

Oracle® Enterprise Manager

Plug-in for Oracle Unified Directory User's Guide

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Preface

The Enterprise Manager Plug-in for Oracle Unified Directory extends Oracle Enterprise Manager Cloud Control 13c to add support for monitoring Oracle Unified Directory (OUD) instances.

This guide includes installation, configuration, and uninstallation information, and a detailed analysis of the metrics that can be monitored using the Enterprise Manager Plug-in for OUD.

Audience

This document is intended for enterprise architects and system administrators.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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Related Documentation

For more information, see the following documentation libraries on the Oracle Technology Network (OTN) Documentation Index page at <http://docs.oracle.com/en/>.

- Oracle Enterprise Manager Cloud Control 13c Release 2 (13.2.1.1.0) Documentation
- Oracle Unified Directory 13c Release 2 (13.2.1.1.0) Documentation Library

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Installing and Using the Oracle Enterprise Manager Plug-in for OUD

The Enterprise Manager Plug-in for Oracle Unified Directory extends Oracle Enterprise Manager Cloud Control 13c to add support for monitoring Oracle Unified Directory (OUD) instances.

Topics:

- [Before You Install](#)
- [Deploying the Enterprise Manager Plug-in for OUD](#)
- [Viewing Performance Metrics for an OUD Instance](#)
- [Managing Configuration Data](#)
- [Uninstalling the Enterprise Manager Plug-in for OUD](#)
- [Limitations of this Release](#)

1.1 Before You Install

You can install Oracle Unified Directory as an LDAP directory server, an LDAP proxy server, or as a replication gateway.

OUD can function in one of the following three modes:

- As an LDAP directory server instance, used to contain data
- As an LDAP proxy server instance, where the server acts as an interface between the client and the directory server or servers that contain the data
- As a replication gateway instance between OUD and Oracle Directory Server Enterprise Edition (ODSEE)

The Enterprise Manager Plug-in for OUD is provided as an archive that includes three target types, one for each OUD installation mode or type. (See "[Deploying the Plug-in](#)" for download information.) Install the plug-in that corresponds to the type of OUD instance that you want to monitor.

Review these topics for more information:

- [Release Information](#)
- [Installation Prerequisites](#)

1.1.1 Release Information

The 13.2.1.1.0 version of the Enterprise Manager Plug-in for OUD enables you to monitor the Oracle Unified Directory 11.1.2.2.0 and later.

You can monitor the following:

- Oracle Unified Directory 11.1.2.2.0 and later for Directory target instances
- Oracle Unified Directory 11.1.2.2.0 and later for Proxy target instances
- Oracle Unified Directory 11.1.2.2.0 and later for Replication Gateway target instances

Version 11g Release 2 (11.1.2.1.0) of the Enterprise Manager Plug-in for OUD, formerly named the Oracle System Monitoring Plug-in for OUD for Enterprise Manager 11g Grid Control, is available at <http://www.oracle.com/technetwork/oem/downloads/unified-directory-514420.html>.

1.1.2 Installation Prerequisites

Make sure you review these prerequisites before installing the Enterprise Manager Plug-in for OUD.

- See the Enterprise Manager Plug-In for Oracle Unified Directory Certification Matrix available on [My Oracle Support](#).
The certification matrix contains information about supported installation types, platforms, operating systems, databases, JDKs, and third-party products.
- Install Enterprise Manager Cloud Control 13c (13.2.0.0.0) or later with the latest bundle patch. Be sure Oracle Management Service and the Oracle Management Agent are installed. It is recommended that the Oracle Management Agent and the OUD instances be installed on the same host.
For detailed information, see the Enterprise Manager Cloud Control 13c Documentation at <http://docs.oracle.com/en/>.
- Make sure that the Oracle Management Agent can communicate with your Oracle Enterprise Manager Server and can upload data. For example, Agent Availability must be UP, Last Load Time should show a recent date/timestamp, and Last Load Time should be Periodically updated. For information about installing and configuring the Oracle Management Agent, see the *Oracle® Enterprise Manager Cloud Control Basic Installation Guide*.

1.2 Deploying the Enterprise Manager Plug-in for OUD

Review this topic for the major steps required to deploy the plug-in for Oracle Unified Directory.

For many of the steps, you will be directed to use the instructions already provided in the Oracle Enterprise Manager Cloud Control Administrator's Guide.

To deploy the Plug-in for OUD:

1. Import the plug-in. See [Importing the Plug-in Archive](#).
2. Deploy the plug-in. See [Deploying the Plug-in](#).
3. Create a target instance of the plug-in on the Oracle Management Agent. See [Adding Targets to Monitor](#).

1.2.1 Importing the Plug-in Archive

You can import the Plug-in Archives to Oracle Software Library.

For detailed instructions, see the "Downloading Plug-ins" chapter in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

1.2.2 Upgrading the Plug-In

You can upgrade from one plug-in version to another higher plug-in version or a revision of another higher plug-in version.

For detailed instructions to upgrade from 12.1.0.1.0 or 12.1.0.2.0 or 13.1.1.1.0 to 13.2.1.1.0, see the sections "Upgrading Plug-Ins Deployed to Oracle Management Service" and "Upgrading Plug-Ins Deployed to Oracle Management Agent" in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

1.2.3 Deploying the Plug-in

Deploy the plug-in on the Oracle Unified Directory instances to be monitored. This deployment enables you to create a target instance.

For detailed instructions, see "Deploying Plug-ins to Oracle Management Service" in the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

1.2.4 Adding Targets to Monitor

Create a target instance of the Enterprise Manager Plug-in for OUD on one or more agents. You must create one target instance for each OUD instance.

To add targets:

1. On the Setup Menu, choose **Add Target > Add Targets Manually**.
2. On the Add Target page, choose the **Add Targets Declaratively by Specifying Target Monitoring ProPerties** option.

Choose the **Target Type** and the list of agents to which you deployed the plug-in.

3. Click **Add Manually**.
4. On the Add OUD Instance proPerties page, enter the following values:

OUd Credentials

- In the **Directory Server Username** and **Password** fields, enter a username and password that will be used by the agent to bind to the server instance. Ensure the password is in the appropriate field.

ProPerties

- In the **Administration Port** field, enter the administration port of the target server instance.
- In the **Directory Server Host** field, enter the fully qualified domain name of the target server instance. For replicated servers, you must provide the same host name that was used when replication was configured.
- The **Trust All** field is set to true by default. This implies that all the certificates that are presented by the server (or servers, in the case of replication) will be accepted automatically. Change this setting if you want to specify different behavior.

- (Optional) If you have changed the default setting for the **Trust All** field, enter a path in the **Trust Store Path** field.

The agent will use the trust store located in this path to validate the certificates of the administration connector that are presented by the server(s). This path must be readable by the agent (and thus located in a file system that is accessible by the agent). The trust store must contain the public keys of the administration connector certificates. It must be in JKS format and must not be password protected.

5. Click **OK**.

1.3 Viewing Performance Metrics for an OUD Instance

The Enterprise Manager Plug-in for Oracle Unified Directory collects and displays information and performance metrics for an Oracle Unified Directory instance.

This section contains the following topics:

- [Viewing an OUD Instance Home Page](#)
- [Using the All Metrics Page](#)
- [Setting Metric Thresholds](#)
- [Summary of Directory Server Instance Monitoring Information](#)
- [Summary of Proxy Server Instance Monitoring Information](#)
- [Summary of Replication Gateway Monitoring Information](#)

1.3.1 Viewing an OUD Instance Home Page

The monitoring information displayed in the Enterprise Manager Cloud Control console depends upon the current Oracle Unified Directory instance type: Directory Server instance, Proxy Server instance, or Replication Gateway instance.

To navigate to an OUD instance Home page:

1. On the Oracle Enterprise Manager home page, select **Targets**.

The Hosts page is displayed.

2. Click **All Targets** in the top menu bar.

3. Choose the OUD target instance name.

The target instance Home page is displayed.

[Table 1-1](#) summarizes the information available for the different OUD instance types.

Table 1-1 Monitoring Data Available Through the Enterprise Manager Plug-in

Information	Directory	Proxy	Replication GW
General Information	Yes	Yes	Yes
JVM Resources	Yes	Yes	Yes

Table 1-1 (Cont.) Monitoring Data Available Through the Enterprise Manager Plug-in

Information	Directory	Proxy	Replication GW
Connections	Yes	Yes	-
Administration Connector	Yes	Yes	Yes
Connection Handlers	Yes	Yes	-
Operations	Yes	Yes	Yes
Replication Information	Yes	-	Yes
Backends / Databases	Yes	Yes	-
Internal Resources / Caches / Workqueues	Yes	Yes	-
Global Index Catalog	-	Yes	-
Distribution / Partitions	-	Yes	-
Data Sources / Connection Pools	-	Yes	-

Monitoring information is displayed on various pages in the Enterprise Manager Cloud Control console. You can access these pages through the OUD target instance submenu.

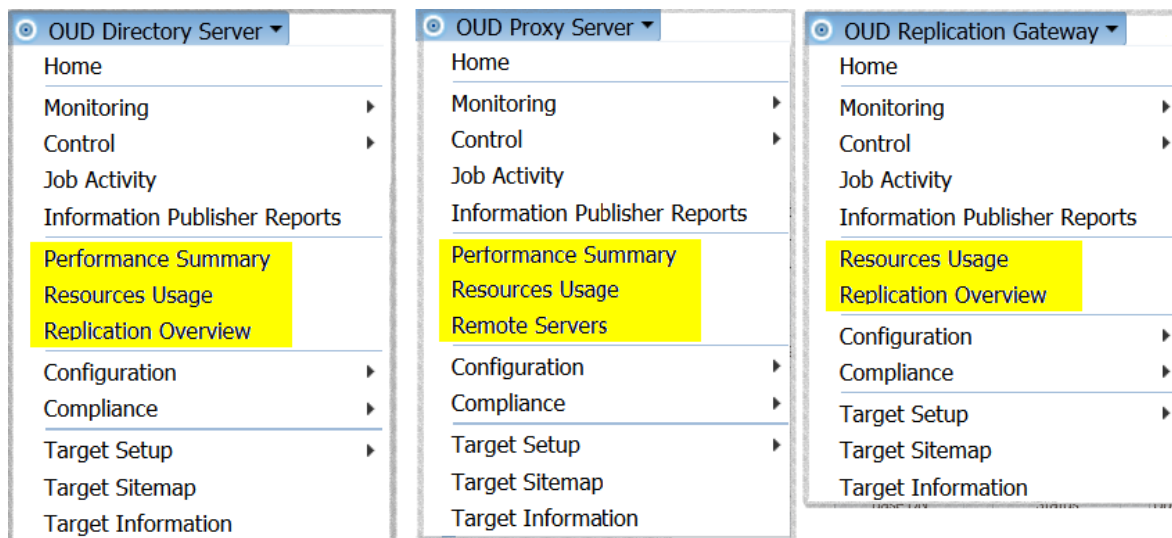
Figure 1-1 Comparison of Target Instance Submenus

Table 1-1 compares submenus for an OUD Directory Server instance, OUD Proxy Server instance, and OUD Replication Gateway instance. All submenus include many identical commands including: Home, Monitoring, Control >, Job Activity, Information Publisher Reports, Configuration >, Compliance >, Target Setup >, Target Sitemap, and Target Information. For each target instance, however, the Home page presents different high-level information based on the target instance type.

In [Table 1-1](#), the following differences are highlighted:

- For a Directory Server instance, the submenu provides access to the following information: Performance Summary, Resources Usage, and Replication Overview.
- For a Proxy Server instance, the submenu provides access to the following information: Performance Summary, Resources Usage, and Remote Servers.
- For a Replication Gateway instance, the submenu provides access to the following information: Resources Usage and Replication Overview.

For all target types, the **Monitoring > All Metrics** command provides access to a complete list of the monitored metrics for the target instance. The information displayed is determined by the Oracle Unified Directory instance type.

Performance information is provided in terms of averages and rates, depending on the information type. Data is represented in both text and graphical form.

Numerical information and comparative data indicates the most recent sampled data. By default, the Oracle Management Agent gathers a new sample of data every five minutes. Line graphs are constructed by point, with each point representing a collected data.

Alerts are generated, based on specific thresholds that you can configure on the **Monitoring > Metrics and Collection Settings** page.

1.3.2 Using the All Metrics Page

The Oracle Unified Directory submenu pages display only a subset of the monitored metrics. The **Monitoring > All Metrics** command provides access to all the monitored metrics for the target instance.

For example, the **Performance Summary** page of a directory server page provides information on the about the `add`, `delete`, `modify`, `modify DN`, `search`, and `bind` Operations Performed on the server. The All metrics page also provides Operations information for each LDAP connection handlers, which are not included in the Performance Summary page.

To display the **All Metrics** page:

1. On the Oracle Enterprise Manager home page, choose **Targets**.

The **Hosts** page is displayed.

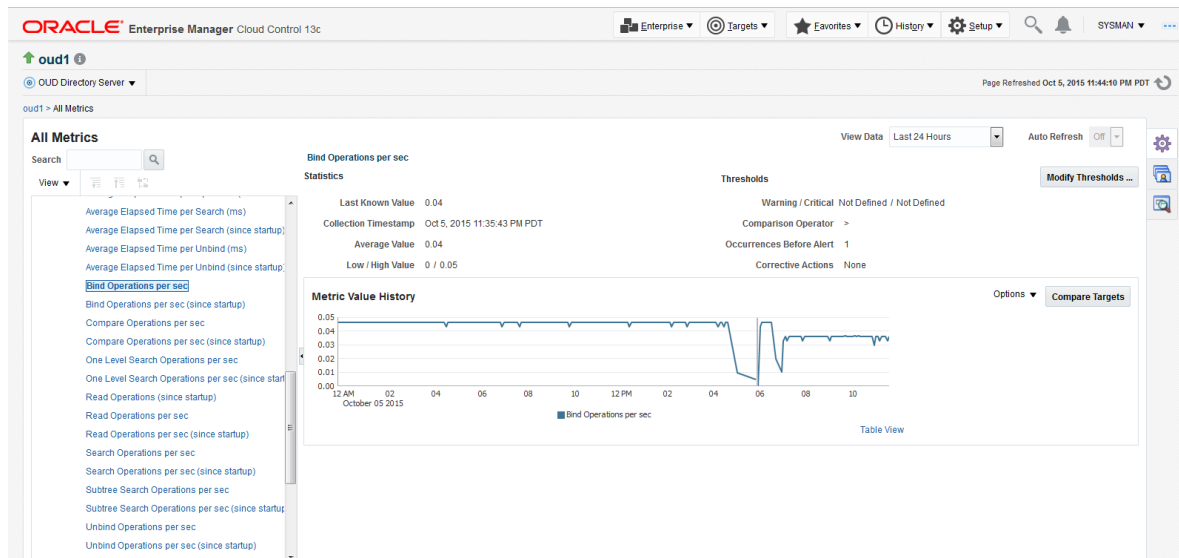
2. Click **All Targets** in the top menu bar.
3. Choose the target instance name.

The target instance **Home** page is displayed.

4. At the bottom of the **Home** page, under the Related Links menu, click **All Metrics**.

The **All Metrics** page is displayed.

Metrics are organized in logical groups. The following figure illustrates the metrics available when the **Operations Read Information** group is expanded, and **Bind Operations Per Second** is selected.

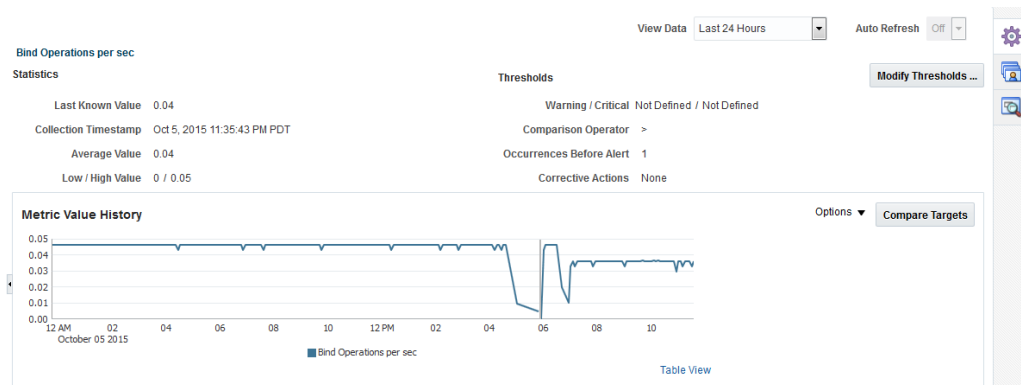
Figure 1-2 Operations Read Information

To display details of the metric, click on the metric name. In [Figure 1-3](#), to display information about Bind Operations Per Second within the last 24 hours, you need to choose the **Bind Operations per sec** metric from the All Metrics page. A new page dedicated to this metric is displayed.

[Figure 1-3](#) lists the following Statistics:

- Last Known Value: 0.04
- Average Value: 0.04
- Low Value: 0
- High Value: 0.05
- Warning Threshold: Not Defined
- Critical Threshold: Not Defined
- Occurrences Before Alert: 1
- Corrective Actions: None

A graph is labeled with metric values ranging from 0.00 to 0.50, and hourly intervals spanning 24 hours. The graph data illustrates activity peaks between the hours of 08AM and 08AM the following day.

Figure 1-3 One Level Search Operations Per Second page

The All Metrics page enables you to specify how you want to view a particular metric. The All Metrics page also provides the ability to compare the metrics against to target instances. Use the **View Data** field to select a specific time Period for which to display the monitored data. Time Periods for seven days or more also display the minimum, maximum and average values of a metric during that Period.

1.3.3 Setting Metric Thresholds

Metric thresholds enable you to specify when alerts should be generated for a specific monitored metric. For example, if you want to receive an alert when the number of read operations per second exceeds a certain maximum, you can configure a threshold for this metric.

To configure a metric threshold:

1. From the Home page of the Target Instance menu, go to **Monitoring > Metric and Collection Settings**.

By default, the list of metrics for which thresholds have been defined is displayed. See [Figure 1-4](#).

2. From the View list, select **All metrics**.
3. Scroll down to locate the metric for which you want to set a threshold.
4. Enter a value in the **Warning Threshold** column to specify the point at which you should receive a warning alert.
5. Enter a value in the **Critical Threshold** column to specify the point at which you should receive a critical alert.
6. To change the collection schedule for that metric:
 - Click the existing value in the Collection Schedule column.
 - Edit the collection settings, as required.
7. To specify any corrective behavior that should be taken if the metric reaches the warning threshold or critical threshold:
 - Click the **Edit** icon.
 - On the Monitored Objects pane, click **Edit**.

- On the Corrective Actions pane, click **Add** next to the threshold for which you want to specify the corrective action.
 - Follow the steps in the **Add Corrective Action** wizard.
8. On the Metrics and Collection Settings page, click **OK** to save your changes.

Figure 1-4 shows the **All Metrics** view for a directory server target instance. The view contains two tabs: Metrics and Other Collected Items. The Metrics tab contains a table which lists metrics collected for this directory server instance. For each metric, the following values may be reported: Comparison Operator, Warning Threshold, Critical Threshold, Corrective Actions, and Collections Schedule.

To reconfigure the settings for a metric, click the **Edit** icon the end of its row.

Figure 1-4 The Metric and Collections Settings Page for a Directory Server Target Instance

The screenshot shows the 'Metric and Collection Settings' page for a Directory Server Target Instance. The page is titled 'ds1' and 'OUD Directory Server'. The main heading is 'Metric and Collection Settings'. There are two tabs: 'Metrics' (selected) and 'Other Collected Items'. A 'View' dropdown is set to 'All metrics'. There are 'Expand All' and 'Collapse All' links. The table below lists various metrics with their respective settings.

Metric	Comparison Operator	Warning Threshold	Critical Threshold	Corrective Actions	Collection Schedule	Edit
ds1						
Administration Connector Extended Operations					Every 5 Minutes	
Average Elapsed Time per Extended	>			None		
Average Elapsed Time per Extended (since startup)	>			None		
Extended Operations per sec	>			None		
Extended Operations per sec (since startup)	>			None		
Administration Connector General Information					Every 5 Minutes	
Average Elapsed Time per Operation	>			None		
Average Elapsed Time per Operation (since startup)	>			None		
Current Connections	>			None		
Delta Total Connections per sec	>			None		
Kb Read per sec	>			None		
Kb Read per sec (since startup)	>			None		
Kb Written per sec	>			None		
Kb Written per sec (since startup)	>			None		
Operations Completed (per sec)	>			None		
Operations Completed (per sec) (since startup)	>			None		
Operations Initiated (per sec)	>			None		
Operations Initiated (per sec) (since startup)	>			None		
Operations Unsuccessful (per sec)						
Operations Unsuccessful (per sec) (since startup)						
Returned Search Result Entries per sec	>			None		

1.3.4 Summary of Directory Server Instance Monitoring Information

You can review the monitoring information of the directory server instance displayed on various pages in the Enterprise Manager Cloud Control console.

- [Directory Server Instance Home Page Metrics](#)

- [Directory Server Instance Performance Summary Page Metrics](#)
- [Directory Server Instance Resources Usage Page Metrics](#)
- [Directory Server Instance Replication Overview Page Metrics](#)

1.3.4.1 Directory Server Instance Home Page Metrics

The directory server instance Home page provides the following basic information about the server instance:

- General Information about the directory server instance and its current status including: up time, the administration port, the full version of the server, install and instance path, server role, and whether replication is enabled or disabled in the LDAP server
- Availability of the server
- Current load of the LDAP server including: the number of Operations Per Second, the average lifetime Per Operation, the number of Connections Per Second, the number of Current Connections, and the Connections Leak
- List of configured suffixes and for each suffix, the DN, the entry count in the suffix, and indication of whether the suffix is replicated or not replicated
- List of configured connection handlers, and each connection handler name and type (such as LDAP, SNMP, JMX and so forth), the Listen Port Number, whether the connection handler is enabled or disabled, Average etime (ms) Per Operation on the connection handler, and the number of Operations Per Second Since the Last Collection
- Performance overview with line charts indicating the following:
 - The number of Operations Completed Per Second since the server startup, and Operations Completed Per Second Since the Last Collection
 - The eTime Per Operation Since Startup of the server, and the eTime Per Operation Since the Last Collection
 - The number of Connections Per Second Since Startup, and the number of Connections Per Second Since the Last Collection
 - CPU usage

In addition, the Home page displays any alerts that might have been generated by the monitored server instance.

If the plug-in type that you have selected does not correspond to the server instance type that you want to monitor (that is, directory, proxy, or replication gateway, an alert to this effect is displayed on the Home tab.

1.3.4.2 Directory Server Instance Performance Summary Page Metrics

The OUD Directory Server Performance Summary Page displays the following:

- Current Load of the server with the number Operations Per Second, the Average eTime, the number of Connections Per Second, the number of Current Connections, and Connections Peak

- A pie chart representing the number of Completed Operations compared to the Unsuccessful Operations Per Second
- Two bar charts representing, for each read and write operation type, the number of Operations Per Second
- For each Operation type, the number of Operations Per Second and the associated elapsed time

1.3.4.3 Directory Server Instance Resources Usage Page Metrics

The OUD Directory Server Resource Summary Page displays the following:

JVM Information

- VM information like the Java version, Java home, Java Architecture, Max allowed Memory (MB), Total Memory (MB), Used Memory (MB) and the Free Memory (MB)
- A line chart representing the Free Memory in Heap, and the Used Memory in Heap
- A line chart representing the JVM Non Heap Usage (MB)

Backend Information

- Berkeley DB JE version, Number of Backends and the total number of Entry Count in the directory server
- A bar chart representing, for each backend the number of owned entries, the current size of the DB cache and the Free Disk Space

Workqueue Information

- Current Request in the backlog of the workqueue, the Request Backlog Peak, Rejected Requests, and Configured Capacity of the workqueue
- A line chart representing the number of requests in the queue

Cache Information

Entry Cache Hits, Entry Cache Tries, Cached Entries, Cache Hit Ratio, and a line chart representing the number of hits Per Second and the Number of Tries Per Second

1.3.4.4 Directory Server Instance Replication Overview Page Metrics

The OUD Directory Server Replication Overview Page displays the following:

Local Replication Server

- Administration port
- Replication Enabled Replication Port, Missing Changes, Oldest Missing Changes, Replication Delay, Received Updates Per Second, Sent Updates Per Second, and Untrusted Changes Per Second
- A line chart representing the number of Missing Changes in the local replication server

- A line chart representing the age of the Oldest Missing Changes

Local Replication Domains

- A bar chart representing, for each domain, the average number of Replication Updates Received Per Second for this replication domain
- A bar chart representing, for each domain, the average number of Replication Updates Sent Per Second for this replication domain

Global Replication Report

The Global Replication Report provides a summary of all servers in a replicated topology, as well as the overall replication status across the topology.

Table 1-2 summarizes the metrics reported in the Global Replication Report for each replication domain in the topology:

Metric	Description
Host Name	Name of the host on which the directory server instance is running.
Admin Port	Administration port of the directory server instance.
Base DN	Base DN that is being replicated.
Entries	Number of entries in that base DN.
Replication Status	Status of the replication domain on this directory server. The status can be one of the following: Replication Ongoing. The connection to a replication server is established with the correct data set. Replication is working. If assured mode is used, then acknowledgements from this directory server are sent. For information about assured mode, see the Oracle® Fusion Middleware Administrator's Guide for Oracle Unified Directory 11g Release 2 (11.1.2). Degraded. The connection to a replication server is established with the correct data set. Replication is working in degraded mode as the directory server has numerous changes that are pending in the replication server queue. If assured mode is used, then acknowledgements from this directory server are not expected. Being Initialized. The connection to a replication server is established and a new data set is received from this connection (online import), to initialize the local back end. Requires Initialization. The connection to a replication server is established with a data set that is different from the rest of the topology. Replication is not working. Either the other directory servers of the topology should be initialized with a compatible data set, or this server should be initialized with another data set that is compatible with the other servers. Not Connected. The directory server is not connected to any replication server.

Metric	Description
Missing Changes	Number of changes that are still missing on this server (and that have been applied to at least one other server in the topology).
Oldest Missing Change	Age (in seconds) of the oldest missing change that has not yet arrived on this server.
Received Updates Per Second	Average number of replication updates received by this server Per Second.
Sent Updates Per Second	Average number of replication updates sent by this server Per Second.
Untrusted Changes Per Second	Average number of changes Per Second that were made on an untrusted server, and not yet replicated to the topology.

Table 1-3 summarizes the metrics reported in the Global Replication Report *for each replication server* in the topology.

Metric	Description
Host Name	Name of the host on which the replication server instance is running.
Replication Port	Replication port of the replication server instance.
Base DN	Base DN that is being replicated.
Missing Changes	Number of changes that still need to be replayed on any server in the topology.
Oldest Missing Change	Age (in seconds) of the oldest missing change from any server in the topology.

Table 1-4 summarizes the metrics reported in the Global Replication Report *for the entire topology*.

Metric	Description
Missing Changes	The number of changes that still need to be replayed on any server in the topology.
Age of Oldest Missing Change	The age (in seconds) of the oldest missing change from any server in the topology.

1.3.5 Summary of Proxy Server Instance Monitoring Information

You can review the monitoring information of the proxy server instance displayed on various pages in the Enterprise Manager Cloud Control console.

- [Proxy Server Instance Home Page Metrics](#)
- [Directory Server Instance Performance Summary Page Metrics](#)
- [Proxy Server Instance Resource Usage Page Metrics](#)
- [Proxy Server Instance Remote Servers Page Metrics](#)

1.3.5.1 Proxy Server Instance Home Page Metrics

The proxy server instance Home page provides the following basic information:

- General information about the proxy server instance and its current status including: up time, the administration port, the full version of the server, install and instance paths, and server role
- Availability of the server
- The current load of the LDAP server with the number of Operations Per Second, the Average etime Per Operation, the number of Connections Per Second, the number of Current Connections, and the Connections Peak
- List of configured suffixes with the server role, the network groups, and the associated algorithms
- List of configured connection handlers with the type, the port number, whether connection handler is enabled or disabled, Average etime (ms) Per Operation, and the number of Operations Per Second Since the Last Collection
- List of remote servers with, for each server, the name, the host name, the port number, the SSL port number, the suffix and workflow element, the status of the remote server, the last up time, and the last down time
- Performance overview with line charts representing the number of Operations Completed, the Operations eTime, the number of connections, and the CPU usage.

In addition, the Home page displays any alerts that might have been generated by the monitored server instance.

1.3.5.2 Proxy Server Instance Performance Summary Page Metrics

The OUD Proxy Server Performance Summary Page displays the following:

- Current Load of the server with the number Operations Per Second, the Average eTime, the number of Connections Per Second, the number of Current Connections, and Connections Peak
- A pie chart representing with the number of completed Operations compared to the Unsuccessful Operations Per Second
- Two bar charts representing, for each read and write operation, the number of Operations Per Second
- For each operation type, the number of Operations Per Second and the associated elapsed time
- Line charts representing the number of Operations Completed, the Operations eTime, the number of connections, and the CPU usage

1.3.5.3 Proxy Server Instance Resource Usage Page Metrics

The OUD Proxy Server Resource Summary Page displays the following:

JVM Information

- JVM information like the java version, Java home, Java Architecture, Max allowed Memory (MB), Total Memory (MB), Used Memory (MB) and the free memory (MB)

- A line chart representing the Free Memory in Heap, and the Used Memory in the heap
- A line chart representing the JVM Non Heap Usage (MB)

Request Backlog Information

- Current Request in the backlog of the workqueue, the request backlog peak, Rejected Requests
- A line chart representing the number of requests in the queue

Global Index Shared Cache Space Usage Information

- Cache name, Used In, Used Space
- A line chart representing the amount of Used Space of the global index cache if configured

1.3.5.4 Proxy Server Instance Remote Servers Page Metrics

The OUD Proxy Server Remote Servers Page displays the following:

- List of Remote Data sources with for each remote data sources: Name, Hostname, Port number, SSL port number, Suffix/WFE, Status, Last Up time, Last Down time, Connection Pool Used, Read Operation Per Second, Writes Operations Per Second, and number of Silent Binds Per Second
- A bar chart representing, for each remote server, the number of Failed Operations, number of Aborted Operations, and the number of Completed Operations
- A bar chart representing the number of Read Operations for each remote server
- A bar chart representing the number of Write Operations Per Second for each remote server
- A bar chart representing, for each remote server, the eTime of Failed Operations, of Aborted Operations and Completed Operations
- A bar chart representing the eTime of Read Operation for each remote server
- A bar chart representing the eTime of Write Operations Per Second for each remote server

1.3.6 Summary of Replication Gateway Monitoring Information

You can review the monitoring information of the replication gateway displayed on various pages in the Enterprise Manager Cloud Control console.

- [Replication Gateway Instance Home Page Metrics](#)
- [Replication Gateway Instance Resources Usage Page Metrics](#)
- [Replication Gateway Instance Replication Overview Page Metrics](#)

If the plug-in type that you have selected does not correspond to the server instance type that you want to monitor (that is, directory, proxy, or replication gateway, an alert to this effect is displayed on the Home tab.

1.3.6.1 Replication Gateway Instance Home Page Metrics

The replication gateway instance Home page provides the following basic information:

- General information about the replication gateway instance and its the current status including: up time, administration port, full version of the server, install and instance paths, server role, and whether replication is enabled or disabled
- Availability of the server
- List of configured suffixes with replication status, the Updates Sent to ODSEE Per Second, Updates Received from ODSEE Per Second, Updates Sent to OUD Per Second, and Updates Received from OUD Per Second
- Performance overview with line charts representing the number of updates sent to ODSEE Per Second, the number of Updates Received from ODSEE Per Second, the number of Updates Sent to OUD Per Second, and the number of Updates Received from OUD Per Second

In addition, the Home page displays any alerts that might have been generated by the monitored replication gateway instance.

1.3.6.2 Replication Gateway Instance Resources Usage Page Metrics

The OUD Replication Gateway Resource Usage Page displays the following:

JVM Information

- VM information: the Java version, Java home, Java Architecture, Max Allowed Memory (MB), Total Memory (MB), Used Memory (MB) and the Free Memory (MB)
- A line chart representing the Free Memory in Heap, and the Used Memory in the heap
- A line chart representing the JVM Non Heap Usage (MB)

1.3.6.3 Replication Gateway Instance Replication Overview Page Metrics

The OUD Replication Gateway Replication Overview Page displays the following:

Local Replication Server

- Administration port
- Replication Enabled Replication Port, Missing Changes, Oldest Missing Changes, Replication Delay, Received Updates Per Second, Sent Updates Per Second, Untrusted Changes Per Second
- A line chart representing the number missing changes in the local replication server
- A line chart representing the age of the Oldest Missing Changes

Local Replication Domains

- A bar chart representing, for each domain, the average number of Replication Updates Received Per Second for this replication domain
- A bar chart representing, for each domain, the average number of Replication Updates Sent Per Second for this replication domain

Global Replication Report

The Global Replication Report provides a summary of all servers in a replicated topology, as well as the overall replication status across the topology.

[Table 1-5](#) summarizes the metrics reported in the Global Replication Report for *each replication domain* in the topology:

Metric	Description
Host Name	Name of the host on which the directory server instance is running.
Admin Port	Administration port of the directory server instance.
Base DN	Base DN that is being replicated.
Entries	Number of entries in that base DN.
Replication Status	<p>Status of the replication domain on this directory server. The status can be one of the following:</p> <p>Replication Ongoing. The connection to a replication server is established with the correct data set. Replication is working. If assured mode is used, then acknowledgements from this directory server are sent. For information about assured mode, see the Oracle® Fusion Middleware Administrator's Guide for Oracle Unified Directory 11g Release 2 (11.1.2).</p> <p>Degraded. The connection to a replication server is established with the correct data set. Replication is working in degraded mode as the directory server has numerous changes that are pending in the replication server queue. If assured mode is used, then acknowledgements from this directory server are not expected.</p> <p>Being Initialized. The connection to a replication server is established and a new data set is received from this connection (online import), to initialize the local back end.</p> <p>Requires Initialization. The connection to a replication server is established with a data set that is different from the rest of the topology. Replication is not working. Either the other directory servers of the topology should be initialized with a compatible data set, or this server should be initialized with another data set that is compatible with the other servers.</p> <p>Not Connected. The directory server is not connected to any replication server.</p>
Missing Changes	Number of changes that are still missing on this server (and that have been applied to at least one other server in the topology).

Metric	Description
Oldest Missing Change	Age (in seconds) of the oldest missing change that has not yet arrived on this server.
Received Updates Per Second	Average number of replication updates received by this server per second.
Sent Updates Per Second	Average number of replication updates sent by this server per second.
Untrusted Changes Per Second	Average number of changes per second that were made on an untrusted server, and not yet replicated to the topology.

Table 1-6 summarizes the metrics reported in the Global Replication Report for each replication server in the topology.

Metric	Description
Host Name	Name of the host on which the replication server instance is running.
Replication Port	Replication port of the replication server instance.
Base DN	Base DN that is being replicated.
Missing Changes	Number of changes that still need to be replayed on any server in the topology.
Oldest Missing Change	Age (in seconds) of the oldest missing change from any server in the topology.

Table 1-7 summarizes the metrics reported in the Global Replication Report for the entire topology.

Metric	Description
Missing Changes	The number of changes that still need to be replayed on any server in the topology.
Age of Oldest Missing Change	The age (in seconds) of the oldest missing change from any server in the topology.

1.4 Managing Configuration Data

Cloud Control collects configuration information for all the managed targets across the Enterprise. You can access up-to-date configuration information for your entire Enterprise through Cloud Control, as the collected configuration information is periodically sent to the Management Repository over HTTP or HTTPS.

Using Cloud Control, you can view, save, track, compare and search the collected configuration information for your managed targets including OUD targets.

See "Managing Configuration Information" chapter in the Oracle Enterprise Manager Life cycle Management Administrator's Guide.

You can use the Configuration Browser to view the latest or saved configuration data of OUD targets. You can also access the configuration feature, such as, compare and history.

To view latest or saved configuration data of OUD targets:

1. From the Targets menu, select All Targets.

2. In the table of returned targets, right-click on the row of the OUD target.
3. In the popup menu, select Configuration, and then select either Last Collected or Saved.
4. If you have selected Saved, select a configuration that you want to browse from the table of saved configurations , and then select View.

The browser opens to display the (last or saved) configuration data for the selected target.

Note:

The Last Collected and the Saved selections are available in the Configuration Menu, and are located on the top-left corner of the OUD target's Home Page.

The browser displays the following OUD configuration files:

- config/config.ldif
- config/java.properties
- config/admin-backend.ldif
- Global Configuration data are also provided in addition to the configuration files of OUD targets.

1.5 Uninstalling the Enterprise Manager Plug-in for OUD

You must remove all target instances of the plug-in before you can undeploy the plug-in.

For example, if you have three OUD instances with two instances deployed to one agent and the third instance deployed to a second agent, you must Perform the following tasks:

- Remove instance 1 (the target instance) on agent 1.
- Remove instance 2 (the second target instance) on agent 1.
- Remove instance 3 (the third target instance) on agent 2.

You can then undeploy the plug-in from the Oracle Enterprise Manager Cloud Control.

To uninstall the Enterprise Manager Plug-in for OUD, complete the following tasks:

- Remove all target instances of the plug-in. See [Removing Target Instances of the Plug-in](#).
- Undeploy the plug-in. See [Undeploying the Plug-in](#).

1.5.1 Removing Target Instances of the Plug-in

You can remove a target instance by following this procedure. Note that when you remove a target instance, all corresponding data (monitoring data that has already been collected) is deleted.

For each target instance of the plug-in that you want to remove, complete the following steps:

1. Select **Targets** on the navigation bar from the Oracle Enterprise Manager home page.

The Hosts page is displayed.

2. Select **All Targets** on the Hosts page.

The All Targets page displays the list of all targets in the Oracle Enterprise Manager Cloud Control including hosts, agents, databases, directory servers and others.

The target instance name is displayed in the Name column.

3. Click **Target Setup > Remove Target** to select the target instance name.

4. Click **Remove**.

The following message is displayed: "You have chosen to remove *target_instance_name* (OUD Directory Server, OUD Proxy Server or OUD Replication Gateway). Do you wish to proceed?"

Click **Yes**. A confirmation message is displayed.

The target instance has now been removed. Repeat these steps to remove any additional target instances of the Enterprise Manager Plug-in for OUD.

1.5.2 Undeploying the Plug-in

When all target instances of the plug-in have been removed, you can undeploy and then delete the Plug-in from the Oracle Enterprise Manager Cloud Control.

Follow the detailed instructions in the following sections of the *Oracle Enterprise Manager Cloud Control Administrator's Guide*:

- "Undeploying Plug-Ins from Oracle Management Service"
- "Undeploying Plug-Ins from Oracle Management Agent"

1.6 Limitations of this Release

Certain limitations apply when dealing with the JVM Resources Report that is generated for each of the three server types.

Note the following limitations:

- The CPU Usage graph is available *only if*:
 - The target instance is running on the same host as the Management Agent in which the instance is registered
 - The target instance and the Management Agent are running with the same access rights
- The Non-Heap Usage graph is not accurate (the reported metric is incorrect).
- If Oracle Management Agent is running on an HP-UX system, then OUD instances should be installed on a path which is limited to 70 characters.