

**Oracle® Communications
Diameter Signaling Router**

IDIH Operation, Administration, and Maintenance Guide

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Oracle Communications Diameter Signaling Router IDIH Operation, Administration, and Maintenance Guide

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Chapter 1

Introduction

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This chapter contains an overview of the OAM application of the Integrated Diameter Intelligence Hub. The contents include sections on the organization, scope, and audience of the documentation, as well how to receive customer support assistance.

Revision History

Date	Description
August 2011	Initial Release
June 2016	Updated to include accessibility changes

Overview

This document provides information about the OAM application of the Integrated Diameter Intelligence Hub (IDIH).

The OAM application provides functionality to configure IDIH mediation for processing and storing TDR records. It also provides configuration so a user can view TDR record in the IDIH ProTrace application.

The OAM application is only available to users logging into IDIH as **idihadmin**.

Scope and Audience

This documentation is intended for personnel who maintain operation of the DSR.

The integration of DIH capabilities into the DSR product allows for troubleshooting of issues that might be identified with the Diameter traffic that transmits on the DSR. These capabilities can supplement other network monitoring functions to help pinpoint quickly the root cause of signaling issues associated with connections, peer signaling nodes, or individual subscribers.

This manual does not describe how to install or replace software or hardware.

Manual Organization

Introduction contains general information about this document, how to contact *My Oracle Support (MOS)*, *Locate Product Documentation on the Oracle Help Center Site*.

IDIH OAM Configuration provides information about configuring the IDIH OAM application.

Related Specifications

For information about additional publications related to this document, refer to the Oracle Help Center site. See [Locate Product Documentation on the Oracle Help Center Site](#) for more information on related product publications.

My Oracle Support (MOS)

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request
2. Select **3** for Hardware, Networking and Solaris Operating System Support
3. Select one of the following options:
 - For Technical issues such as creating a new Service Request (SR), Select **1**
 - For Non-technical issues such as registration or assistance with MOS, Select **2**

You will be connected to a live agent who can assist you with MOS registration and opening a support ticket.

MOS is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity /traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at <http://www.adobe.com>.

1. Access the Oracle Help Center site at <http://docs.oracle.com>.
2. Click **Industries**.
3. Under the Oracle Communications subheading, click the **Oracle Communications documentation** link.
The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings "Network Session Delivery and Control Infrastructure" or "Platforms."
4. Click on your Product and then the Release Number.
A list of the entire documentation set for the selected product and release appears.
5. To download a file to your location, right-click the **PDF** link, select **Save target as** (or similar command based on your browser), and save to a local folder.

Chapter 2

IDIH OAM Configuration

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This chapter provides information about how to configure the IDIH OAM application.

Accessing OAM

To open OAM, follow these steps:

1. Log in to IDIH .
The IDIH Application board is displayed.
2. Click **OAM**.
The OAM home page is displayed.

Setting User Preferences on IDIH Dashboard

Once inside IDIH, a user can set User Preferences. These include:

- Time specifications (such as date format, time zone)
- Enumeration values (numerals vs. text)

Setting Time Format

Follow these steps to set the time format:

1. Click **User Preferences** on the Application board.
The User Preferences screen is displayed.
2. Click the **Date/Time** tab.
The Date/Time screen is displayed. The red asterisk denotes a required field.
Note: Use the tips on the screen to help configure the time format.
3. Enter the format for these time-related displays.
 - **Date format**
 - **Time format**
 - **Date and time fields**
4. Select the formats for these time-related displays by using the drop-down arrow.
 - **Duration fields** - how the hours, minutes, seconds, and milliseconds of the Time format is displayed
 - **Time zone**
Note: The local time zone must be chosen to get local time.
5. To reset the time-related displays to default settings, click **Reset**.
6. Click **Apply** to save settings.

Setting Mapping Preferences

The user can set the Mapping settings using the User Preferences feature.

Follow these steps to set Mapping preferences.

1. Click **User Preferences** in the Application board.
The User Preferences screen is displayed.
2. Click the **Mapping** tab.
The Mapping screen is displayed.
3. Check **Translate ENUM values** to display text instead of numerals.
Enumeration is used by TDRs to display text values instead of numeric. Rather than showing the numeral for Alarm Severity, the user interface will show the actual word, such as Major or Critical.
4. Check **IP Address to Node Name** to translate an IP Address to a textual Node Name.
5. To reset the Mapping values to the default, click **Reset**.
6. Click **Apply** to save the changes.

Overview of the IDIH OAM

The IDIH OAM application provides functionality which configures IDIH mediation for processing, storing, and viewing TDR records. The configuration to process and store records is done automatically during installation. The IDIH OAM application is accessed from the IDIH application server and is restricted to user **idihadmin**.

Actions during setup (custom settings), could be accessed post setup:

- SSO Remote Zone(s) Add/Delete
- SSO Local Zone Name Change
- SSO Domain Name Change
- TDR Field Display Changes
- AVP Display Hiding
- Network IDIH Site Configuration

Actions only by design level personnel:

- Dictionary Delete
- Dictionary Add
- Record Table Add
- Record Table Delete
- DSR Diameter I/F <-> Record Table Mapping Change

Initial Launch of the IDIH OAM Application

The available main menus are:

- Home - Navigate to other applications available from the IDIH Portal.
 - Home - IDIH Portal
 - Maintenance

- Mediation - Navigate to the various IDIH Mediation views:
 - Server
 - Record Table
 - Dictionary
 - Data Warehouse
- Application - Navigate to IDIH OAM specific application views (DSR only supported at this time):
 - DSR
- System - Navigate to IDIH (DIH) System Configuration views:
 - Single Sign On Zones (SSO)
 - AVP Hiding
 - Network IDIH
 - Apply Changes
- Help - Access to the user manual.

Auto Configuration

The configuration required for the IDIH to receive, create, and store records is done automatically during IDIH product install/deployment. No further manual configuration is required from the IDIH OAM GUI for that chain of operations to occur.

Note: Server configuration for network traces requires manual configuration.

View IDIH Mediation Server

Displays the internal configuration for the Application Server to communicate with the IDIH Mediation. Fields for display are:

- Name: There is only one preconfigured server for this release.
- Host/IP Address: Internal IP of the IDIH Mediation server.
- Port: The port on the server's internal interface used for communication by the Application server.
- Description: Free form text.
- Pending Update Applied: Indicates if an update has been applied

View IDIH Data Warehouse (DWH) Server

The Data Warehouse server contains all of the stored IDIH records from the IMP. Fields for display are:

- Name: There is only one preconfigured server for this release.
- Host/IP Address: Internal IP of the DWH server.

- Type: The type of DWH (for example, Oracle, MySQL). There is only one Oracle DWH in this release.
- Description - Free form text.

View IDIH Dictionary List

A Dictionary contains metadata that describes the format of the data contained in a Record Table (known as a data bucket). All required dictionaries are pre-configured automatically during deployment. Fields displayed are:

- Name
- Version
- Type

Modifying Dictionary Display Fields

Some attributes of dictionary fields can be modified, masked, or set not to display at all.

The display changes to show the fields for the selected dictionary are shown on the Dictionary Field Display tab.

Various fields can be changed:

- Short Name
- Description
- Name
- Enumeration
- Filterable
- Displayable - If checked, field is displayed in ProTrace output
- Mask Action
 - None - No characters are hidden, Masked Characters value remains 0 (zero - not editable)
 - All - All characters are hidden, Masked Characters value remains 0 (zero - not editable)
 - From Start - Valid Masked Characters value is 0 - 2147483647
 - From End - Valid Masked Characters value is 0 - 2147483647

How to edit fields:

- To change a non-checkbox field, double click the field and enter/change the value. Pressing return or navigating to a new field/row will automatically save your changes.
- To change a checkbox field, just click the box to toggle the value. Again, pressing return or navigating away from the field will automatically the value.
- Use the **Esc** key to discard a change while editing.

Modifying Enum Display Fields

If the dictionary field is an Enum field (**Enumeration** check box has a check), then the Short Name value for each enumeration is editable. The enumeration values will appear automatically in a 2nd grid on the page, with a header of Enum Value Mappings.

Viewing the Dictionary Content

1. Select a row and click the **View Dictionary** icon.
A read only dialog is displayed with the contents.
2. Click the **X (Cancel)** icon to close the dialog.

Deleting a Dictionary

1. Select a Dictionary row and click the **Delete** icon for that row.
Note: Only dictionaries that are not associated with a Record Table could be successfully deleted.
2. The selected Dictionary is deleted.

Record Table List

A Record Table is synonymous with a data bucket. It is the logical name of the table (bucket) in the data warehouse that holds records. In this application, the records will be Diameter TTRs or statistics about Diameter TTRs. The Record Table fields are displayed:

- Name
- Dictionary Name
- Dictionary Version
- Data Warehouse name
- Description

Add Record Table

1. Click **Record Table Add**.
2. The **Add** dialog pops up.
3. Enter a new record table name.
4. Select a dictionary.
5. Select a DWH.
6. Enter description text.
7. Click **X (Cancel)** to close the dialog and return to the list

Delete Record Table

1. Click the **Delete** icon for the desired row.
Note: Only record tables not associated with an Application (for example, DSR Diameter) could be removed.
2. The selected record table is deleted.

Application DSR Diameter Interfaces to Record Table Map List

The Diameter Record Table Map table shows which Record Table contains which Diameter I/F records. This matrix simply maps which Diameter traffic is stored into which record table (data bucket). Fields displayed are:

- Interface (for example, Rx, Base)
- Record Table name
- Data Warehouse – physical location of the stored records
- IDIH Mediation – The IDIH Mediation processing and storing the records
- Mediation Input Sources

Modify Diameter I/F to Record Table Mapping

1. Select a row, then click **Modify Mapping**.
The **Modify Diameter Map Entry** dialog is displayed.
2. Select a **Record Table** from the list, then click **Save**.

Note: Only Record Tables that have a dictionary that supports the selected interface will be in the list.

When **Save** is clicked, the changes are saved to the application server configuration database. The changes are not propagated to the Mediation component at this point and the application server OAM is considered out of sync with the Mediation's configuration.

3. An indication is displayed to the user in the GUI indicating change(s) need be applied.
4. Click on **Changes indicator** to display the **Apply Changes** window.
5. Optionally click **Extension** to display details about the change(s).
6. Click **Apply Changes** in the mediation row to send the listed change(s) to the IDIH Mediation element. Upon success, the **Apply Changes** window will close and the notification bar will disappear. If IDIH Mediation fails to process the change request, an error dialog is presented to the user and the change indicator remains.

Single Sign On (SSO) View Local and Remote Zones

A remote SSO zone entry is required to allow one click launch of the IDIH ProTrace application from the DSR OAM GUI to succeed without requiring an additional login prompt from IDIH. As part of IDIH post installation, the user will be instructed to copy the **DSR OAM Local Zone X.509 Certificate** value and paste it into an **IDIH Remote Zone X.509 Certificate** field.

Other SSO configurations that could be done are updating the **IDIH SSO Local Zone** and changing the **IDIH SSO Domain**.

Change the SSO Local Zone Value

1. Click **Edit** in the SSO Local Zone frame to enable the field for editing.
Note: Local Zone Name value is 1-15 alpha-numeric characters.
2. When finished editing, click **Save**.

Add SSO Remote Zone

1. click **Add** in the SSO Remote Zones frame.
2. Enter the **Remote Zone Name** and corresponding Certificate contents into the dialog
3. When finished editing, click **Save**.

Delete SSO Remote Zone

Select a desired row in the Remote Zone frame and click **Delete**.

View IDIH SSO Domain

Access the **SSO Parameters** tab by first selecting **Single Sign On** under the **System** menu.

Change IDIH SSO Domain

1. Click **Edit**.
2. Update the value.
3. Click **Save**.

View Hidden AVPs

1. Access the Diameter **AVP Hiding** view from the **System** menu
The AVP Hiding view displays two lists. Displayed AVPs (not hidden) and Hidden AVPs. For those AVP values that a user does not want displayed in the ProTrace application, they are shown in the Hidden AVP list.
2. The user drags an AVP from the displayed list to the hidden list for the values to then be hidden in ProTrace. To change a hidden AVP back to displayable, drag the AVP item from the hidden list to the displayed list.

Set AVP from Displayed to Hidden

1. Drag the desired AVP to the Hidden AVPs List.
2. The Hidden AVPs list is updated with the change.

Accessing OAM N-IDIH

To access Network IDIH on OAM, click **System** in the OAM toolbar. Then click **Network IDIH**.

OAM Network IDIH Configuration

From a high level standpoint, the purpose of OAM with regards to N-IDIH is to configure a list of IDIH application servers that ProTrace uses when retrieving records for a network trace.

Configuration of N-IDIH application servers (sites) in OAM is much more than a list of IP addresses. In addition to the N-IDIH sites configuration, OAM shows the connectivity status to those sites from the local site and the connectivity failure reason (if applicable). OAM also has the ability to push N-IDIH configuration to one or all sites from a management site. Finally, OAM allows for the comparison of the local site's N-IDIH site list with the N-IDIH site list of a remote site.

The default mode after install/upgrade for **Site Management** is **Disabled**.

Once **Site Management** is **Enabled**, individual sites may be configured. One of the sites is configured to be the Site Manager. The remaining sites are managed sites.

If **Site Management** is **Disabled** for a particular site, that site will have no managed sites. If site management changes to **Enabled** on a site, then the remaining sites are displayed in the Managed N-IDIH Sites panel. In addition, the **Latest Data Pushed** field indicates a push is needed.

A Site Manager can push its N-IDIH Site List to the sites it is managing. Configure all sites at the site manager. Then push the data to all Managed N-IDIH Sites.

To push data to all managed N-IDIH Sites:

1. Select a site to be Site Manager
2. Configure all sites in the Site Manager site
3. Start the Push Data action from the Managed N-IDIH Sites grid by clicking the X icon under the Push Data column in the Managed N-IDIH Sites grid.
4. As a result, all sites in the Manager's N-IDIH Site list contain the same set of sites.

Additionally, the Compare action displays a grid that contains a list of entries if the local site and the selected remote site contain different Application Server Address field values. A dialog box

N-IDIH Sites

The N-IDIH Sites grid toolbar contains the standard OAM actions **Refresh**, **Cancel Edit**, and **Add Entry**. It also contains the **Site Management** setting.

An N-IDIH site entry/row has the various attributes:

IDIH Site

- **Name** - Unique logical name of the site. User configured.
- **Application Server Address** - Unique address of the site's application server. User configured.
- **Address Type** - IPv4, IPv6, or NAME

Note: NAME (e.g. Hostname, FQDN, partial FQDN) Address Type requires the server address to be resolvable when the entry is configured.

- This means resolv.conf configuration is required on the application server.
 - This is achieved using the TPD platform platcfg tool.
 - Any changes to resolv.conf requires xih-apps service to be restarted.
 - All application servers must have similar resolv.conf configuration to resolve NAME values after data is pushed.
- **Locale** - Specifies if this is the local site or a remote site. User configured.

Configure a new N-IDIH site by clicking the + icon in the toolbar of the N-IDIH Sites panel's grid. Then enter the **Site Name**, the **Locale**, the **Application Server Address**, and optionally a **Description** in the appropriate fields.

Site Availability

- **Available** - Dynamic status displayed to the user which indicates if the local site is able to communicate to the remote site's IDIH application.
- **Reason** - If the site is not available from the local site, a message is displayed in this field:
 - Site Not Responding - The local site does not get any response from the remote site.
 - Remote Application Not Responding - There is connectivity to the remote site, but the IDIH application at the remote site is not responding.
 - Remote Record Storage Data Warehouse Not Responding - There is connectivity to the remote site IDIH application, but the data warehouse for that site is not responding.
- **Description** - User defined information about the site. User configured.
- **Last Modified** - Timestamp of the last modification to this entry or its initial creation.

Site Management

A site can be enabled as a Site Manager, making all other sites behave as managed sites. The Network IDIH configuration of the managed sites is updated and/or configured by the IDIH designated as a Site Manager, allowing configuration of all Network IDIH sites in every participating IDIH to be centralized and much easier to maintain.

In general, only one site is designated as a site manager and all remaining sites are designated as managed. However, it is possible to have one site, a few sites, or all sites be configured as site managers.

The toolbar for the N-DIH Site configuration maintains the Site Management display. The display includes information as to which entity is managing the site. The information is displayed in the form of name@application_server_address (e.g. IDIH-1@10.240.23.91). This information is derived from the N-IDIH site designated as the local site. There can be only one local site in the N-IDIH site list.

Site Management is Enabled (Managing Site)

A managing site has various behaviors:

- A new N-IDIH site can be added to the list
- The attributes of an N-IDIH site entry can be modified:
 - Name
 - Application Server Address
 - Description
- An N-IDIH entry can be deleted

Note: When an entry is deleted, an attempt is made to delete the configured N-IDIH sites at the remote site. If this attempt is unsuccessful, the failed attempt is logged and the entry is removed locally. A delete request on a remote site will also be rejected if the remote site is managed by some other site.

- View the remote sites being managed (Managed N-IDIH Sites)
- Push the current N-IDIH site configurations to the remote sites (Managed N-IDIH Sites).

Managed N-IDIH Sites

The remote sites either being updated or sending a Data Push action in the Managed N-IDIH Sites panel can only be viewed after a site has been designated as a managing site. The information displayed to the user is:

- IDIH Site Name
- Data Push Status
 - Latest Data Pushed - Indicates if any outstanding edits have not been pushed to this site or if all edits have been pushed.
 - Last Configuration Change - If the latest edits have not been pushed, displays the last change not pushed.
 - Push Fail Reason - If an attempt to push the data is made and it fails, the failed reason is displayed.
 - Last Successful Push - Displays the timestamp of the last successful data push.

Data Push Behaviors:

- Data can only be pushed if a local site is configured.
- A managed site could be updated by more than one managing site. The last managing site to push to the remote site becomes that site's manager.

The Managed N-IDIH Sites grid toolbar contains the standard OAM Refresh action. In addition, it contains the Push To All Managed Sites action.

Site Management is Disabled (Managed Site)

A managed site has various behaviors:

- Cannot add, modify, or delete an N-IDIH site
- Cannot push data to any site
- The managed N-IDIH Sites panel is not displayed

By default, site management is Disabled