**.

**4** Locate the following entry:

```
<setting name="db.connection.pool.timeout"  
sectionResource="section.general"  
refreshRate="Reboot"  
displayInUI="true"  
nameResource="db.connection.pool.timeout.name"  
descResource="db.connection.pool.timeout.desc">  
<value type="number">0</value>  
<value deployment="SMALL" type="number">0</value>  
<value deployment="STANDARD" type="number">0</value>  
<value deployment="ENTERPRISE" type="number">1800000</value>  
</setting>
```

Change the **value type** from **0** to **3600000** and change the value for **Enterprise deployment** from **1800000** to **3600000**.

- 5** Open the following file for editing: <HP Universal CMDB root directory>\UCMDBServer\j2f\conf\pool.properties.
- 6** Change the value of the **HeldTimeoutMillis** parameter from **300000** to **600000**.
- 7** Restart the HP Universal CMDB server.

## **Reset the Maximum Number of Objects and TQLs**

**To reset the maximum number of objects:**

- 1** Estimate the number of objects you are going to define after increasing capacity.
- 2** Go to **Settings > Infrastructure Settings Manager** and select **All**.
- 3** Locate the **Max Number of Objects in Server** setting and change it according to your estimation.
- 4** Locate the **Max Number of Objects in The Customer Model** setting and change it according to your estimation.

**To reset the maximum number of TQLs:**

- 1** Estimate the number of active TQLs you are going to define after increasing capacity.

- 2 Go to **Settings > Infrastructure Settings Manager** and select **All**.
- 3 Locate the **Max Number of Active TQLs in Server** setting and change it according to your estimation.
- 4 Locate the **Max Number of Customer Active TQLs** setting and change it according to your estimation.

## Oracle Cache Recommendations

When working with a system containing 12.5 million objects and links, the performance degradation resulting from the conversion to Partially Resident mode can be mitigated by allocating 8 GB to the Oracle database SGA (the recommended configuration).

The degradation of performance in the 8 GB configuration is mitigated in the following ways:

- ▶ The number of TQLs that remain unaffected by the conversion increases substantially.
- ▶ The number of TQLs whose performance is severely degraded (more than 10 seconds) decreases substantially.

## Managed Hosts and Host-Related CIs

Another consideration in capacity planning is the ratio of managed hosts in your CMDB to host-related CIs. Host-related CIs include all CIs of types which are subclasses of Application Resource, Host Resource, or Software Element.

The following table lists the number of host-related CIs you can discover for each managed host in your environment. This number depends on the size of your deployment and the number of managed hosts: The more managed hosts you maintain in the CMDB, the fewer host-related CIs you can discover for each managed host.

For example, in an Enterprise deployment using the Fully Resident Mode, if you are running 28,000 managed hosts, you can discover 160 host-related CIs for each managed host. If you are running only 9,000 managed hosts, you can discover 500 resource CIs for each managed host.

Deployment	Number of Managed Hosts/Host-Related CIs, Fully Resident Mode	Number of Managed Hosts/Host-Related CIs, Partially Resident Mode
Enterprise	28000/160 – 9000/500	56000/160 - 18000/500
Standard	9000/160 – 3000/500	Not Relevant
Small	4500/160 – 1000/500	Not Relevant

---

**Note:** The numbers in the table include only CIs and not links.

---

## Hardware Specifications

The following hardware was used for the testing of UCMDB capacity:

Role	Machine Type	CPU	Memory	Operating System and Third-Party Software
CMDB Server	ProLiant BL460c G1	Intel Xeon/3.00 GHz	16 GB	Windows 2003, 64-bit
Database	ProLiant DL360 G5	Intel Xeon/2.666 GHz	16 GB	Linux
Probe	ProLiant DL140 G2	Intel Xeon/2.8 GHz	2 GB	Windows 2003

For the Database server, the following specifications apply:

<b>RAID Controller</b>	HP P400i
<b>Disks</b>	6 disks of 72 GB, RAID 0



# 4

---

## Getting Started with HP Universal CMDB

This chapter describes the high-level tasks you perform to set up and start working with HP Universal CMDB.

### **This chapter includes:**

#### Concepts

- Predeployment Planning on page 55

#### Tasks

- Get Started on page 58
- Basic Administration Tasks on page 59

### **Predeployment Planning**

Deploying HP Universal CMDB in an enterprise network environment is a process that requires resource planning, system architecture design, and a well-planned deployment strategy. The following checklist describes some of the basic issues that should be considered prior to installation. For comprehensive best practices documentation on deployment planning, consult with HP Professional Services.

Use the following checklist to review the basic issues that your organization should consider when planning the HP Universal CMDB deployment.

✓	Step
	Define the goals of the project.
	Define the protocols to be used for Discovery and Dependency Mapping (DDM) and ensure that the protocols are available for use.
	Verify that you have access rights for the protocols to be used for DDM. Ask the system administrator for the user name and password for the relevant protocols.
	Define the speed and utilization of the network subnets to be discovered. You may find that you need to increase timeouts for some of the protocols.
	<p>Verify whether the following applications use the default ports. If they are not using the default ports, check which ports they are using.</p> <ul style="list-style-type: none"> <li>▶ FTP</li> <li>▶ IBM HTTP Server</li> <li>▶ IIS</li> <li>▶ Microsoft SQL Server</li> <li>▶ Oracle Server</li> <li>▶ SAP</li> <li>▶ SNMP</li> <li>▶ Siebel</li> <li>▶ WebLogic</li> <li>▶ WebSphere</li> </ul>
	<p>Identify the components to be discovered:</p> <ul style="list-style-type: none"> <li>▶ Server hardware platform</li> <li>▶ Server operating system and version</li> <li>▶ Network device types</li> </ul>

✓	Step
	Install the following tools and utilities to help analyze discovery processes: <ul style="list-style-type: none"> <li>▶ SNMP tool</li> <li>▶ WMI tool</li> <li>▶ LDAP browser</li> <li>▶ Log file tailer (for example, BareTail for Windows or a UNIX tail utility)</li> </ul>
	Define what you want to do with HP Universal CMDB: <ul style="list-style-type: none"> <li>▶ System component mapping</li> <li>▶ Root cause analysis</li> <li>▶ Impact analysis</li> <li>▶ Data center relocation/consolidation</li> </ul>
	Analyze the IT processes and organizational structure and culture that can affect, or be affected by, the deployment.
	Analyze the organization's goals and identify the key IT-enabled business processes to achieve these goals.
	Identify the target users (those with a vested interest in the business processes), such as executives, LOB managers, application owners, system administrators, and security auditors.
	Align the project with current performance management practices.
	Define the project deliverables, including setting expectations regarding measurements, features, the deployment scope, and maturity levels.
	Identify the appropriate HP Universal CMDB functionality.
	Build a deployment roadmap.
	Define success criteria for the project.
	Decide how often you want to run DDM. For details, see "Discovery Scheduler Dialog Box" in <i>Discovery and Dependency Mapping Guide</i> .

## Get Started

This section provides a basic, step-by-step roadmap for getting started with HP Universal CMDB.

### **1 Read about where to get help.**

Learn about the various sources of assistance, including HP Professional Services and HP Software Support, as well as HP Universal CMDB Documentation. For details, see “Welcome to This Guide” on page 11.

### **2 Learn about the HP Universal CMDB components.**

Learn about the components that power the HP Universal CMDB system. For details, see “HP Universal CMDB Overview” on page 20.

### **3 Plan your HP Universal CMDB deployment.**

Create a complete deployment plan prior to installing HP Universal CMDB. Use the Predeployment Planning checklist to assist you. For in-depth deployment planning best practices, consult your HP Professional Services representative. For details, see “Predeployment Planning” on page 55.

### **4 Install HP Universal CMDB components.**

Install the Server (on a Windows or Solaris system) and DDM Probe. For details, see “Installation Procedure Overview” on page 25 and Part II, “Installation.”

### **5 Log in to HP Universal CMDB.**

Launch HP Universal CMDB. For details, see Chapter 21, “Initial Login to HP Universal CMDB.”

### **6 Initiate system administration.**

Set up the HP Universal CMDB system. For details, see “Settings” in *Model Management*.

## Basic Administration Tasks

This section provides a checklist for basic administration and configuration tasks. You use this checklist to review the basic administration tasks required to set up the HP Universal CMDB system.

### **1 Set up Discovery and Dependency Mapping (DDM).**

Licensed DDM users can run the discovery process to identify IT resources in the network infrastructure. For details, see *Discovery and Dependency Mapping Guide*.

### **2 When setting up DDM, request the following from the system administrator:**

- ▶ Operating system credentials
- ▶ Network protocol credentials
- ▶ Application credentials

### **3 Set up users.**

Define permissions for views. Permissions permit or deny users access to views, TQLs, and other components. For details, see “Set Up Users” and “Security Manager User Interface” in *Model Management*.

### **4 Configure recipients of scheduled reports, including method of delivery.**

For details, see “Mail Details Dialog Box” in *Reports*.

### **5 Manually build your IT universe model by defining configuration items (CIs) and CI relationships in the model.**

Divide the model into views that represent logical subsets of the overall model. Add CIs based on discovered network resources or manually define infrastructure components.

For details, see:

- ▶ “IT Universe Manager” in *Model Management*.
- ▶ “View Manager” in *Model Management*.



# 5

---

## Viewing Server Status

This chapter describes the HP Universal CMDB server status HTML page that you can use to view the status of HP Universal CMDB services and contains a description of the services.

### **This chapter includes:**

#### Tasks

- ▶ View the Status of HP Universal CMDB Services on page 61

#### Reference

- ▶ HP Universal CMDB Services on page 63

### **View the Status of HP Universal CMDB Services**

You can view the status of the services run by the HP Universal CMDB service on the HP Universal CMDB server status HTML page that you access by selecting **Start > Programs > HP UCMDB > HP Universal CMDB Server Status**.

To view the status of all the services, right-click the security warning above the HP Software title bar, select **Allow Blocked Content**, and click **Yes** in the dialog box that opens. The line below the HP Software title bar indicates whether all the HP Universal CMDB services are running (Server is READY) or some are down (Server is NOT READY).

To view a list of all the services and their statuses, click the **Nanny Status** and **HAC Status** title bars.

 **Server is READY**

Nanny Status			
ServiceName	ProcessName	Status	ExecutionOrder
domain_manager	DomainManager	STARTED	2
message_broker	MessageBroker	STARTED	4
mercuryAS	MercuryAS	STARTED	6
cmdb	mercury_cmdb	STARTED	12
fcmdb	mercury_fcmbd	STARTED	13
cmdb_res_utils	cmdb_res_utils	STARTED	13
mam	mercury_mam	STARTED	14

HAC Status				
Service	Process	Ping	State - [Since] - [Duration]	
CMDB	cmdb	4s	RUNNING	- [23/Mar/2008 10:54:33] - [1d:22h:44m]
MAMVIEWSYS	mam	0 sec.	RUNNING	- [23/Mar/2008 10:55:08] - [1d:22h:44m]
MAMPACKAGER	mam	0 sec.	RUNNING	- [23/Mar/2008 10:58:04] - [1d:22h:41m]
MAMBASIC	mam	0 sec.	RUNNING	- [23/Mar/2008 10:54:49] - [1d:22h:44m]
MAMDISCOVERY	mam	0 sec.	RUNNING	- [23/Mar/2008 10:55:48] - [1d:22h:43m]
MAMIMPACT	mam	0 sec.	RUNNING	- [23/Mar/2008 10:55:08] - [1d:22h:44m]
MAMREPORT	mam	0 sec.	RUNNING	- [23/Mar/2008 10:55:08] - [1d:22h:44m]
MAMCONFIG	mam	0 sec.	RUNNING	- [23/Mar/2008 10:55:08] - [1d:22h:44m]
FCMDB	fcmbd	10s	RUNNING	- [23/Mar/2008 10:55:01] - [1d:22h:44m]
CMDB_SYS_TQLS	cmdb	4s	RUNNING	- [23/Mar/2008 10:54:43] - [1d:22h:44m]
CMDB_RES_UTILS	cmdb_res_utils	4s	RUNNING	- [23/Mar/2008 10:54:46] - [1d:22h:44m]
CMDB_MOD_NOT	cmdb	4s	RUNNING	- [23/Mar/2008 10:55:43] - [1d:22h:43m]
CMDB_RECONCILE	cmdb	4s	RUNNING	- [23/Mar/2008 10:55:43] - [1d:22h:43m]

---

**Note:** If there are services that are not running, contact HP Software Support to try and resolve the problem.

---

## HP Universal CMDB Services

The HP Universal CMDB Server services are described in the following table:

Service Name	Description of Service
CMDB	A central repository for configuration information that is gathered from the various HP Universal CMDB and third-party applications and tools. This information is used to build HP Universal CMDB views.  <b>Note:</b> The CMDB service is not necessarily run by the mercury_as process.
MAMVIEWSYS	Responsible for the viewing system in HP Universal CMDB.
MAM PACKAGER	Responsible for packages. Packages are zip files containing resources that are structured in organized, predefined subdirectories.
MAM BASIC	Responsible for user management, system parameters, and login/logout services.
MAM DISCOVERY	Responsible for Discovery and Dependency Mapping-related services.
MAM IMPACT	Responsible for HP Universal CMDB impact, root cause, and correlation subsystems.
MAM REPORT	Responsible for HP Universal CMDB report services, such as adding, editing, and removing System reports, calculation of Asset reports, Host Dependency reports.
MAM CONFIG	Responsible for snapshots, CI change queries, and TQL/View History queries.
FCMDB	Responsible for retrieving federated data from external data sources for replication tasks and federated queries.
CMDB_SYS_TQLS	Responsible for the conditions applied to TQL nodes, and the condition results that are stored in the system TQL.
CMDB_RES_UTILS	Responsible for storing the calculations of TQL and Enrichment results.

Service Name	Description of Service
CMDB_MOD_NOT	Responsible for notifications of changes that occur in the CMDB.
CMDB_RECONCILE	Responsible for the reconciliation engine of HP Universal CMDB.

# **Part II**

---

## **Installation**



# 6

---

## HP Universal CMDB Installation on a Windows Platform

This chapter describes the procedures to be performed to install HP Universal CMDB on a Windows system.

### **This chapter includes:**

#### Concepts

- Installation Prerequisites on page 67

#### Tasks

- Install UCMDB on page 68

### **Installation Prerequisites**

Note the following prior to installing HP Universal CMDB:

- It is highly recommended that you thoroughly read the introduction to this guide before commencing installation. For details, see Chapter 1, “Introduction to HP Universal CMDB.”
- For details on licensing, see Chapter 2, “Licensing Models for HP Universal CMDB.”
- For details on troubleshooting login, see “Troubleshooting and Limitations” in *Reference Information*.
- **Important:** HP Universal CMDB must **not** be installed more than once on a server even if the instances are installed in different folders or are different versions.

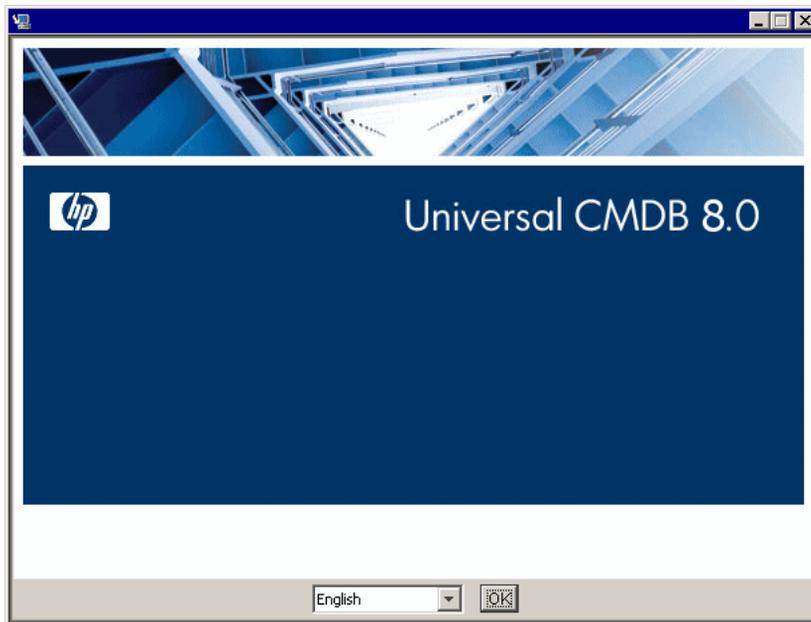
- ▶ **Important:** If you are upgrading your current version to 8.00, read the chapter “Upgrading HP Universal CMDB to Version 8.00” on page 135 before uninstalling your current version. In that chapter, the section “Upgrade Federated CMDB Adapters” on page 144, explains how to avoid losing the adapter configuration files.

## Install UCMDB

The following procedure explains how to install HP Universal CMDB.

**To install HP Universal CMDB:**

- 1** Insert the **HP Universal CMDB Windows Installation** DVD into the drive from which you want to install. If you are installing from a network drive, connect to it.
- 2** Double-click the `<DVD root folder>\UCMDB80\UCMDBServer.exe` file to open the splash screen.

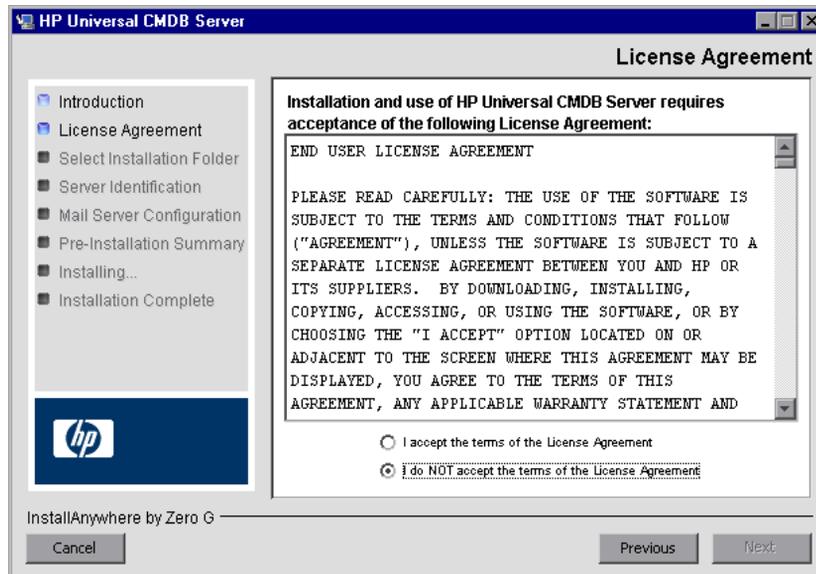


- 3** Choose the locale language and click **OK**.

The Introduction dialog box opens.

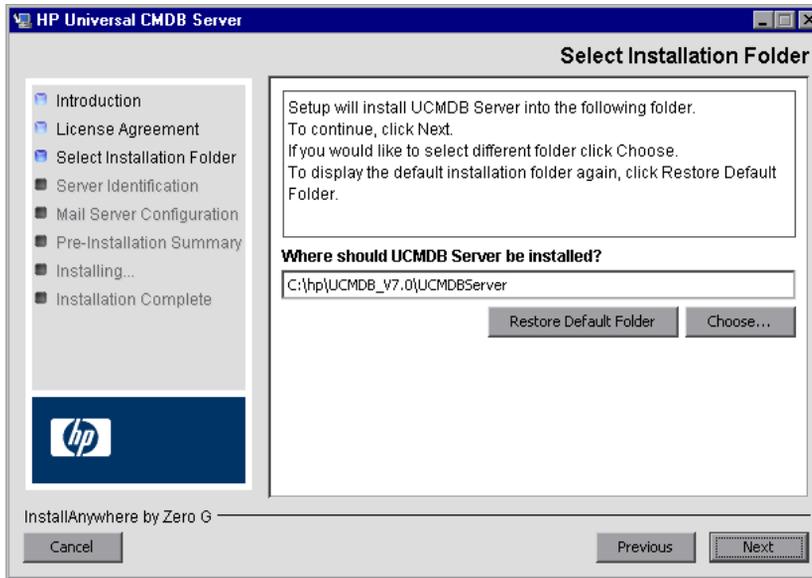


4 Click **Next** to open the License Agreement dialog box.



Accept the terms of the license and click **Next**.

5 Click **Next** to open the Select Installation Folder dialog box.



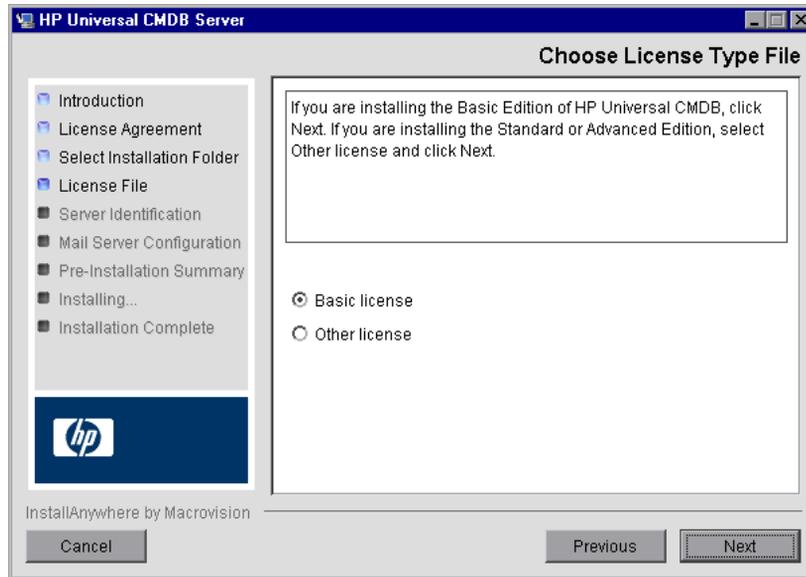
Accept the default entry or click **Choose** to display a standard Browse dialog box. To install to a different directory, browse to and select the installation folder. The installation path should not contain spaces.

---

**Tip:** To display the default installation folder again, click **Restore Default Folder**.

---

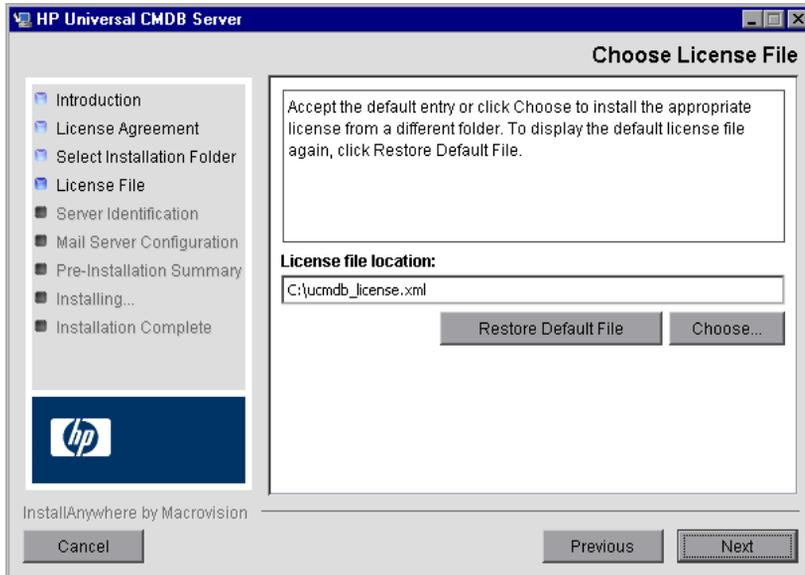
6 Click **Next** to open the Choose License Type File dialog box.



To install the Foundation edition, accept the default entry. To install the Standard or Advanced edition, select **Other license**. For details on licensing, see Chapter 2, “Licensing Models for HP Universal CMDB.”

If you select **Basic license**, skip to step 7.

If you select **Other license**, click **Next** to open the Choose License File dialog box.



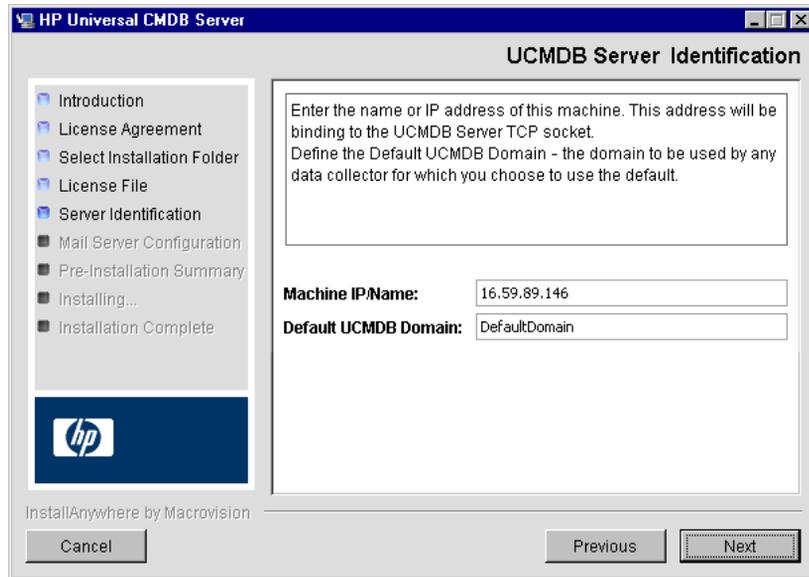
Accept the default entry or click **Choose** to display a standard Browse dialog box. Browse to and select the folder where the license file is located. Select the license file (**ucmdb\_license.xml**).

---

**Tip:** To display the default installation folder again, click **Restore Default File**.

---

7 Click **Next** to open the UCMDB Server Identification dialog box.



**Machine IP Name:** Enter the IP address or the machine name of the workstation on which the HP Universal CMDB server is to be installed, or accept the existing entry. The TCP socket is mapped to this address and port.

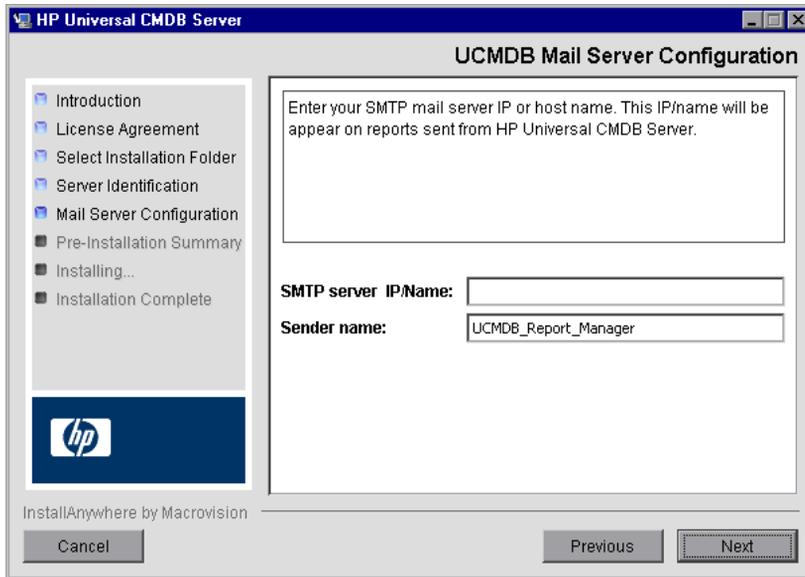
**Default UCMDB Domain:** Accept the default entry (**DefaultDomain**) or enter another domain identifier. This is the domain that is used by data collectors, for example, the DDM Probe. The default domain is the domain name to be used for data collectors if no specific, separate domain is specified during their installation.

---

**Note:** The Default UCMDB Domain is also configurable via the Infrastructure Settings Manager, available after installing HP Universal CMDB (**Foundations > CMDB > CMDB Class Model Settings > Default Domain Property Value**).

---

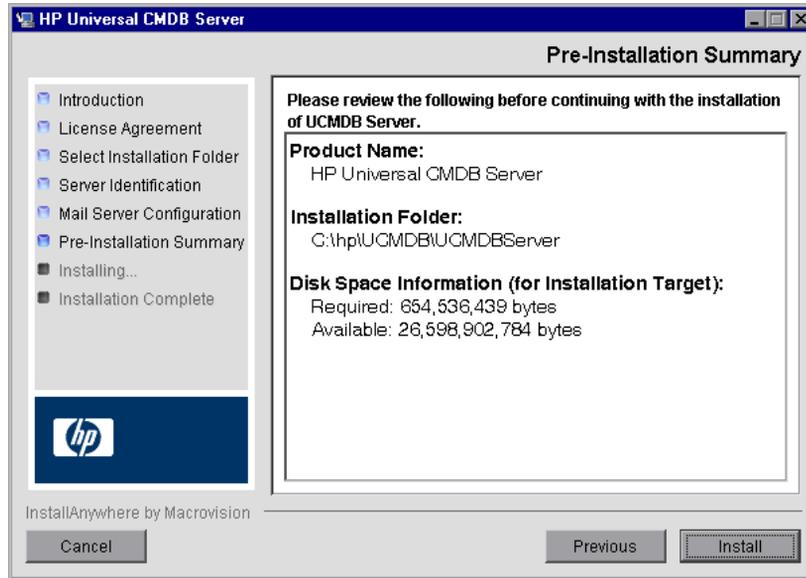
- 8 Click **Next** to open the UCMDB Mail Server Configuration dialog box.



In the SMTP server IP/Name box, enter the server IP or name. It is recommended that you specify the complete Internet address of the SMTP server. Use only alphanumeric characters.

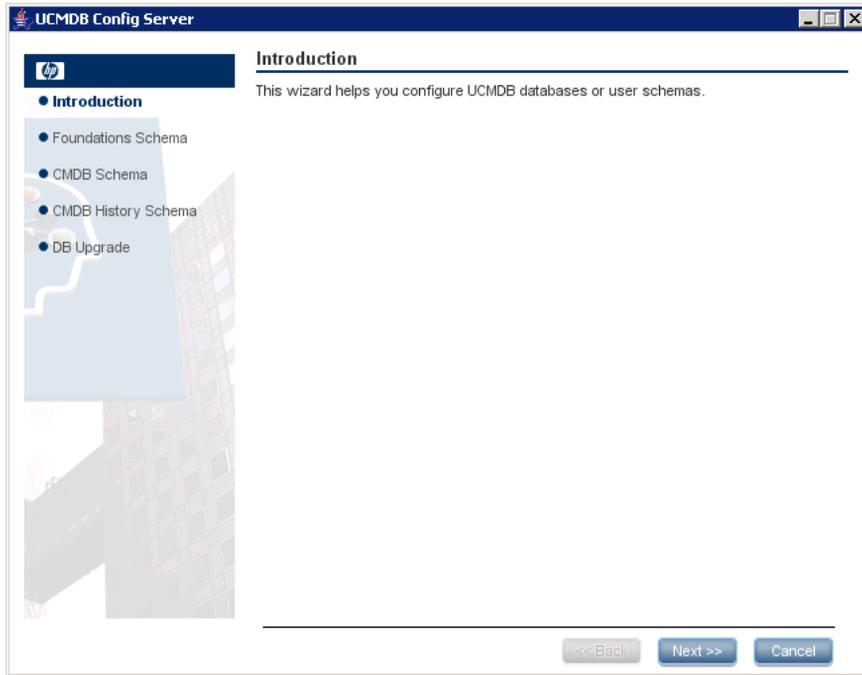
In the Sender name box, specify the name to appear in reports that HP Universal CMDB sends. Accept the default name (**UCMDB\_Report\_Manager**) or enter another sender name.

- 9 Click **Next** to open the Pre-Installation Summary dialog box that lists the installation options you have selected.



- 10 If you are satisfied with the summary, click **Install**. A message is displayed indicating that the installation is currently being performed.
- 11 The next stage of the procedure is to launch the UCMDB Server Configuration Wizard (to set up the database or schema). Click **Yes** to continue with the configuration and open the Introduction dialog box.

If you prefer, you can set up the database or schema later. Access the UCMDB Server Configuration Wizard from the Windows Start menu.



During the following stages, you choose between creating a new database or schema (Microsoft SQL Server or Oracle Server), or connecting to an existing database or schema. You would probably create a new database or schema for a new installation of HP Universal CMDB and would connect to an existing schema or database when reinstalling a server or installing an additional server.

This procedure is the same for an installation on Windows and an installation on Solaris.

- ▶ For the introduction to creating or connecting to a database, see “Choosing the Database or Schema” on page 92.
- ▶ For the procedure for creating a Microsoft SQL Server database, see “Create a Microsoft SQL Server Database” on page 95.
- ▶ For the procedure for creating an Oracle schema, see “Create an Oracle Schema” on page 108.

- ▶ For the procedure for connecting to an existing Microsoft SQL Server database, see “Connect to an Existing Microsoft SQL Server Database” on page 122.
- ▶ For the procedure for connecting to an existing Oracle schema, see “Connect to an Existing Oracle Schema” on page 123.



# 7

---

## HP Universal CMDB Installation on a Solaris Platform

This chapter describes the procedures to be performed to install HP Universal CMDB on a Solaris system.

### **This chapter includes:**

#### Concepts

- Installation Prerequisites on page 79

#### Tasks

- Install UCMDB on page 80

### **Installation Prerequisites**

Note the following before installing HP Universal CMDB:

- It is highly recommended that you thoroughly read the introduction to this guide before commencing installation. For details, see Chapter 1, “Introduction to HP Universal CMDB.”
- For details on licensing, see Chapter 2, “Licensing Models for HP Universal CMDB.”
- For details on troubleshooting login, see “Troubleshooting and Limitations” in *Reference Information*.
- **Important:** HP Universal CMDB must **not** be installed more than once on a server even if the instances are installed in different folders or are different versions.

- **Important:** If you are upgrading your current version to 8.00, read the chapter “Upgrading HP Universal CMDB to Version 8.00” on page 135 before uninstalling your current version. In that chapter, the section “Upgrade Federated CMDB Adapters” on page 144, explains how to avoid losing the adapter configuration files.

## Install UCMDB

The following procedure explains how to install HP Universal CMDB.

**To install HP Universal CMDB:**

- 1** Insert the **HP Universal CMDB Solaris Installation** DVD into the drive from which you want to install. If you are installing from a network drive, mount it.
- 2** Move to the root directory of the DVD drive.

```
cd /cdrom/cdrom0
```

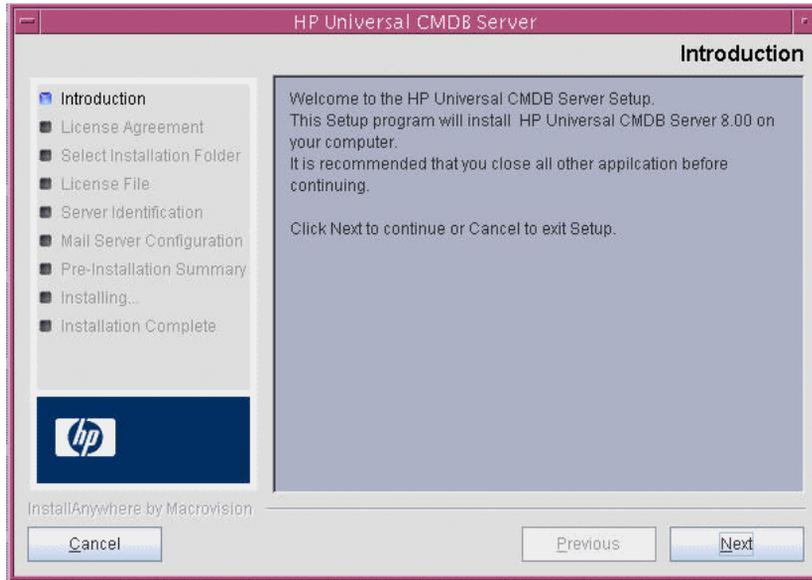
- 3** Move to the HP Universal CMDB 8.00 directory:

```
cd ucldb80
```

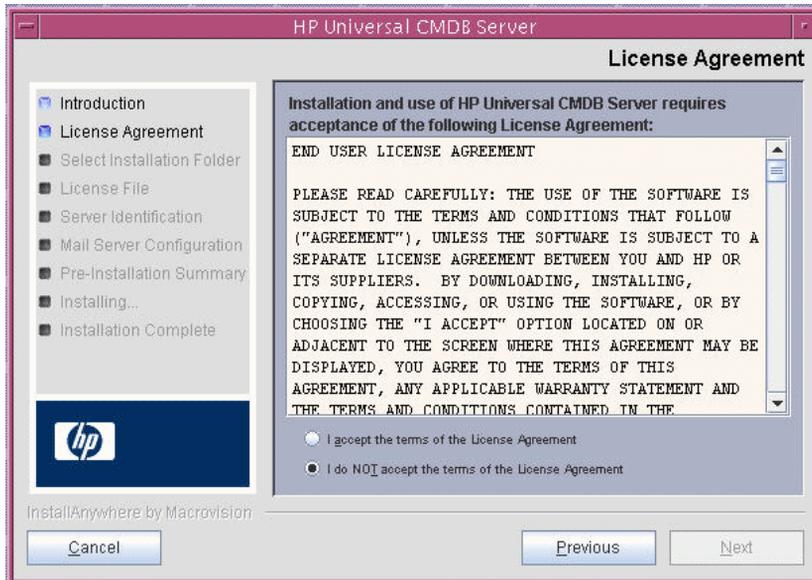
- 4** Run the command to install the HP Universal CMDB server:

```
./UCMDBServer.bin
```

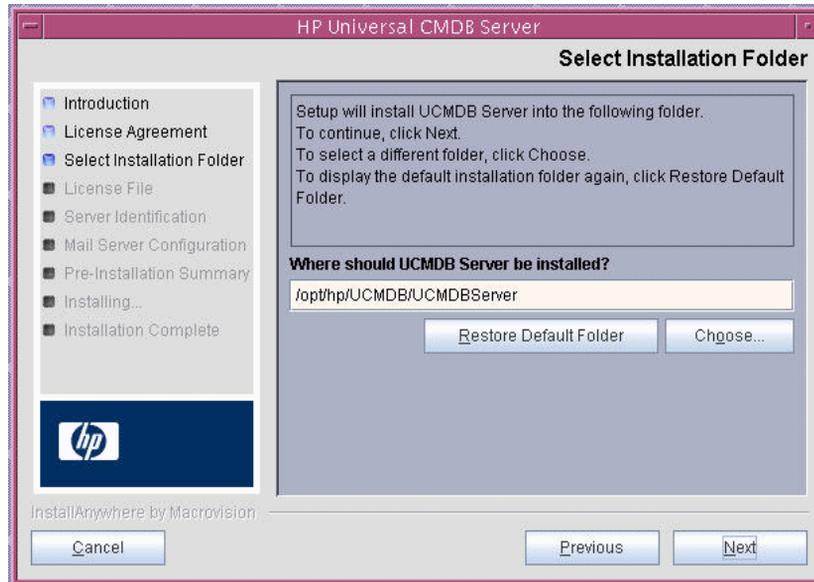
A progress bar is displayed. Once the initial process is complete, the Introduction dialog box opens.



5 Click **Next** to open the License Agreement dialog box.



Accept the terms of the license and click **Next**.

**6** Click **Next** to open the Select Installation Folder dialog box.

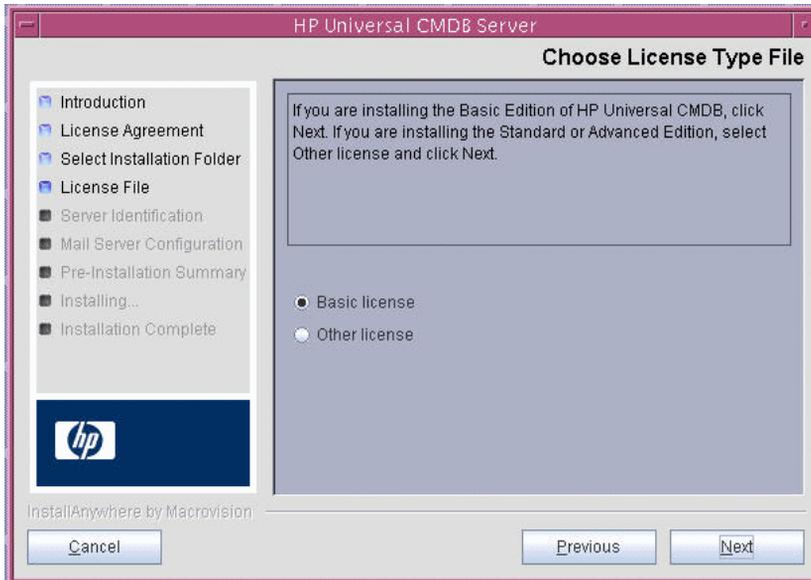
Accept the default entry or click **Choose** to display a standard Browse dialog box. To install to a different directory, browse to and select the installation folder.

---

**Tip:** To display the default installation folder again, click **Restore Default Folder**.

---

7 Click **Next** to open the Choose License Type File dialog box.



To install the basic edition, accept the default entry. To install the Standard or Advanced edition, select **Other license**. For details on licensing, see Chapter 2, “Licensing Models for HP Universal CMDB.”

If you select **Basic license**, skip to step 8.

If you select **Other license**, click **Next** to open the Choose License File dialog box.

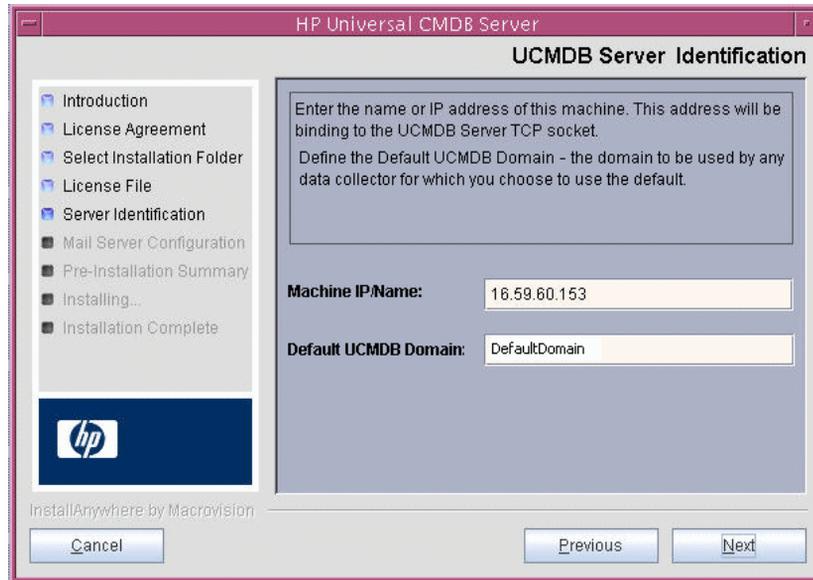
Accept the default entry or click **Choose** to display a standard Browse dialog box. Browse to and select the folder where the license file is located. Select the license file (**ucmdb\_license.xml**).

---

**Tip:** To display the default installation folder again, click **Restore Default File**.

---

- 8 Click **Next** to open the UCMDB Server Identification dialog box.



Enter the IP address or the machine name of the workstation on which the HP Universal CMDB server is to be installed in the **Machine IP/Name** box, or accept the existing entry. The TCP socket is mapped to this address and port.

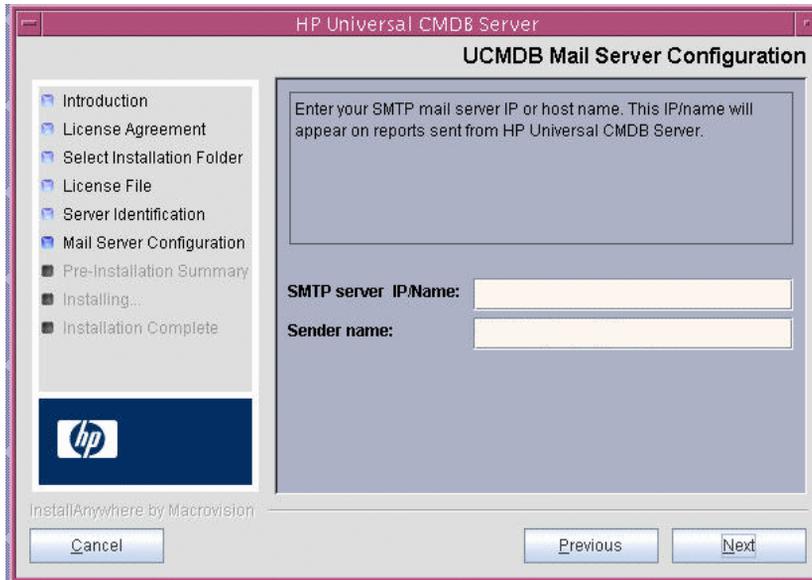
**Default UCMDB Domain:** Accept the default entry (**DefaultDomain**) or enter another domain identifier. This is the domain that is used by data collectors, for example, the DDM Probe. The default domain is the domain name to be used for data collectors if no specific, separate domain is specified during their installation.

---

**Note:** The Default UCMDB Domain is also configurable via the Infrastructure Settings Manager, available after installing HP Universal CMDB (**Foundations > CMDB > CMDB Class Model Settings > Default Domain Property Value**).

---

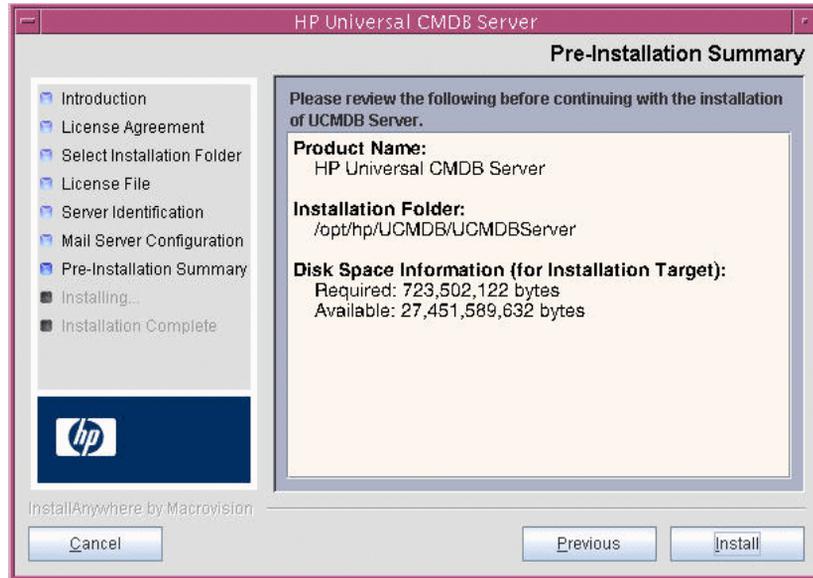
- 9 Click **Next** to open the UCMDB Mail Server Configuration dialog box.



In the SMTP server IP/Name box, enter the server IP or name. It is recommended that you specify the complete Internet address of the SMTP server. Use only alphanumeric characters.

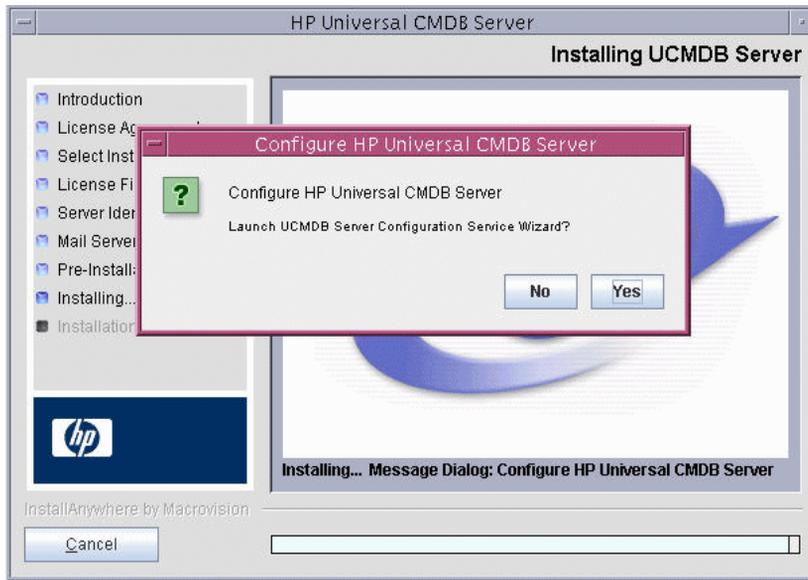
In the Sender name box, specify the name to appear in reports that HP Universal CMDB sends. Accept the default name, **UCMDB\_Report\_Manager**, or enter another sender name.

- 10 Click **Next** to open the Pre-Installation Summary dialog box that lists the installation options you have selected.



- 11 If you are satisfied with the summary, click **Install**. A message is displayed indicating that the installation is currently being performed.

- 12** The next stage of the procedure is to launch the UCMDB Server Configuration Wizard (to set up the database or schema).



Click **Yes** to continue with the configuration and open the Introduction dialog box.

During the following stages, you choose between creating a new database or schema (Microsoft SQL Server or Oracle Server), or connecting to an existing database or schema. You would probably create a new database or schema for a new installation of HP Universal CMDB and would connect to an existing schema or database when reinstalling a server or installing an additional server.

This procedure is the same for an installation on Windows and an installation on Solaris.

- ▶ For the introduction to creating or connecting to a database, see “Choosing the Database or Schema” on page 92.
- ▶ For the procedure for creating a Microsoft SQL Server database, see “Create a Microsoft SQL Server Database” on page 95.
- ▶ For the procedure for creating an Oracle schema, see “Create an Oracle Schema” on page 108.

- ▶ For the procedure for connecting to a Microsoft SQL Server database, see “Connect to an Existing Microsoft SQL Server Database” on page 122.
- ▶ For the procedure for connecting to an Oracle schema, see “Connect to an Existing Oracle Schema” on page 123.



# 8

---

## UCMDB Server Configuration

This chapter describes the second stage of the installation procedure, which is to launch the UCMDB Server Configuration Wizard (to set up the database or schema). For details on the first stage of the installation, see Chapter 6, “HP Universal CMDB Installation on a Windows Platform” or Chapter 7, “HP Universal CMDB Installation on a Solaris Platform.”

---

**Note:** It is highly recommended that you thoroughly read the introduction to this guide before commencing installation. For details, see Chapter 1, “Introduction to HP Universal CMDB.”

---

### **This chapter includes:**

#### **Concepts**

- Choosing the Database or Schema on page 92
- Required Information for Setting Database Parameters on page 93
- Allocating Memory to Processes on page 95

#### **Tasks**

- Access the UCMDB Server Configuration Wizard on page 95
- Create a Microsoft SQL Server Database on page 95
- Create an Oracle Schema on page 108
- Connect to an Existing Microsoft SQL Server Database on page 122
- Connect to an Existing Oracle Schema on page 123
- Upgrade Database Schemas on page 124

- ▶ Restart the Server on page 128

## **Choosing the Database or Schema**

During installation, you must decide whether you want to create the database users or use predefined users. HP Universal CMDB enables you to make this choice at the same time as you choose on which database you want to run the application:

**Choose to create a database or schema user in the following cases:**

- ▶ There are no existing database users.
- ▶ There are existing database users, but you want to initialize the database default contents.

**Choose to connect to an existing database or schema user in the following cases:**

- ▶ You want to upgrade to a newer version of HP Universal CMDB, and use the database contents you have from using the previous version of HP Universal CMDB.
- ▶ You do not want to change the database's default contents, for example, because you have data in your database or schema from a previous installation of the same release. In this case, Setup updates the necessary server configuration files with the database details and updates the database scripts configuration file. For details, see the *HP Universal CMDB Database Guide* PDF.
- ▶ Your database administrator provides instructions for creating the database users in advance according to company policy. To manually create Microsoft SQL Server databases or Oracle schemas, see the *HP Universal CMDB Database Guide* PDF.

## Required Information for Setting Database Parameters

Before setting foundation, CMDB, and CMDB history database parameters, you should prepare the information described in the following sections.

### Deploying Microsoft SQL Server

You need the following information for both creating new databases and connecting to existing ones:

- ▶ **Host name.** The name of the machine on which Microsoft SQL Server is installed. If you are connecting to a non-default Microsoft SQL Server instance, enter the following: <host\_name>\<instance\_name>
- ▶ **Port.** The Microsoft SQL Server's TCP/IP port. HP Universal CMDB automatically displays the default port, **1433**.
- ▶ **Database name.** The name of the existing database, or the name that you will give your new database (for example, UCMDB\_Foundation).
- ▶ **User name and Password.** (if you are using Microsoft SQL Server authentication) The user name and password of a user with administrative rights on Microsoft SQL Server. The default Microsoft SQL Server administrator user name is **sa**. Note that a password must be supplied.

You can create and connect to a database using Windows authentication instead of Microsoft SQL Server authentication. To do so, you must ensure that the Windows user running the HP Universal CMDB service has the necessary permissions to access the Microsoft SQL Server database. For information on assigning a Windows user to run the HP Universal CMDB service, see Chapter 9, “Changing the HP Universal CMDB Service User.” For information on adding a Windows user to Microsoft SQL Server, see “Using Windows Authentication to Access Microsoft SQL Server Databases” in the *HP Universal CMDB Database Guide* PDF.

### Deploying Oracle Server

Before setting foundation, CMDB, and CMDB history database parameters, ensure that you have created at least one default tablespace for each user schema for data persistency purposes, and that at least one temporary tablespace is assigned to each user schema.

You need the following information for both creating a new user schema and connecting to an existing one:

- **Host name.** The name of the host machine on which Oracle Server is installed.
- **Port.** The Oracle listener port. HP Universal CMDB automatically displays the default port, **1521**.
- **SID.** The Oracle instance name that uniquely identifies the Oracle database instance being used by HP Universal CMDB.
- **Schema name and password.** The name and password of the existing user schema, or the name that you will give the new user schema (for example, UCMDB\_FOUNDATION).

If you are creating a new user schema, you need the following additional information:

- **Admin user name and password** (to connect as an administrator). The name and password of a user with administrative permissions on Oracle Server (for example, a System user).
- **Default tablespace.** The name of the default tablespace you created for the user schema. For details on creating an HP Universal CMDB tablespace, see “Creating Schema Default and Temporary Tablespaces” in the *HP Universal CMDB Database Guide* PDF.
- **Temporary tablespace.** The name of the temporary tablespace you assigned to the user schema. The default Oracle temporary tablespace is **temp**.

---

**Note:** To create a new user schema, you must have user creation privileges.

---

## Allocating Memory to Processes

The amount of memory allocated to a process is calculated by:

- ▶ The settings in the `C:\hp\UCMDB\UCMDBServer\j2f\conf\deployment.xml` file.
- ▶ The amount of physical memory available on the server at the time the UCMDB Server Configuration Wizard is running.

If you add more memory to the server later, you should rerun the Wizard so that HP Universal CMDB can take advantage of the added memory.

## Access the UCMDB Server Configuration Wizard

If you did not set up the database or schema during installation, you can set it up using one of the following methods:

- ▶ Access the UCMDB Server Configuration Wizard from the Windows Start menu by selecting **Start > Programs > HP UCMDB > Start UCMDB Server Configuration Wizard**.
- ▶ Double-click the following file: `<HP Universal CMDB root directory>\UCMDBServer\j2f\tools\ConfigServer\ucmdb-config-server-wizard.bat`.

## Create a Microsoft SQL Server Database

This section explains how to set up the Microsoft SQL Server database. There are three parts to this stage of the installation: setting up the Foundations, CMDB, and CMDB History databases.

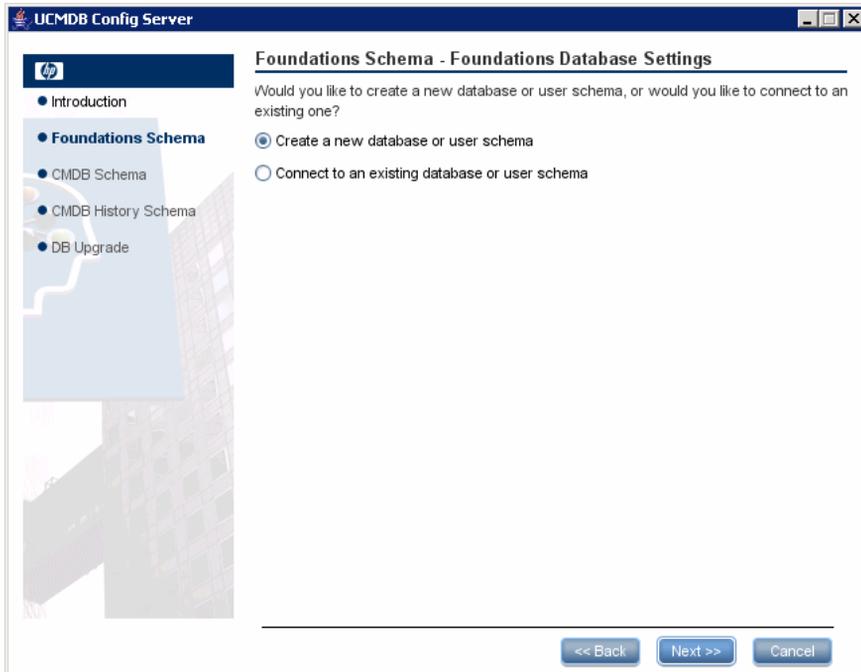
**To set up the Microsoft SQL Server database:**

- 1** Following installation, click **Next** to open the Foundations Database Settings dialog box.

---

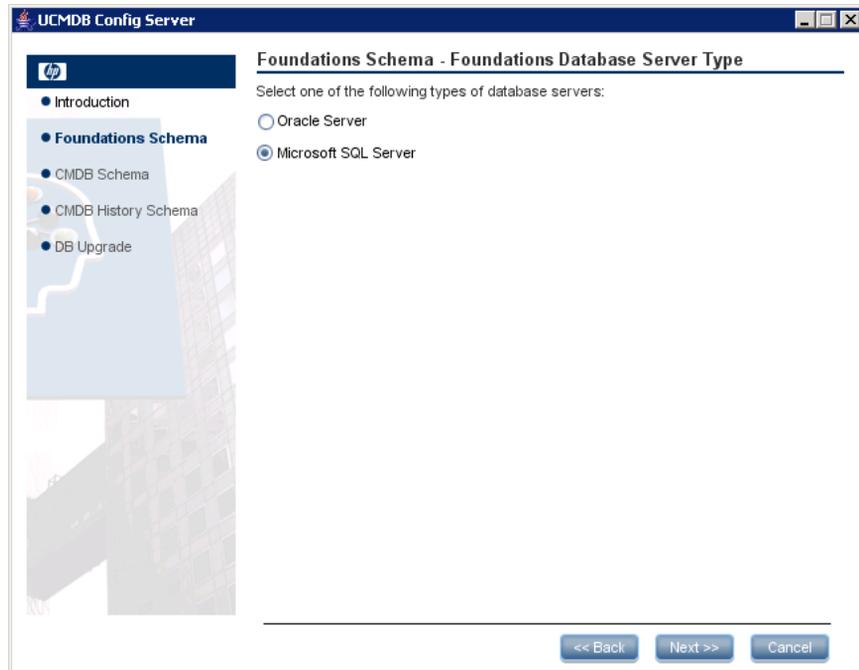
**Note:** If you have finished installation, you can access the UCMDB Server Configuration Wizard from the Windows Start menu. For details, see “Access the UCMDB Server Configuration Wizard” on page 95.

---



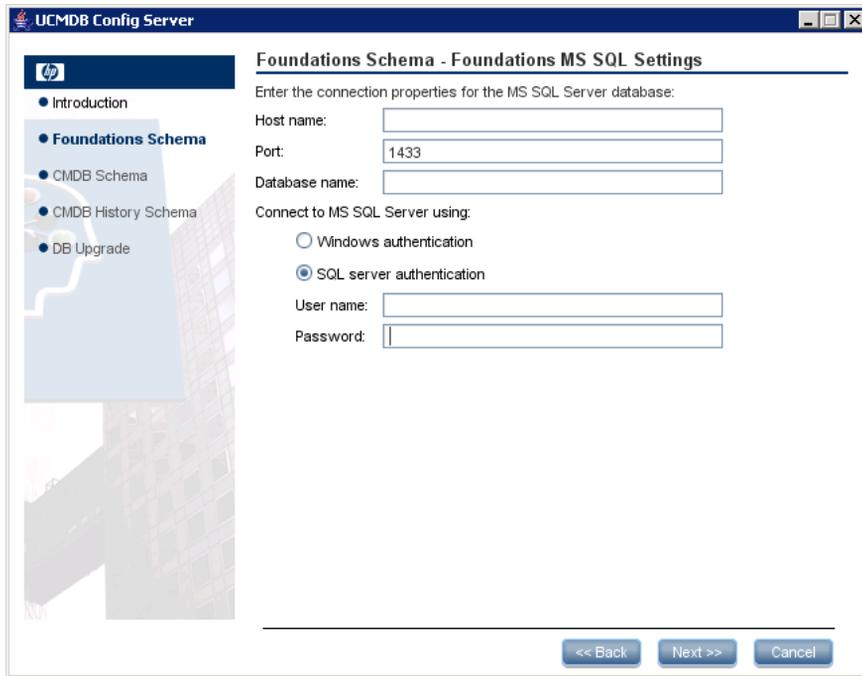
Select **Create a new database or user schema**.

2 Click **Next** to open the Foundations Database Server Type dialog box.



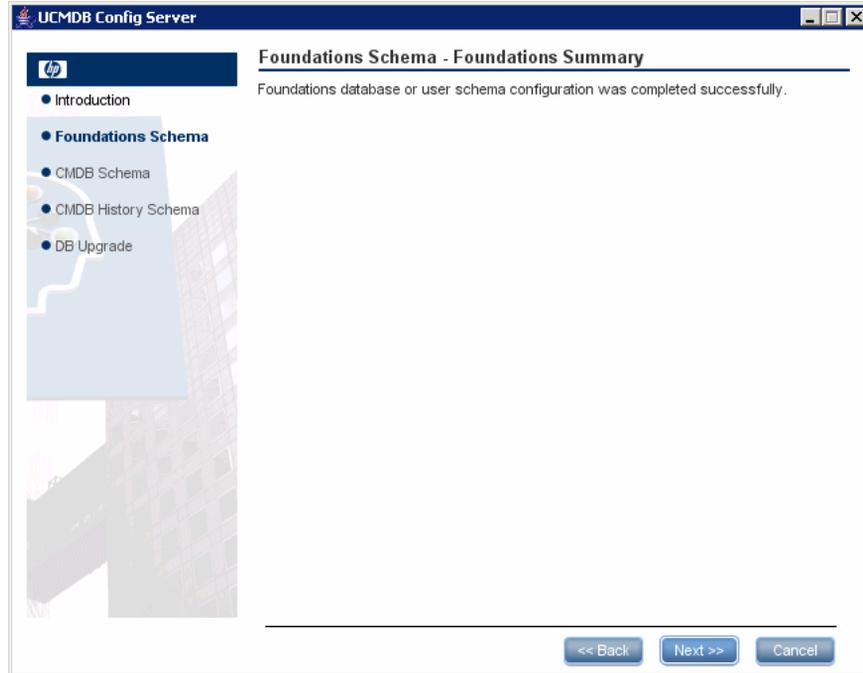
Select **Microsoft SQL Server**.

3 Click **Next** to open the Foundations MS SQL Settings dialog box.

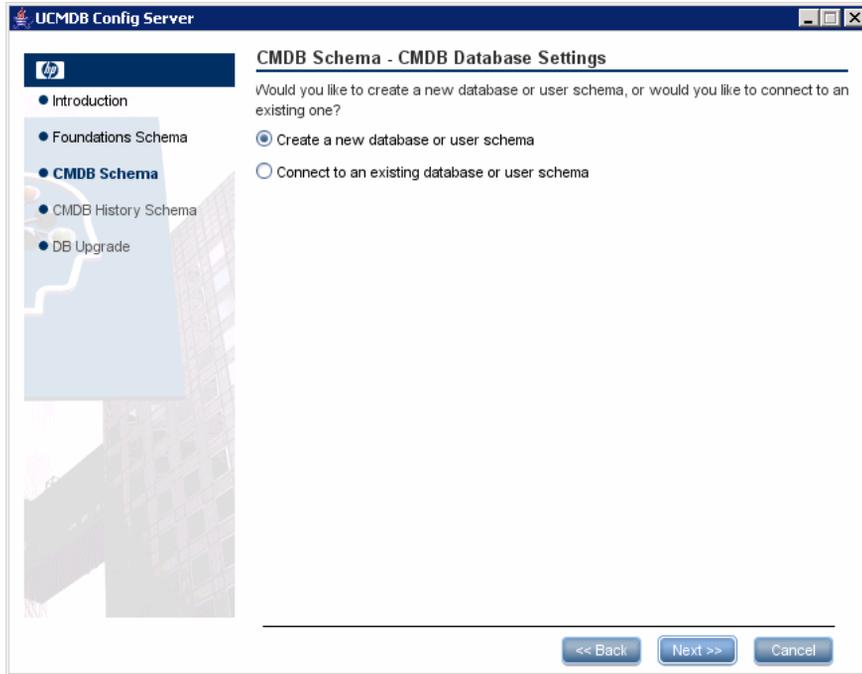


Enter the host name and database name and decide which authentication HP Universal CMDB should use to connect to the database server. For details, on Windows authentication, see “Using Windows Authentication to Access Microsoft SQL Server Databases” in the *HP Universal CMDB Database Guide* PDF.

- 4 Click **Next**. The Foundations database is created. When database creation is complete, the Foundations Summary dialog box is displayed.

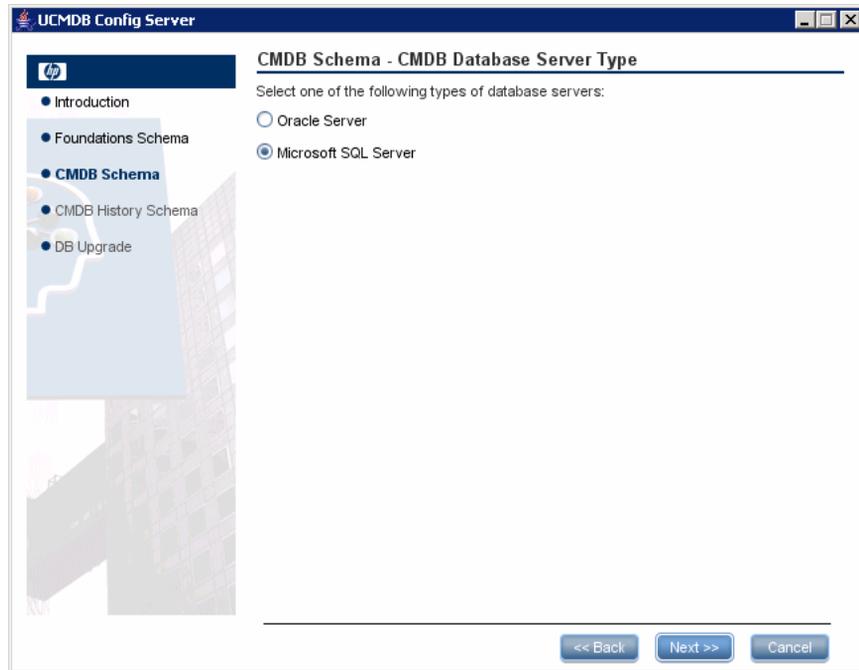


5 Click **Next** to display the CMDB Database Settings dialog box.



Select **Create a new database or user schema**.

6 Click **Next** to open the CMDB Database Server Type dialog box.



Select **Microsoft SQL Server**.

7 Click **Next** to open the CMDB MS SQL Settings dialog box.

The screenshot shows a window titled "UCMDB Config Server" with a sub-tab "CMDB Schema - CMDB MS SQL Settings". On the left is a navigation pane with the following items:

- Introduction
- Foundations Schema
- **CMDB Schema**
- CMDB History Schema
- DB Upgrade

The main content area contains the following fields and options:

Enter the connection properties for the MS SQL Server database:

Host name:

Port:

Database name:

Connect to MS SQL Server using:

Windows authentication

SQL server authentication

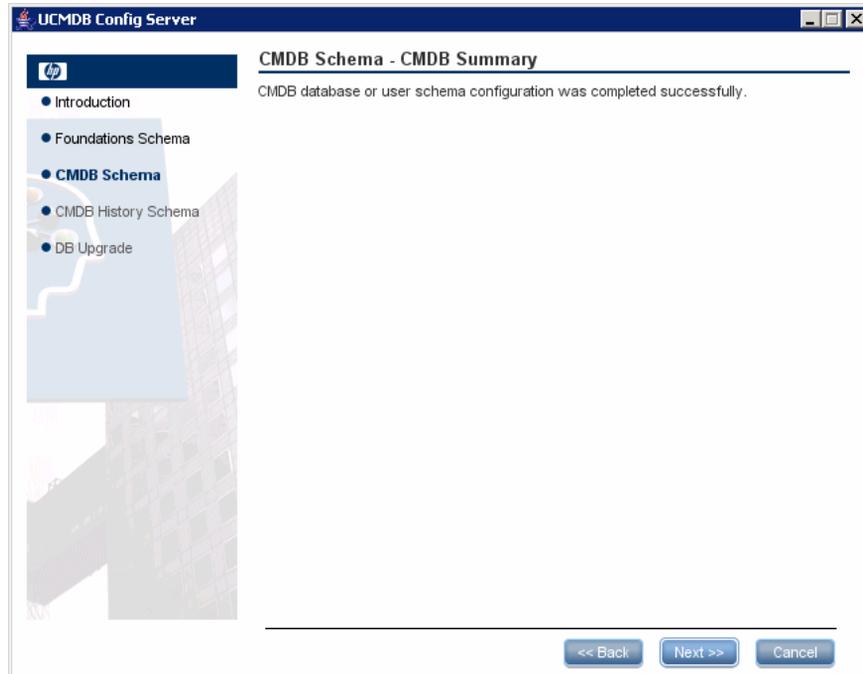
User name:

Password:

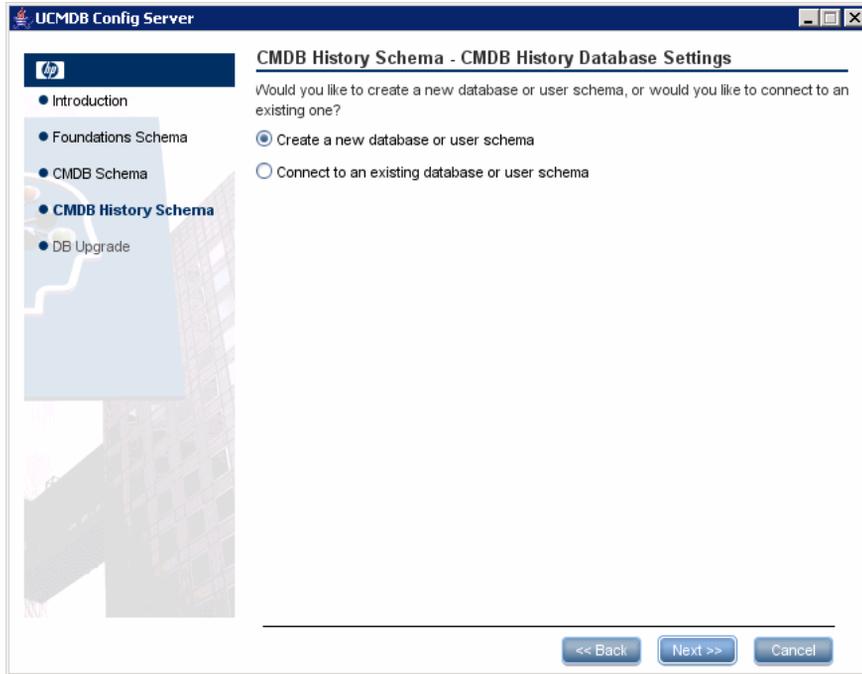
At the bottom right, there are three buttons: "<< Back", "Next >>", and "Cancel".

The values you added for the Foundation settings are displayed in the box.

- Click **Next**. The CMDB database is created. When database creation is complete, the CMDB Summary dialog box is displayed.

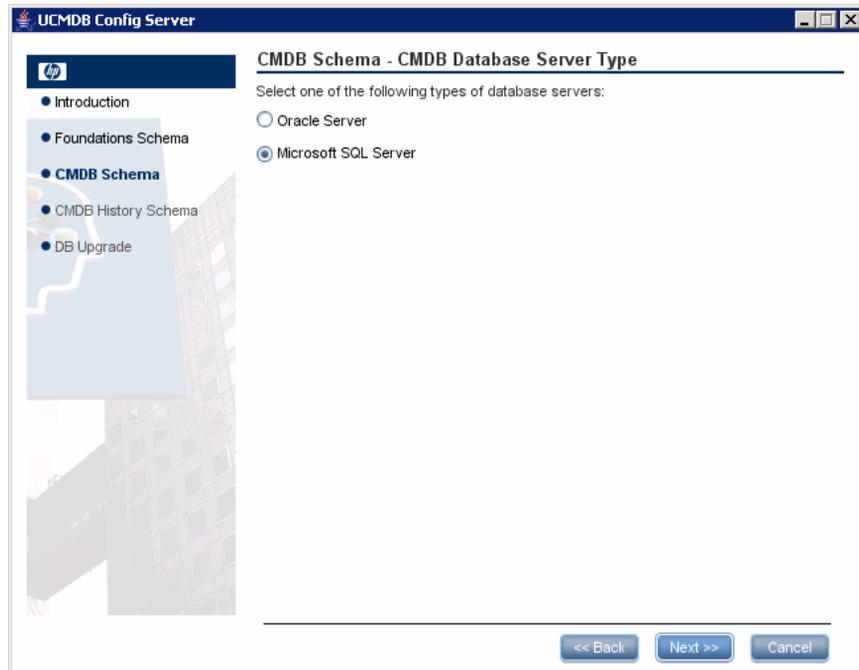


9 Click **Next** to display the CMDB History Database Settings dialog box.



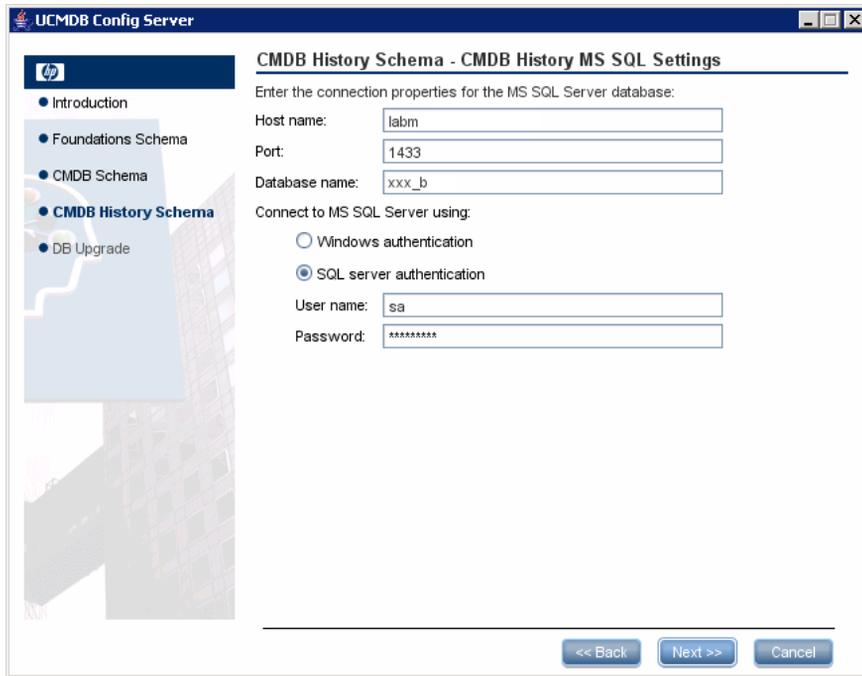
Select **Create a new database or user schema**.

**10** Click **Next** to open the CMDB History Database Server Type dialog box.



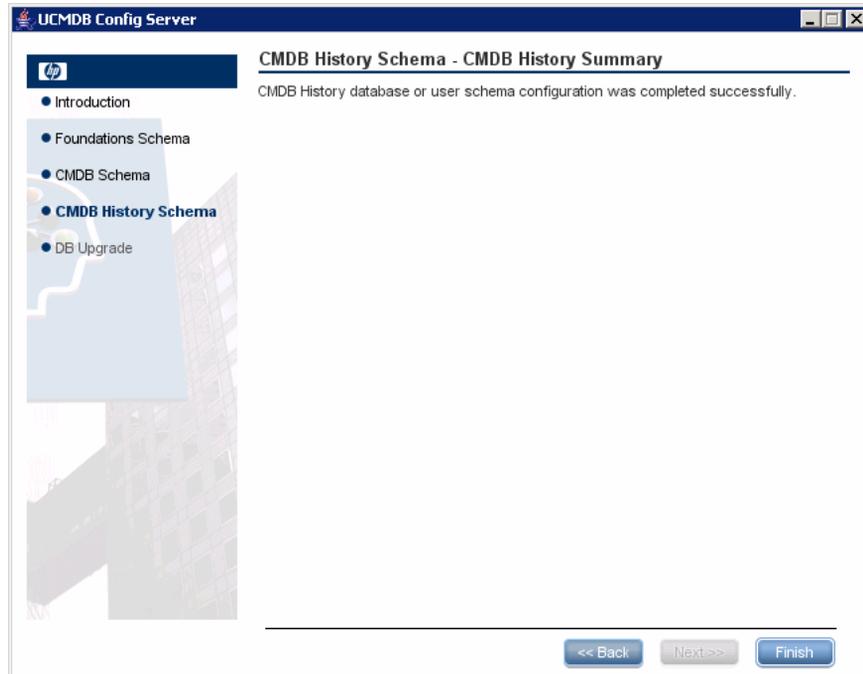
Select **Microsoft SQL Server**.

**11** Click **Next** to open the CMDB History MS SQL Settings dialog box.



The values you added for the Foundation settings are displayed in the box.

- Click **Next**. The CMDB History database is created. When database creation is complete, the CMDB History Summary dialog box is displayed.



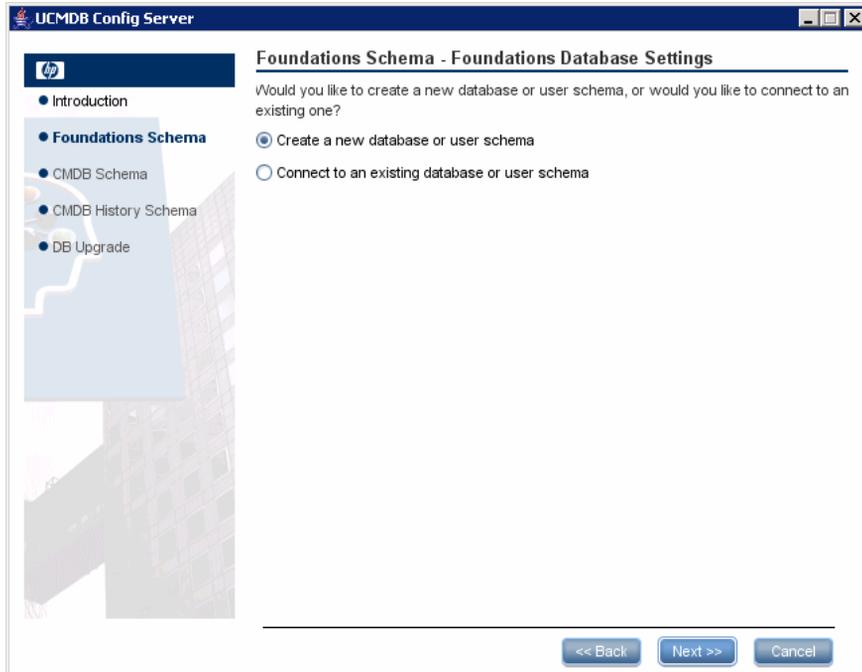
- Click **Finish**.

## Create an Oracle Schema

This section explains how to set up the Oracle schema. There are three parts to this stage of the installation: setting up the Foundations, CMDB, and CMDB History schemas.

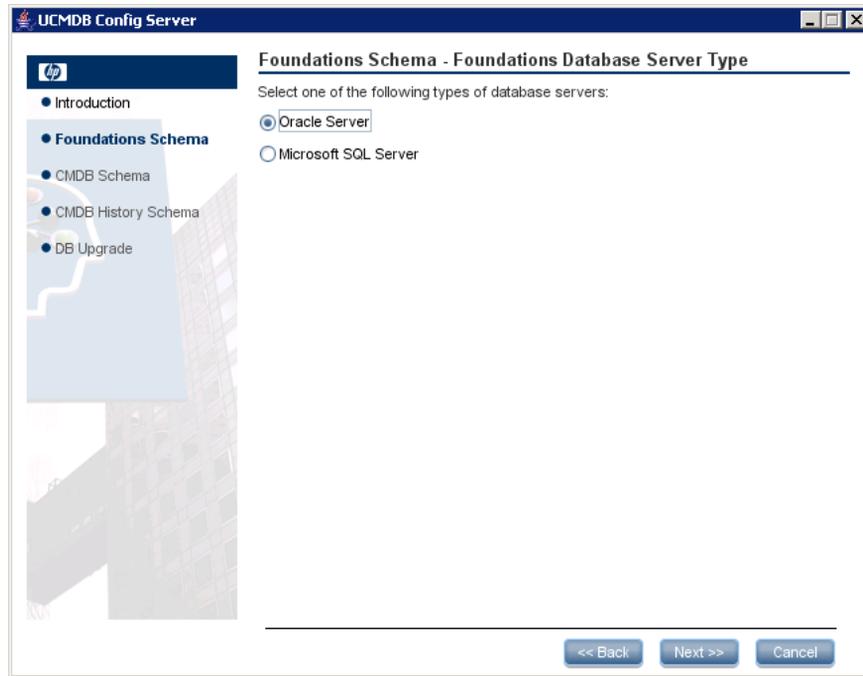
**To set up the Oracle schema:**

- 1 Click **Next** to open the Foundations Database Settings dialog box.



Select **Create a new database or user schema**.

2 Click **Next** to open the Foundations Database Server Type dialog box.



Select **Oracle Server**.

3 Click **Next** to open the Foundations Oracle Schema Settings dialog box.

UCMDB Config Server

**Foundations Schema - Foundations Oracle Schema Settings**

Enter the credentials of the administrative user with which you want to connect to the Oracle Server database:

Host name:

Port:

SID:

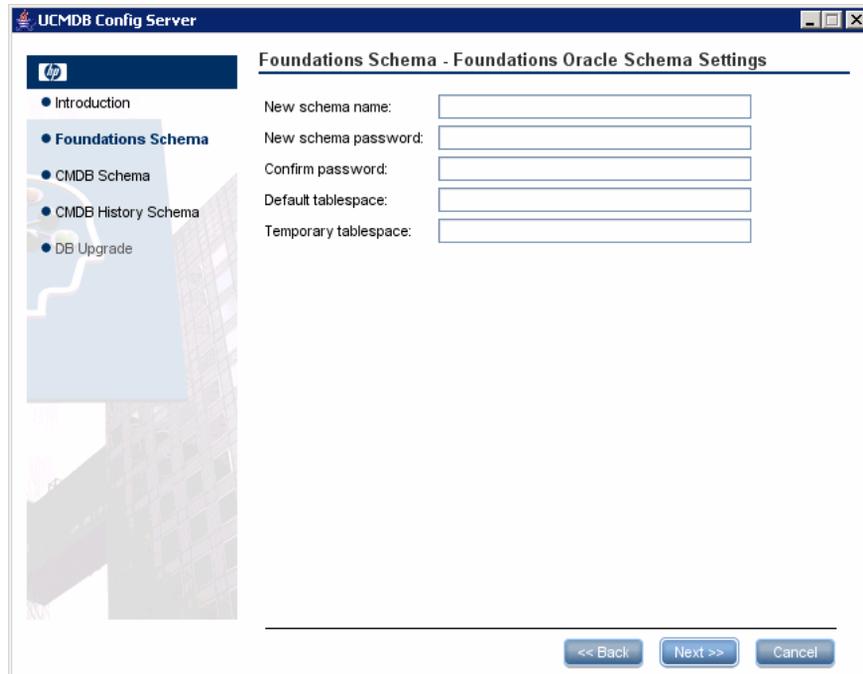
Admin user name:

Admin user password:

<< Back   Next >>   Cancel

Enter the details of the administration user.

- 4 Click **Next** to open the Foundations Oracle Schema Settings dialog box.



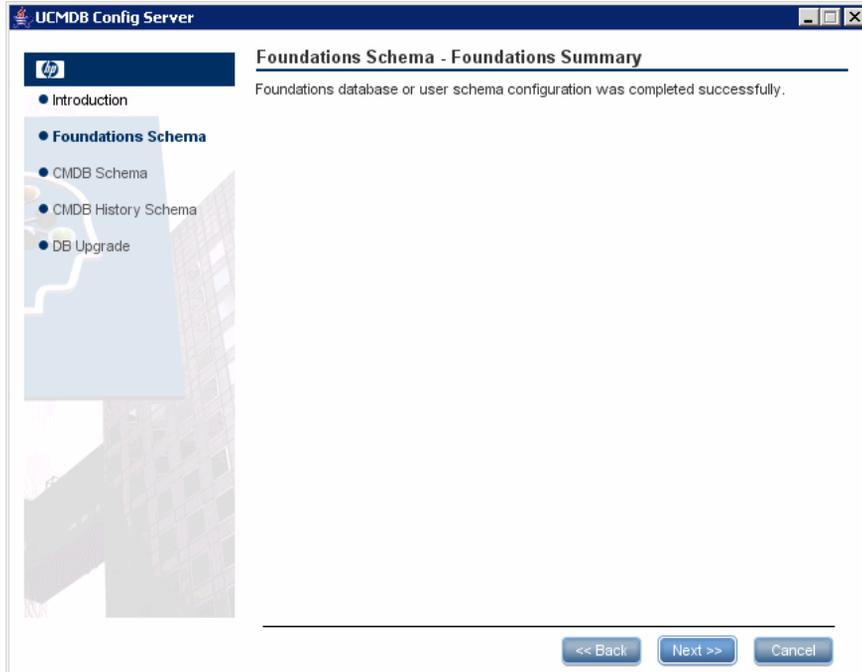
The screenshot shows a window titled "UCMDB Config Server" with a sub-header "Foundations Schema - Foundations Oracle Schema Settings". On the left, a navigation pane lists: Introduction, Foundations Schema (selected), CMDB Schema, CMDB History Schema, and DB Upgrade. The main area contains four input fields: "New schema name:", "New schema password:", "Confirm password:", "Default tablespace:", and "Temporary tablespace:". At the bottom right, there are three buttons: "<< Back", "Next >>", and "Cancel".

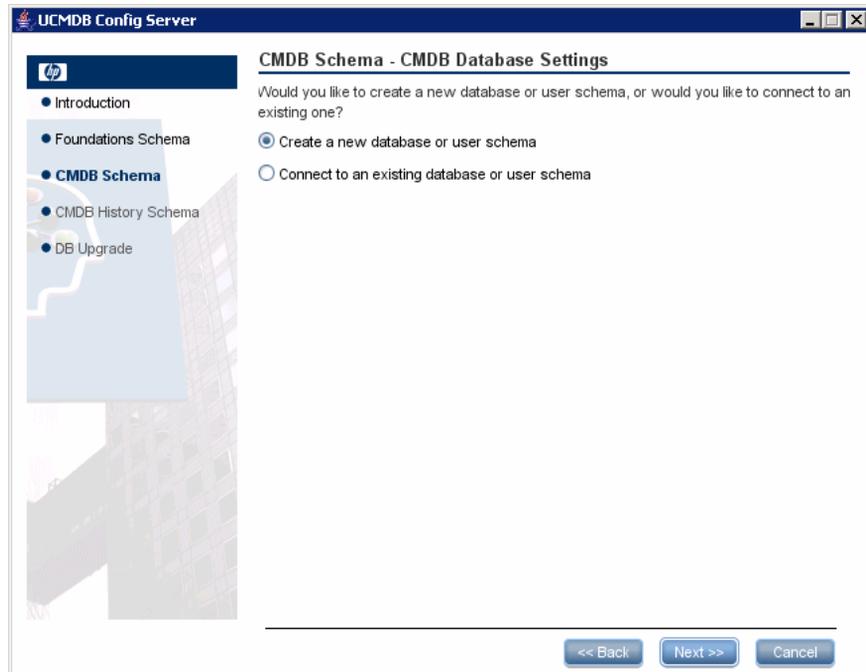
Enter the details of the schema.

**New schema name.** The schema name must be unique.

**Temporary tablespace.** If your database administrator created a non-default temporary tablespace, enter that name, otherwise enter **temp**.

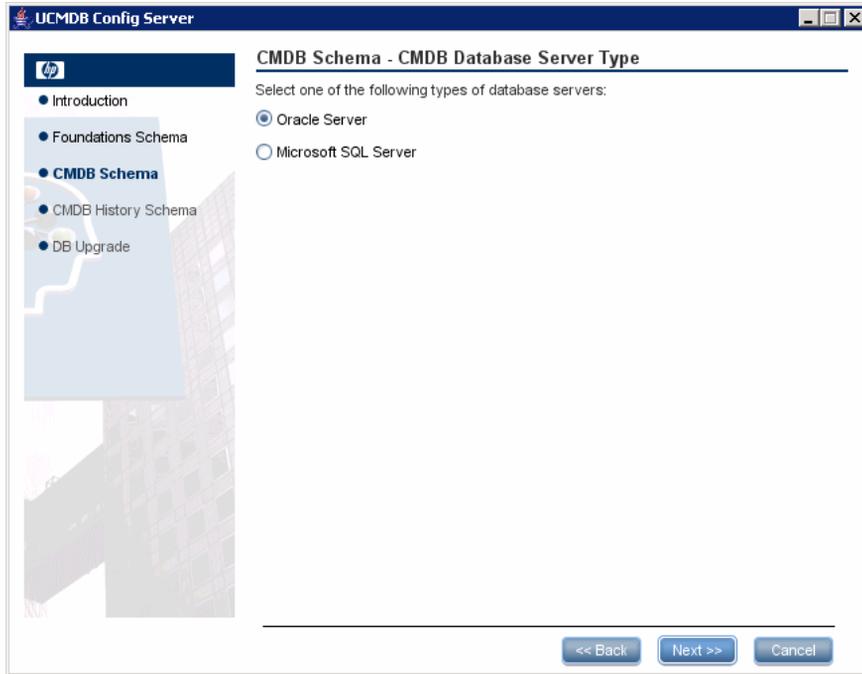
- 5 Click **Next**. Setup writes the information to the new schema and opens the Foundations Summary dialog box.



**6** Click **Next** to open the CMDB Database Settings dialog box.

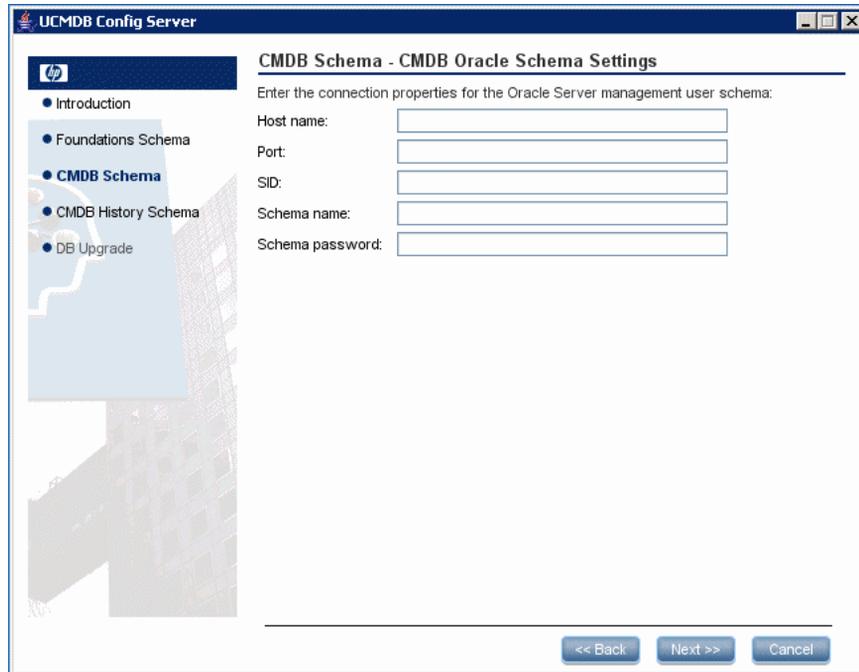
Select **Create a new database or user schema**.

7 Click **Next** to open the CMDB Database Server Type dialog box.



Select **Oracle Server**.

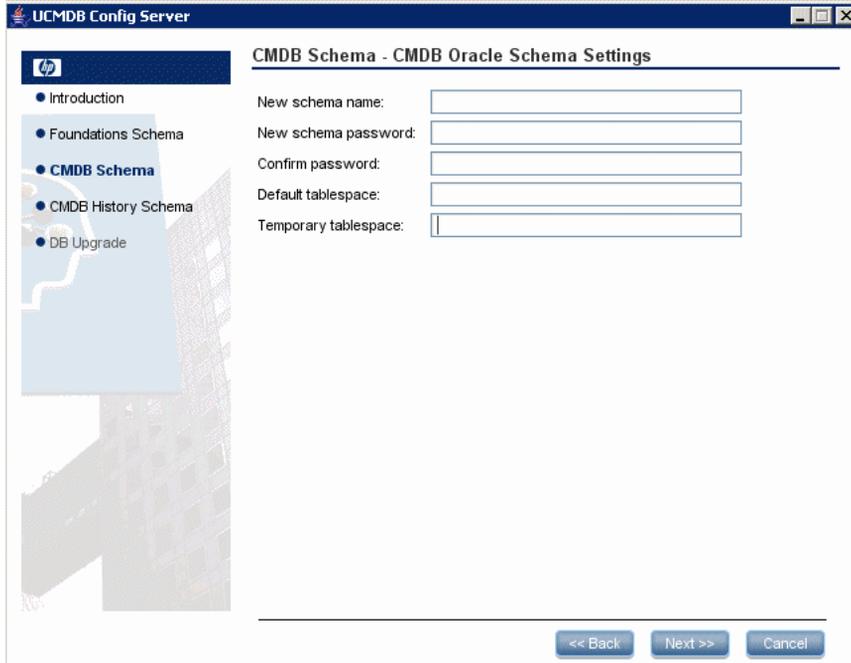
8 Click **Next** to open the CMDB Oracle Schema Settings dialog box.



The screenshot shows a window titled "UCMDB Config Server" with a sub-header "CMDB Schema - CMDB Oracle Schema Settings". On the left, a navigation pane lists: Introduction, Foundations Schema, **CMDB Schema**, CMDB History Schema, and DB Upgrade. The main area contains the instruction "Enter the connection properties for the Oracle Server management user schema:" followed by four input fields: "Host name:", "Port:", "SID:", "Schema name:", and "Schema password:". At the bottom right, there are three buttons: "<< Back", "Next >>", and "Cancel".

The values you added for the Foundation settings are displayed in the box. Make any necessary changes.

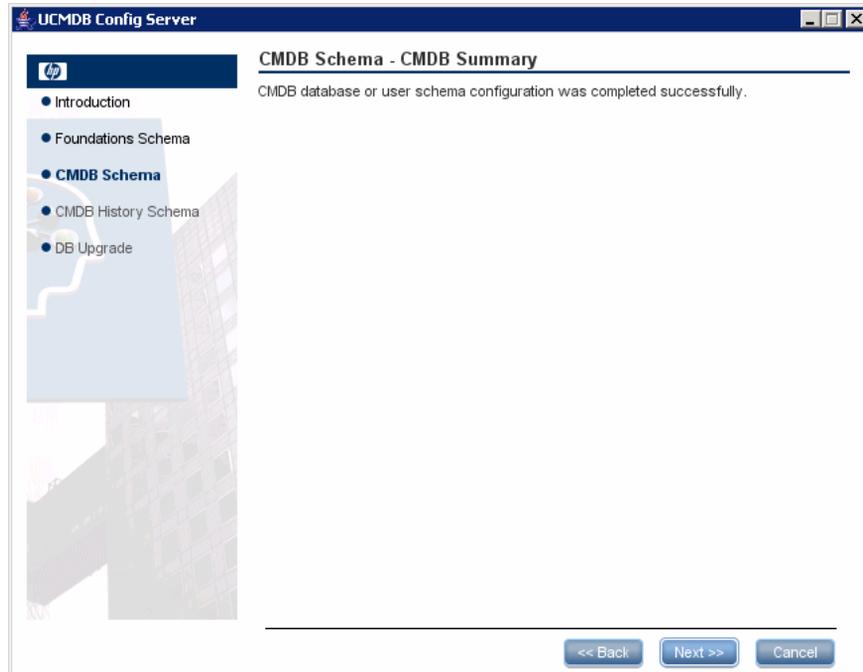
9 Click **Next** to open the CMDB Oracle Schema Settings dialog box.



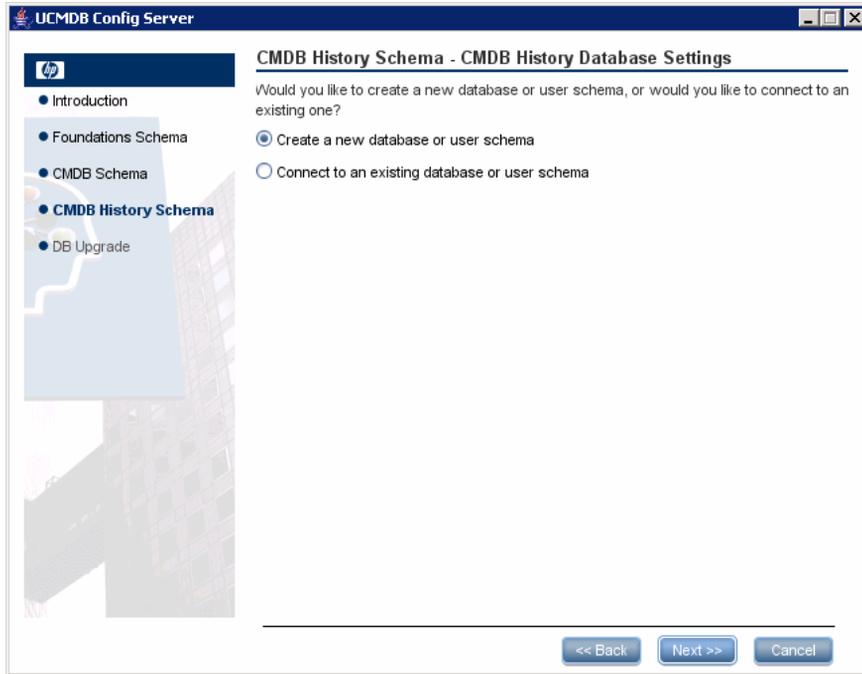
Enter the details of the schema.

- **New schema name.** The schema name should be unique.
- **Default tablespace.** Update this field.
- **Temporary tablespace.** If your database administrator created a non-default temporary tablespace, enter that name; otherwise, enter **temp**.

- 10 Click **Next**. Setup writes the information to the new schema and opens the CMDB Summary dialog box.

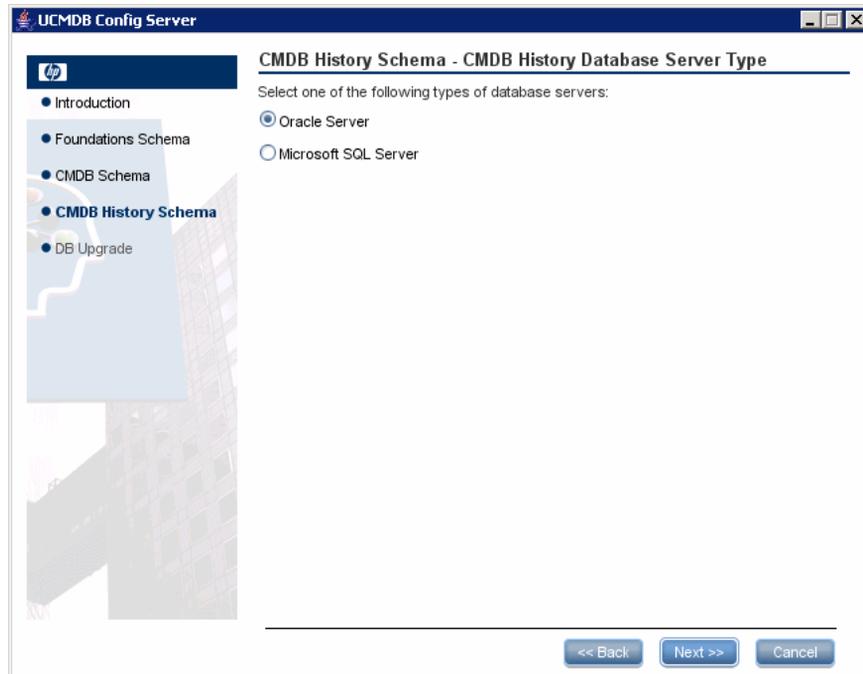


**11** Click **Next** to open the CMDB History Database Settings dialog box.



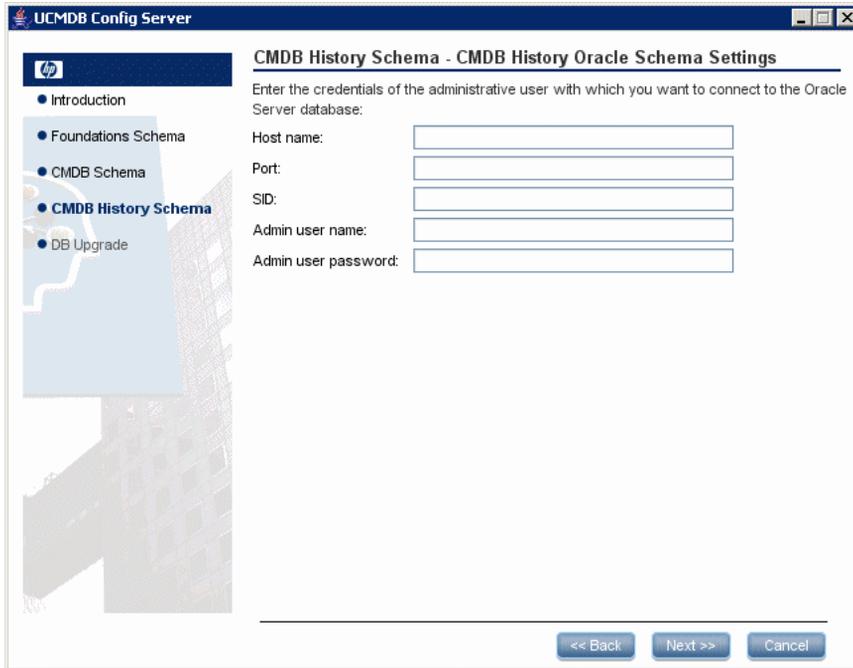
Select **Create a new database or user schema**.

**12** Click **Next** to open the CMDB History Database Server Type dialog box.



Select **Oracle Server**.

**13** Click **Next** to open the CMDB History Oracle Schema Settings dialog box.



The values you added for the Foundation settings are displayed in the box. Make any necessary changes.

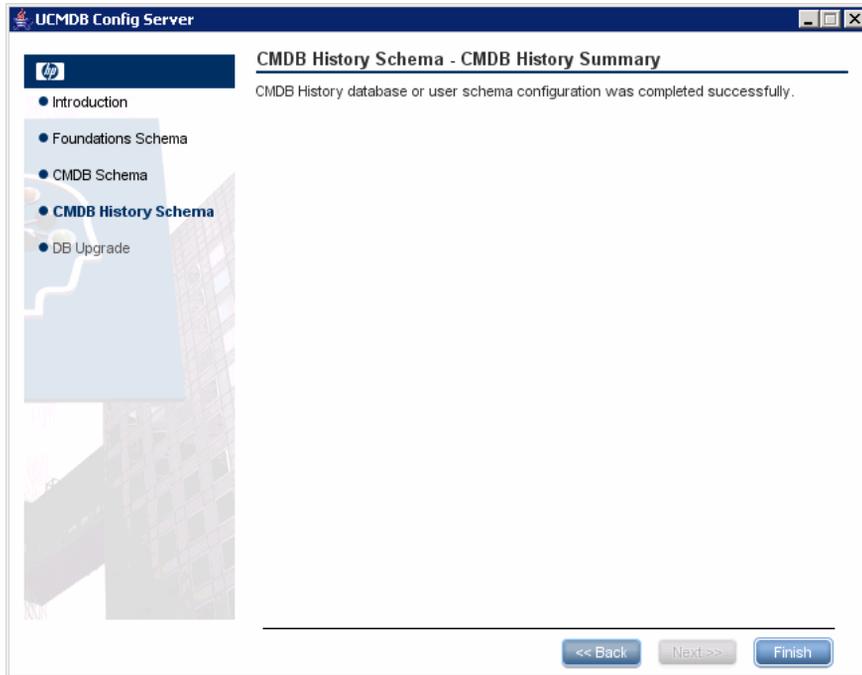
- 14** Click **Next** to open the CMDB History Oracle Schema Settings dialog box.

The screenshot shows a window titled "UCMDB Config Server" with a sub-title "CMDB History Schema - CMDB History Oracle Schema Settings". On the left, there is a navigation pane with a tree view containing the following items: Introduction, Foundations Schema, CMDB Schema, **CMDB History Schema** (highlighted), and DB Upgrade. The main area contains four input fields with labels: "New schema name:", "New schema password:", "Confirm password:", "Default tablespace:", and "Temporary tablespace:". At the bottom right, there are three buttons: "<< Back", "Next >>", and "Cancel".

Enter the details of the schema.

- **New schema name.** The history schema name should be unique.
- **Default tablespace.** Update this field.
- **Temporary tablespace.** If your database administrator created a non-default temporary tablespace, enter that name; otherwise, enter **temp**.

- 15 Click **Next**. Setup writes the information to the new schema and opens the CMDB History Summary dialog box.



- 16 Click **Finish**.

## **Connect to an Existing Microsoft SQL Server Database**

This section explains how to connect to an existing Microsoft SQL Server database. There are three parts to this stage of the installation: connecting to the Foundations, CMDB, and CMDB History databases.

Follow the instructions for creating a Microsoft SQL Server database except for the following steps:

- ▶ In step 1 on page 95, select **Connect to an existing database or user schema** and click **Next**.
- ▶ In step 5 on page 100, select **Connect to an existing database or user schema** and click **Next**.

- In step 9 on page 104, select **Connect to an existing database or user schema** and click **Next**.
- If you want to connect to existing schemas for upgrading to HP Universal CMDB 8.00, follow the instructions in “Upgrade Database Schemas” on page 124.

## **Connect to an Existing Oracle Schema**

This section explains how to connect to an existing Oracle Server schema. There are three parts to this stage of the installation: connecting to the Foundations, CMDB, and CMDB History databases.

Follow the instructions for creating an Oracle Server schema except for the following steps:

- In step 1 on page 108, select **Connect to an existing database or user schema** and click **Next**.
- From step 3 on page 110, skip to step 5 on page 112.
- In step 6 on page 113, select **Connect to an existing database or user schema** and click **Next**.
- From step 8 on page 115, skip to step 10 on page 117.
- In step 11 on page 118, select **Connect to an existing database or user schema** and click **Next**.
- From step 13 on page 120, skip to step 15 on page 122.
- If you want to connect to existing schemas for upgrading to HP Universal CMDB 8.00, follow the instructions in “Upgrade Database Schemas” on page 124.

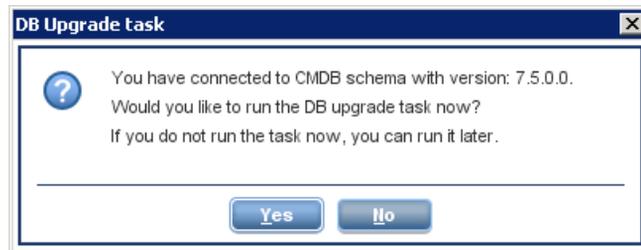
## Upgrade Database Schemas

This section explains how to upgrade your database schemas after either connecting to an existing Microsoft SQL Server database or an existing Oracle Server schema.

In this step, the UCMDB Server Configuration Wizard launches the **cmdbDbUpgrade** tool in the background and reports the result. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

**To upgrade your database schemas:**

- 1 After you have either connected to an existing Microsoft SQL Server CMDB database or an existing Oracle Server CMDB schema from a previous version, the following message appears:



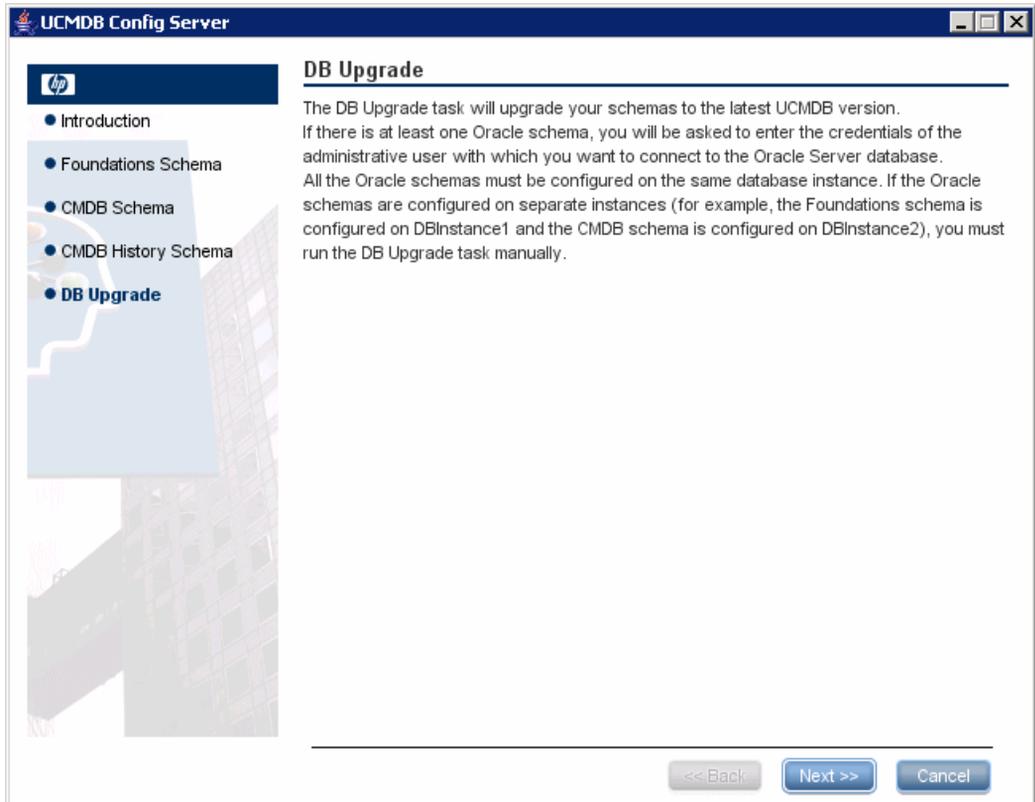
- Click **No** to skip the database upgrade step, then click **Finish** to exit the UCMDB Server Configuration Wizard.

---

**Note:** You can complete the database upgrade step later either using the UCMDB Server Configuration Wizard or by running the **cmdbDbUpgrade** tool manually. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

---

- Click **Yes** to continue the upgrade process and open the DB Upgrade dialog box.

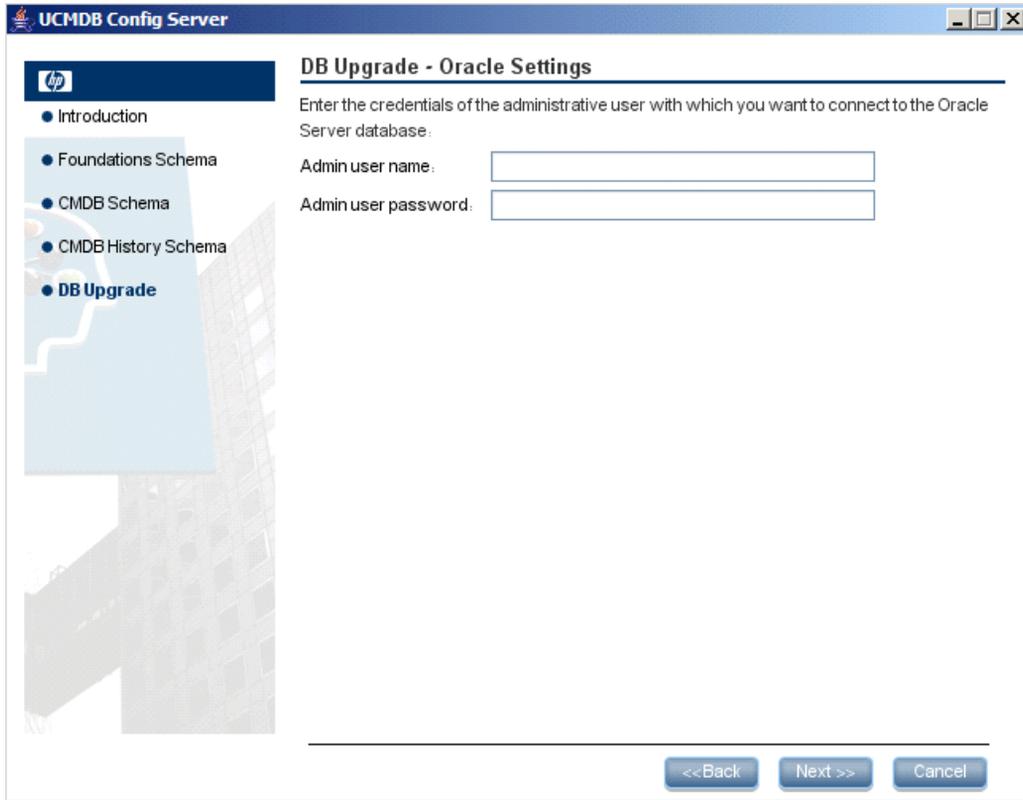


---

**Note:** The following step—step 2 on page 126—is relevant only if you have connected to an existing Oracle Server schema.

---

- 2 Click **Next** to upgrade your schemas to the latest HP Universal CMDB version and open the DB Upgrade - Oracle Settings dialog box.



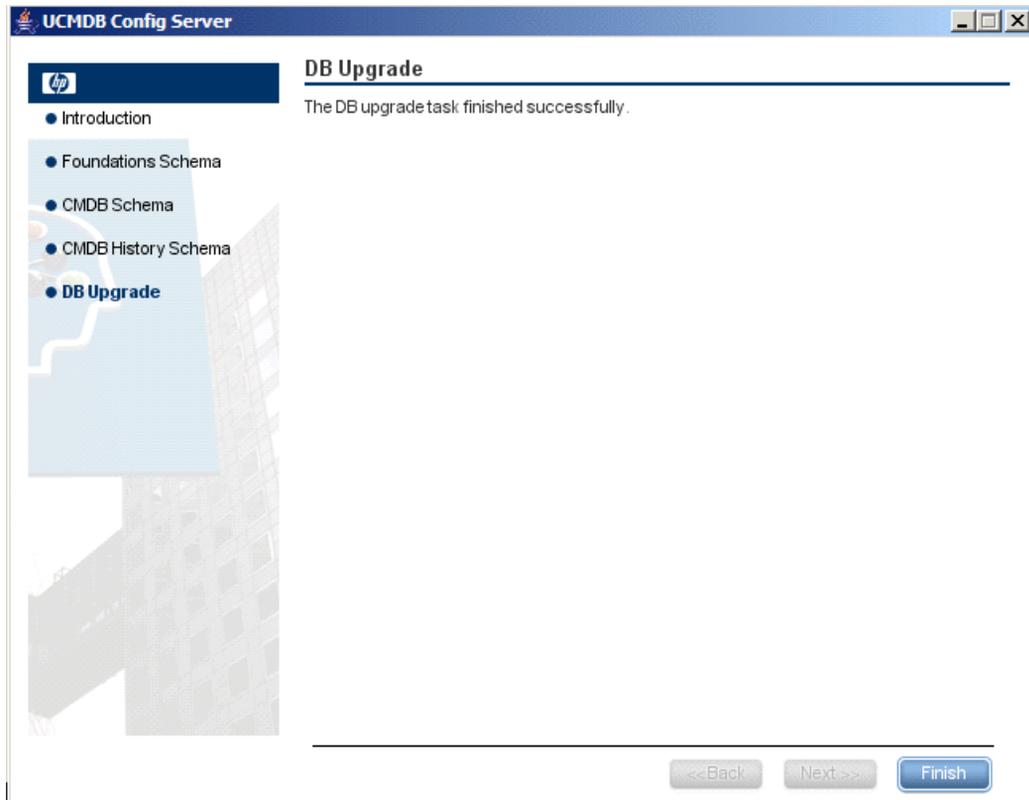
Enter the **Admin user name** and the **Admin user password** of the administrative user with which you want to connect to the Oracle Server database.

---

**Note:** If you do not want to supply your database administrator account user name and password, you can create a user name with the minimum privileges required for the **cmdbDbUpgrade** tool to operate. For details on how to create this user, see “Creating Schema User Permissions” in the *HP Universal CMDB Database Guide* PDF.

---

- 3 Click **Next** to continue the upgrade process and open the DB Upgrade dialog box.



- 4 Click **Finish** to complete the upgrade process.

---

**Note:** If the database upgrade process fails, continue with the next step.

---

- 5 If the database upgrade fails, a dialog box opens displaying the location of the log file that identifies the reason for the upgrade failure. If relevant, diff and sql files are created in **<HP Universal CMDB root folder>\UCMDBServer\j2f\tools\dbverify\_standalone**. For details, see "Upgrade Static Tables with the cmdbDbUpgrade Tool" on page 147.

After correcting the root cause of the failure, you need to re-run the database upgrade step again. You have two options:

- ▶ Use the UCMDB Server Configuration Wizard to repeat the database upgrade steps.

or

- ▶ Click **Finish** to close the wizard and run the **cmdbDbUpgrade** tool manually from command prompt. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

## Restart the Server

If you ran the UCMDB Server Configuration Wizard as part of HP Universal CMDB server installation, you must start HP Universal CMDB on the server only after successfully setting the parameters for all the databases.

If you ran the UCMDB Server Configuration Wizard to modify previously defined database types or connection parameters, restart the HP Universal CMDB server and the DDM Probe after successfully completing the parameter modification process.

# 9

---

## Changing the HP Universal CMDB Service User

### **This chapter includes:**

#### Concepts

- Overview on page 129

#### Tasks

- Change the HP Universal CMDB Service User on page 130

### **Overview**

On a Windows platform, the HP Universal CMDB service, which runs all HP Universal CMDB services and processes, is installed when you run the Server and Database Configuration utility. By default, this service runs under the local system user. However, you may need to assign a different user to run the service (for example, if you are using NTLM authentication). This chapter explains how to change this user.

The user you assign to run the service must have the following permissions:

- sufficient database permissions (as defined by the database administrator)
- sufficient network permissions
- administrator permissions on the local server

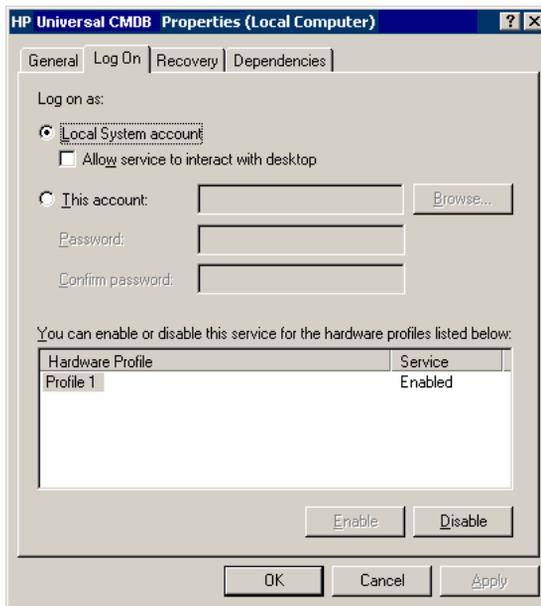
---

**Note:** When the HP Universal CMDB service is installed, it is installed as a manual service. When you enable HP Universal CMDB for the first time, it becomes an automatic service.

---

## Change the HP Universal CMDB Service User

- 1 Disable HP Universal CMDB (**Start > Programs > HP UCMDB > Stop UCMDB Server**).
- 2 In Microsoft's Services window, double-click **Universal CMDB**. The Universal CMDB Properties (Local Computer) dialog box opens.
- 3 Click the **Log On** tab.



- 4 Select **This account** and browse to choose another user from the list of valid users on the machine.

- 5 Enter the selected user's Windows password and confirm this password.
- 6 Click **Apply** to save your settings and **OK** to close the dialog box.
- 7 Enable HP Universal CMDB (**Start > Programs > HP UCMDB > Start UCMDB Server**).



# Part III

---

## Upgrading HP Universal CMDB



# 10

---

## Upgrading HP Universal CMDB to Version 8.00

This chapter explains how to upgrade HP Universal CMDB from versions 7.x to 8.00.

### **This chapter includes:**

#### Concepts

- Upgrade Prerequisites on page 136
- HP Universal CMDB and Federated CMDB Adapters Upgrade Notes on page 137

#### Tasks

- Upgrade to Version 8.00 from Versions 7.x on page 139
- Upgrade Application View (From Version 7.x to 8.00) on page 143
- Upgrade Federated CMDB Adapters on page 144
- Upgrade HP Business Availability Center in Staging Mode with an External CMDB on page 146
- Upgrade Static Tables with the cmdbDbUpgrade Tool on page 147
- Run the DB Delete Tool on page 151

**Troubleshooting and Limitations** on page 154

## Upgrade Prerequisites

- ▶ **Important:** It is highly recommended that you thoroughly read this chapter before commencing the upgrade procedure.
- ▶ **Important:** Before you begin the upgrade process, review the changes that occur to the CMDB, the Class Model, and TQL-based resources during the upgrade process. For details, see “Class Model Changes” on page 187.
- ▶ All proprietary configuration files should be backed up before any install or uninstall procedure since uninstalling the previous version deletes the configuration files on the disk. For details on how to back up your configuration files, see “Upgrade Federated CMDB Adapters” on page 144.
- ▶ To upgrade from version 6.x to 8.00, you need to first upgrade to 7.0. For details, see “Upgrading HP Universal CMDB to Version 7.0” on page 161.
- ▶ If you need to upgrade an external CMDB for use with HP Business Availability Center, and HP Business Availability Center is being upgraded to version 8.00 in staging mode, you must perform the procedure described in “Upgrade HP Business Availability Center in Staging Mode with an External CMDB” on page 146.
- ▶ For details on upgrading the Discovery and Dependency Mapping (DDM) Probe, see “Upgrade the Probe” in *Discovery and Dependency Mapping Guide*. Note that before starting the upgrade, you should stop the currently running DDM probes and start (the new version of them) only after the server upgrade is complete.

## HP Universal CMDB and Federated CMDB Adapters Upgrade Notes

This section includes upgrade issues relating to HP Universal CMDB and Federated CMDB adapters.

---

**Note:** The issues are relevant only if you are upgrading from versions 7.0x or 7.50. If the current version is 7.51 or later, there is no need to perform a replication or to upgrade the Generic DB Adapter.

---

### Replication

When upgrading from HP Universal CMDB 7.0x or 7.5, it is recommended that you perform a diff replication on your current system prior to upgrading to 8.00. This prevents losing data for removal during the full synch. After upgrading to 8.00, each replication job should be run in full replication mode. For details on running diff and full replication, see the Replication Jobs Tab section in *Model Management*.

### Proprietary Adapters Based on Generic DB Adapter

If you created proprietary adapters based on the Generic DB Adapter, you must perform the below procedure for each such adapter, after upgrading from HP Universal CMDB 7.0x or 7.50 to 8.00.

---

**Important:** Before upgrading, remember to save any Generic database adapter configuration files to which you made changes. For details, see “Upgrade Federated CMDB Adapters” on page 144.

---

- 1 Copy all **.jar** files from **<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\Codebase\GenericDBAdapter** to the proprietary adapter folder. Overwrite any existing files with the same name, if such files exist.

- 2 Copy **plugins.txt** from <HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\Codebase\GenericDBAdapter\META-INF to <HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\Codebase\<proprietary adapter folder>\META-INF.
- 3 Open <HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\Codebase\<proprietary adapter folder>\META-INF\orm.xml using a text or XML editor.
- 4 In **orm.xml**, for each CI type that is defined as a multinode in the **reconciliation\_rules.txt** file, change the mapped attribute name from <CI type name>\_<attribute name> to <attribute name>.

For example, if "host" is a multinode, change:

```
<basic name="host_host_hostname">
  <column updatable="false" insertable="false" name="[column_name]"/>
</basic>
```

to:

```
<basic name="host_hostname">
  <column updatable="false" insertable="false" name="[column_name]"/>
</basic>
```

If a reconciliation rule includes a link, attributes of end2 should still be prefixed by the corresponding CI type name. For example, if one of the reconciliation rules is **multinode[host] expression[host.host\_hostname or ip.ip\_address] end1\_type[host] end2\_type[ip] link\_type[contained], ip.ipaddress** should still be mapped as:

```
<basic name="ip_ip_address">
  <column updatable="false" insertable="false" name="[column_name]"/>
</basic>
```

- 5 In **orm.xml**, completely delete any entities whose name starts with **IdClass2PK** or **IdClass3PK**. For example, an entity defined as **<entity class="generic\_db\_adapter.IdClass2PK\_cpu" name="IdClass2PK\_cpu">** should be deleted.

- 6 In `orm.xml`, delete all lines that are similar to:  
`<id-class class="generic_db_adapter.IdClass2PK_xxx"/>` or  
`<id-class class="generic_db_adapter.IdClass3PK_xxx"/>`.
- 7 Delete the `<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\Codebase\<proprietary adapter folder>\dynamic_classes` folder, if it exists.
- 8 In HP Universal CMDB, select **Admin > Settings** tab > **Federated CMDB > Data Stores** tab and click the **Reload Adapter** button. For details, see “Introduction to Federated CMDB” in *Model Management*.



## Upgrade to Version 8.00 from Versions 7.x

The following procedure explains how to upgrade HP Universal CMDB from versions 7.x to 8.00.

---

**Important:** Before uninstalling 7.x versions, you must first copy and save any Service Desk or Generic database adapter configuration files or any proprietary configuration files to which you made changes. Configuration files should be backed up before any install or uninstall procedure since uninstalling the previous version deletes the configuration files on the disk. For details on how to back up your configuration files, see “Upgrade Federated CMDB Adapters” on page 144.

---

### To upgrade to version 8.00 from versions 7.x:

- 1 Back up the CMDB, History and Foundation databases.
- 2 If you have a previous version of HP Universal CMDB installed on the same machine on which you are going to install 8.00, uninstall it prior to installing HP Universal CMDB 8.00.
- 3 Install HP Universal CMDB version 8.00. For details, see Part II, “Installation.”

- 4 During server configuration, you are asked for details of the Foundation, CMDB, and History databases (in the UCMDB Server Configuration Wizard). Use the **Connect to an existing database or user schema** option in the UCMDB Server Configuration Wizard, and enter the names of the version 7.x databases and schemas. For details, see “UCMDB Server Configuration” on page 91.

---

**Note:** Make sure you use the same Foundation schema that you created during the version 7.x installation.

---

- 5 (If the database upgrade step in the UCMDB Server Configuration Wizard was completed successfully, you can skip this step.) If the database upgrade step in the UCMDB Server Configuration Wizard fails (for details, see “Access the UCMDB Server Configuration Wizard” on page 95), run the **cmdbDbUpgrade** tool. For details on the **cmdbDbUpgrade** tool, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

---

**Important:** After the upgrade to 8.00, do not start the server before running the **DB Delete** tool, if running the **DB Delete** tool is required. Since the **DB Delete** tool works directly on the database, you run the tool when the server is offline (that is, before you start the server).

---

- 6 Before starting the HP Universal CMDB server, check to see if you need to run the **DB Delete** tool. For details, see “Checking Whether Running the DB Delete Tool Is Required for the Upgrade Process” on page 151.
- 7 Start the HP Universal CMDB server.
- 8 Verify that all services are up including the HP Universal CMDB MAMPACKAGER service. For details, see “Viewing Server Status” on page 61.

- 9 If you have used scheduled reports in version 7.0x, invoke a JMX that converts the already-saved reports to the new format:

---

**Note:** This step is only relevant only for users who are upgrading from 7.0x. It is not relevant for users who are upgrading from 7.5.

---

- a Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You log in using the JMX console authentication credentials. For details, see “Working With the JMX Console” in *Reference Information*.

- b Click the **MAM > service=MAM Report Services** link.
  - c In the JMX MBEAN View page, locate the following operation:  
**upgradeReportsData()**.
  - d In the **customerID** field, enter **1**; in the **version** field, enter a number to represent the version of 7.x from which you are upgrading. For example, if you are upgrading from version 7.01, enter **7.0.1**. If you are upgrading from 7.0, enter **7.0**.
  - e Click **Invoke**. A message is displayed showing the updated status of the reports.
- 10 If you have used the Add to Application functionality in View Manager in version 7.x, continue with the procedure in “Upgrade Application View (From Version 7.x to 8.00)” on page 143.

- 11** This step is relevant if you created custom packages in previous HP Universal CMDB versions and you are planning to deploy them in the future on other HP Universal CMDB 8.00 systems.

During the 8.00 upgrade process, HP Universal CMDB transforms some of the TQL-based resources in your system, such as views and enrichment rules. Therefore, if you created custom packages in previous HP Universal CMDB versions, the packages should be exported again to contain the most updated resources. This step defines how to export all custom packages:

- a** Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You log in using the JMX console authentication credentials. For details, see “Working With the JMX Console” in *Reference Information*.

- b** Click the **MAM Packaging Services** link.
- c** In the JMX MBEAN View page, locate the following operation: **exportPackages()**.
- d** In the **ParamValue** box for the parameter **customerID**, enter **1**.
- e** Leave the **packageNames** box empty to export all the custom packages.
- f** In the **outputDir** box, enter the location on the HP Universal CMDB server machine where the exported packages are created.
- g** In the **ParamValue** box for the parameter **userOnly**, select **True**.
- h** Click **Invoke**.
- 12** If you created instance views in previous versions of HP Universal CMDB (6.x or 7.x), continue with this step to invoke a JMX that converts instance views into perspective based views. For details on perspective based views, see “Modeling Studio” in *Model Management*.
- a** Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You log in using the JMX console authentication credentials. For details, see “Working With the JMX Console” in *Reference Information*.

- b** Click the **MAM Views Services** link.
  - c** In the JMX MBEAN View page, locate the following operation:  
**upgradeOldInstanceView()**.
  - d** In the **ParamValue** box for the parameter **customerID**, enter **1**.
  - e** Click **Invoke**.
- 13** You can now begin working with version 8.00.

## Upgrade Application View (From Version 7.x to 8.00)

You should run the following procedure if you have used the **Add to Applications** functionality in View Manager.

**To upgrade Application views:**

- 1** Obtain the list of TQL-based resources, such as, queries, views, and so on, that have nodes connected to an application. You can retrieve the list of views by using the JMX method:
  - a** Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You log in using the JMX console authentication credentials. For details, see “Working With the JMX Console” in *Reference Information*.

- b** Click the **Topaz > service=CMDB Business View Enrichment Services** link.
- c** In the JMX MBEAN View page, locate the following operation:  
**retrievePatternWithOldBusinessViewLink()**.
- d** In the **customerID** field, enter **1**.

- e Click **Invoke**. A message is displayed showing the names of the TQLs that are suspected of containing an application on which a condition was defined.
- 2 Review the list you created in step 1 on page 143. Manually replace the **Depends On** relationship with the **Contains** relationship where relevant. For example, TQL patterns that were created to query application CIs created by the **Add To Application** functionality (for details, see “Link Nodes to Application CI” in *Model Management*) should be modified.

## Upgrade Federated CMDB Adapters

To prevent loss of information, use the following procedure for upgrading Federated CMDB adapters.

### Upgrade Out of the Box Adapters

---

**Note:**

- This procedure is relevant if you made changes to the configuration files of the Service Desk and generic database adapters or the CmdbRMIAdapter.zip package.
  - This procedure is relevant for 7.x versions. It must be implemented before any install or uninstall procedure since uninstalling the previous version deletes the configuration files on the disk.
-

**To upgrade out of the box adapters:**

- 1 Before uninstalling 7.x versions or the CmdbRMIAdapter.zip package, back up any Service Desk or Generic database adapter configuration files to which you made changes.
  - **Service Desk adapter.** Back up the following configuration files **serviceDeskConfiguration.xml**, **smSyncConfFile.xml**, **webserviceAdapters.xml**, and all files with the **.xslt** extension, for backup.  
  
These files are located in the **<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\CodeBase\ServiceDeskAdapter** folder.
  - **Generic database adapter.** Back up the configuration files from the **<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\CodeBase\GenericDBAdapter\META-INF** folder for backup.
  - **CMDB RMI adapter.** The CmdbRmiAdapter.zip package is overwritten during upgrade. If you modified the CmdbRmiAdapter package, copy the existing **<HP Universal CMDB root directory>\UCMDBServer\root\lib\factory\_packages\CmdbRmiAdapter.zip** package to a temporary directory before starting the upgrade process.
- 2 Install HP Universal CMDB version 8.00. For details, see “Installation” on page 65.
- 3 Once HP Universal CMDB version 8.00 is installed, copy the saved configuration files to their original location, as follows:
  - **Service Desk adapter.** Copy the saved files to the **<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\CodeBase\ServiceDeskAdapter** folder.
  - **Generic database adapter.** Copy the saved files to the **<HP Universal CMDB root directory>\UCMDBServer\j2f\fcmdb\CodeBase\GenericDBAdapter\META-INF** folder.
  - **CMDB RMI adapter.** After the upgrade process, edit the files in the new **CmdbRmiAdapter.zip** package to match the changes you had made to the old adapter package. You must make the changes in the new CmdbRmiAdapter.zip and not overwrite it with your old package.

## Proprietary Java Adapters

The published interface for developing proprietary adapters was changed in version 7.50. There is no backward compatibility for the adapters that were developed for version 7.0x (earlier than 7.50). You should fix the code of these adapters by implementing the new adapter interface described in HP Universal CMDB 7.50. For details, see “The Federation Framework SDK” in *Model Management*. The interface of HP Universal CMDB 7.50 is backward compatible in 8.00.

## Upgrade HP Business Availability Center in Staging Mode with an External CMDB

This section is relevant only if you are upgrading an external CMDB for use with HP Business Availability Center, and HP Business Availability Center is being upgraded to version 8.00 in staging mode. If you are upgrading HP Business Availability Center in direct mode, you do not have to perform this procedure.

---

**Important:** Before uninstalling 7.x versions, you must first copy and save any Service Desk or Generic database adapter configuration files, or the CmdbRMIAdapter.zip package, to which you made changes. Configuration files should be backed up before any install or uninstall procedure since uninstalling the previous version deletes the configuration files on the disk. For details on how to back up your configuration files, see “Upgrade Federated CMDB Adapters” on page 144.

---

### To upgrade an external CMDB for use with HP Business Availability Center in staging mode:

- 1 Back up the CMDB, History and Foundation databases and restore them to another database server.
- 2 Install HP Universal CMDB 8.00. For details, see, Part II, “Installation.”

**Note:** Do not configure the mail server during the installation.

---

- 3** Run the upgrade process and connect the CMDB to the Foundation, CMDB, and CMDB History schemas, which were restored in step 1. For details, see “Upgrade to Version 8.00 from Versions 7.x” on page 139.
- 4** Once the upgrade procedure is successfully completed, and HP Universal CMDB is running again, log in to HP Universal CMDB, go to **Admin > Settings > Infrastructure Settings > Foundations** context > **CMDB > Is Aging Enabled** and set the aging mechanism to **false**. For details, see “Infrastructure Settings Manager” in *Model Management*.
- 5** Restart the HP Business Availability Center server.

## **Upgrade Static Tables with the cmdbDbUpgrade Tool**

The **cmdbDbUpgrade** tool upgrades the static tables in the version 7.x database to the target version database (version 8.00), according to XML descriptors that describe the desired database state.

The static tables in the database that are verified and upgraded by the tool are:

- All the tables in the Foundation schema
- Only the CCM\_XXX tables in the CMDB schema
- All the tables in the History schema

This section describes the tasks performed by the **cmdbDbUpgrade** tool.

- ▶ The **cmdbDbUpgrade** tool checks whether the current database structure (tables, indexes, and so forth) of the CMDB, Foundation, and History schemas match the expected template of your current version.

If there is a difference, the **cmdbDbUpgrade** tool reports a failure and does the following:

- ▶ Creates .diff files for each schema in which a difference was found. Each .diff file contains a description of each difference, such as a missing table or an extra column.
- ▶ Creates an .sql script file to fix (or undo) the differences and roll back each schema to its original template structure.

If the **cmdbDbUpgrade** tool detects a difference in one of the schemas, review the difference and fix it using the SQL script the tool has created. Then, run the **cmdbDbUpgrade** tool again.

---

**Note:**

- ▶ If the **cmdbDbUpgrade** tool is launched manually from the command prompt, the .diff and .sql files are placed in the <HP Universal CMDB root folder>\j2f\dbverify\dbverify\_standalone folder.
- ▶ If you launch the tool from the DB upgrade step in the UCMDB Server Configuration Wizard, the .diff and .sql files are placed in the <HP Universal CMDB root folder>\j2f\tools\dbverify\_standalone folder.

- 
- ▶ After the **cmdbDbUpgrade** tool has confirmed that the schema structures match their templates, it automatically changes the schemas to match the target template of version 8.00. The tool adds the new components, such as the tables and columns that are required for the 8.00 version.

**Note:**

- ▶ Data upgrade is performed during the first start up of the HP Universal CMDB Server. Therefore, the schema version is updated to 8.00 only after data upgrade has completed. For details on obtaining the version number, see step 1 on page 156.
  - ▶ Before the database upgrade is run, the History database is upgraded to the version 7.00 baseline.
- 

**To run the cmdbDbUpgrade tool:**

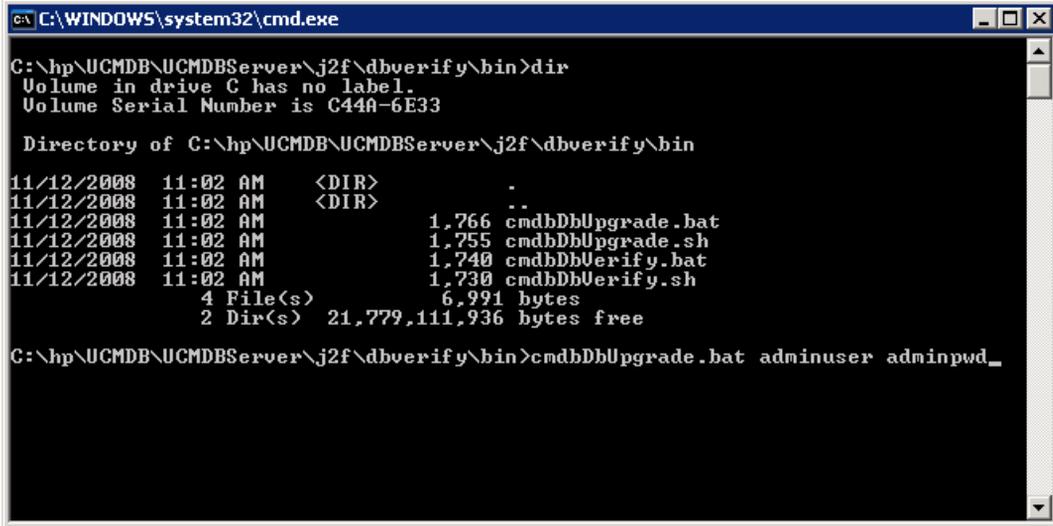
- 1** In Windows, open the Command Prompt window and navigate to the following directory: **<HP Universal CMDB root directory>\UCMDBServer\j2f\dbverify\bin\**.
- 2** Type **cmdbDbUpgrade.bat**, followed by the user name and password parameters, depending on your database deployment (depending on which database the Foundation, CMDB, and History databases are installed in). Possible scenarios are as follows:
- 3 If the Foundation, CMDB, and History schemas reside on Oracle:**

In most cases, when all three schemas reside on the same Oracle instance, you should run **cmdbDbUpgrade** with just two parameters – the user name of a database user with admin privileges (for example, **system**) and the password.

However, if the Foundation, CMDB, and History schemas reside on different Oracle instances, you should specify the admin user name and password for each Oracle instance where the schema is located, in the following order:

- ▶ Foundation schema
- ▶ CMDB schema
- ▶ History schema

For example:



```
C:\WINDOWS\system32\cmd.exe
C:\hp\UCMDB\UCMDBServer\j2f\dbverify\bin>dir
Volume in drive C has no label.
Volume Serial Number is C44A-6E33

Directory of C:\hp\UCMDB\UCMDBServer\j2f\dbverify\bin

11/12/2008  11:02 AM    <DIR>          -
11/12/2008  11:02 AM    <DIR>          ..
11/12/2008  11:02 AM                1,766  cmdbDbUpgrade.bat
11/12/2008  11:02 AM                1,755  cmdbDbUpgrade.sh
11/12/2008  11:02 AM                1,740  cmdbDbVerify.bat
11/12/2008  11:02 AM                1,730  cmdbDbVerify.sh
               4 File(s)          6,991 bytes
               2 Dir(s)  21,779,111,936 bytes free

C:\hp\UCMDB\UCMDBServer\j2f\dbverify\bin>cmdbDbUpgrade.bat adminuser adminpwd_
```

---

**Note:** If you do not want to supply your database administrator account user name and password, you can create a user name with the minimum privileges required for the **cmdbDbUpgrade** tool to operate. For details on how to create this user, see “Creating Schema User Permissions” and “Database Permissions” in the *HP Universal CMDB Database Guide* PDF.

---

- 4** If the Foundation, CMDB, and History schemas reside on Microsoft SQL Server: Run **cmdbDbUpgrade.bat** with no parameters.
- 5** For UNIX:
  - a** Move to the <HP Universal CMDB root directory>/UCMDBServer/j2f/dbverify/bin directory.
  - b** Run the command **./cmdbDbUpgrade.sh**.

---

**Note:** For details on problems that may occur while performing the upgrade, see “Troubleshooting Issues for the cmdbDbUpgrade Tool” on page 159.

---

## Run the DB Delete Tool

---

**Note:** You use the **DB Delete** tool to shorten the time it takes to delete CIs from the database. To run the **DB Delete** tool, you must ensure that a current Java Runtime Environment version is installed on the machine where HP Universal CMDB is running. For details, see “Hardware and Software Requirements” on page 32.

---

### **Checking Whether Running the DB Delete Tool Is Required for the Upgrade Process**

You use the **DB Delete** tool to shorten the time it takes to delete CIs from the database during the process of upgrading from version 7.x to 8.00 or later.

---

**Important:** After the upgrade to 8.00, do not start the server before running the **DB Delete** tool. Since the **DB Delete** tool works directly on the database, you run the tool when the server is offline (before you start the server).

---

You can use the **DB Delete** tool to delete all instances of certain CI types. During the upgrade process of HP Universal CMDB from versions 7.x to 8.00, some CIs are deleted from the CMDB to conform to the class model of version 8.00. For details, see “Class Model Changes” on page 187. Using the **DB Delete** tool allows you to significantly reduce the time it takes to delete the CIs from the CMDB before you start the server. For details on how to delete all instances of certain CI types, see “Running the DB Delete Tool” on page 153.

The relevant CI types are:

- **databaseresource**
- **j2eemanagedobject**
- **ipserver**
- **program**

- **logicaldisk**
- **applicationcomponent**

Run the following queries against the CMDB database/schema to check how many instances you currently have:

---

**Important:** Perform these queries after running the **ucmdbDBUpgrade** tool (for details, see “Upgrade Static Tables with the cmdbdbUpgrade Tool” on page 147) and before the HP Universal CMDB server is started up for the first time.

---

- **select count(\*) from CDM\_DATABASERESOURCE\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

- **select count(\*) from CDM\_CDM\_J2EEMANAGEDOBJECT\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

- **select count(\*) from CDM\_IPSERVER\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

- **select count(\*) from CDM\_PROGRAM\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

- **select count(\*) from CDM\_LOGICALDISK\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

- **select count(\*) from CDM\_APPLICATIONCOMPONENT\_1**

If the result exceeds 200,000, it is recommended that you run the **DB Delete** tool to delete the CIs before starting the server.

## Running the DB Delete Tool

Before running the tool, you should determine that you have a sufficient number of CIs for deleting (over 200,000 per deleted class) . You run this tool before you start the server after the upgrade.

**To run the DB Delete tool to delete all instances of certain CI types:**

- 1** In Windows, open the Command Prompt window and navigate to the following directory: <HP Universal CMDB root directory>\UCMDBServer\j2f\cmdb\dbscripts\.
- 2** Type dbtool type, followed by the CI types whose instances you want to delete from the CMDB. For example: dbtool type <CI typ1>,<CI type2>. A comma (,) is used to separate the different CI types.

## Other Uses for the DB Delete Tool

Other uses for the **DB Delete** tool include:

- **Deleting aged CIs.** If there are too many aged CIs in the CMDB, this may cause the server to fail to start. For details, see “CI Lifecycle – Overview” in *Model Management*.

---

**Important:** You use the **DB Delete** tool to delete the aged CIs before you start the server.

---

**To run the DB Delete tool to delete the aged CIs:**

- 1** In Windows, open the Command Prompt window and navigate to the following directory: <HP Universal CMDB root directory>\UCMDBServer\j2f\cmdb\dbscripts\.
  - 2** Type dbtool aging. The aged CIs are deleted from the CMDB.
- **Deleting the CIs based on an SQL statement.** Enables you to delete all instances of certain CI types based on an SQL statement inside a file. The SQL statement returns a list of IDs from the CMDB of all the instances of the specified CI type.

**To run the DB Delete tool to delete CIs based on an SQL statement:**

- 1** Open a text editor and type `select cmdb_id from cdm_<ci type>_1`  
where <ci type> is the CI type whose instances you want to delete from the CMDB.
- 2** Save the file using an .sql extension.
- 3** In Windows, open the Command Prompt window and navigate to the following directory: `<HP Universal CMDB root directory>\UCMDBServer\j2f\cmdb\dbscripts\`.
- 4** Type `dbtool sql` followed by the full path of the file. For example, if the name of the file is `file1.sql`, run the command `dbtool sql <full path of file1.sql>`.

## Troubleshooting and Limitations

This section describes the components you can use to check for problems during the upgrade.

This section includes the following topics:

- “Log Files” on page 155
- “JMX” on page 156
- “Inconsistency between Tables in the Database” on page 157
- “Large Number of CIs in the Database” on page 158

## Log Files

---

**Note:** If a **log\mam** or a **log\cmdb** folder does not exist, look for the log files under **log\EJBContainer**.

---

- **package deployment reports** are located in: <HP Universal CMDB root directory>\UCMDBServer\root\lib\\_reports\customer\_1\deployReports. This file contains high level information about the package deployment process. The information contained in the report does not include exceptions.

For more information about package deployment errors, check the **mam.packaging.log** file, located in: <HP Universal CMDB root directory>\UCMDBServer\j2f\log\mam. Check this file for errors. Some errors are acceptable, for example, those that relate to CIT changes that did not succeed due to user or factory issues. For example, the Package Manager tries to remove user attributes and fails. This is the correct behavior.

- The **cmdb.classmodel.log** file is located in: <HP Universal CMDB root directory>\UCMDBServer\j2f\log\cmdb. This file contains information about changes in the class model. Some errors are acceptable (for an example, see the **mam.packaging.log** description).
- The **upgrade.report.log** file is located in: <HP Universal CMDB root directory>\UCMDBServer\j2f\log\. This file contains high level information about the upgrade process. The information contained in the log does not include exceptions. Some failures are caused by the errors in the **cmdb.classmodel.log** file. Some of the errors are acceptable, for example, attributes that were supposed to be deleted and failed.

To see the exceptions, check the following log files:

- ▶ **upgrade.short.log** file, located in: <HP Universal CMDB root directory>\UCMDBServer\j2f\log\cmdb and <HP Universal CMDB root directory>\UCMDBServer\j2f\log\mam.
- ▶ **upgrade.detailed.log** file is located in:<HP Universal CMDB root directory>\UCMDBServer\j2f\log\mam and <HP Universal CMDB root directory>\UCMDBServer\j2f\log\cmdb This file contains the XML text of all the resources (such as TQLs or views), that are being transformed as a result of the class model changes. If some of the transformations fail, you can use the XML text to restore the original resource.
- ▶ **dbverify.log**. This file contains information written by the **cmdbDbUpgrade** and **cmdbDbVerify** tools. The location of the log file depends on where the **cmdbDbUpgrade** tool was launched. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

## JMX

Check that the version number is correct:

- 1 Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where <machine name or IP address> is the machine on which HP Universal CMDB is installed. You log in using the JMX console authentication credentials. For details, see “Working With the JMX Console” in *Reference Information*.

- 2 Click the **Topaz > service=CMDB Dal services** link.
- 3 In the JMX MBEAN View page, locate the following operation:  
**getCmdbVersion()**.
- 4 In the **ParamValue** box for the parameter **customerID** field, enter **1**.
- 5 In the **ParamValue** box for the parameter **detailed**, you have two options:
  - ▶ Choose **False** and then **Invoke**. A message displays the version number of your CMDB. If the upgrade is successful, the displayed value is 8.0.0.0

- Choose **True** and then **Invoke**. A message is displayed showing the statuses of different dedicated upgraders and the version number of your CMDB. If the upgrade is successful, the displayed value is 8.0.0.0.

```

upgrader.CalculatedAttributeModelUpgrader.ModelUpdateManager : 8.0.0.0
upgrader.DeleteCITsUpgrader.PackageManager : 8.0.0.0
upgrader.ObsoleteModulesUpgrader.DiscoverySubSystem : 8.0.0.0
upgrader.DbColumnsUpgrader.ModelQueryManager : 8.0.0.0
upgrader.BasicClassModelManipulateDbUpgrader.ClassModelManager : 8.0.0.0
upgrader.BusinessViewEnrichmentsUpgrader.PackageManager : 8.0.0.0
upgrader.JythonScriptsSyntaxUpgrader.DiscoverySubSystem : 8.0.0.0
upgrader.ResourcesUpgrader.PackageManager : 8.0.0.0
upgrader.CleanCorruptedResourcesUpgrader.PackageManager : 8.0.0.0
upgrader.EncryptedAdapterPasswordsUpgrader.ConfigUpdateManager : 8.0.0.0
upgrader.SoftwareElementDisplayLabelPopulator.PackageManager : 8.0.0.0
upgrader.ClassModelUpgrader.ClassModelManager : 8.0.0.0
upgrader.DeleteInstancesUpgrader.PackageManager : 8.0.0.0
upgrader.BasicClassModelUpgrader.ModelQueryManager : 8.0.0.0
upgrader.DeleteValidLinksUpgrader.PackageManager : 8.0.0.0

Cmdb db version : 8.0.0.0
Cmdb db build : 102
Cmdb code version : 8.0.0.0
Cmdb code build : 102

```

If the upgrade of at least one of the dedicated upgraders fails, the version number next to that upgrader is either empty or displays the number of the previous version, for example, **7.5.0.0**, and the **Cmdb db version** number at the bottom also displays the number of the previous version.

## Inconsistency between Tables in the Database

In cases where there is an inconsistency between the **CDM\_LINK\_1** table and the **CDM\_ROOT\_1** table in the database, the upgrade might fail with the following error message:

```

2009-01-20 13:44:08.931 [CTRL-SVCStarter] (LogUtil.java:29) ERROR - Failed to execute command
[PopulateLinksClasses] time [NA ms] customer ID [1, id name: Default Client] operation stack [74484107]
com.mercury.topaz.cmdb.server.manage.dal.CmdbDalException: SQL error executing statement update
CDM_LINK_1 set CLASS =(select source.CLASS from CDM_ROOT_1 source where source.CMDB_ID =
CDM_LINK_1.CMDB_ID)
Can't execute prepared statement [update CDM_LINK_1 set CLASS =(select source.CLASS from
CDM_ROOT_1 source where source.CMDB_ID = CDM_LINK_1.CMDB_ID)], due to exception:
java.sql.SQLException: [mercury][Oracle JDBC Driver][Oracle]ORA-01407: cannot update
("CDM_LINK_1"."CLASS") to NULL

```

In this case, verify that the problem is really caused by the inconsistency mentioned above by running the following SQL statement:

```
select cmdb_id from CDM_LINK_1 l where not exists (select 1 from cdm_root_1
r where r.cmdb_id=l.cmdb_id)
```

If this SQL statement verifies that the table inconsistency is indeed the problem, correct the problem by running the following SQL statement:

```
delete from CDM_LINK_1 l where not exists (select 1 from cdm_root_1 r where
r.cmdb_id=l.cmdb_id)
```

## Large Number of CIs in the Database

If the number of CIs in the database exceeds 3,000,000 before the upgrade, you must increase the amount of time the connection to the database remains open during the upgrade. In the following setting, increase 18,000,000 milliseconds to 180,000,000 milliseconds:

```
<!-- This setting determines how much time a connection can remained opened against the db -->
<setting name="db.connection.pool.timeout"
  sectionResource="section.general"
  refreshRate="Reboot"
  displayInUI="true"
  nameResource="db.connection.pool.timeout.name"
  descResource="db.connection.pool.timeout.desc">
  <value type="number">0</value>
  <value deployment="SMALL" type="number">0</value>
  <value deployment="STANDARD" type="number">0</value>
  <value deployment="ENTERPRISE" type="number">180000000</value>
</setting>
```

---

**Important:** After the upgrade, you must return the parameter to its default setting (18,000,000 milliseconds).

---

## Troubleshooting Issues for the cmdbDbUpgrade Tool

This section describes some common problems that might occur during the upgrade process using the **cmdbDbUpgrade** tool. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.

- ▶ It is impossible to complete the **cmdbDbUpgrade** process when there are open connections to at least one of the CMDB, Foundation, or History schemas.
  - ▶ You must close all such open connections before running the **cmdbDbUpgrade** tool.
  - ▶ You must stop the server. When the server is up, it holds the connections to the schemas and prevents upgrading.
- ▶ For the **cmdbDbUpgrade** tool to succeed, you must use a database user with the required permissions. If you need to upgrade the Oracle schema, it is not enough to have the schema's credentials. You are required to supply the admin user credentials. For details on how to create this user, see “Creating Schema User Permissions” and “Database Permissions” in the *HP Universal CMDB Database Guide* PDF.
- ▶ If you changed some of the schemas, for example, added a new table, and then you try to upgrade the database, the upgrade process fails. To perform the upgrade successfully, the schemas' database structure needs to match the original 7.x version. To ensure this, you need to use the .diff and .sql files created by the **cmdbDbUpgrade** tool. For details, see “Upgrade Static Tables with the cmdbDbUpgrade Tool” on page 147.
- ▶ If you get an error message saying that you do not have enough space, you need to use a larger tablespace or to clear the tablespace you are currently using for the schema. The error message tells you which schema does not have enough space.

## Limitations

Note the following limitations:

- ▶ There is no automatic upgrade for scheduled reports created in versions 7.0x. For details on the manual procedure, see “Upgrade to Version 8.00 from Versions 7.x” on page 139.
- ▶ There is no automatic upgrade for queries using the Application CI type in version 7.x. For the manual upgrade see “Upgrade Application View (From Version 7.x to 8.00)” on page 143.
- ▶ If you configured a CI Type icon in 7.0x to change according to its CI attribute values, the definition is reset to the default icon after upgrade to version 8.00. To restore the specific non-default icon behavior, you must redefine the icon in the CI Type Manager in version 8.00. For details, see “Icon Page” in *Model Management*.

For details on version 7.0 limitations, see “Upgrade Limitations” on page 180.

# 11

---

## Upgrading HP Universal CMDB to Version 7.0

This chapter explains how to upgrade HP Universal CMDB from version 6.x to 7.0.

### **This chapter includes:**

#### **Tasks**

- ▶ Upgrade Workflow on page 162
- ▶ Version 7.0 Upgrade Tool on page 163
- ▶ Upgrade Procedure on page 164
- ▶ Upgrade Business Service View (from Version 6.x to 7.0) on page 166
- ▶ Upgrade Contents on page 168
- ▶ CMDB Deletion Utility on page 170
- ▶ CIT Log Files on page 175

#### **Reference**

- ▶ Large Deployments on page 179
- ▶ Upgrade Limitations on page 180

## Upgrade Workflow

This section describes the workflow for upgrading HP Universal CMDB from version 6.x to version 7.0.

**To perform the upgrade:**

### **1 Run the upgrade tool.**

For details on changes that are made during the upgrade to the customer environment, see “Version 7.0 Upgrade Tool” on page 163.

---

**Important:** You must run the upgrade tool in version 6.x before moving to version 7.0.

---

### **2 Perform the upgrade procedure.**

For details, see “Upgrade Procedure” on page 164.

### **3 View upgraded components.**

For details, see “Upgrade Contents” on page 168.

### **4 Validate success.**

For details, see the `classModelDiffs.log` file in “CIT Log Files” on page 175.

The upgrade runs automatically when the CMDB starts running for the first time after installation of version 7.0. Upgrade uses the 6.x framework as its basis. Before and after each Manager startup, the relevant upgrade runs. A successful upgrade is one in which all the upgrade processes finish successfully.

## Version 7.0 Upgrade Tool

---

**Important:** Run this procedure on the 6.x environment.

---

During upgrade, run this procedure to collect the following information about the upgrade process:

- ▶ The differences between the version 6.x CIT model (the factory CIT model in the customer environment) and the version 7.0 CIT model.
- ▶ Patterns, enrichments, and CIs that use attributes and CIs that no longer exist in version 7.0.
- ▶ Data on Link Nodes to Application CI views that are to be used later to manually define application enrichment.

**To run the upgrade tool:**

- 1** Locate the following service archive files (.sar) on the **Tools and Utilities\CmdbUpgrade** directory on the HP Universal CMDB CD-ROM, version 7.0:
  - ▶ Business service view service archive (**cmdb-bs-preupgrade-services.zip**)
  - ▶ Class model differences and dependencies service archive (**cmdb-cm-preupgrade-services.zip**)
- 2** Copy the files to the **<HP Universal CMDB root directory>\j2f\AppServer\mbeans\** folder on the version **6.x** environment.
- 3** Change the extension from **zip** to **sar**.
- 4** Restart the server.
- 5** Invoke the following JMX functions:
  - ▶ Business Service View pre upgrade Services (you may have to log in with the user name and password)
  - ▶ CMDB Class Model pre-upgrade Services

---

**Important:** Save the output for this service to use in validating success. For details, see the `classModelDiffs.log` file in “CIT Log Files” on page 175.

---

## Upgrade Procedure

The following procedure explains how to upgrade HP Universal CMDB from version 6.x to 7.0.

For details on changes that are made during the upgrade, see “Version 7.0 Upgrade Tool” on page 163.

### To upgrade HP Universal CMDB:

- 1** After installing version 7.0 and before starting up HP Universal CMDB for the first time:
  - a** Back up the databases.
  - b** Delete all process instances: Depending on whether you are using an Oracle Server schema or Microsoft SQL Server database, run **delete cis by type.bat** from:
    - `<HP Universal CMDB root directory>\j2f\cmdb\dbscripts\oracle\`
    - `<HP Universal CMDB root directory>\j2f\cmdb\dbscripts\ms_200x`

For more details, see “CMDB Deletion Utility” on page 170.

- c** If necessary, for a deployment larger than 5 MB of MIs, you may need to change configuration settings. For details, see “Large Deployments” on page 179.

---

**Note:** Do not make any changes without consulting HP Software Support.

---

- d** Start the server.

- 2 Verify that all services are up including the HP Universal CMDB packager service.
- 3 Force deploy all packages:

- a Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You may have to log in with the user name and password.

- b Click the **MAM > service=Package Manager** link.
- c In the JMX MBEAN View page, locate the following operation: **deployPackages()**.
- d In the **ParamValue** box for the parameter **customerId**, enter **1**.
- e Click **Invoke**.

To confirm that the forced deployment is finished, open the file **mam.packaging.log** and verify that no more lines are being added to it.

- 4 Run the Discovery and Dependency Mapping upgrade:

- a Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You may have to log in with the user name and password.

- b Click the **MAM > service=Discovery manager** link.
- c In the JMX MBEAN View page, locate the following operation: **isUpgradeRequired()**.
- d In the **ParamValue** box for the parameter **customerId**, enter **1** and click **Invoke**.
- e If **True** is returned, perform the upgrade; otherwise, skip to step 6 on page 166.

**f** Locate **runDiscoveryUpgrader()** and enter the following information:

In the **ParamValue** box for the parameter **customerId**, enter **1** and click **Invoke**.

**5** Perform the manual upgrade of Business Service Views. For details, see “Upgrade Business Service View (from Version 6.x to 7.0)” on page 166.

**6** Export all user-defined packages:

**a** Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You may have to log in with the user name and password.

**b** Click the **MAM > service=Package manager** link.

**c** In the JMX MBEAN View page, locate the following operation: **exportPackage()**.

**d** In the **ParamValue** box for the parameter **customerId**, enter **1**.

**e** Click **Invoke**.

## Upgrade Business Service View (from Version 6.x to 7.0)

You should run the following procedure if you have used the **Add to Business Service** functionality in View Manager in version 6.x.

**To upgrade Business Service views:**

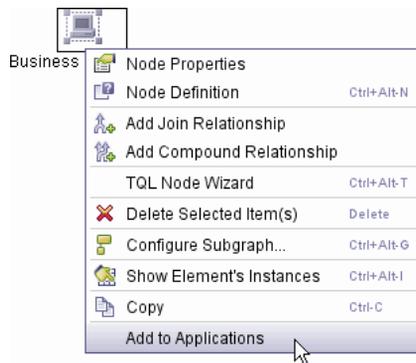
**1** Delete the Business Service views instances:

**a** Launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

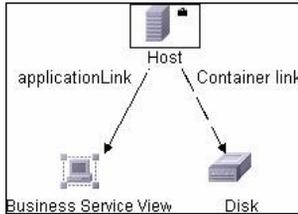
where **<machine name or IP address>** is the machine on which HP Universal CMDB version 7.0 is installed. You may have to log in with the user name and password.

- b** Click the **Topaz service=CMDB Class Model Services** link.
  - c** In the JMX MBEAN View page, locate the following operation: **deleteByClassType()** and enter the following information:
    - In the ParamValue box for the parameter **customerId**, enter **1**.
    - In the classType parameter, enter **BusinessService**.
    - In the chunkSize parameter, enter **1000**.
    - In the **isDerived** parameter, enter **true**.
  - d** Click **Invoke**.
- 2** Log in to HP Universal CMDB version 7.0. Access View Manager. Locate the relevant views according to the Business Service view report (for details, see step 5 in “Version 7.0 Upgrade Tool” on page 163). The report consists of all version 6.x Business Service views. Each Business Service view consists of:
- The view name on which the Business Service view is defined.
  - The full path of the view in the View Explorer tree.
  - The node numbers and CI Type names of each node that is included in the Application view.
  - The pattern definition for which the view is defined.
- 3** For each view, identify the relevant nodes, right-click each node and choose **Add to Application**:

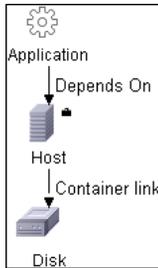


Enter the Application name in the box and click **OK**. For details, see “Link Nodes to Application CI” in *Model Management*.

- 4 Update the queries, views, and other TQL-based resources that are using the Business Service View CIT: Replace **link with Business Service Views** with **links with Application**. For example, if, in version 6.x, there is a TQL condition Host linked by **applicationLink** to Business Service View:



Now the condition should be Application **Depends On** Host:



## Upgrade Contents

This section explains which components are upgraded.

This section includes the following topics:

- “CITs” on page 169
- “Configuration” on page 169
- “Data” on page 169
- “Deployment” on page 169

## CITs

- The JVM class heapsize attribute is changed from int to long.
- Duplicate attributes are removed, meaning that if an attribute exists in a parent CIT, its definition is removed from the current CIT.
- All CITs are upgraded to version 7.0. Any attributes, CIs, or valid links that cannot be removed are marked as being created by the user. The result of this action is a CMDB that includes version 7.0 CITs as well as user additions that are marked as such.
- User packages are updated. This is carried out through a JMX invocation and not as part of the automatic upgrade, by export.
- The list of factory packages resides in `<HP Universal CMDB server>\root\lib\server\factory_packages.txt`.

## Configuration

- View profiles links are deleted.
- Scheduled job definitions are upgraded in the Scheduler.

---

**Note:** TQLs, enrichments, and views may still include version 6.5 definitions, so there is no need to perform upgrade on these components.

---

## Data

- A link is added for the Gold Master report from the root report.

## Deployment

- History database: A customer ID column is added to the raw events and active events tables.
- The ID\_CATALOG CMDB content is copied to the Foundation database > Management ID\_CATALOG table.
- The Settings Manager table is populated with the CMDB\_SYS\_VER content.

## **CMDB Deletion Utility**

The Delete per Type Utility is a Java tool for deleting instances of CI types from the CMDB model. It operates on a CMDB customer context. You delete instances in step b on page 164 of the upgrade procedure.

The tool input parameters are:

- CMDB type (matching one of the CITs in the CMDB class model)
- CMDB customer ID
- Connection details to the CMDB database.

The utility's main uses are:

- 7.0 upgrade process
- Customer environments where a certain CIT instance needs to be removed from the model.

For example, the tool can delete all instances of the nt CIT and all the links that hold nt instances on either side.

This section includes the following topics:

- “Database Preinstallation Activities” on page 170
- “Recovery Procedure” on page 171
- “Example of Output Log” on page 174

### **Database Preinstallation Activities**

On the database server where the CMDB schema is located, the following activities should be carried out prior to operation of the tool:

#### **Backup**

Back up the CMDB schema (or perform a full backup of the database) before operating this utility.

## Database Statistics

Update all database statistics against the CMDB schema. Current statistics are essential for the database server to choose the best execution of SQL statements.

## RECYCLEBIN System Parameter on Oracle 10g Server

If the database server is an Oracle 10g Server, it is recommended that you turn off the RECYCLEBIN System database parameter. This parameter controls whether dropped tables can be restored and may affect performance.

This utility in particular may be affected by this parameter if set to ON.

The general recommendation for the databases is to set RECYCLEBIN to OFF.

## Recovery Procedure

The **delete overall** utility goes through all the relevant CDM tables and deletes the instances of the input CI Type.

If the utility fails at some stage, recovery steps are probably needed to keep the model in consistent mode. For example, instances must be deleted from five CDM tables and there is a failure after the first table; in this case, the model is inconsistent until the instances are deleted from the rest of the tables.

**If the process does not complete successfully, perform the following steps:**

- 1 Identify the point of failure using the log.

The first step after a crash or failure is to read the output log and locate the point of failure within the **delete overall** process. The log file is located in the following folder: <HP Universal CMDB root directory>\j2f\log\.

---

**Note:** In versions 7.0 and 7.01, the log file name is **ucmdb\_all.log**. In versions 7.02 or later, the log file name is **cmdb.util.log**.

---

Since the delete process works separately for each CDM table, it is important to:

- Identify the participating CDM tables.
- Identify the active table during the failure and/or the last table successfully processed.

For an example of an output log, see “Example of Output Log” on page 174. The log specifies the list of CDM tables from which the CMDB instances of the input type should be deleted.

After a successful execution, for each of the CDM tables, the log contains the following lines at the beginning and at the end of the delete process:

```
deleting data of <type> from <CDM table>  
deleted data from <CDM table>
```

In case of a failure, use the log to:

- Map all the tables that appear in the CDM tables list output but do not include the two log lines displayed above. From each of these tables, perform a manual delete as specified in the next step.
- In case of failure during processing a table, the first line appears but not the last. In this case, use the log file to recover the last active table as specified in the next step.

## 2 Perform recovery using recovery tables.

If deletion is not completed successfully, you can use one of the following two tables in the CMDB schema for performing the recovery process:

- **temp\_ids**. This table holds all the IDs of objects and links to be deleted.

According to the point of failure detected, apply the following recovery steps:

Use **temp\_ids** to delete the IDs from all tables not processed by the utility. For example, if **CDM\_SYSTEM\_1** appears in the log list but is not processed before the failure, use the following statement to delete the IDs:

```
DELETE FROM CDM_SYSTEM_1 C WHERE EXISTS (SELECT 1 FROM  
TEMP_IDS T WHERE T.CMDB_ID=C.CMDB_ID)
```

Perform **commit**.

---

**Note:** Deleting many IDs can be time consuming.

---

- **cmdb\_del\_recovery\_log.** If the failure occurs during table processing, use this table (that holds DDL commands) to be applied on the last active table. This table is empty if the failure did not occur during table processing.

Use the **cmdb\_del\_recovery\_log** table for applying the missing DDL commands against the last active table. This is necessary only if the failure occurred in the middle of processing a CDM table.

Select the **ddl\_cmd** column for outputting all commands and run them against the last active table. The last active table also appears in the **table\_name** column of **cmdb\_del\_recovery\_log**.

---

**Note:** If the tool completes successfully, no such tables remain in the schema.

---

## Example of Output Log

```
Deleting instances of process from CMDB database
---->temp_ids has 3169223 CMDB Ids
---->List of tables is created. The CDM tables to delete from are :
Table to delete process instances : CDM_IT_WORLD_LINKS_1

Table to delete process instances : CDM_PROCESS_1

Table to delete process instances : CDM_DATA_1

Table to delete process instances : CDM_HOSTRESOURCE_1

Table to delete process instances : CDM_PROGRAM_1

Table to delete process instances : CDM_SYSTEM_1

Table to delete process instances : CDM_OBJECT_1

Table to delete process instances : CDM_CONTAINER_F_1

Table to delete process instances : CDM_LINK_1

Table to delete process instances : CDM_IT_WORLD_1

Table to delete process instances : CDM_ROOT_1

Table to delete process instances : CDM_LIST_ATTR_PRIMITIVE_1

deleting data of process from CDM_IT_WORLD_LINKS_1
Saved DDL statements for CDM_IT_WORLD_LINKS_1 in cmdb_del_recovery_log
Saved DDL statements for CDM_IT_WORLD_LINKS_1 in cmdb_del_recovery_log
Running DDL statements against CDM_IT_WORLD_LINKS_1.....->

ALTER TABLE "CMDB2"."CDM_IT_WORLD_LINKS_1" ADD CONSTRAINT
"PK_CDM_IT_WORLD_LINKS_1" PRIMARY KEY ("CMDB_ID")
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS
2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1 BUFFER_POOL DEFAULT)
TABLESPACE "CMDBDATA" ENABLE
```

```
deleted data from CDM_IT_WORLD_LINKS_1
delete took: 201.0 seconds.
deleting data of process from CDM_PROCESS_1
Saved DDL statements for CDM_PROCESS_1 in cmdb_del_recovery_log
Saved DDL statements for CDM_PROCESS_1 in cmdb_del_recovery_log
Running DDL statements against CDM_PROCESS_1.....->

...

deleted all instances of process
delete took: 7740.0 seconds.

Process finished with exit code 0
```

## CIT Log Files

Once the version 7.0 environment has started running, and to validate upgrade success, check the following logs:

- ▶ **classModelDiffs.log**. Check this file for the differences between the version 7.0 factory CITs and the version 6.x factory CITs (the factory CITs in the customer environment).

---

### Note:

- ▶ This log ignores changes to the CITs made by the user.
  - ▶ You define the location of this log file during the running of the upgrade tool.
-

The following is an excerpt from a classModelDiffs.log file:

```
classmodel Comparison Result:
From version 6.5
Classes: 572 TypeDefs: 36 ValidLinks: 454
To version 7.0
Classes: 612 TypeDefs: 42 ValidLinks: 464

Valid Links:
-----

Removed: (9)
-----
valid link: class name [patternstats], end1 [discoverypattern], end2 [cmdbclass]
valid link: class name [discovers], end1 [discoverypattern], end2 [cmdbclass]
valid link: class name [discoverydest], end1 [discoverypattern], end2 [object]
valid link: class name [triggers], end1 [discoverytql], end2 [discoverypattern]
valid link: class name [triggers], end1 [cmdbclass], end2 [discoverypattern]
valid link: class name [depend], end1 [discoverypattern], end2 [discoverytql]
valid link: class name [container_f], end1 [snmp], end2 [mibtree]
valid link: class name [depend], end1 [webservice], end2 [iiswebdir]
valid link: class name [viewprofile], end1 [user], end2 [mapview]
Added: (19)
-----
```

valid link: class name [fcmdb\_conf\_aggregation], end1 [fcmdb\_configuration], end2 [fcmdb\_configuration]  
 valid link: class name [fcmdb\_conf\_composition], end1 [fcmdb\_configuration], end2 [fcmdb\_configuration]

valid link: class name [fcmdb\_info\_composition], end1 [fcmdb\_info], end2 [fcmdb\_info]  
 valid link: class name [member], end1 [host], end2 [host]  
 valid link: class name [member], end1 [vmserver], end2 [hostresource]  
 valid link: class name [depends\_on], end1 [object], end2 [logical\_application]  
 valid link: class name [applicationLink], end1 [object], end2 [logical\_application]  
 valid link: class name [patternstats], end1 [discoveryjob], end2 [cmdbclass]  
 valid link: class name [discoverydest], end1 [discoveryjob], end2 [object]  
 valid link: class name [triggers], end1 [discoverytql], end2 [discoveryjob]  
 valid link: class name [notification\_template\_of], end1 [alert\_recipient], end2

[notification\_template]

valid link: class name [alert\_recipient\_of], end1 [alert], end2 [alert\_recipient]  
 valid link: class name [link], end1 [offering\_level], end2 [schedule]  
 valid link: class name [offering\_dimension\_of], end1 [offering\_level], end2 [dimension]  
 valid link: class name [offering\_of], end1 [object], end2 [offering\_level]  
 valid link: class name [sla\_offering\_of], end1 [object], end2 [offering\_level]  
 valid link: class name [history\_link], end1 [it\_world], end2 [HistoryChange]  
 valid link: class name [acl\_attachment], end1 [user], end2 [acl\_role]  
 valid link: class name [contains], end1 [iiswebdir], end2 [webservice]

Changed: (0) & (445)-unchanged

-----

Type Defs:

-----

Removed: (0)

-----

Added: (6)

-----

statusaccounting\_enum  
 concrete\_synch\_config\_status  
 synch\_config\_unit\_status  
 synch\_unit\_state  
 history\_attribute\_types  
 history\_change\_type\_list

Changed: (2) & (34)-unchanged

-----

```
Item:
alert_context_type
Changes:
Add Enum Entry: Enum entry [3, event]

Item:
notification_type
Changes:
Add Enum Entry: Enum entry [0, message]

Classes:
-----
Removed: (3)
-----
class: name [discovers] super class [configuration_links] type [LINK] isFactory [true]
isUserUpdated [false]
class: name [dispatched] super class [configuration_links] type [LINK] isFactory [true]
isUserUpdated [false]
class: name [mibtree] super class [hostresource] type [OBJECT] isFactory [true]
isUserUpdated [false]

Added: (43)
-----
class: name [fcmdb_configuration_link] super class [configuration_links] type [LINK]
isFactory [true] isUserUpdated [false]
class: name [fcmdb_conf_aggregation] super class [fcmdb_configuration_link] type
[LINK] isFactory [true] isUserUpdated [false]
class: name [fcmdb_conf_composition] super class [fcmdb_configuration_link] type
[LINK] isFactory [true] isUserUpdated [false]
class: name [fcmdb_info_composition] super class [fcmdb_configuration_link] type
[LINK] isFactory [true] isUserUpdated [false]
class: name [offering_dimension_of] super class [configuration_links] type [LINK]
isFactory [true] isUserUpdated [false]

...
```

- **cmdb.info log.** Check that the CMDB version is set to 7.0 (if errors are reported, check the **cmdb.upgrader.log** file).

- **mam.Packaging.log.** Check this file for errors. The only acceptable errors are those that relate to CIT changes that did not succeed due to user or factory issues. For example, the Package Manager tries to remove user attributes and fails. This is the correct behavior.
  - **mam.scheduler.log.** Check this file to verify that all scheduled jobs are upgraded successfully.
- 

**Note:**

- To export updated packages, run JMX from the packages service.
  - The upgrade status is available in **cmdb.upgrade.log** or from a JMX invocation in **cmdb dal services: getCmdbVersion**.
  - If necessary, for a deployment larger than 5 MB of MIs, you may need to change configuration settings. For details, see “Large Deployments” on page 179.
- 

## Large Deployments

The following list of settings may need to be changed for large deployments (after consulting with HP Software Support):

- **HeldTimeoutMillis in pool.properties.** The connection timeout. This setting determines how long a connection can remain open against the database. The default is 5 minutes but for a large deployment you may need to change it to 30 minutes.
- **server.sync.session.timeout in cmdb.xml.** The CMDB session timeout. This setting determines for how long a CMDB operation can run till a timeout exception is thrown. The default is 10 minutes but for a large deployment you may need to change it to 60 minutes.
- **quota.name.customer.model.objects in cmdb.xml.** The maximum number of CIs. This setting determines the upper threshold for the number of CIs in the model.

- ▶ **quota.name.customer.tql.active in cmdb.xml.** The maximum number of active TQLs. This setting determines the upper threshold for the number of active TQLs. This settings must not be changed without consulting HP Software Support.
- ▶ **Maximum number of patterns from group allowed being active.** Appropriate numbers should be increased for all the group types.

## Upgrade Limitations

- ▶ There is no automatic upgrade for Business Service views. You manually upgrade the views during the upgrade procedure for version 7.50.
- ▶ During upgrade the CMDB compares a CIT from both versions, and tries to apply the differences to the version 7.0 CIT.

Differences that cannot be applied are marked as user differences. Differences in the remove attribute, remove class, and remove or add qualifiers remain because of their possible use by TQLs or enrichment, or the existence of CI instances.

If a version 7.0 factory CI has the same name as a version 6.x user CI, the factory CI is not updated.

- ▶ There is no upgrade for factory packages that were edited by the user in version 6.x. Only user packages are upgraded.

If a user creates a package and does not update the factory package, a JMX invocation repacks the user package.

In addition, if factory values for the Display Name value, Description value, and so on, were changed by the factory initiator, they are updated according to version 7.0 factory values. For example, if the description of an attribute is changed for an attribute that was created by factory and the changer of the description was factory, it is changed again in the 7.0 description.

To upgrade 6.5 packages, deploy them in the 6.5 environment. Any packages not deployed will not be compatible with version 7.0.

- ▶ The CMDB SOAP API for version 6.5 is not compatible with the version 7.0 API.

- ▶ The following scheduled jobs are not upgraded:

**SchedulableDeployPackages** (deploy this package through the application)

**SchedulableRebuildViews**

**SchedulableRunCorrelation**

**SchedulableRunTql**

The Scheduler upgrade occurs during system startup. Its status is available at **mam.scheduler.log** and not as part of the upgrade log.

- ▶ The following configuration files are installed with factory values:

**cmdb.conf**

**gui.properties.** This file contains values such as the number of objects in a layer, the pooling delay of the UI, and so on.

- ▶ The script to delete process instances is not supported for consolidated tables (HP Managed Software Solutions Support only).
- ▶ Menus that were edited by the user are not upgraded. The factory definitions overwrite them.



# 12

---

## Package Migration Utility

This chapter explains how to use the package migration utility to migrate custom packages in HP Universal CMDB (UCMDB) from version 7.x to version 8.03.

### **This chapter includes:**

#### Concepts

- ▶ Package Migration Utility – Overview on page 183

#### Tasks

- ▶ Migrate a Custom Package on page 184

#### Reference

**Troubleshooting and Limitations** on page 185

### **Package Migration Utility – Overview**

Custom packages created before upgrading the system to version 8.03 may contain resources that are not supported in the new version. To reduce the risk of problems in such custom packages, it is recommended that you migrate these packages offline using the provided Package Migration Utility before deploying the packages in the UCMDB version 8.03 system.

Using the Package Migration Utility to migrate custom packages offline provides the following benefits:

- ▶ No downtime is required.
- ▶ Migration of custom packages can be completed before they are deployed in the system, thereby reducing risk.

- ▶ You can migrate your packages, then immediately deploy them and rediscover the data.
- ▶ HP content packages can be migrated in a single process, reducing the risk of corrupted content.

The Package Migration Utility enables you to perform the migration on custom packages offline, without the need for a running server.

## Migrate a Custom Package

The following procedure explains how to migrate custom packages to HP Universal CMDB version 8.03.

### To migrate custom packages:

- 1 Place the custom packages to be migrated in a separate directory together with the packages on which the upgraded resources depend. For example:
  - ▶ If a custom package contains a view or enrichment rule which relies on a TQL definition that resides in another package, place the package containing the TQL definition in the directory with the custom package.
  - ▶ If a custom package has a reference to a custom class definition which is not supplied by any of the factory packages, place the package with the custom class definition in the directory with the custom package.
- 2 Ensure that you have the following XML files:
  - ▶ the old class model definition, that is, the class model of the UCMDB version (such as 7.0 or 7.5) with which your package was created.
  - ▶ the class model definition of the new system (8.00).

If you do not have these files, create them through the JMX console. (To create them, access the JMX console, navigate to **CMDB Class Model Services** and run the **exportClassModelToXML** method.)

- 3 Run the script <UCMDB Server  
Root> \j2f\packupgrade\bin\packupgrade.bat on Windows, or <UCMDB  
Server Root>/2f/packupgrade/bin/packupgrade.sh on Solaris.

The syntax for running the script is shown below. (This information can also be displayed by running the script without arguments.)

```
packupgrade -cmold {CLASS_MODEL_DEF_FILE} -cmnew
{CLASS_MODEL_DEF_FILE} [-u {UPGRADE_CONFIG_FILE}] -out {OUTPUT_DIR}
{INPUT_DIR}
-i
  log to console
-cmold {CLASS_MODEL_DEF_FILE}
  file name of the OLD class model definition;
  this file can be created via JMX:
  navigate to the Class Model Services in JMX console and apply
  "exportClassModelToXml" method
-cmnew {CLASS_MODEL_DEF_FILE}
  file name of the NEW class model definition;
  this file can be created via JMX:
  navigate to the Class Model Services in JMX console and apply
  "exportClassModelToXml" method
-u {UPGRADE_CONFIG_FILE}
  upgrade configuration file;
  by default it's taken from {PRODUCT_DIR}\cmdb\services\upgrade_resources.xml
-out {OUTPUT_DIR}
  directory path for upgraded packages
{INPUT_DIR}
  directory path of the packages to be upgraded
```

For example:

```
packupgrade -cmold ClassModel-7.5.xml -cmnew ClassModel-8.0.xml -out
c:\MyPackages\Upgraded\ c:\MyPackages\
```

- 4 Locate the migrated packages in the output directory you provided. Deploy your migrated packages in the UCMDDB version 8.03 system.

## Troubleshooting and Limitations

- The Package Migration Utility has been verified only for packages compatible with UCMDDB 7.x.
- Enrichment definition packages that refer to deleted or updated CI types cannot be updated using the Package Migration Utility.

- ▶ Partial migration is not supported. The Package Migration Utility does not create a new package if one or more of the resources cannot be migrated successfully.
- ▶ Migration may fail due to a known defect in the JMX method that exports class models to XML in UCMDB version 7.52. In that version of UCMDB, the XML file may be created with illegal characters. If this occurs, the following error message is generated by the Package Migration Utility:

```
Couldn't read old class model definition from <xml file name>.
```

**Solution 1.** Open the XML file exported from UCMDB 7.52 with an XML editing tool (for example, Altova XMLSpy) and save it. Then, run the Package Migration Utility again.

**Solution 2:** Open the XML file exported from UCMDB 7.52 in a text editor (for example, Notepad). Search for the ellipse "..." character (ascii code 0133). In Notepad, you can find this character by clicking in the **Find What** box, and then pressing and holding the ALT key while entering **0133** using the numeric keypad. Locate and remove all occurrences of this character in the XML file. Then, run the Package Migration Utility again.

# 13

---

## Class Model Changes

This chapter documents the changes that are automatically made to the class model, TQL-based resources, and the CMDB during upgrade, to enable compliance with the class model of version 8.00.

### **This chapter includes:**

#### **Reference**

- Class Model Changes on page 187
- Transformation of TQL Based Resources on page 194
- Discovery Modules on page 198
- Upgrading the DDM DomainScopeDocument File on page 199
- **Troubleshooting and Limitations** on page 199

### **Class Model Changes**

This section contains the following topics:

- “Host Alignment” on page 189
- “Database CIT and Database Resources” on page 190
- “J2EE Changes” on page 191
- “Cluster Topology Changes” on page 192
- “Alteon (Load Balancer) Modeling Changes” on page 192
- “Disk Partition Changes” on page 193
- “Application Component Changes” on page 193

## Chapter 13 • Class Model Changes

- “Service Address Changes” on page 194
- “Relationships” on page 194



## Host Alignment

Actual Change in Class Model	Upgrade Notes
<p>The <b>Host</b> CIT is divided into two sub-categories: Computer and Net Device. The Computer components are general purpose machine CITs, for example, desktop, server. The Net Device components are specific entities, for example, switches, routers.</p> <p>The Computer and Net Device CITs contain the following child CITs:</p> <ul style="list-style-type: none"> <li>➤ Computer: <ul style="list-style-type: none"> <li>➤ Clustered Server</li> <li>➤ Mainframe</li> <li>➤ Mainframe Logical Partition</li> <li>➤ Terminal Server</li> <li>➤ Unix</li> <li>➤ VAX</li> <li>➤ VMware ESX Server</li> <li>➤ Windows</li> </ul> </li> <li>➤ Net Device: <ul style="list-style-type: none"> <li>➤ ATM Switch</li> <li>➤ Chassis</li> <li>➤ Concentrator</li> <li>➤ Firewall</li> <li>➤ Load Balancer</li> <li>➤ Net Printer (also previously under the Net Device CIT)</li> <li>➤ Remote Access Service</li> <li>➤ Router</li> <li>➤ Switch</li> </ul> </li> </ul> <p><b>Note:</b> In previous versions, all these CITs were located under the Host CIT.</p> <p>The Enterasys 7 Blade CIT was removed.</p> <p>The <b>host_dnsname</b> attribute is no longer used for calculating the host display label.</p>	<p>During upgrade, the new category of the CITs is automatically determined.</p>

 **Database CIT and Database Resources**

Actual Change in Class Model	Upgrade Notes
<ul style="list-style-type: none"> <li>➤ Key attributes changed for:                             <ul style="list-style-type: none"> <li>➤ data_name(Const:'Oracle DB'/'IBM DB2'/'MSSQL DB'/'Sybase DB')</li> <li>➤ root_container (Host)</li> <li>➤ database_dbsid (this key attribute refers to the Database Instance Name. It is added to all databases)</li> </ul> </li> <li>➤ The entire Database Resources CIT was moved under Application Resource.</li> <li>➤ A new abstract CIT Database schema was created under Application Resource.</li> <li>➤ The MSSQL Database CIT was moved under Database schema.</li> <li>➤ The Sybase DB CIT was moved under Database schema.</li> <li>➤ The DB2 Schema CIT, derived from the Database schema, was created.</li> <li>➤ The Oracle Schema CIT, derived from the Database schema, was created.</li> <li>➤ The DB2USER CIT was removed.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Changes to key attributes affect all Database CI instance; these instances are automatically deleted during upgrade.</li> <li>➤ The hierarchy for the database CITs is automatically changed during upgrade.</li> </ul>

 **J2EE Changes**

Actual Change in Class Model	Upgrade Notes
<ul style="list-style-type: none"> <li>▶ The J2EE Model was aligned so it is now shared between WebSphere, WebLogic, and JBoss.</li> <li>▶ New strong CITs were created to represent WebLogic AS and JBoss AS under J2EE Server. All platform-specific attributes were moved from J2EE Server to the specific CITs.</li> <li>▶ The WebSphere AS CIT was moved under J2EE Server, on the same level as the WebLogic AS and JBoss CITs.</li> <li>▶ Key attributes for JBoss AS, WebLogic AS, and WebSphere AS were changed to enable Software Element reconciliation (via the shared Name attribute), and allow the modeling of multiple J2EE Server instances on a single machine.</li> <li>▶ The J2EE Domain CIT was moved under the Application System CIT.</li> <li>▶ The J2EE Cluster CIT was moved under the Cluster CIT.</li> <li>▶ The J2EE Managed Object CIT was moved under Application Resource CIT.</li> <li>▶ The obsolete CIT websphere was removed and merged with the generic J2EE Domain CI.</li> </ul>	<ul style="list-style-type: none"> <li>▶ You need to run discovery on the J2EE Topology again after the upgrade, as almost all relevant J2EE CIs are being removed as part of the upgrade process to accommodate the changes described here.</li> <li>▶ The hierarchy changes are automatically done during the upgrade.</li> </ul>

## Cluster Topology Changes

Actual Change in Class Model	Upgrade Notes
<ul style="list-style-type: none"> <li>▶ The Overall Cluster Topology was aligned so it is now shared between Veritas, Microsoft Cluster, and Service Guard.</li> <li>▶ The Cluster CIT was moved under the Application System CIT.</li> <li>▶ Load Balancing Cluster CIT was created under the Cluster CIT.</li> <li>▶ The Failover Cluster CIT was created under the Cluster CIT.</li> <li>▶ MS Cluster, SG Cluster, Veritas Cluster, and VMWare Cluster were moved under Failover Cluster.</li> <li>▶ J2EE Cluster and Oracle RAC were moved under Load Balance Cluster.</li> <li>▶ The Member relationship now links Failover Cluster and Failover Cluster SW instead of Cluster and Host. Connecting to Failover Cluster SW contributes to a better cluster model.</li> <li>▶ The Contains relationship now links Failover Cluster and Clustered Server (the virtual host). Clustered Server is the new container for Cluster Resource Group.</li> </ul>	<ul style="list-style-type: none"> <li>▶ The hierarchy changes are automatically done during the upgrade.</li> <li>▶ Cluster Topology views are automatically upgraded to correspond to the new Cluster Model.</li> <li>▶ You need to run Cluster discovery again to populate the CMDB with the new relationships.</li> </ul>

## Alteon (Load Balancer) Modeling Changes

In DDM 8.00, a new package has been created for Alteon Load Balancer, which replaces the package developed in HP Universal CMDB 7.5. The new package replaces the model for Alteon Load Balancer with a new model. The new model includes new CITs and the relationships between them. All the CITs that were part of the 7.5 Alteon Load Balancer package have been removed from the class model.

For details on load balancer modeling, including the `Alteon_application_switch` package, see “Load Balancer” in *Discovery and Dependency Mapping Content Guide*.

These CITs were removed:

- Alteon Real Group
- Alteon Virtual Server
- Alteon Resource
- Alteon Switch Virtual Server
- LB Virtual Address

### **Disk Partition Changes**

Version 7.5 included a File System CIT that was derived from the Disk CIT. The File System CIT was never reported by the Discovery process, so it has been removed from the class model. The Disk CIT replaces the File System CIT; the display label is changed to File System.

### **Application Component Changes**

In HP Universal CMDB 7.5 the Application Component CIT (derived from Software Element) was introduced to reflect an application signature.

This CIT was reported whenever an application was discovered using a shallow discovery. The discovered CI did not contain the required information about the application, for example the version, the type, and so on.

Due to reconciliation engine changes, Application Component CIs were no longer being reported, and the Software Element CI itself was used instead to reflect a weak type application. Therefore the Application Component CIT has been removed from the class model.

For details, see “Class Model – Overview” in *Discovery and Dependency Mapping Guide*.

## Service Address Changes

Prior to HP Universal CMDB 8.00, the class model contained a CIT called TCP/IP Port (ipserver), which represented a specific port (usually TCP) on a host. Its key attributes were <port number> and <container (host)>.

In DDM 8.00, the role of the ipserver CIT was extended to represent a more generic address that can be either a TCP/UDP port or a URL address. The ipserver CIT was renamed Service Address, to represent an address used by client software to retrieve a service from a software element. The key attributes of the Service Address CIT were changed and now include: Address Type and Service Address.

For more information on the Service Address CIT, see “The Service Address CIT” in *Discovery and Dependency Mapping Guide*.

## Relationships

This section describes the legacy relationships that were removed.

Actual Change in Class Model	Upgrade Notes
<p>The following relationships were removed:</p> <ul style="list-style-type: none"> <li>➤ execute</li> <li>➤ Uni-Connection</li> <li>➤ Bridge backbone</li> <li>➤ Brother (replaced with Depend)</li> <li>➤ VLAN membership (replaced with Member)</li> <li>➤ share</li> </ul>	<p>Any views or TQLs that include a relationship that was removed in version 8.00, are automatically updated.</p>

## Transformation of TQL Based Resources

This section contains the following topics:

- “CI Type Changes” on page 195
- “Nodes Deleted from TQLs” on page 195
- “Relationship Conditions” on page 196

- “Relationships Replaced by Compound Relationships” on page 197
- “Attribute Condition Changes” on page 198

### **CI Type Changes**

This section describes the nodes in TQL-based resources that are replaced with a node of a different CI type.

Nodes in TQL-based Resources	Replacement CI Type Nodes
websphere	j2eedomain
JDBC Provider	JDBC Datasource
Connection Pool	JDBC Datasource
Drive	Disk
VM Server	Hypervisor
Business Service	Logical Application

### **Nodes Deleted from TQLs**

Nodes of the CI types listed in this section are removed from TQL-based resources.

The following nodes were deleted:

- Alteon Switch Virtual Server
- Alteon Real Group
- Alteon Resource
- Alteon Virtual Server
- Application Component
- Cluster Component
- db2user
- Enterasyse 7 Blade
- Execute

- File System
- J2EE Socket
- LB Virtual Address
- Logical Disk
- Program

### Relationship Conditions

Relationships defined with a condition are replaced by a relationship of a different CI type.

Relationship Condition	Replacement CI Type Condition
Brother linking Vlan and Bridge	Depend
Brother linking Process and Daemon	Depend
Brother linking Process and Service	Depend
Member linking VM Server and Host	Run
VLAN Membership linking Port and Vlan	Member
container_f linking Websphere and J2EE Server	Member
Deployed linking Host and J2EE Server	container_f
container_f linking J2EE Server and JDBC Provider	Deployed
container_f linking J2EE Server and J2EE Application	Deployed
container_f linking J2EE Server and Connection Pool	Deployed

## Relationships Replaced by Compound Relationships

TQL-based resources that contain a relationship condition are replaced by compound relationships.

Relationship Condition	Replacement Compound Relationship Condition
Use linking J2EE Application and JVM	<ul style="list-style-type: none"> <li>▶ Deployed connecting J2EE Application and J2EE Server</li> <li>▶ container_f connecting J2EE Server and JVM</li> </ul>
container_f linking J2EE Server and JMS Destination	<ul style="list-style-type: none"> <li>▶ Deployed connecting J2EE Server and JMS Server</li> <li>▶ container_f connecting JMS Server and JMS Destination</li> </ul>
container_f linking J2EE Server and JMSD Resource J	<ul style="list-style-type: none"> <li>▶ Deployed connecting J2EE Server and JMS Server</li> <li>▶ container_f connecting JMS Server and JMSD Resource</li> </ul>
Member linking Cluster and Host	<ul style="list-style-type: none"> <li>▶ Member connecting Cluster and container_f</li> <li>▶ container_f connecting container_f and Host</li> </ul>
Member linking Cluster and Cluster Group	<ul style="list-style-type: none"> <li>▶ Contains connecting Cluster and Clustered Server</li> <li>▶ container_f connecting Clustered Server and Cluster Group</li> </ul>
Client Server linking Process and Process	<ul style="list-style-type: none"> <li>▶ Client Server connecting Process and IP Server</li> <li>▶ Use connecting IP Server and Application</li> </ul>

## **Attribute Condition Changes**

TQL-based resources that contained a condition on the attribute `data_name` for the CI type Database before the upgrade, undergo the following change: After the upgrade, the condition is on the attribute `database_dbsid`, instead of `data_name`.

## **Discovery Modules**

This section describes the discovery modules that were either removed from HP Universal CMDB or renamed. The following discovery modules were either removed or renamed:

- Application – Webservices was renamed Application – Webservices.
- Application Signature was removed and merged with Network – Host Resources.
- Host Resources was renamed Network – Host Resources.
- Load Balancer – Alteon was renamed Network – Load Balancer.
- Mainframe was renamed Network – Mainframe.
- MS Cluster was renamed Cluster – Microsoft Cluster.
- NetLinks – Passive Network Connections Discovery was renamed Network Connections – Passive Discovery.
- Network – Credential-less Discovery was renamed Network – Credentialless Discovery.
- Network – Protocol connections was removed. The module Network – Basic contains all the necessary connection patterns.
- Network – TCP Discovery was renamed Network Connections – Active Discovery.
- Service Guard Cluster was renamed Cluster – Service Guard.
- Veritas Cluster was renamed Cluster – Veritas.
- Websphere\_MQ was renamed Application – WebSphere MQ.

## Upgrading the DDM DomainScopeDocument File

During upgrade, the DSD document is decrypted by the upgrade process and then encrypted by the AES mechanism. The encryption/decryption key remains the same. For details, see Chapter 10, “Hardening Discovery and Dependency Mapping,” in *Discovery and Dependency Mapping Guide*.

## Troubleshooting and Limitations

During the upgrade, HP Universal CMDB automatically transforms TQL definitions and TQL-based resources (view definitions, Correlation rules, Enrichment definitions, report definitions, and Gold Master reports) to conform to the new 8.00 class model.

This section includes the following topics:

- “Log Files” on page 199
- “Causes for Upgrade Failure” on page 200
- “Upgrade Produces Different TQL Results” on page 201

### Log Files

The information describing the actions taken by the upgrade is found in the following files:

- The **upgrade.report.log** file is located in <HP Universal CMDB root directory>\UCMDBServer\j2f\log\. This file contains high level information about the upgrade process.
- The **upgrade.short.log** file contains information on all actions performed by the upgrade.
- The **upgrade.detailed.log** file contains the XML text of all the upgraded resources before and after the upgrade.

During the upgrade, some of the resources may be removed from the system. A resource may be removed when the upgrade of this resource fails, or when the transformation may cause an unpredictable impact on the system. For example, changing the TQL of an Enrichment definition can cause CIs to be added, updated, or deleted. To avoid this, the upgrade system prefers to remove the Enrichment definition rather than risk an uncertain impact.

The XML text for the removed resources are written to the **upgrade.detailed.log** file and can be recovered after the upgrade.

**To recover the XML text for the removed resources:**

- 1** Extract the XML text for that resource from the **upgrade.detailed.log** file.
- 2** Save the XML text in a separate file.
- 3** Import the XML text using the relevant manager's user interface or the JMX console.

### **Causes for Upgrade Failure**

Common cases which may cause upgrade failure are:

- A Correlation rule refers to a node or relationship that has been removed from its corresponding TQL query.
- An Enrichment definition is based on a TQL query that has been changed by the upgrade.
- The CI type or attribute name of an Enrichment definition does not exist in the 8.00 class model.

## Upgrade Produces Different TQL Results

Upgraded TQL definitions may produce results that differ from the pre-upgrade results. Some of the most common cases are:

► **Case 1**

A node is removed from the TQL query because a condition has been defined for that node refers to a CI type that no longer exists in the class model. The removal of the node caused the removal of its connecting relationships. This, in turn, caused changes in the relationship conditions of other nodes. Even though the upgraded TQL is still valid and conforms to the class model, the results are different and cannot be used.

► **Case 2**

A relationship in the TQL query has been replaced by a compound relationship. Even though the query and the results are still valid, they differ from the pre-upgrade results.



# 14

---

## Discovery and Dependency Mapping API Changes

This chapter documents the changes made to the Discovery and Dependency Mapping API in version 8.00. For details on class model changes to DDM, see “Class Model – Overview” in *Discovery and Dependency Mapping Guide*.

### **This chapter includes:**

#### **Reference**

- Removed Methods on page 203
- Import Changes on page 204
- Jython Script Changes on page 206

### **Removed Methods**

The following methods have been removed and the Jython scripts have been updated:

- Framework.executeCommand()
- Framework.getClientFactory()
- Framework.getLogger()
- Framework.getMbeanServer()
- Framework.getRegularExpressionResults()
- Framework.getTriggerCIErrors()

- Framework.getUrlsClassPath()
- Framework.getUrlsClassPathList()
- Framework.performXslTransformation()

**Example of Removing the Method Framework.getClientFactory()**

Since the Framework.getClientFactory method is obsolete, you must remove all instances of clientFactory in the code. Usages of clientFactory.getAvailableProtocols should be changed to Framework.getAvailableProtocols. For example, the following lines in the previous code:

```
clientFactory = Framework.getClientFactory(ClientsConsts.SQL_PROTOCOL_NAME)
protocols = clientFactory.getAvailableProtocols(ip_address)
```

should be changed to:

```
protocols = Framework.getAvailableProtocols(ip_address,
clientsConsts.SQL_PROTOCOL_NAME)
```

 **Import Changes**

Existing classes have been moved from the Discovery Probe. These classes include classes that implement protocol clients.

Classes from the Package...	Were Moved to the Package...
com.hp.ucmdb.discovery.probe.clients (for example, BaseClient, ClientsConsts)	com.hp.ucmdb.discovery.library.clients
com.hp.ucmdb.discovery.probe.services. dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents

The following table lists classes that have been moved:

Class	Old Location	New Location
<b>Clients</b>		
BaseClient	com.hp.ucmdb.discovery.probe.clients	com.hp.ucmdb.discovery.library.clients
ClientsConsts	com.hp.ucmdb.discovery.probe.clients	com.hp.ucmdb.discovery.library.clients
HttpClient	com.hp.ucmdb.discovery.probe.clients	com.hp.ucmdb.discovery.library.clients
<b>Agents</b>		
AgentConstants	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
BaseAgent	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
JBossJMXAgent	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
JMXAgent	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
JMXUtil	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
MSSQLClient	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
SAPAgent	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
SSHAgent	com.hp.ucmdb.discovery.probe.services.dynamic.agents	com.hp.ucmdb.discovery.library.clients.agents
<b>Miscellaneous</b>		
TimeoutException	com.hp.ucmdb.discovery.probe.protocols.command	com.hp.ucmdb.discovery.library.clients.protocols.command
SQLClient	com.hp.ucmdb.discovery.probe.clients.query	com.hp.ucmdb.discovery.library.clients.query

Class	Old Location	New Location
CollectorsParameters	com.hp.ucmdb.discovery.probe.util	com.hp.ucmdb.discovery.library.common
CiMappingConfigFile	com.hp.ucmdb.discovery.probe.agents.problemgr.downloader.cfgfiles	com.hp.ucmdb.discovery.library.communication.downloader.cfgfiles
GeneralSettingsConfigFile	com.hp.ucmdb.discovery.probe.agents.problemgr.downloader.cfgfiles	com.hp.ucmdb.discovery.library.communication.downloader.cfgfiles
IPProtocols	com.hp.ucmdb.discovery.probe.agents.problemgr.downloader.cfgfiles	com.hp.ucmdb.discovery.library.communication.downloader.cfgfiles
ProtocolDictionaryManager	com.hp.ucmdb.discovery.probe.util.credentials	com.hp.ucmdb.discovery.library.credentials.dictionary
DomainScopeManager	com.hp.ucmdb.discovery.probe.util	com.hp.ucmdb.discovery.library.scope

## Jython Script Changes

The following changes have been made to the Jython scripts:

Old Syntax	New Syntax
Framework.getClientFactory().createClient(	Framework.createClient(
Framework.getClientFactory(ClientsConsts.SNMP_PROTOCOL_NAME).createClient(	Framework.createClient(
Framework.getClientFactory(ClientsConsts.SQL_PROTOCOL_NAME).createClient(	Framework.createClient(
Framework.getClientFactory(ClientsConsts.WMI_PROTOCOL_NAME).createClient(	Framework.createClient(
Framework.getClientFactory(ClientsConsts.NT_CMD_PROTOCOL_NAME).createClient(	Framework.createClient(
Framework.getClientFactory(ClientsConsts.SAP_PROTOCOL_NAME).createClient(	Framework.createClient(

Old Syntax	New Syntax
Framework.getClientFactory(ClientsConsts.LOCAL_SHELL_PROTOCOL_NAME).createClient()	Framework.createClient(ClientsConsts.LOCAL_SHELL_PROTOCOL_NAME)
Framework.getClientFactory(ClientsConsts.ICMP_PROTOCOL_NAME).createClient(param)	Framework.createClient(ClientsConsts.ICMP_PROTOCOL_NAME, param)
Framework.getClientFactory(ClientsConsts.HTTP_PROTOCOL_NAME).createClient()	Framework.createClient(ClientsConsts.HTTP_PROTOCOL_NAME)
Framework.getParameterValue()	Framework.getParameter()
Framework.getBundle()	Framework.getEnvironmentInformation().getBundle()
FrameworkImpl.addExecutionRecordLog()	ScriptsExecutionManager.addExecutionRecordLog()
FrameworkImpl.getFramework()	Framework.getFramework()
Framework.getBundle()	Framework.getEnvironmentInformation().getBundle()
Framework.getDefaultLanguage()	Framework.getEnvironmentInformation().getDefaultLanguage()
Framework.getProbeGwId()	Framework.getEnvironmentInformation().getProbeGwId()
Framework.getProbeGWIp()	Framework.getEnvironmentInformation().getProbeGWIp()
Framework.getProbeManagerDomain()	Framework.getEnvironmentInformation().getProbeManagerDomain()
Framework.getProbeManagerIP()	Framework.getEnvironmentInformation().getProbeManagerIP()
Framework.getProbeMgrIp()	Framework.getEnvironmentInformation().getProbeMgrIp()
Framework.isIpInScope()	Framework.getEnvironmentInformation().isIpInScope()
Framework.doConnectionPool()	dbutils.doConnectionPool()
Framework.getDestinationAttributeAsObject()	Framework.getTriggerCIData()

Old Syntax	New Syntax
Framework.getDestinationAttrValueList(	Framework.getTriggerCIDataAsList(
Framework.getHostIP(	netutils.getHostAddress(
Framework.getHostName(	netutils.getHostName(
Framework.getListDestinationAttribute(	Framework.getTriggerCIDataAsList(
Framework.getParameterValue(	Framework.getParameter(
Framework.getPortDescription(	netutils.getPortDescription(
Framework.sendResults(	Framework.sendObjects(
Framework.setObjectsToDelete(	Framework.deleteObjects(
Framework.tcpConnect(	DynamicPortConnectionOperation.connect(

# Part IV

---

## HP Universal CMDB High Availability



# 15

---

## HP Universal CMDB High Availability

This chapter provides information on HP Universal CMDB run in high availability mode.

### **This chapter includes:**

#### Concepts

- ▶ Best Practices for the HP Universal CMDB High Availability Solution on page 211

#### Tasks

- ▶ Install HP Universal CMDB in High Availability Mode on page 214
- ▶ Configure Network High Availability on page 216
- ▶ Configure Full Site on page 217

### **Best Practices for the HP Universal CMDB High Availability Solution**

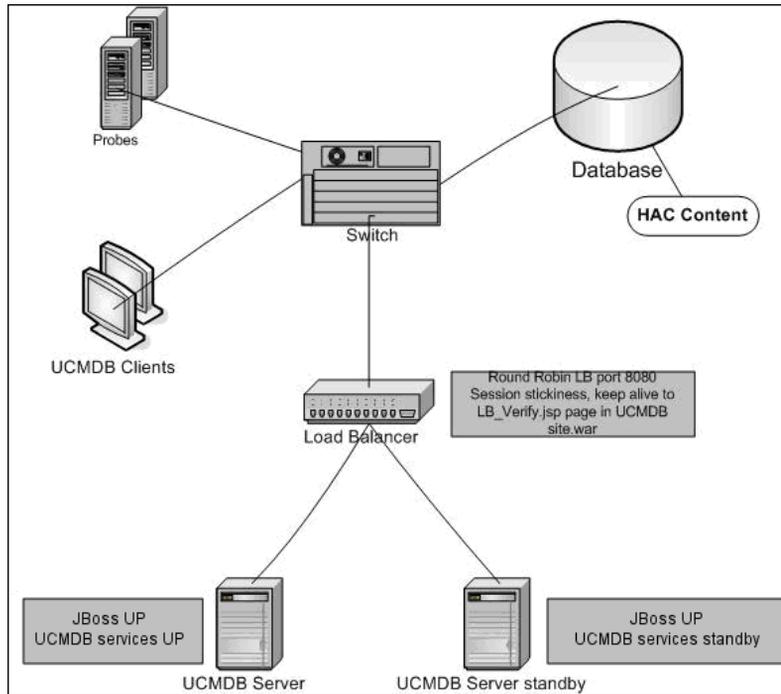
This section outlines best practices for field implementation of the HP Universal CMDB High Availability solution.

This section includes the following topics:

- ▶ “Light Site Configuration” on page 212
- ▶ “Full Site Configuration” on page 213

## Light Site Configuration

Solution diagram:

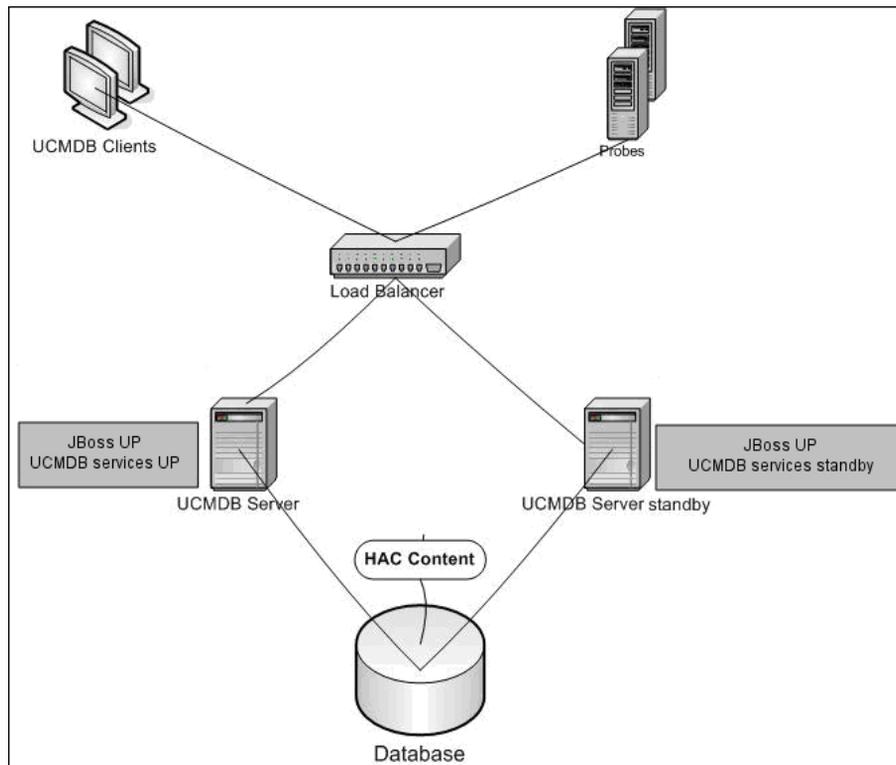


- This High Availability solution is based on the HP Business Availability Center High Availability solution (High Availability Controller and load balancer).
- All external access to the HP Universal CMDB application is via the load balancer.
- Two servers are configured.
- JBoss is active on both servers.
- All HP Universal CMDB services except the CMDB service run on the active server and remain in standby on the other server. The CMDB service runs on both servers. Services can run on the standby server in the case of a partial or complete failure of the active server.

- Load balancer with:
  - Keep alive to **http://real server name:8080/ucmdb/LB\_Verify.jsp**.
  - Session stickiness.
  - Round robin policy for the servers.

## Full Site Configuration

Solution diagram:



This configuration has the same features as the Light Site configuration. In addition, each server is connected to two separate networks:

- Front-end (for load balancer access)
- Back-end (for database and High Availability Controller communication)

## Install HP Universal CMDB in High Availability Mode

This section describes the installation, startup, and configuration procedures when HP Universal CMDB is run in high availability mode.

This section includes the following topics:

- “Server Configuration” on page 214
- “Load Balancer Configuration” on page 215
- “Probe Configuration” on page 215

### Server Configuration

**To install the server:**

- 1** Run the server installation on two machines without running the configuration wizard (select **No** at the wizard prompt).
- 2** Run the configuration wizard on both servers. To run the wizard from a Windows platform, select **Start > HP Universal CMDB > Start UCMDB server configuration wizard**. From a Solaris platform, run **ucmdb-config-server-wizard.sh** from **UCMDBServer/j2f/tools/ConfigServer**.

The first time the wizard runs, select the **Create new DB** option. The second time, select the **Connect to** option.

**To complete the server startup:**

- 1** Start the first server. Wait until the startup process is completed.
- 2** Start the second server. Wait until the startup process finishes successfully.

**To configure the server:**

- 1** Connect to the JMX console on one of the UCMDB servers by entering the following address in your Web browser: **http://<server\_name>:8080/jmx-console**, where **<server\_name>** is the name of the selected server.
- 2** Verify that all services are running on the primary server. Under **Topaz**, click **service=hac-manager**. Locate **java.lang.String listAllAssignments**. Click **Invoke**.

- 3 Define the backup server. Under **Topaz**, click **service=hac-backup** and locate **java.lang.String listServers** to check if a backup server is already defined. If one is not defined, use **java.lang.String addBackupServer** to define a backup server.
- 4 Enable the High Availability Controller high availability setting. Under **Topaz**, click **service=Infrastructure Settings Manager** and locate **java.lang.String setGlobalSettingValue**. Enter the following parameters:
  - contextName=**hac**
  - settingName=**hac.automatic.failover.enabled**
  - newValue=**true**

### Load Balancer Configuration

Define the virtual IP for the two HP Universal CMDB servers with the following configuration:

- Port 8080 should be selected.
- There should be a round robin policy for the servers.
- Session stickiness should be maintained.
- The keep alive address for the session is: **http://<real server name>:8080/ucmdb/LB\_Verify.jsp**.

### Probe Configuration

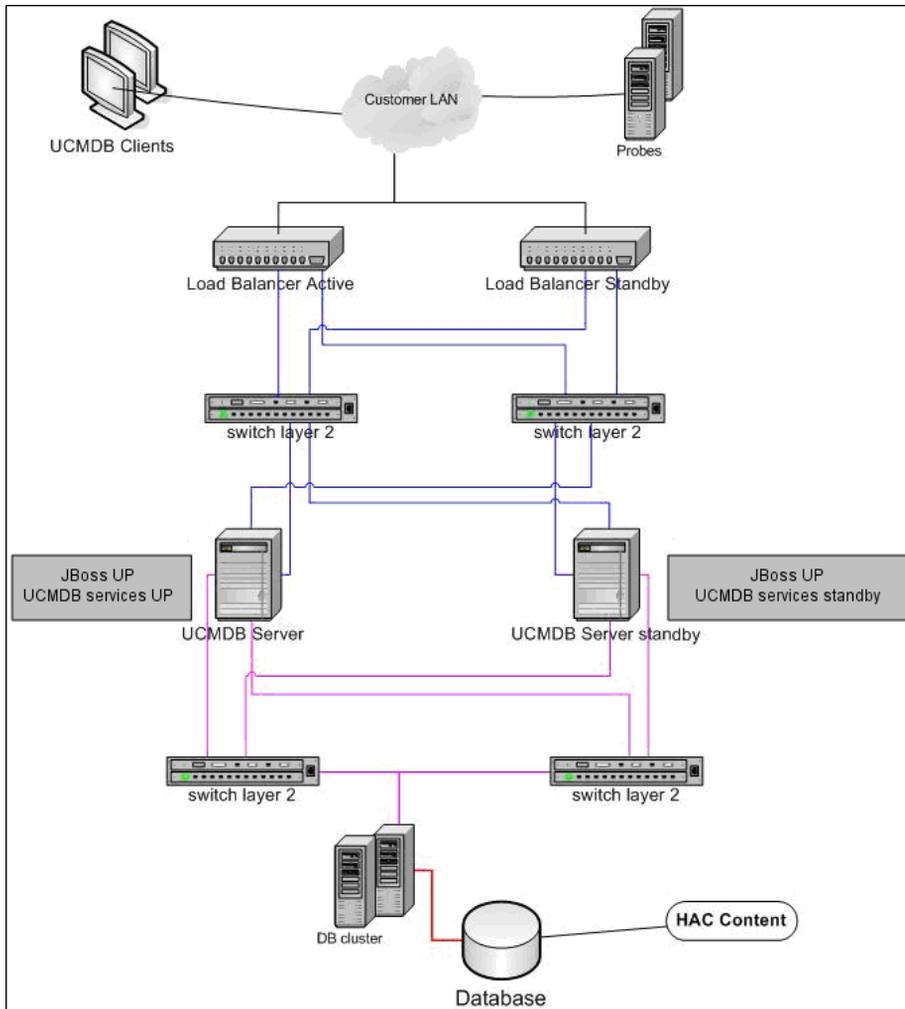
To configure the Probe:

- 1 Run the Probe installation on the Probe machine with the load balancer virtual IP address as the HP Universal CMDB server name.
- 2 Start the Probe.

## Configure Network High Availability

To deploy network high availability, connect load balancers and databases via switches to servers using spanning tree Intel NIC mode (for Windows) and Solaris IP Multipathing (for Solaris).

Full Network Redundancy configuration solution diagram:



## **Configure Full Site**

- The back-end network should be defined on the prime interface (the interface bound to the server name). If it is not defined this way, edit the `etc/hosts` file to define the back-end interface as bound to the server name.
- During the server installation, the back-end hostname/IP should be defined as the HP Universal CMDB server/IP.



# Part V

---

## Hardening HP Universal CMDB



# 16

---

## Introduction to Hardening

This chapter introduces the concept of a secure HP Universal CMDB application and discusses the planning and architecture required to implement security. It is highly recommended that you read this chapter before proceeding to the hardening discussion in the following chapters.

### **This chapter includes:**

#### Concepts

- ▶ Hardening Overview on page 222
- ▶ Hardening Preparations on page 223

#### Tasks

- ▶ Deploy HP Universal CMDB in a Secure Architecture on page 224
- ▶ Limit Access to UCMDB Server from JBoss URLs on page 225
- ▶ Harden Discovery and Dependency Mapping on page 226

#### Reference

- ▶ Security Settings Configuration Instructions on page 226

## **Hardening Overview**

HP Universal CMDB is designed so that it can be part of a secure architecture, and can therefore meet the challenge of dealing with the security threats to which it might be exposed.

The hardening guidelines deal with the configuration required to implement a more secure (hardened) HP Universal CMDB. The hardening guidelines relate to both single machine and distributed deployments of HP Universal CMDB.

The hardening information provided is intended primarily for HP Universal CMDB administrators who should familiarize themselves with the hardening settings and recommendations prior to beginning the hardening procedures.

It is highly recommended that you use a reverse proxy with HP Universal CMDB to achieve a secure architecture. For details on configuring a reverse proxy for use with HP Universal CMDB, see Chapter 18, “Using a Reverse Proxy.”

If you must use another type of secure architecture with HP Universal CMDB, contact HP Software Support to determine which architecture is the best one for you to use.

**Important:**

- ▶ The hardening procedures are based on the assumption that you are implementing only the instructions provided in these chapters, and that you are not performing other hardening steps documented elsewhere.
  - ▶ Where the hardening procedures focus on a particular distributed architecture, this does not imply that this is the best architecture to fit your organization's needs.
  - ▶ It is assumed that the procedures included in the following chapters are to be performed on machines dedicated to HP Universal CMDB. Using the machines for other purposes in addition to HP Universal CMDB may yield problematic results.
  - ▶ The hardening information provided in this section is not intended as a guide to making a security risk assessment for your computerized systems.
- 

## **Hardening Preparations**

- ▶ Evaluate the security risk/security state for your general network, and use the conclusions when deciding how to best integrate HP Universal CMDB into your network.
- ▶ Develop a good understanding of the HP Universal CMDB technical framework and HP Universal CMDB security capabilities.
- ▶ Review all the hardening guidelines.
- ▶ Verify that HP Universal CMDB is fully functioning before starting the hardening procedures.
- ▶ Follow the hardening procedure steps chronologically in each chapter. For example, if you decide to configure the HP Universal CMDB server to support SSL, read Chapter 17, “Enabling Secure Sockets Layer (SSL) Communication” and then follow all the instructions chronologically.

- ▶ HP Universal CMDB does not support basic authentication with blank passwords. Do not use a blank password when setting basic authentication connection parameters.

---

**Tip:** Print out the hardening procedures and check them off as you implement them.

---

## Deploy HP Universal CMDB in a Secure Architecture

Several measures are recommended to securely deploy your HP Universal CMDB servers:

- ▶ **DMZ architecture using a firewall**

The secure architecture referred to in this document is a typical DMZ architecture using a device as a firewall. The basic concept of such an architecture is to create a complete separation, and to avoid direct access between the HP Universal CMDB clients and the HP Universal CMDB server.

- ▶ **Secure browser**

Internet Explorer in a Windows environment and FireFox in a Solaris environment must be configured to securely handle Java scripts, applets, and cookies.

- ▶ **SSL communication protocol**

Secure Sockets Layer protocol secures the connection between the client and the server. URLs that require an SSL connection use a secure version (HTTPS) of the Hypertext Transfer Protocol. For details, see “Enabling Secure Sockets Layer (SSL) Communication” on page 227.

- ▶ **Reverse proxy architecture**

One of the more secure and recommended solutions suggests deploying HP Universal CMDB using a reverse proxy. HP Universal CMDB fully supports secure reverse proxy architecture. For details, see “Using a Reverse Proxy” on page 231.

---

**Note:** Mutual authentication using SSL between the UCMDB server and the DDM Probe is not supported when the connection is made by reverse proxy. For details, see “Enable SSL Between UCMDB Server and DDM Probe with Mutual Authentication” in *Discovery and Dependency Mapping Guide*.

---

## Limit Access to UCMDB Server from JBoss URLs

You can prevent unauthenticated access to the UCMDB server through the JBoss URLs. The JBoss application running on the UCMDB server machine includes a Web console. It is possible to access the UCMDB server from the Web console with the following JBoss URLs:

- `http://<UCMDB server>:8080/status`
- `http://<UCMDB server>:8080/web-console`

### To disable access to the JBoss status page:

The status page URL is `http://<UCMDB server>:8080/status`.

- 1 Stop the UCMDB server.
- 2 On the UCMDB server machine, remove the `C:\hp\UCMDB\UCMDBServer\j2f\EJBContainer\server\mercury\deploy\jbossweb-tomcat55.sar\ROOT.war` folder.
- 3 Start the UCMDB server.

### To disable access to the JBoss Web Console page:

The Web Console page URL is `http://<UCMDB server>:8080/web-console`.

- 1 Stop the UCMDB server.
- 2 On the UCMDB server machine, remove the `C:\hp\UCMDB\UCMDBServer\j2f\EJBContainer\server\mercury\deploy\management\console-mgr.sar\web-console.war` folder.
- 3 Start the UCMDB server.

## **Harden Discovery and Dependency Mapping**

For details, see Part V, “Discovery and Dependency Mapping Security” in *Discovery and Dependency Mapping Guide*.

## **Security Settings Configuration Instructions**

Instructions for configuring security settings can be found in the appropriate Web server documentation, available at the following sites:

- ▶ **for IIS 5.0/6.0.** The Microsoft Web site ([support.microsoft.com/default.aspx?scid=kb;EN-US;298805](http://support.microsoft.com/default.aspx?scid=kb;EN-US;298805))
- ▶ **for Apache.** The Apache Jakarta Web site ([tomcat.apache.org/tomcat-5.0-doc/ssl-howto.html](http://tomcat.apache.org/tomcat-5.0-doc/ssl-howto.html))
- ▶ **for Sun Java System Web Server.** The Sun Web site ([docs.sun.com](http://docs.sun.com))

# 17

---

## Enabling Secure Sockets Layer (SSL) Communication

This chapter explains how to configure HP Universal CMDB to support communication using the Secure Sockets Layer (SSL) channel.

### **This chapter includes:**

#### Tasks

- Enable SSL on the Tomcat Web Server on page 227
- Enable SSL on the Client Machines on page 230

### **Enable SSL on the Tomcat Web Server**

HP Universal CMDB uses the Tomcat 5 HTTP Coyote connector as the default Web server. A complete guide to enabling SSL on Tomcat 5 using the Coyote connector can be found at <http://tomcat.apache.org/tomcat-5.5-doc/ssl-howto.html>.

The HP Universal CMDB keystore (JKS type) should be placed at `<HP Universal CMDB server root directory>\j2f\EJBContainer\server\mercury\conf`.

---

**Note:** For the procedure for enabling mutual SSL authentication on the DDM Probe, see “Hardening the DDM Probe” in *Discovery and Dependency Mapping Guide*.

---

**To enable SSL on the Tomcat Web server using a self-signed certificate:**

- 1 Create a keystore (JKS type) with a self-signed certificate and matching private key:

```
%JAVA_HOME%\bin\keytool -genkey -alias MAMserver -keyalg RSA -keystore MAMkeystore
```

A console dialog box opens.

- ▶ Enter the keystore password.
- ▶ Choose a password that you will use when exporting the self-signed certificate (<your password>).
- ▶ To answer the question **What is your first and last name?** enter the HP Universal CMDB Web server name.  
Enter the other parameters according to your organization.
- ▶ Enter a key password, or press ENTER to cause the key password to be the same as the keystore password chosen above.

A JKS keystore is created named MAMkeystore.

- 2 Export the self-signed certificate.

For every client that needs to communicate with HP Universal CMDB over SSL using this self-signed certificate, place this certificate in the client's trusted stores:

```
%JAVA_HOME%\bin\keytool -export -alias MAMserver -keystore MAMkeystore -storepass <your password> -file MAMCert
```

A certificate named MAMCert is created. This certificate can be sent or imported by all clients that need to communicate with HP Universal CMDB over SSL.

- 3 Copy the created keystore (MAMkeystore) to <HP Universal CMDB server root directory>\j2f\EJBContainer\server\mercury\conf.

**4** Edit the Tomcat 5 Coyote connector configuration file:

- Open the **server.xml** file located at **<HP Universal CMDB server root directory>\j2f\EJBContainer\server\mercury\deploy\jbossweb-tomcat55.sar**.
- Locate:

```
<!-- SSL/TLS Connector configuration using the admin devl guide keystore
<Connector port="8443" address="{jboss.bind.address}"
  maxThreads="100" minSpareThreads="5" maxSpareThreads="15"
  scheme="https" secure="true" clientAuth="false"
  keystoreFile="{jboss.server.home.dir}/conf/chap8.keystore"
  keystorePass="rmi+ssl" sslProtocol = "TLS" />
-->
```

- Replace with:

```
<!-- SSL/TLS Connector configuration using the admin devl guide keystore-->
<Connector port="8443" address="{jboss.bind.address}"
  maxThreads="100" minSpareThreads="5" maxSpareThreads="15"
  scheme="https" secure="true" clientAuth="false"
  keystoreFile="conf/MAMkeystore" keystorePass="<your password>"
  sslProtocol = "TLS" />
```

---

**Note:** If you are enabling mutual authentication between the UCMDB server and the DDM Probe, you must add information here about the trust store. For details, see step 1 in “Enable Mutual Certificate Authentication” in *Discovery and Dependency Mapping Guide*.

---

- Disable the 8080 port: locate **<!-- A HTTP/1.1 Connector on port 8080 -->**. Comment out this section by moving the comment end marker (**-->**) to the end of the section, after **connectionTimeout="20000"** **disableUploadTimeout="true"** **URIEncoding="UTF-8"/>**.
- Replace the **keystorePass** value with the password that you defined when creating a keystore in step 1.

**5** Save the file and restart Tomcat.

## **Enable SSL on the Client Machines**

If the certificate used by the HP Universal CMDB Web server is issued by a well-known Certificate Authority (CA), it is most likely that your Web browser can validate the certificate without any further action.

If the CA is not trusted by the Web browser, you should either import the entire certificate trust path or import the certificate used by HP Universal CMDB explicitly into the browser's trust store.

The following example demonstrates how to import the self-signed MAMCert certificate into the Windows trust store to be used by Internet Explorer.

### **To import a certificate into the Windows trust store:**

- 1** Locate and rename the MAMCert certificate to **MAMCert.cer**.  
In Windows Explorer, the icon shows that the file is a security certificate.
- 2** Double click **MAMCert.cer** to open the Internet Explorer Certificate dialog box.
- 3** Follow the instructions for enabling trust by installing the certificate with the Certificate Import Wizard.

# 18

---

## Using a Reverse Proxy

This chapter describes the security ramifications of reverse proxies and contains instructions for using a reverse proxy with HP Universal CMDB. Security aspects of a reverse proxy are discussed but not other aspects such as caching and load balancing.

### **This chapter includes:**

#### Concepts

- ▶ Reverse Proxy Overview on page 232
- ▶ Security Aspects of Using a Reverse Proxy Server on page 233

#### Tasks

- ▶ Configure a Reverse Proxy Using Infrastructure Settings Manager on page 234
- ▶ Configure a Reverse Proxy Using the JMX Console on page 235

#### Reference

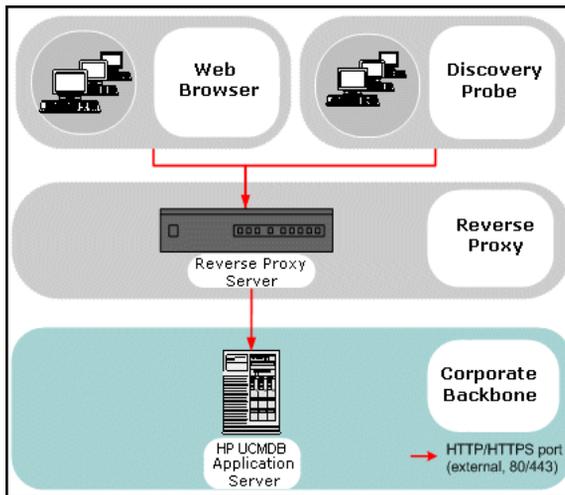
- ▶ Apache 2.0.x – Example Configuration on page 236

## Reverse Proxy Overview

A reverse proxy is an intermediate server that is positioned between the client machine and the Web servers. To the client machine, the reverse proxy appears to be a standard Web server that serves the client machine's HTTP protocol requests.

The client machine sends ordinary requests for Web content, using the name of the reverse proxy instead of the name of a Web server. The reverse proxy sends the request to one of the Web servers. Although the response is sent back to the client machine by the reverse proxy, it appears to the client machine as if it is being sent by the Web server.

HP Universal CMDB supports a reverse proxy in DMZ architecture. The reverse proxy is an HTTP mediator between the Discovery and Dependency Mapping (DDM) Probe and the Web client and the HP Universal CMDB server.



---

**Note:** Different types of reverse proxies require different configuration syntaxes. For an example of an Apache 2.0.x reverse proxy configuration, see “Apache 2.0.x – Example Configuration” on page 236.

---

## Security Aspects of Using a Reverse Proxy Server

A reverse proxy server functions as a bastion host. The proxy is configured to be the only machine addressed directly by external clients, and thus obscures the rest of the internal network. Use of a reverse proxy enables the application server to be placed on a separate machine in the internal network.

This section discusses the use of a DMZ and reverse proxy in a back-to-back topology environment.

The following are the main security advantages of using a reverse proxy in such an environment:

- ▶ No DMZ protocol translation occurs. The incoming protocol and outgoing protocol are identical (only a header change occurs).
- ▶ Only HTTP access to the reverse proxy is allowed, which means that stateful packet inspection firewalls can better protect the communication.
- ▶ A static, restricted set of redirect requests can be defined on the reverse proxy.
- ▶ Most of the Web server security features are available on the reverse proxy (authentication methods, encryption, and so on).
- ▶ The reverse proxy screens the IP addresses of the real servers as well as the architecture of the internal network.
- ▶ The only accessible client of the Web server is the reverse proxy.
- ▶ This configuration supports NAT firewalls (as opposed to other solutions).
- ▶ The reverse proxy requires a minimal number of open ports in the firewall.
- ▶ The reverse proxy provides good performance compared to other bastion solutions.

## **Configure a Reverse Proxy Using Infrastructure Settings Manager**

The following procedure explains how to access the Infrastructure Settings Manager to enable a reverse proxy configuration:

**To enable a reverse proxy configuration:**

- 1** Access the Infrastructure Settings Manager (**Admin > Settings > Infrastructure Settings Manager**).
- 2** In the Applications box, select **UCMDB Server Additional Configuration**.
- 3** In the **UCMDB Server Additional Configuration - General** table, locate the UCMDB proxy server option. To enter the address of the proxy server, click the **Edit** button. Enter the address in the dialog box that opens. For example, enter **https://my\_proxy\_server:443**.
- 4** Change the UCMDB connected to proxy server option to **true**.

---

**Important:** Once you have made this change, you cannot access the HP Universal CMDB server directly through a client. However, you can change the reverse proxy configuration using the JMX console on the server machine. For details, see the next section.

---

## Configure a Reverse Proxy Using the JMX Console

The following procedure explains how to make changes to the reverse proxy configuration by using the JMX console on the HP Universal CMDB server machine.

**To change a reverse proxy configuration:**

- 1 On the HP Universal CMDB server machine, launch the Web browser and enter the following address:

```
http://<machine name or IP address>.<domain_name>:8080/jmx-console
```

where **<machine name or IP address>** is the machine on which HP Universal CMDB is installed. You may have to log in with the user name and password.

- 2 Click the **Foundations > service=Infrastructure Settings Manager** link.
- 3 To verify the status of the HP Universal CMDB installation, in the JMX MBEAN View page, locate the **java.lang.String getGlobalSettingsValues()** operation.
- 4 In the contextName field, enter **mamProxy**.
- 5 Click **Invoke**.

A table is displayed with the status of the HP Universal CMDB server:

- **mam.proxy.server.path:** The address of the HP Universal CMDB server. If this field is empty, the address has not been defined.
  - **mam.proxy.has.proxy: false:** the HP Universal CMDB server is not set up to work with a reverse proxy.
- 6 To make changes to the status of the HP Universal CMDB server, in the JMX MBEAN View page, locate the **void setGlobalSettingValue()** operation.
  - 7 In the contextName field, enter **mamProxy**.

**8** In the `settingName` field, enter:

▶ **`mam.proxy.server.path`** to define the address of the HP Universal CMDB server

or

▶ **`mam.proxy.has.proxy`** to determine whether HP Universal CMDB should work with a reverse proxy

**9** In the `newValue` field:

▶ If you entered **`mam.proxy.server.path`** in the `settingName` field, enter the address of the HP Universal CMDB server.

▶ If you entered **`mam.proxy.has.proxy`** in the `settingName` field, enter **false** or **true**.

**10** Click **Invoke**.

A table is displayed with the new status of the HP Universal CMDB server.

## **Apache 2.0.x – Example Configuration**

Below is a sample configuration file that supports the use of an Apache 2.0.x reverse proxy in a case where both DDM Probes and application users connect to HP Universal CMDB.

---

### **Note:**

- ▶ In the example below, the HP Universal CMDB machine's DNS name is **`MAM_server`**.
  - ▶ Only users with a knowledge of Apache administration should make this change.
- 

**1** Open the `<Apache machine root directory>\Webserver\conf\httpd.conf` file.

**2** Enable the following modules:

- ▶ LoadModule proxy\_module modules/mod\_proxy.so
- ▶ LoadModule proxy\_http\_module modules/mod\_proxy\_http.so

**3** Add the following lines:

```
ProxyRequests off
<Proxy *>
    Order deny,allow
    Deny from all
    Allow from all
</Proxy>
ProxyPass      /mam          http://MAM_server/mam
ProxyPassReverse/mam          http://MAM_server/mam
ProxyPass      /mam_images  http://MAM_server/mam_images
ProxyPassReverse/mam_images  http://MAM_server/mam_images
ProxyPass      /mam-collectors http://MAM_server/mam-collectors
ProxyPassReverse/mam-collectors http://MAM_server/mam-collectors
ProxyPass      /ucmdb       http://MAM_server/ucmdb
ProxyPassReverse /ucmdb     http://MAM_server/ucmdb

ProxyPass      /site        http://MAM_server/site
ProxyPassReverse/site      http://MAM_server/site
```

**4** Save your changes.



# Part VI

---

## Disaster Recovery



# 19

---

## Disaster Recovery Setup

This chapter explains how to set up and activate (when necessary) a Disaster Recovery (DR) system for HP Universal CMDB.

### **This chapter includes:**

#### Concepts

- ▶ Disaster Recovery Overview on page 242

#### Tasks

- ▶ Prepare the Disaster Recovery Environment on page 242
- ▶ Prepare the HP Universal CMDB Failover Instance for Activation on page 245
- ▶ Perform Startup Cleanup Procedure on page 246

## Disaster Recovery Overview

This chapter describes the basic principles and guidelines on how to set up a Disaster Recovery system, and the required steps to make a Secondary HP Universal CMDB system become the new Primary HP Universal CMDB system. The chapter covers a typical HP Universal CMDB environment consisting of one HP Universal CMDB server and one database server containing HP Universal CMDB database schemas.

---

**Note:**

- ▶ This chapter is a high level guide to introduce concepts of enabling disaster recovery.
  - ▶ Disaster Recovery involves manual steps in moving various configuration files and updates to the HP Universal CMDB database schemas. This procedure requires at least one HP Universal CMDB administrator and one database administrator who is familiar with the HP Universal CMDB databases and schemas.
  - ▶ There are a number of different possible deployment and configurations for HP Universal CMDB. To validate that the Disaster Recovery scenario works in a particular environment, it should be thoroughly tested and documented. You should contact HP Professional Services to ensure best practices are used in the design and failover workflow for any Disaster Recovery scenario.
- 

## Prepare the Disaster Recovery Environment

Preparing the Disaster Recovery environment comprises the following stages:

- ▶ “Install HP Universal CMDB Software in the Failover Environment” on page 243
- ▶ “Configure System and Data Backup” on page 243

## Install HP Universal CMDB Software in the Failover Environment

Install a second instance of HP Universal CMDB that matches your current production environment.

- Install exactly the same version of HP Universal CMDB in your backup environment, as that used in your production environment.
- To simplify issues with disparate capacities and deployments, the backup environment should be the same as your production environment.
- Do not run the Server and Database Configuration utility and do not create any databases.
- Do not start the Backup system.

---

**Note:** The Disaster Recovery environment should closely resemble the HP Universal CMDB production environment. The hardware, deployment, and versions should all be matched to prevent any loss of functionality when moving to the Failover system.

---

## Configure System and Data Backup

This stage includes copying configuration directories to the Failover instance and configuring database log file shipping.

### Copying Configuration Directories to the Failover Instance

Copy from the HP Universal CMDB Production instance to the same server type in the Failover instance, any files changed in the following directories:

- j2f/conf
- j2f/cmdb
- root/lib/packages
- root/lib/packages\_undeployed

Also copy any other files or directories in the system that are customized.

**Note:** It is recommended that you perform backups of HP Universal CMDB servers at least daily. Depending on the number and interval of configuration changes, it may be necessary to incorporate a faster interval to prevent a large loss of configuration changes in the event of losing the Production instance.

---

### **Microsoft SQL Server—Configure Database Log File Shipping**

To provide the most up to date monitoring and configuration data, it is critical to enable log file shipping to minimize the time in data gaps. By using log file shipping you can create an exact duplicate of the original database, out of date only by the delay in the copy-and-load process. You then have the ability to make the standby database server a new primary database server, if the original primary database server becomes unavailable. When the original primary server becomes available again, you can make it a new standby server, effectively reversing the servers' roles.

The log file shipping must be configured for the following HP Universal CMDB databases:

- ▶ HP Universal CMDB Foundation database
- ▶ HP Universal CMDB database
- ▶ HP Universal CMDB History database

This section does not contain the specific steps to configure log file shipping. The HP Universal CMDB database administrator can use the following links as a guide to configure log file shipping for the appropriate version of database software that is used in the HP Universal CMDB environment:

#### **Microsoft SQL Server 2000:**

- ▶ [support.microsoft.com/default.aspx?scid=http://support.microsoft.com/support/sql/content/2000papers/LogShippingFinal.asp](http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com/support/sql/content/2000papers/LogShippingFinal.asp)
- ▶ [www.microsoft.com/technet/prodtechnol/sql/2000/maintain/logship1.msp](http://www.microsoft.com/technet/prodtechnol/sql/2000/maintain/logship1.msp)

**Microsoft SQL Server 2005:**

- [msdn2.microsoft.com/en-us/library/ms188625.aspx](http://msdn2.microsoft.com/en-us/library/ms188625.aspx)
- [msdn2.microsoft.com/en-us/library/ms190016.aspx](http://msdn2.microsoft.com/en-us/library/ms190016.aspx)
- [msdn2.microsoft.com/en-us/library/ms187016.aspx](http://msdn2.microsoft.com/en-us/library/ms187016.aspx)

**Oracle—Configure the Standby Database (Data Guard)**

Oracle only has logs at the database level, not for each schema. This means that you cannot make a standby database on the schema level, and must create copies of the production system databases on your backup system.

---

**Note:** HP recommends that if Oracle is the database platform, Oracle 10g should be used to utilize Data Guard.

---

This section does not contain the specific steps to configure a Standby database. The HP Universal CMDB database administrator can use the following link as a guide to configure a Standby database for Oracle 10g:

[http://download.oracle.com/docs/cd/B19306\\_01/server.102/b14239/toc.htm](http://download.oracle.com/docs/cd/B19306_01/server.102/b14239/toc.htm)

Upon successful completion of the Backup database configuration, the HP Universal CMDB Failover database should be synchronized with the HP Universal CMDB Production database.

## Prepare the HP Universal CMDB Failover Instance for Activation

When it is time to activate the Failover instance, perform the following steps in the Failover environment:

- Activate the Backup system, including its database.
- Ensure that all the latest database logs have been updated into the Failover environment's databases.

- Run the Perform Startup Cleanup Procedure (for details, see page 246) to remove any localization in the databases.

## Perform Startup Cleanup Procedure

This procedure cleans up all the machine specific references in the configurations from the Production instance. It is needed to reset the database on the Backup system.

---

### Note:

- Before starting the activation procedures, the HP Universal CMDB Administrator should ensure that the appropriate license has been applied to the Failover instance.
  - HP recommends that an experienced database administrator perform the SQL statements included in this procedure.
  - All the SQL statements included in this procedure need to be run against the Foundation database.
- 

### 1 HAC Tables

**a** Empty the HAC tables:

- ALTER TABLE HA\_SERVICES\_DEP DROP CONSTRAINT HA\_SERVICES\_DEP\_FK1;
- ALTER TABLE HA\_SERVICES\_DEP DROP CONSTRAINT HA\_SERVICES\_DEP\_FK2;
- ALTER TABLE HA\_SRV\_ALLWD\_GRPES DROP CONSTRAINT HA\_SRV\_ALLWD\_GRPES\_FK2;
- ALTER TABLE HA\_SERVICES DROP CONSTRAINT HA\_SERVICES\_FK1;
- TRUNCATE TABLE HA\_BACKUP\_PROCESSES
- TRUNCATE TABLE HA\_PROC\_ALWD\_SERVICES
- TRUNCATE TABLE HA\_SRV\_ALLWD\_GRPES

- TRUNCATE TABLE HA\_SERVICES\_DEP
- TRUNCATE TABLE HA\_SERVICES
- TRUNCATE TABLE HA\_SERVICE\_GRP
- TRUNCATE TABLE HA\_TASK\_ASSIGN
- ALTER TABLE HA\_SERVICES\_DEP ADD CONSTRAINT HA\_SERVICES\_DEP\_FK1 FOREIGN KEY (SERVICE\_ID) REFERENCES HA\_SERVICES (ID);
- ALTER TABLE HA\_SERVICES\_DEP ADD CONSTRAINT HA\_SERVICES\_DEP\_FK2 FOREIGN KEY (DEPENDS\_ON) REFERENCES HA\_SERVICES (ID);
- ALTER TABLE HA\_SRV\_ALLWD\_GRP ADD CONSTRAINT HA\_SRV\_ALLWD\_GRP\_FK2 FOREIGN KEY (GROUP\_ID) REFERENCES HA\_SERVICE\_GRP (ID);
- ALTER TABLE HA\_SERVICES ADD CONSTRAINT HA\_SERVICES\_FK1 FOREIGN KEY (GROUP\_ID) REFERENCES HA\_SERVICE\_GRP (ID);

**b** Erase references to **controller upgrade** from **properties**:

```
delete from Properties
where NAMESPACE='FND_AUTO_UPGRADE' and
NAME='HAServiceControllerUpgrade'
```

## 2 Bus Tables

Remove the reference to bus locations (including the Domain Manager) in the **properties** table:

```
DELETE FROM properties
WHERE namespace='MessageBroker' or
namespace='SonicMQ_Namespace'
```

## 3 Setting Manager Values

Update the URLs in the SETTING\_PARAMETERS table.

For each key in the table, modify and run the following query:

```
update SETTING_PARAMETERS set SP_VALUE='<new value>'
where SP_CONTEXT='<context value>' and SP_NAME='<name value>'
```

#### 4 Server and Database Configuration utility

Run the Server and Database Configuration utility on each machine to reinitialize the needed tables in the database. To run the Server and Database Configuration utility, select **Start > Programs > HP UCMDB > Start UCMDB Configuration Wizard**.

---

**Note:**

- ▶ When running the Server and Database Configuration utility, make sure to reconnect to the same databases that were created for the Failover environment (that is, the one to which the backup data was shipped). Possible complete loss of configuration data will result if the utility is run on the Production instance.
- ▶ When prompted for the databases by the Server and Database Configuration utility, ensure that you enter the names of the new databases in the Failover environment.

---

#### 5 Bring up the Backup Environment

Start HP Universal CMDB in the Failover environment.

# Part VII

---

## Accessing HP Universal CMDB



# 20

---

## Starting and Stopping the Server

This chapter describes how to start and stop the HP Universal CMDB server.

### **This chapter includes:**

#### Tasks

- Start and Stop the Server on the Windows Platform on page 251
- Start and Stop the Server on the Solaris Platform on page 252

### **Start and Stop the Server on the Windows Platform**

During the installation of HP Universal CMDB, a start menu for HP Universal CMDB is added to the settings of the machine on which the installation is made. To access the HP Universal CMDB start menu, select **Start > Programs > HP UCMDB**. The menu includes the following options:

- **Start UCMDB Server Configuration Wizard.** Enables you to run the wizard to connect to an existing database or schema or to create a new database or schema. For details, see “Choosing the Database or Schema” on page 92.
- **Start UCMDB Server.** Click to start the server service.
- **Stop UCMDB Server.** Click to stop the server service.
- **UCMDB Server Status.** Click to open a Web page with information about the server. For details, see Chapter 5, “Viewing Server Status.”
- **Uninstall UCMDB Server.** Click to uninstall the server.

## **Start and Stop the Server on the Solaris Platform**

This section describes the procedure for starting or stopping the HP Universal CMDB server running on a Solaris machine.

**To start or stop the HP Universal CMDB server on a Solaris platform:**

- 1** Log in to the server.

You can log in as a super user (root) or a regular user.

- 2** Navigate to the **scripts** directory using the following command:

```
cd <HP Universal CMDB root directory>/j2f/scripts//scripts/
```

- 3** Run the following script:

```
./run_ucmdb_server (start|stop)
```

where:

**start** starts the HP Universal CMDB server

**stop** stops the HP Universal CMDB server

You are returned to the command line prompt when the script has finished.

# 21

---

## Initial Login to HP Universal CMDB

This chapter describes how to log in to HP Universal CMDB for the first time.

### **This chapter includes:**

#### Concepts

- Viewing HP Universal CMDB on page 253
- Java Applets on page 254

#### Tasks

- Log In to UCMDB on page 254
- Log Out of UCMDB on page 255

### **Viewing HP Universal CMDB**

You view HP Universal CMDB within a supported Web browser. To access HP Universal CMDB, the client machine must have a network connection (intranet or Internet) to the HP Universal CMDB server.

For details on Web browser requirements as well as minimum requirements to successfully view HP Universal CMDB, see “Hardware and Software Requirements” on page 32.

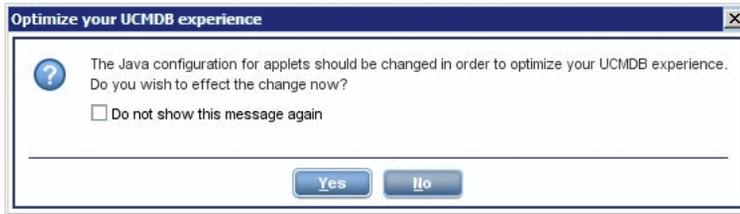
## Java Applets

If Java is not installed on your machine, during login a message is displayed asking you whether to install the correct Java Runtime Environment version. JRE is needed to view HP Universal CMDB applets.

Click the relevant button to allow HP Universal CMDB to install Java from either sun.com or the HP Universal CMDB Server.

### Updating the Java Configuration

The following message is displayed when HP Universal CMDB detects problems with initial memory:



---

**Note:** From Java version 6 update 10, this message is no longer displayed as it is no longer relevant.

---

## Log In to UCMDB

You log in to HP Universal CMDB from the login page. To set up an LDAP authentication method for logging in, see “Authentication for HP Universal CMDB Login” in *Reference Information*.

---

**Tip:** Click the **Help** button on the login page for complete login help.

---

**To access the HP Universal CMDB login page and log in for the first time:**

- 1** Enter the URL of the HP Universal CMDB server, for example, **http://<server name or IP address>.<domain name>:8080/ucmdb** where <server name or IP address>.<domain name> represents the fully qualified domain name (FQDN) of the HP Universal CMDB server.
- 2** Enter the default superuser login parameters—Login Name=**admin**, Password=**admin**—and click **Log In**. After logging in, the user name appears at the top right.
- 3** (Recommended) Change the superuser password immediately to prevent unauthorized entry. For details on changing the password, see “Change Password Dialog Box” in *Model Management*.
- 4** (Recommended) Create additional administrative users to enable HP Universal CMDB administrators to access the system. For details on creating users in the HP Universal CMDB system, see “Users Tab” in *Model Management*.

---

**Note:**

- ▶ For login troubleshooting information, see “Troubleshooting and Limitations” in *Reference Information*.
  - ▶ For details on setting login credentials, see “Set Login Credentials” on page 30.
  - ▶ For details on accessing HP Universal CMDB securely, see Part V, “Hardening HP Universal CMDB.”
- 

 **Log Out of UCMDB**

When you have completed your session, it is recommended that you close HP Universal CMDB to prevent unauthorized entry.

**To log out:**

Click **Logout** at the top of the page.



# 22

---

## Accessing HP Universal CMDB Through the IIS Web Server

This chapter describes how to access HP Universal CMDB using the Microsoft Internet Information Services (IIS) Web server.

### **This chapter includes:**

#### Concepts

- ▶ Accessing HP Universal CMDB Through IIS Overview on page 257

#### Tasks

- ▶ Set Up IIS to Enable Access to HP Universal CMDB on page 258

### **Accessing HP Universal CMDB Through IIS Overview**

You can set up the IIS Web server to enable end users and clients of HP Universal CMDB (for example, the DDM Probe) to access the system via the IIS Web server. In this setup, end users and clients of HP Universal CMDB use the IIS machine's URL to access UCMDB, instead of using the UCMDB machine URL.

This section includes the following topics:

- ▶ “Software Required for Integration” on page 258
- ▶ “Supported Configurations” on page 258

## Software Required for Integration

The following table describes the software required for integration:

IIS Web Server	Version 6.0
HP Universal CMDB Server	Version 8.01 or later

## Supported Configurations

The following configurations are supported for this integration:

- ▶ Windows 2003 32-bit, HP Universal CMDB 8.01 or later and IIS 6 on the same server.
- ▶ Windows 2003 32-bit, HP Universal CMDB 8.01 or later and IIS 6 on separate servers.

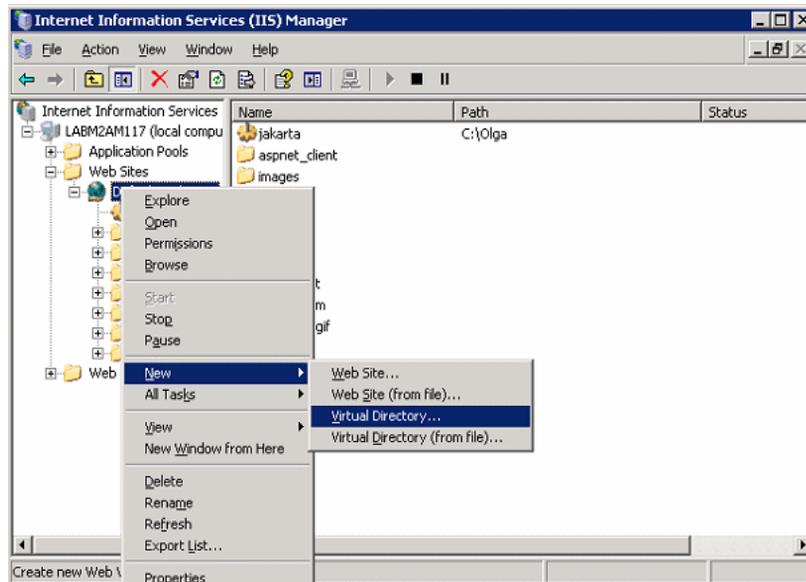
## Set Up IIS to Enable Access to HP Universal CMDB

This section outlines the procedure to integrate HP Universal CMDB and IIS.

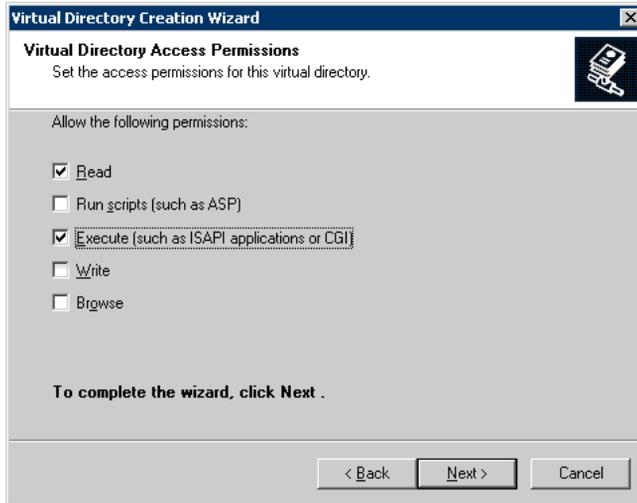
**To manually integrate HP Universal CMDB and IIS:**

- 1** If the HP Universal CMDB server does not reside on the same machine as IIS, copy all the files from the `<UCMDB_INSTALL_DIR>\UCMDBServer\j2f\tools\iis_integration` directory to the `c:\ucmdb_iis` folder on the IIS machine. On the IIS machine, modify the following files:
  - a** In the `workers.properties.minimal` file, change the string `worker.localAjp.host=localhost` to the UCMDB server hostname.
  - b** In the `isapi_redirect.properties` file:
    - ▶ the `log_file` should point to a folder containing the integration logs, for example, `c:\ucmdb_iis\isapi.log`.
    - ▶ the `worker_file` should contain the location of the `workers.properties.minimal` file, for example, `c:\ucmdb_iis\workers.properties.minimal`.

- ▶ the **worker\_mount\_file** should contain the location of the **uriworkermap.properties** file, for example **c:\ucmdb\_iis\uriworkermap.properties**.
- 2 If the HP Universal CMDB server resides on the same machine as IIS, modify the **isapi\_redirect.properties** file in the **<UCMDB\_INSTALL\_DIR>\UCMDBServer\j2f\tools\iis\_integration** directory as follows:
    - a the **log\_file** should point to a folder containing the integration logs, for example, **UCMDBServer\j2f\log\isapi.log**.
    - b the **worker\_file** should contain the location of the **workers.properties.minimal** file, for example, **UCMDBServer\j2f\tools\iis\_integration\workers.properties.minimal**.
    - c the **worker\_mount\_file** should contain the location of the **uriworkermap.properties** file, for example **UCMDBServer\j2f\tools\iis\_integration\uriworkermap.properties**.
  - 3 Open the IIS management console. Run **inetmgr** from the command line.
  - 4 Add a new virtual directory to your IIS Web site.

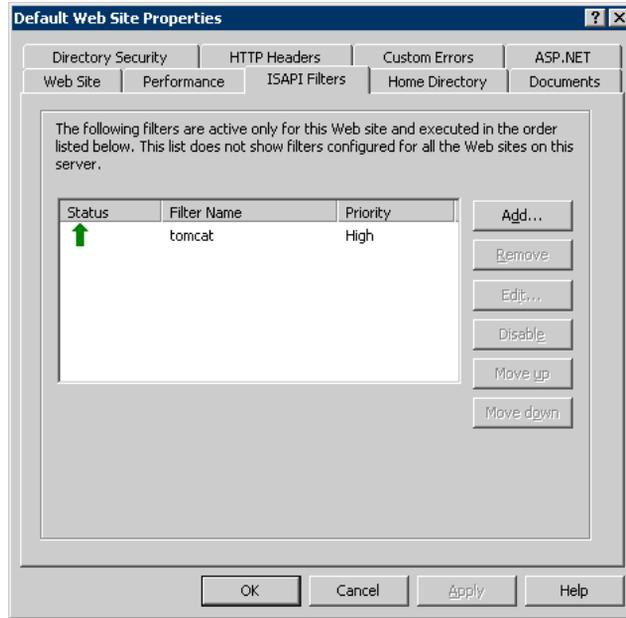


- 5 The Virtual Directory Creation Wizard window appears. The alias of the virtual directory must be **jakarta**. Its physical path should be `<UCMDB_INSTALL_DIR>\UCMDBServer\j2f\tools\iis_integration`. If the UCMDB server and the IIS server are running on separate machines, the path should be the directory on the IIS machine. Assign **Execute** access to the new virtual directory:



- 6 Open the **Default Web Site Properties** dialog box and add **isapi\_redirect.dll** as an ISAPI filter to your IIS Web site. The name of the filter should reflect its task (for example, **tomcat**) and its executable must be **isapi\_redirect.dll**. If the UCMDB server and the IIS server are running on separate machines, the executable must be **isapi\_redirect.dll** in the directory where you copied it on the IIS machine.
- 7 Open **Web Service Extensions**, select **All Unknown ISAPI Elements** from the list, and click **Allow**.
- 8 Restart IIS (stop and start the IIS service) and make sure that the **tomcat** filter is marked with a green up arrow.

Do not change anything on the UCMDB side.



9 For DDM configuration, change the following strings in the **DDM\DiscoveryProbe\root\lib\collectors\DiscoveryProbe.properties** file:

- serverName = <IIS host name>
- serverPort = <IIS HTTP port>, by default 80

The IIS URL (for example, **http://<IIS hostname>/ucmdb**) can now be used to access UCMDB, the JMX console, the UCMDB SDK, and so on.



---

# Index

## A

- accessing UCMDB
  - set up IIS Web server 258
  - through IIS web server 257
  - through IIS Web server, overview 257

## C

- capacity planning 45
  - configuring partially resident mode 48
  - hardware specifications 52
  - managed hosts and host-related CIs 51
  - Oracle cache recommendations 51
  - overview 46
  - partial and full resident mode 47
- CITs
  - upgrading to version 7.0 168
- class model changes 187
  - DDM modules 198
  - TQL-based resource transformations 194
  - troubleshooting 199
- cmdbDBUpgrade tool 147
- configuration
  - upgrading to version 7.0 168
- configuration management database (CMDB)
  - introduction 23

## D

- data
  - upgrading to version 7.0 168
- database
  - system installation requirements 37

- database installation
  - configuring the UCMDB server 91
  - restarting the server 128
  - setting database parameters 93
- DB Delete tool 151
- DDM
  - API changes
    - in version 8.0 203
  - hardening 226
- DDM API changes
  - import changes 204
  - Jython script changes 206
  - removed methods 203
- DDM Probe
  - hardening 226
- deployment
  - in secure architecture 224
  - upgrading to version 7.0 168
  - Windows server installation 67
- disaster recovery
  - before startup cleanup procedure 246
  - HP Universal CMDB 241
  - installing HP Universal CMDB
    - software in the Failover environment 243
  - introduction 242
  - preparing the environment 242
  - preparing the HP Universal CMDB failover instance for activation 245
  - system configuration backup, data configuration backup 243
- Discovery
  - overview 24
- documentation, online 13
- DomainScopeDocument file
  - upgrading 199

## Index

### DVD

- contents 27

### G

getting started 58

- administration tasks 59
- predeployment planning 55

### H

hardening 221

- DDM 226
- DDM Probe 226
- enabling SSL on Tomcat Web server 227
- enabling SSL on Web clients 230
- example of Apache 2.0.x configuration 236
- preparations 223
- reverse proxy overview 232
- reverse proxy, security aspects 233
- reverse proxy, using 231
- secure architecture deployment 224
- security settings links 226
- SSL 227

Help

- accessing 13

high availability 211

- installation of UCMDB 214

HP Software Support Web site 14, 15

HP Universal CMDB

- server status 61

HP Universal CMDB

- about 20
- deployment 22
- disaster recovery 241
- getting started 55
- introduction 19
- launching 26
- overview 20
- running on VMware platform 29
- server status 61
- service user, changing 129
- Start menu 251
- system architecture 22

- viewing 253

HP Universal CMDB server

- starting, stopping on a Solaris platform 252
- starting, stopping on a Windows platform 251

### I

installation

- choosing database or schema 92
- connecting to an existing Microsoft SQL Server database 122
- connecting to an existing Oracle schema 123
- creating a Microsoft SQL Server database 95
- creating an Oracle schema 108
- deploying Microsoft SQL Server 93
- on Solaris deployment 79
- overview 25
- prerequisites 27, 28
- procedure for typical deployment with Oracle Server 68, 80
- server requirements 33
- stages 25

### J

Java

- installing during login 254

Java applets

- change memory allocation 31

JBoss

- limit access to UCMDB server 225

### K

Knowledge Base 14

### L

licensing 39

- DDM Probe installation 42
- for HP ServiceCenter/Service Manager 41
- for HP Software-as-a-Service 41

- overview 40
- troubleshooting and limitations 43
- upgrading to standard or advanced 42
- logging in 254
  - initial login 253
  - installing Java 254
- logging out 255
- login credentials
  - setting 30

**M**

- memory
  - allocating to processes 95
- Microsoft SQL Server
  - connecting to existing database 122
  - creating a database 95
  - deployment 93
  - installation requirements 37
- migrating from previous versions 30

**O**

- online documentation 13
- online resources 14
- Oracle
  - connecting to existing schema 123
  - creating a schema 108
  - installation requirements 37
  - user schema parameters 93

**P**

- prerequisites
  - installation 27, 28
- printer-friendly documentation 14
- processes
  - allocating memory 95

**R**

- Readme 13
- requirements
  - database system 37
  - GUI Web client 36
  - hardware, software 32
  - Microsoft SQL Server 37

- Oracle 37
- servers 33
- reverse proxy
  - overview 232
  - security aspects 233
  - using 231

**S**

- secure architecture
  - deployment 224
- security
  - hardening 221
- server installation
  - on Windows 67
- server status, viewing 61
- servers
  - installation requirements 33
- service user
  - changing 129
- Solaris deployment
  - installation 79
- SSL 227
  - enabling on Tomcat Web server 227
  - enabling on Web clients 230
- Start menu 251
- system requirements
  - VMware platform 29

**T**

- Topology Query Language (TQL)
  - introduction 24
- Troubleshooting and Knowledge Base 14

**U**

- upgrading to version 7.0 161
  - Business Service views 166
  - CIT log files 175
  - CITs, configuration, data, deployment 168
  - CMDB deletion utility 170
  - database preinstallation activities 170
  - large deployments 179
  - limitations 180
  - output log example 174

## Index

- procedure 164
- recovery procedure 171
- upgrade tool 163
- workflow 162

upgrading to version 8.00 135

## **V**

VMware, running HP Universal CMDB 29

## **W**

Windows

- server installation 67