

Oracle® Communications Session Monitor Mediation Engine Connector User Guide



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July 2019

The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Preface

This guide describes how to configure and use Oracle Communications Session Monitor Mediation Engine Connector.

The Oracle Communications Session Monitor product family includes the following products:

- Operations Monitor
- Enterprise Operations Monitor
- Fraud Monitor
- Control Plane Monitor

Documentation Set

Document Name	Document Description
Developer Guide	Contains information for using the Session Monitor SAU Extension.
Fraud Monitor User Guide	Contains information for installing and configuring Fraud Monitor to monitor calls and detect fraud.
Installation Guide	Contains information for installing Session Monitor.
Mediation Engine Connector User Guide	Contains information for configuring and using the Mediation Engine Connector.
Operations Monitor User Guide	Contains information for monitoring and troubleshooting IMS, VoLTE, and NGN networks using the Operations Monitor.
Release Notes	Contains information about the Session Monitor 4.2 release, including new features.
Security Guide	Contains information for securely configuring Session Monitor.
Upgrade Guide	Contains information for upgrading Session Monitor.

Revision History

This section provides a revision history for this document.

Date	Description
July 2019	Initial release.

1

Overview of the Mediation Engine Connector User Interface

This chapter provides an overview of the Oracle Communications Session Monitor Mediation Engine Connector user interface.

Logging In to Mediation Engine Connector

You must first install an instance of Mediation Engine Connector, connect it to your network, and access the user interface using a web browser.

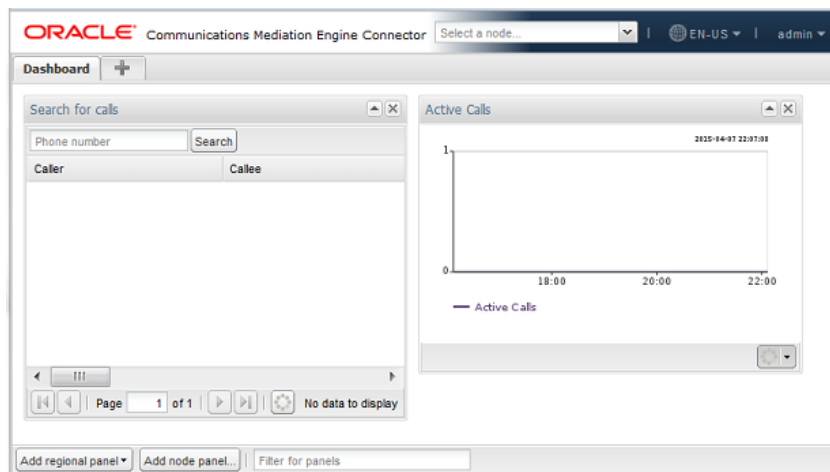
Note:

Your browser must have JavaScript enabled. Additionally, allowing "HTTP cookie" is recommended for several of the features.

1. Point the browser to the configured IP address of the management interface to load the login screen.
2. Log in with your credentials.

About the Mediation Engine Connector Dashboard

After logging in, you should see the Mediation Engine Connector dashboard. In the top-right corner, a drop-down menu displays the current user and contains links to the Mediation Engines window, the HTML version of this manual (opens in a new browser window), and the option to logout.



The Mediation Engine Connector dashboard is similar to the dashboard of the mediation engines. It allows you to view at a glance important information retrieved from single probes, as well as information aggregated from all mediation engines. The dashboard contains a configurable number of panels, which can be added or removed by the user. The following functionality is available for the Mediation Engine Connector dashboard.

Adding a Dashboard Panel

To add a dashboard panel:

1. Right-click on the dashboard.
A context menu appears.
2. Select **Add a panel...**
A wizard appears in a new window, which guides you through the creation of the new dashboard panel.

A new dashboard panel is created.

Removing a Dashboard Panel

To remove a dashboard panel:

1. Click the cross button in the upper-right corner of the panel.
A dialog box appears.
2. Click **Yes**.

The dashboard panel gets removed.

Adding a Group Tab

To add a group tab:

1. Click **Add group** tab beside the **Dashboard** tab.
A **New Group 1** tab is created.
2. Double click the **New Group 1** tab and rename the panel group. You can create multiple dashboard panels.



Note:

When a new widget is added in the **Dashboard** tab which is not the default, the widget gets added in the default dashboard.

Rearranging Dashboard Panels

Dashboard panels can be rearranged using drag and drop. Drag a dashboard panel by clicking and holding the title bar and drop it where you would like it to stay on the page.

Enabling Dashboard Panel Refresh

The information in a dashboard panel refreshes only when it is active in a dashboard tab. Panels refresh only when they are visible to the user in an active browser window. You can change this behavior to enable panels to continue to refresh when they are not displayed in an active browser window.

 **Note:**

Enabling panel refresh can affect the system performance.

To enable dashboard panels to refresh:

1. Select the menu title that displays your user name.
2. Click **My Profile**.
The **Edit own user information** menu appears.
3. From the Widgets Refresh list, select refresh options that you would like to enable.
4. Click **Finish**.

About Dashboard Panels

This section describe only panels containing aggregated information. Panels containing mediation engine-related information are the same as the panels for the dashboard of the mediation engine.

The Mediation Engine Connector dashboard can have the following types of panels:

- Panels containing aggregated information
- Panels containing information retrieved from a single mediation engine

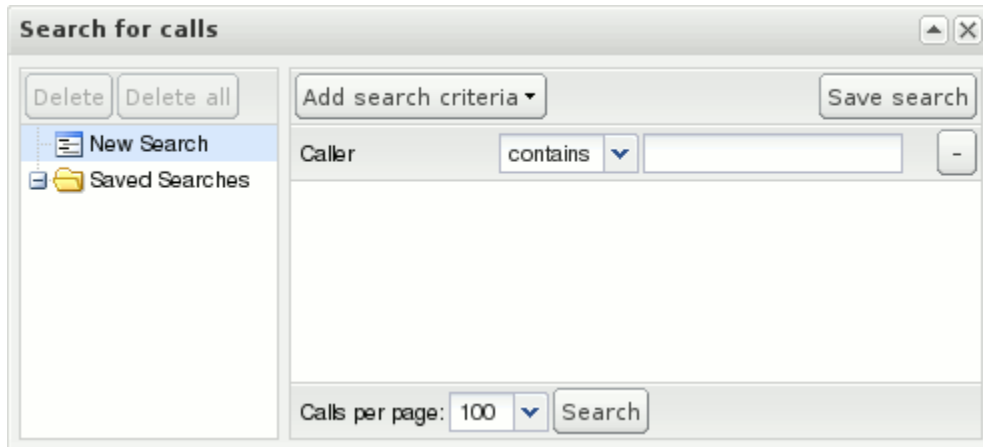
Call Search Panel

The Call Search panel allows you to specify the search criteria and display matching unique calls on all probes simultaneously.

The Call Search panel provides the following functionality:

- Enter search criteria: To enter the search criteria, click Add search criteria button and select the field for which you want to enter a search criterion. A new row appears in the center-right area of the Call Search panel. You can enter a comparison operator and a comparison value for the criterion in this row.
- Execute a search: Click Search to execute the active search. The Call Search Results page appears.
- Save search and retrieve saved searches: You can save a search by clicking Save Search. A new node appears in the tree to the left of the panel, under the Saved Searches folder. To give a name to the saved search, click the tree node for the search and enter a name. To retrieve a previously saved search, click select a node from under the Saved Searches folder. You can also delete a saved search by selecting its node and clicking Delete.

Clicking Delete all deletes all saved searches. Note, that saved searches will be gone, once you reload the page or logout from Mediation Engine Connector and login again.

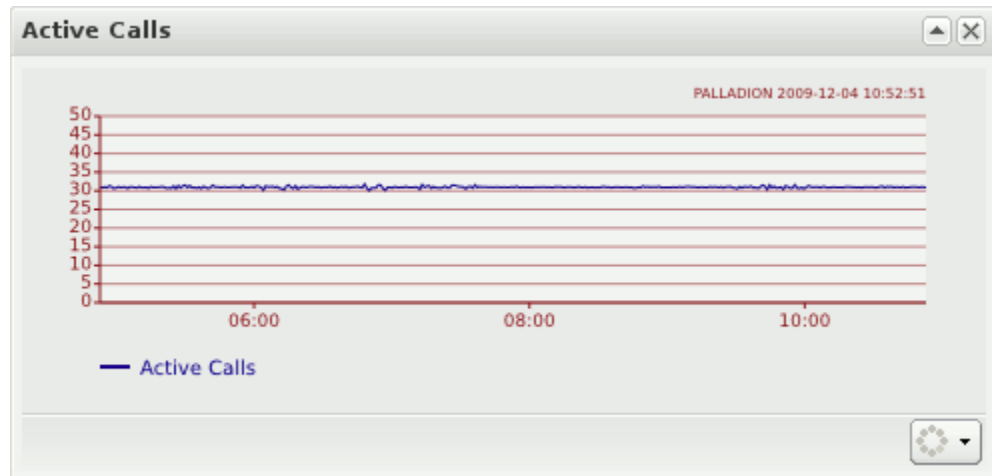


- Call Search Results page: The Call Search Results page appears after you execute a search and displays unique calls that match the search criteria found on all mediation engines.

Caller	Callee	Start timestamp	Call time	Code	Ingress device
+492345324763110	+491233454763110	2009/12/04 10:50:56	3'55ms	200	proxy3
+492345324762110	+491233454762110	2009/12/04 10:49:16	3'95ms	200	proxy3
+492345324761107	+491233454761107	2009/12/04 10:47:36	3'87ms	200	proxy3
+492345324761110	+491233454761110	2009/12/04 10:47:36	3'87ms	200	proxy3
+492345324761108	+491233454761108	2009/12/04 10:47:36	3'87ms	200	proxy3
+492345324761106	+491233454761106	2009/12/04 10:47:36	3'87ms	200	proxy3
+492345324761109	+491233454761109	2009/12/04 10:47:36	3'87ms	200	proxy3
+492345324761104	+491233454761104	2009/12/04 10:47:35	3'87ms	200	proxy3
+492345324761102	+491233454761102	2009/12/04 10:47:35	3'87ms	200	proxy3
+492345324761105	+491233454761105	2009/12/04 10:47:35	3'87ms	200	proxy3
+492345324761100	+491233454761100	2009/12/04 10:47:35	3'94ms	200	proxy3
+492345324761103	+491233454761103	2009/12/04 10:47:35	3'87ms	200	proxy3
+492345324761101	+491233454761101	2009/12/04 10:47:35	3'87ms	200	proxy3
+492345324760110	+491233454760110	2009/12/04 10:45:56	3'27ms	200	proxy3
+492345324759110	+491233454759110	2009/12/04 10:44:16	3'60ms	200	proxy3
+492345324758110	+491233454758110	2009/12/04 10:42:36	3'69ms	200	proxy3
+492345324757110	+491233454757110	2009/12/04 10:40:56	3'80ms	200	proxy3

Active Calls Counter Panel

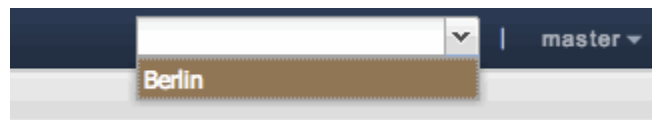
The Active Calls counter panel displays a chart which is computed based on values aggregated from all mediation engines. Currently the active calls counter is available. It is the only option present in the dashboard add panel wizard, when you choose **Display a counter**.



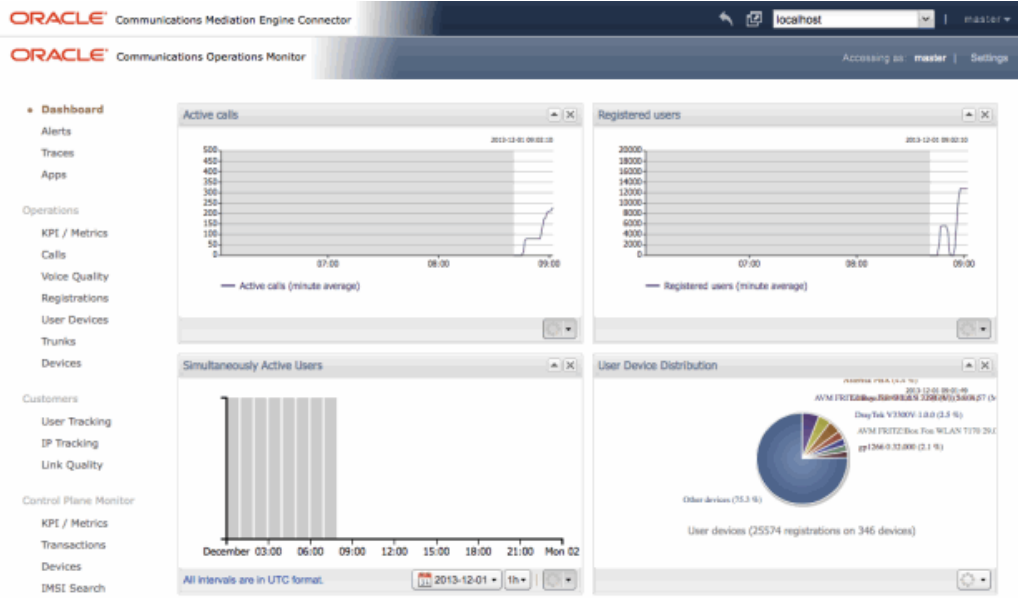
About Mediation Engine Selection and View

Mediation Engine Selection refers to the controls in the header bar of the Mediation Engine Connector user interface. These controls allow you to select a mediation engine to display in the mediation engine view.

You can also display the Mediation Engine view in its own window by clicking Open in new window button.



Select the mediation engine you want to view from the drop-down list and the Mediation Engine view for this mediation engine is displayed. The Mediation Engine view is displayed in an iframe inside the Mediation Engine Connector user interface. You are automatically logged in with the user name that you are already log into the Mediation Engine Connector user interface.



2

Configuring Mediation Engine Connector

This chapter describes how to configure Oracle Communications Session Monitor Mediation Engine Connector.

Changing the Default Administrator Password

Start by changing the default administrator password. Click the user name in the top-right corner and then on the **My Profile** link. The Edit own user information dialog box appears. Enter the new password twice and click **Finish**.

 **Note:**

The default administrator password is easy to guess and is available to sub-users. Oracle strongly recommends changing the administrator password before creating any sub-users.

Configuring Users and Realms

Due to the powerful visibility that Mediation Engine Connector offers inside a network and the associated user privacy risks, a comprehensive user rights management system is available to restrict Mediation Engine Connector users to defined views and functionalities.

When using multiple Mediation Engines with a Mediation Engine Connector, the Mediation Engine Connector is responsible for managing users and realms. The user database and the realm definitions are entered using the Mediation Engine Connector user interface, which then distributes the information across the Mediation Engines. User database and realm definitions should be set up before the Mediation Engines are connected.

 **Note:**

When using multiple Mediation Engines with a Mediation Engine Connector, the Mediation Engine is not responsible for managing users, passwords, and realms.

When a user is created in the Mediation Engine Connector, the information about the user is propagated to all the nodes, but the KPIs for the user are not created. For creating the KPIs for the user, you should login into the Mediation Engine. However, when a user is deleted from the Mediation Engine Connector, the KPIs are also deleted for that user.

Configuring Realms

Realms are used to partition the captured data for presenting a separate view to each Mediation Engine Connector user. This is especially useful in cases where different resellers share the

same Mediation Engine Connector instance, each being allowed to view only the SIP users served by themselves.

In the Mediation Engine Connector, a realm is defined by a pattern containing a set of telephone numbers, a set of domains, or both. Realms defined only by a range of telephone numbers should be used when the resellers share the same domain, but have different SIP users. Realms defined only by domain should be used when the Mediation Engine Connector is analyzing the traffic from multiple domains. A combination of both cases defines a pattern with a domain and a telephone number range.

To add a pattern that defines a realm, click the **Add pattern** button. A new row appears at the top of the table. The pattern is editable by double clicking on the row.

Name: The name of the realm that defines a reseller.

First Number: The lower limit of the telephone numbers range.

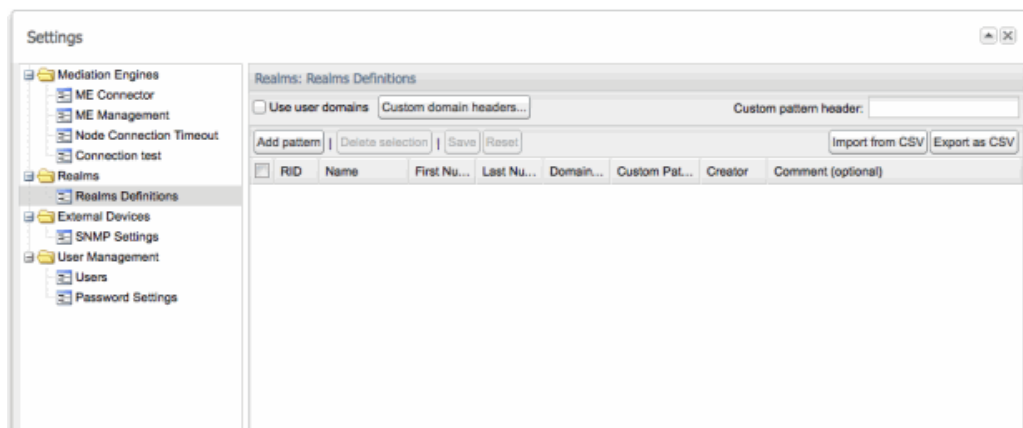
Last Number: The higher limit of the telephone numbers range.

Domain: The domain name. The field is optional as the realm might be identified only by number range.

Comment: An optional comment line, only for convenience.

To delete a selected pattern, click **Delete selection**. You can import and export realm configuration to and from CSV files, which helps in maintaining the realm configuration when many patterns have been defined.

You may also provision realm patterns automatically by uploading a similar CSV file via FTP.



Configuring User Access

A *user* is identified by a name, a set of access rights, a set of relations with other users, a realm to which the user belongs, an e-mail address, and a logo image file.

Users are organized hierarchically, with admin being the root user with default password having unrestricted access. Every user can create a set of sub-users, who have less permissions than their parent user.

User interface access is defined by permissions, that control which pages or sections from the user interface the user can see and use, and should be defined by the parent user when the user is created.

User management is similar to the process in the Mediation Engines. The difference being that users provisioned in the Mediation Engine Connector are duplicated to all Mediation Engines belonging to it.

Configuring External Authentication Authorization

The Mediation Engine Connector supports authenticating users using an external authentication provider, like LDAP, RADIUS, or single sign-on authentication. This authentication must be configured on the reverse proxy (NGINX or Apache) which acts as a gateway for the Mediation Engine Connector. Authorization for the user must be done using Mediation Engine Connector permissions, as described in the section "Configuring User Access".

If external authentication is enabled in the Mediation Engine Connector settings, the `x-Forwarded-User` HTTP header set by the reverse proxy must contain the authenticated user's login name. Configuration file for Apache, which sets up HTTP basic external authentication, can be found at the location, `/opt/oracle/ocsm/etc/httpd/conf.d`.

Configuring the Mediation Engine Connector URL and Authentication Secret

1. Enter the hostname or IP address of the Mediation Engine Connector.
2. Enter the authentication secret used to authenticate the Mediation Engines to Mediation Engine Connector.
3. Click **Save**.

The screenshot shows the 'ME Connector' configuration page. The left sidebar contains a tree view with the following items: Mediation Engines, ME Connector, REST API, ME Management, Node Connection Settings, Connection test, Realms, Realms, Realm Patterns, External Devices, SNMP Settings, User Management, Users, Password Settings, External Authentication, and Default Language. The main content area is titled 'ME Connector' and contains the following fields and buttons:

- Version:** (empty text input)
- Hostname or IP of MEC:** The hostname or IP of this machine that the Mediation Engine nodes will use to connect to this machine. Typically the external IP of this machine:
- Password for Mediation Engine nodes:** This is used by the ME nodes to connect to this machine. This only needs to be entered here and will be propagated to the nodes:
- Buttons:** Save, Refresh

Connecting Mediation Engine with Mediation Engine Connector

This section provides information to connect Mediation Engine to Mediation Engine Connector.

Important:

For secure connections, you must upload server certificates of Mediation Engine to Mediation Engine Connector and vice versa.

To connect Mediation Engine with Mediation Engine Connector:

1. Upload Server Certificate by doing one of the following:
 - To upload Self-signed certificates

- a. Login to PSA of Mediation Engine and navigate to **Server Certificate** screen. Download the Server certificate of ME.
The Server certificate can either be a CA certificate or a self-signed certificate. Click **Download Current Certificate** to download the server certificate.
- b. Login to PSA of Mediation Engine Connector (MEC) and navigate to **Server Certificate** screen. Download the Server certificate of MEC.
The Server certificate can either be a CA certificate or a self-signed certificate. Click **Download Current Certificate** to download the server certificate.
- c. Login to PSA of Mediation Engine, navigate to **Trusted Certificate** screen, and upload the certificate of MEC.
- d. Login to PSA of MEC, navigate to **Trusted Certificate** screen, and upload the certificate of Mediation Engine.

 **Note:**

Enable **Skip hostname validation for HTTPS connection** checkbox on the MEC when uploading ME self-signed certificate that does not have valid hostnames.

 **Note:**

The supported certificate format is PEM.

- To upload CA certificate:
Login to PSA of Mediation Engine, navigate to **Trusted Certificate** screen, and upload the CA certificate. Repeat the same for MEC.

 **Note:**

The supported certificate format is PEM.

2. Log into Operation Monitor.
3. Click **Admin** and then click **Settings**.
4. Click **Mediation Engine Connector**.
5. In the **Authentication Token** field, enter your choice of token details for the Mediation Engine, and click **Update**.

 **Note:**

For Mediation Engine Connector to connect to Mediation Engine, the token values entered while adding the Mediation Engine node must match with the value mentioned in the Authentication Token field.

You must note down the token details for future reference.

6. Log into Mediation Engine.

7. Under **Settings**, click **ME Management**.
8. Select the desired node, double-click the disabled column field, and select yes from the drop-down list or click Add.
9. Add a new node by doing the following:
 - a. Click **Add**.
A new row gets added.
 - b. Double-click the **Node name** field, and enter the Mediation Engine node name.
 - c. Double-click the **Hostname or IP** field, enter the IP address or Hostname of the Mediation Engine.
 - d. Double-click the **Shared secret** field, enter the shared secret of the Mediation Engine.
 - e. The Connection responsive field auto populates as following:
 - True. If node entries are valid and node connection is successful.
 - False. If either node entries are not valid or the node connection is unsuccessful.
 - f. Double-click the Disabled field, select the option yes or no from the drop-down list for enabling or disabling the node.
10. Click **Save**.

Result: Mediation Engine node is added

 **Note:**

When adding a new Mediation Engine, the list of local users on the Mediation Engine might be lost. Any local users and realms in the Mediation Engine will be replaced with the current list of users and realms that exist on the Mediation Engine Connector. If there are users and realms on the Mediation Engine that do not exist on the Mediation Engine Connector, these will be lost.

Result: Mediation Engine connects with the Mediation Engine Connector.

 **Note:**

By this procedure, the Mediation Engine and the Mediation Engine Connector are disconnected so the Mediation Engine will be on its own when it comes to information, it can use at that time. No other implications are known.

Disconnecting Mediation Engine from Mediation Engine Connector

To disconnect Mediation Engine from Mediation Engine Connector:

1. Log into Operation Monitor.
2. Click **Admin** and then click **Settings**.
3. Click **Network**.

4. Click **Mediation Engine Connector**.
5. Click **Unlink MEC....**

 **Note:**

You can only unlink Mediation Engine from Mediation Engine Connector by clicking Unlink MEC.... To connect back, you have configure the Mediation Engine by logging into Mediation Engine Connector.

 **Note:**

Hint: To view the details of the Mediation Engine you are disconnecting, click System Settings and then double-click the entry, Name of this Mediation Engine.

The Mediation Engine is disconnected from Mediation Engine Connector.

 **Note:**

Though, Mediation Engine disconnected from Mediation Engine Connector, Mediation Engine details appears in the mediation engine list. To remove the Mediation Engine from the list, navigate to **ME Management**, select the node, click **Delete Selected** and the click **Save**. If you click **Replicate Configuration**, the mediation engine will connect back to the Mediation engine connector. Make sure to note down all the fields of this entry before disconnecting for future reference.

Setting the Timeout for Call Searches in Mediation Engine Connector

In Mediation Engine Connector, the setting, Timeout for call searches in seconds controls the time a call search is performed in the nodes, using simple search, advanced search, or user tracking search.

When searching for a call event in the Mediation Engine Connector, all mediation engine nodes are queried. If a Mediation Engine node identifies a call event, it queries the neighboring nodes to check for additional call legs.

Use the setting, Timeout for call searches in seconds to set the timeout for the full call search from the Mediation Engine Connector nodes to the Mediation Engine nodes.

To set the timeout for call searches:

1. In a web browser, log in to Mediation Engine Connector.
The Mediation Engine Connector screen appears.
2. From the user list, select **Settings**, where user is your login name.
3. Under **Mediation Engines**, select **Node Connection Settings**.
The Node Connection Settings screen appears.

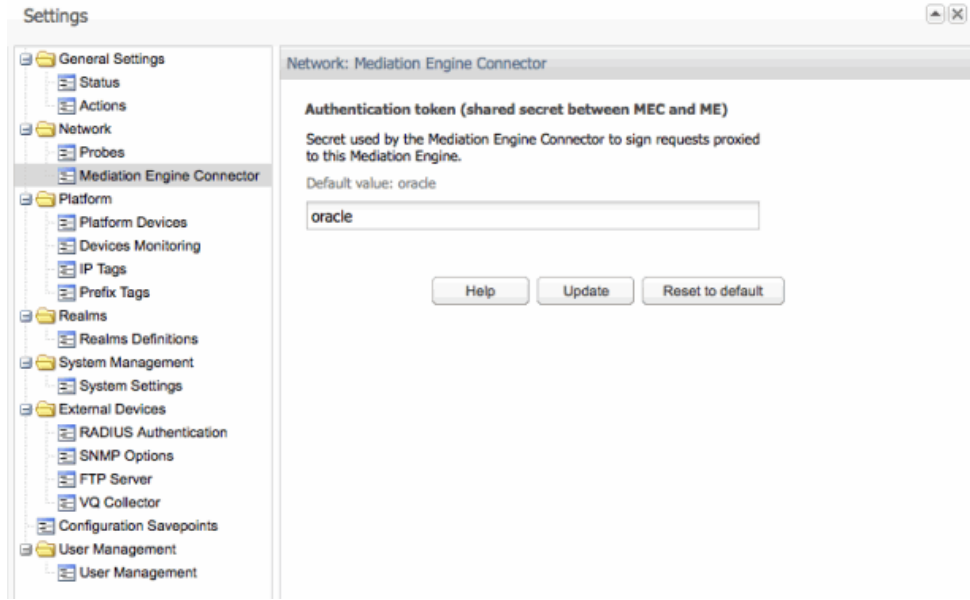
4. In the **Timeout for call searches in seconds** field, enter the number of seconds after which the call search ends.
5. Click **Save**.

Table 2-1 Node Connection Settings Fields

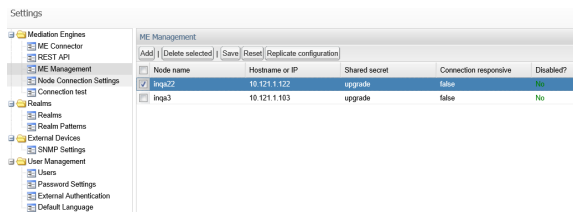
Field	Description
Timeout for node connection in seconds	This timeout applies to any request sent from the Mediation Engine Connector to the Mediation Engine nodes.
Time range for call searches in seconds in simple search	When searching for a call in the Call Search panel, this is the amount of time (in seconds) traversed to search for queried call. The search displays only the calls not older than mentioned number of seconds. The default search limit for simple search is 900 seconds.
Time range for call searches in seconds in advanced search	When searching for a call, in the Advanced Search panel, this is the amount of time (in seconds) traversed to search for queried call. The search displays only the calls not older than mentioned number of seconds. The default search limit for advanced search is 86400 seconds.
Timeout for call searches in seconds	This timeout applies only to call search requests from the Mediation Engine Connector to the Mediation Engine nodes.
Use same timeout as for node connections	If you select the checkbox, the setting, Timeout for call searches in seconds will have the same value as setting, Timeout for node connections in seconds . If the checkbox is not selected, then Timeout for call searches in seconds may have different value than Timeout for node connections in seconds .

Adding Mediation Engines

1. To prepare probing for a connection from Mediation Engine Connector, go to the Settings page of the Mediation Engine.
2. Navigate to **Network**, and then **Mediation Engine Connector**, and set the secret key.



3. Navigate to **Mediation Engines**, and then **ME Management**.
4. Click **Add**.
5. Double click the row to edit a field.
 - Node name: The name you enter forms part of the URL under which the Mediation Engine is reachable from the Mediation Engine Connector
 - Hostname or IP: Must be the HTTP URL under which the Mediation Engine's user interface is reachable
 - Shared secret: The secret must match the one you entered while preparing the probe.



6. Click **Save** when you are finished.

When adding a new Mediation Engine, a warning is displayed when the connection is made, indicating that the following settings in Mediation Engine are going to be overridden by the settings in the Mediation Engine Connector:

- Custom header for realm definition
- Headers in which to look for realm URIs
- Use user domains
- Expire passwords periodically
- Enforce stringent password rules
- User default locale

 **Important:**

When adding a new mediation engine, the list of local users on the mediation engine might be lost. Any local users and realms in the mediation engine will be replaced with the current list of users and realms that exist in Mediation Engine Connector. If there are users and realms on the mediation engine that do not exist in Mediation Engine Connector, these will be lost.

Password Settings for User Account

You can define the password settings for users using Mediation Engine Connector settings. To modify the password settings:

1. Login to Mediation Engine Connector as an admin.
2. Click **Admin** and select **Settings**.
The Settings screen appears.
3. From the **Settings** menu, click **Password Settings**.
4. To enforce users to change their password regularly, set the time period by doing the following:
 - a. Select **Force users to change their password regularly**.
 - b. Enter the number of days in the **Period in days to force password change for users with access to sensitive data** field. The default setting is 90 days.
 - c. Enter the number of days in the **Period in days to force password change for users without access to sensitive data** field. The default setting is 180 days.
 - d. Click **Save** to save the changes or click **Cancel**.

 **Note:**

The entries in these fields are applied when the user changes the password next time.

5. Enforce stringent password rules by doing the following:
 - a. Select **Enforce stringent password rules** to increase the level of security required in user passwords.

 **Note:**

A stringent password:

- Should not begin with a digit
- Must contain at least one uppercase letter
- Must contain at least one lower case letter
- Must contain at least one digit
- Must contain a special character such as @, #, \$, -, _
- Must be different from the previous password

By default, the account gets locked after three unsuccessful attempts for 15 minutes.

- b. Click **Save**.

3

Configuring Mediation Engines

This chapter describes how to set the location of Oracle Communications Mediation Engine Connector and mediation engine URLs and test the connections between each mediation engine and Mediation Engine Connector and between every two mediation engines.

Setting Mediation Engine Connector Configurations

The URL of Mediation Engine Connector represents the location of the Mediation Engine Connector instance.

Mediation engines use the password for authenticating probes at Mediation Engine Connector. The default password is oracle and should be changed by the administrator. Its value should be identical with the password set in the mediation engines (Proxy authentication secret field of the System Settings panel).

Click **Save** to commit changes to these fields.

Settings

Mediation Engines

- ME Connector
- REST API
- ME Management
- Node Connection Settings
- Connection test

Realms

- Realms
- Realm Patterns

External Devices

- SNMP Settings

User Management

- Users
- Password Settings
- External Authentication
- Default Language

ME Connector

Version:

Hostname or IP of MEC
The hostname or IP of this machine that the Mediation Engine nodes will use to connect to this machine. Typically the external IP of this machine:

10.121.1.123

Password for Mediation Engine nodes
This is used by the ME nodes to connect to this machine. This only needs to be entered here and will be propagated to the nodes:

oracle

Save Refresh

Note:

When using multiple Mediation Engines with a Mediation Engine Connector, you can still login into the Mediation Engine directly without using the Mediation Engine Connector.

Setting Mediation Engine Configurations

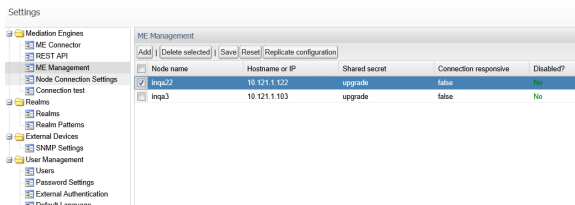
1. Navigate to the **ME Management** section.
2. Click **Add**.
3. Double click a row to edit its values.
 - Node name: The name of the mediation engine is used by Mediation Engine Connector to form the URL under which the mediation engine is reached.
 - Hostname or IP: The hostname or IP address of the mediation engine.
 - Shared secret: The password required by the mediation engine to authenticate itself while connecting to Mediation Engine Connector.

Note:

The same password needs to be set in the connecting mediation engine from the **ME Management** page in the **System Settings** dialog box.

- Disabled: Disconnect a mediation engine from Mediation Engine Connector

4. Click **Save**.



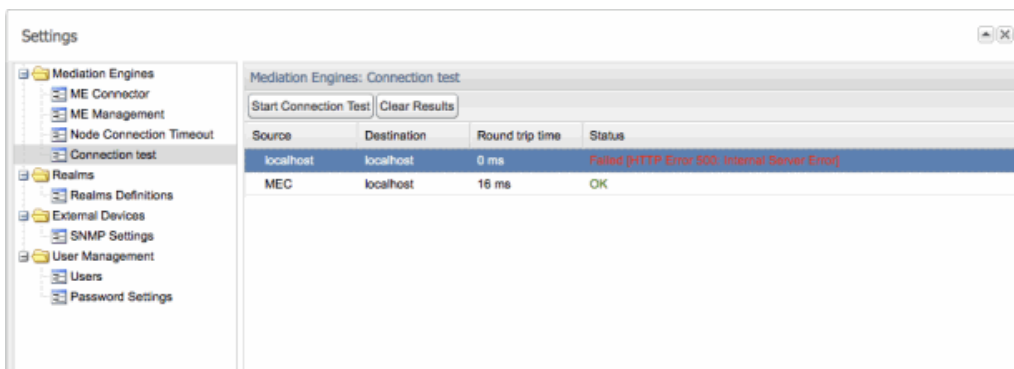
Setting a Node Connection Timeout

Node connection timeout is the timeout value for connecting to nodes, for example when replicating settings to nodes. The value is given in seconds.

Testing Connections between Mediation Engines

After the mediation engines have been configured in the ME Management page, the link between any two mediation engines (including Mediation Engine Connector) may be tested by clicking Start Connection Test button. A ping is sent by each mediation engine and by Mediation Engine Connector to each other in order to determine the link quality presented by the Round trip time value.

1. Navigate to **Mediation Engines**, and then **Connection Test**.
2. Click on a row to select a Mediation Engine.
3. Click **Start Connection Test**.



The Status is displayed as OK in case the source and destination mediation engines are connected to each other, or Failed otherwise.

Understanding Mediation Engine Connection Testing Error Codes

The following table describes some common error codes that appear in the connection testing of Mediation Engines.

Table 3-1 Mediation Engine Connection Testing Error Codes

Error Code	Brief Description	Error Description	Possible Required Actions
401	Unauthorized	A misconfiguration in the Node Secret or the Masterweb Secret.	Ensure that Secrets are correctly setup both in Mediation Engine Connector and Mediation Engine and that the same product versions are used for Mediation Engine and Mediation Engine Connector.
408	Timeout	A timeout occurs when trying to connect to the Mediation Engines.	Contact your System Administrator.
500	Internal Server Error	An unknown connection error occurs in the Node.	Contact your System Administrator.

Any other error code that appears is attributable to the local network connection error issues. Check the network connections and contact your System Administrator or Network Administrator for assistance.

Understanding Call Correlation

Message segments (call legs) of a call event can be distributed and stored on multiple mediation engines. Call correlation is the process of collecting all the distributed message segments of the call event from each mediation engine, merging them in the order of the call, and displaying the call event as a whole.

Mediation Engine Connector allows a user to monitor multiple mediation engines. Because each mediation engine contains its own list of call events, which may contain only call legs of the full call event, Mediation Engine Connector has to decide which of the call events from each mediation engine are from the same call. When passing a call event through a device monitored by multiple mediation engines, the Mediation Engine Controller locates any identical call events and consolidates the data. The consolidated call event data is displayed as one single call event flow in Mediation Engine Connector.

Note:

If any error is encountered while connecting to any of the Mediation Engine, a warning is displayed besides the Mediation Engine node selector drop-down so that the users can check the connection nodes in the Connection test settings option.

About On Demand Correlation

In the Mediation Engine Connection screen, when opening a call from an Mediation Engine node view, the Mediation Engine Connector tries to correlate the call against other calls seen in different Mediation Engines, then it is an On Demand Correlation.

In an On Demand Correlation:

- There is no real time in the inter-Mediation Engine call correlation.
- The Active Calls Mediation Engine Connector KPI is the sum of the active session from all Mediation Engines, there is no correlation behind and thus the value is higher than the real one.

The key for Mediation Engine Connector correlation is having the platform devices well defined across the Mediation Engines, assigning properly their internal/external role in the Platform Devices settings view. The call segment between an internal and an external device must be seen twice, by two Mediation Engines. There can be more than one segment between two Mediation Engines for the same call.

When a call leg happens between an internal and an external platform device, the Mediation Engine builds a hash that identifies that leg.

```
Call hash = hash ( INVITE message )
```

The Mediation Engine Connector relies on the call hashes to find the other related calls across different Mediation Engines. There is no hash between internal vs. internal or external vs external devices. Therefore, platform devices must be correctly configured or Mediation Engine Connector inter-node correlation does not occur. If two Mediation Engines don't see the same call segment the correlation is not possible. For correlation to occur, call segment must be seen twice.

To correlate Mediation Engine Connector:

1. Find the related call's Mediation Engine:
 - When opening a call from a node panel this step is not needed, since we already know the Mediation Engine node.
 - When searching for calls from a regional panel, the Mediation Engine Connector queries all the Mediation Engines to find the related Mediation Engine(s).
 - The ME where the call was found queries the neighboring nodes to check for additional call legs, using the call hashes. Furthermore, those nodes will check in another nodes, avoiding the nodes they already traversed.

Implementing Call Correlation

Mediation Engine Connector will correlate the call event when call events share a common call leg.

For each call leg that is a candidate for being the common call leg, the mediation engine runs a hash function over the INVITE message and stores it in the database together with a pointer to the call event of the call leg. A candidate call leg is a call leg where **one** of the two endpoints is a neighbor device. A neighbor device is a device configured on one of the other mediation engines, which is not marked as an **External** device.

When displaying the call event, each mediation engine is checked for an identical hash in their database. If true, the details of their call event are included in the display.

 **Note:**

In Operations Monitor, the **Mediation Engine Connector hash on P-Charging-Vector icid-value** parameter and the **Mediation Engine Connector hash search on all external legs** settings affect the generation of hashes. For more information on the **Mediation Engine Connector hash on P-Charging-Vector icid-value** parameter and the **Mediation Engine Connector hash search on all external legs** settings, see **System Settings Summary** in *Operations Monitor User's Guide*.

For example:

You have a device configuration that contains multiple sites containing one mediation engine for each site. Each site also contains several devices and all of the call's event traffic involved in one of these devices is sent to the site's mediation engine.

1. The call event leaves site A and directly enters site B, such as there is a call leg with one device on site A and one device on site B.
2. A device is configured as an Internal device on its site's mediation engine.
3. If there is direct traffic between a device on site A and a device on site B, the device on site B is configured as an External device on the mediation engine of site A. If there is direct traffic between a device on site B and a device on site A, the device on site A is configured as an External device on the mediation engine of site B.
4. Additional devices on a site can be configured as External devices on other sites mediation engines.

Configuration 1

The call event traverses five devices.

Devices DEV1 and DEV 2 are on site **A**, devices DEV 3, DEV 4, and DEV 5 are on site **B**. The following **Internal** assignments satisfy the requirement in point 2.

```

      DEV1 <--leg1--> DEV2 <--leg2--> DEV3 <--leg3--> DEV4 <--leg4--> DEV5
ME1  Internal      Internal
ME2                                     Internal      Internal      Internal

```

Configuration 2

If there is traffic from DEV2 to DEV3, add **External** devices as follows:

```

      DEV1 <--leg1--> DEV2 <--leg2--> DEV3 <--leg3--> DEV4 <--leg4--> DEV5
ME1  Internal      Internal      External
ME2                                     External      Internal      Internal

```

Because leg2 goes from DEV2 to DEV3 the above configuration satisfies the requirement in point 1 for this call event. This is a functioning configuration.

Configuration 3

This can be extended to the following, which satisfies point 4.

```

      DEV1 <--leg1--> DEV2 <--leg2--> DEV3 <--leg3--> DEV4 <--leg4--> DEV5
ME1  Internal      Internal      External      External      External
ME2  External      External      Internal      Internal      Internal

```

Configuring Multiple Mediation Engine Nodes for Call Correlation

To configure multiple mediation engine nodes for call correlation, do the following:

1. [Setting the Authentication of a Mediation Engine](#)
2. [Setting the Authentication of Mediation Engine Connector](#)
3. [Adding the Mediation Engines to the Mediation Engine Connector Node List](#)
4. [Testing the Connection](#)
5. [Setting the Platform Devices for Each Mediation Engine](#)
6. [Applying Configuration Changes](#)
7. [\(Optional\) Setting the Timeout for Call Searches](#)
8. [Viewing Correlation Calls](#)

Setting the Authentication of a Mediation Engine

Mediation engines communicate with Mediation Engine Connector using the fully qualified host name or IP address of Mediation Engine Connector and an authentication password, which is used by Mediation Engine Connector to verify the authentication of the mediation engines.

To set the authentication of a mediation engine:

1. In a web browser, log in to Mediation Engine Connector.
The Mediation Engine Connector window appears.
2. From the *user* list, select **Settings**, where user is your login name.
The Settings window appears.
3. Under **Mediation Engines**, select **ME Connector**.
The **ME Connector** page appears.
4. In the **Hostname or IP** of MEC text box, enter the host name of Mediation Engine Connector.
5. In the **Password for Mediation Engine nodes**, enter a secure password.
6. Click **Save**.

Setting the Authentication of Mediation Engine Connector

Before a connection is made between Mediation Engine Connector and a mediation engine, an authentication token (password) is used to verify the authentication of Mediation Engine Connector.

All mediation engines require their own individual authentication token. Apply the following steps to each mediation engine in your network.

To set the authentication of Mediation Engine Connector:

1. In a web browser, log in to Operations Monitor.
The Operations Monitor window appears.

2. From the user list, select **Settings**, where user is your login name.
The Settings window appears.
3. Under **System Management**, select **Systems Settings**.
The **System Settings** page appears.
4. Scroll down to the **Authentication token (shared secret between MEC and ME)** row.
5. Double-click the **Authentication token (shared secret between MEC and ME)** row.
The **Update System Setting** dialog box appears.
6. In the **Default value** text box, enter the mediation engine's authentication secret.
7. Click **Update**.
8. Under **Network**, select **Mediation Engine Connector**.
The **Mediation Engine Connector** page appears.
9. In the **Authentication token (shared secret between MEC and ME)** text box, enter the mediation engine's authentication secret.
10. Click **Update**.
11. Click **Close**, which closes the Settings window

Adding the Mediation Engines to the Mediation Engine Connector Node List

Adding the mediation engines to the Mediation Engine Connector node list makes each mediation engine available as a node in the top menu bar of Mediation Engine Connector. To add the mediation engines to the Mediation Engine Connector node list:

1. Verify that the Settings window is still open.
2. Under **Mediation Engines**, select **ME Management**.
The **ME Management** page appears.
3. In the **ME Management** toolbar, click **Add**.
4. In the **Node Name** column, enter a name for the mediation engine's node.
5. In the **Hostname or IP** column, enter the host name of the mediation engine.
6. In the **Share secret** column, enter the mediation engine's authentication secret.
7. Repeat step 3 to step 6 for all the mediation engines in your network.
8. In the **ME Management** toolbar, click **Replicate configuration**, which propagates the changes to all your mediation engines.
9. In the **ME Management** toolbar, click **Save**.

Testing the Connection

To test the connection:

1. Verify the Settings window is open.
2. Under **Mediation Engines**, select **Connection test**.
The **Connection test** page appears.

3. In the **Connection test** toolbar, click **Start Connection Test**.
4. Verify that the **Status** column displays **OK**, which confirms that the configuration is working and all the machines are reachable.
5. Click **Close**, which closes the Settings window.

Setting the Platform Devices for Each Mediation Engine

To set the platform devices for each mediation engine:

1. In a web browser, log in to Operations Monitor.
The Operations Monitor window appears.
2. From the user list, select **Settings**, where user is your login name.
The Settings window appears.
3. Under **Platform**, select **Platform Devices**.
The **Platform Devices** page appears.
4. Select the device you wish to set as an **External** device.
By default, devices are set as **Internal** devices.
5. In the **Platform Devices** toolbar, click **Toggle external**, which sets the device as an **External** device and makes it visible to other mediation engines on Mediation Engine Connector.
6. Click **Close**, which closes the Settings window.

Applying Configuration Changes

It is important to replicate the configuration after any change related to platform devices on any Mediation Engine node. When you have finished configuring your devices, apply the configuration changes.

To apply configuration changes:

1. In a web browser, log in to Mediation Engine Connector.
The Mediation Engine Connector window appears.
2. From the user list, select **Settings**, where user is your login name.
The **Settings** window appears.
3. Under **Mediation Engines**, select **ME Management**.
The **ME Management** page appears.
4. In the **ME Management** toolbar, click **Replicate configuration**, which propagates the changes to all your mediation engines.
5. In the **ME Management** toolbar, click **Save**.
6. Click **Close**, which closes the Settings window.

(Optional) Setting the Timeout for Call Searches

When searching for a call event in Mediation Engine Connector, all mediation engine nodes are queried. If a mediation engine node finds a call event, it queries the neighboring nodes to check

for additional call legs. Use the **Timeout for Mediation Engine querying system** setting to set the timeout for these queries on the mediation engine nodes
To set the timeout for call searches:

1. In a web browser, log in to Operations Monitor.
The Operations Monitor window appears.
2. From the user list, select **Settings**, where user is your login name.
3. Under **System Management**, select **Systems Settings**.
The **System Settings** page appears.
4. Scroll down the **System Settings** page until you see the **Timeout for Mediation Engine querying** row.
5. Double-click the **Timeout for Mediation Engine querying** row.
The **Update System Setting** dialog box appears.
6. In the Maximum value text box, enter a number between 5 and 120.
7. Click **Update**.

Viewing Correlation Calls

A correlated call event is only viewable when a mediation engine is accessed from Mediation Engine Connector. If you access the mediation engine directly from a web browser and not from Mediation Engine Connector, only the call events content found in the mediation engine is displayed.

To view correlation calls:

1. In a web browser, log in to Mediation Engine Connector.
The Mediation Engine Connector window appears.
2. In the top menu bar, select a mediation engine from the **Select a node** list.
The Operations Monitor window appears.
3. From the Navigation pane under **Operations**, click **Calls**.
4. In the Recent calls table, right-click the row for which to display the correlated call event's message flow.
The **Message Flow for Call: caller and callee** window appears.
where *caller* is the number that initiated the *call* and *callee* is the call number that received the call.
5. When you have finished viewing the call event's message flow, press the **ESC** key, which closes the message flow window.