Oracle® Communications
Diameter Signaling Router
MAP-Diameter Interworking Function User's Guide
Release 8.1
E87966 Revision 01

July 2017
# Table of Contents

## Chapter 1: Introduction

Revision History ................................................................. 8
Overview ................................................................................... 8
Scope and Audience .............................................................. 9
Manual Organization ............................................................... 9
Documentation Admonishments .............................................. 9
Related Publications ............................................................. 10
Locate Product Documentation on the Oracle Help Center Site ........................................... 10
Customer Training ................................................................. 11
My Oracle Support (MOS) ......................................................... 11
Emergency Response ............................................................ 12

## Chapter 2: User Interface Introduction

User Interface Organization .................................................. 13
User Interface Elements ....................................................... 14
Main Menu Options ............................................................. 15
Missing Main Menu options .................................................. 16
Common Graphical User Interface Widgets ......................... 21
Supported Browsers ............................................................. 22
System Login Page .............................................................. 22
Main Menu Icons ................................................................. 24
Work Area Displays ............................................................. 25
Customizing the Splash Page Welcome Message ................ 28
Column Headers (Sorting) ...................................................... 28
Page Controls ........................................................................... 28
Clear Field Control ............................................................... 29
Optional Layout Element Toolbar ......................................... 29
Filters ..................................................................................... 30
Pause Updates ......................................................................... 33
Max Records Per Page Controls ............................................. 33

## Chapter 3: MAP-Diameter IWF Introduction

Overview ................................................................................... 34
List of Figures

Figure 1: Oracle System Login.......................................................................................................................23
Figure 2: Paginated Table................................................................................................................................25
Figure 3: Scrollable Table................................................................................................................................26
Figure 4: Form Page.........................................................................................................................................26
Figure 5: Tabbed Pages....................................................................................................................................27
Figure 6: Tabbed Pages....................................................................................................................................27
Figure 7: Report Output....................................................................................................................................27
Figure 8: Sorting a Table by Column Header..............................................................................................28
Figure 9: Clear Field Control X.......................................................................................................................29
Figure 10: Optional Layout Element Toolbar...............................................................................................29
Figure 11: Automatic Error Notification........................................................................................................30
Figure 12: Examples of Filter Styles...............................................................................................................31
Figure 13: Diameter to MAP Requests...........................................................................................................38
Figure 14: MAP to Diameter Requests...........................................................................................................39
Figure 15: Request Processing with Multiple DSR Applications.................................................................40
List of Tables

Table 1: Admonishments ..........................................................................................................................10
Table 2: User Interface Elements ............................................................................................................15
Table 3: Main Menu Options .....................................................................................................................16
Table 4: Main Menu Icons ........................................................................................................................24
Table 5: Example Action Buttons .............................................................................................................28
Table 6: Submit Buttons ............................................................................................................................29
Table 7: Filter Control Elements ...............................................................................................................31
Table 8: DM-IWF Metadata-Generating Events .......................................................................................42
Table 9: MD-IWF Options Elements .........................................................................................................52
Table 10: Diameter Realm Elements ........................................................................................................58
Table 11: Diameter Identity GTA Elements .............................................................................................61
Table 12: GTA Range to PC Elements ......................................................................................................63
Table 13: MD-IWF Map Exception Elements ............................................................................................67
Table 14: CCNDC Mapping Elements ......................................................................................................71
Table 15: DM-IWF Options Elements ........................................................................................................75
Table 16: DM-IWF Diameter Exception Elements ....................................................................................77
Table 17: MD-IWF Admin State and Operational Status ...........................................................................82
Table 18: DM-IWF Admin State and Operational Status ...........................................................................85
Chapter 1

Introduction

Topics:

- Revision History.....9
- Overview.....9
- Scope and Audience.....9
- Manual Organization.....9
- Documentation Admonishments.....10
- Related Publications.....10
- Locate Product Documentation on the Oracle Help Center Site.....10
- Customer Training.....11
- My Oracle Support (MOS).....11
- Emergency Response.....12

This section contains an overview of the available information for the DSR MAP-Diameter Interworking application.
Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2016</td>
<td>Initial release</td>
</tr>
</tbody>
</table>

Overview

This document describes the features associated with the MAP-Diameter Interworking Function. This document will also:

- Provide a conceptual overview of the MAP-Diameter Interworking Function's purpose, architecture, and functionality
- Describe the pages and elements on the MAP-Diameter Interworking Function GUI
- Provide procedures for using the the MAP-Diameter Interworking Function interface
- Explain the organization of and how to use this document

Scope and Audience

This document is intended for anyone responsible for configuring and using the DSR MAP-Diameter Interworking Function. Users of this manual must have a working knowledge of telecommunications and network installations.

Manual Organization

Information in this manual is organized into sections:

- Introduction
- MAP-Diameter IWF Introduction
- MAP-Diameter Interworking Function Configuration
- MD-IWF Application Configuration
- DM-IWF Application Configuration
- Maintenance for MD-IWF
- Maintenance for DM-IWF

E87966 Revision 01, July 2017
Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1: Admonishments

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![DANGER](image) | Danger:  
(This icon and text indicate the possibility of personal injury.) |
| ![WARNING](image) | Warning:  
(This icon and text indicate the possibility of equipment damage.) |
| ![CAUTION](image) | Caution:  
(This icon and text indicate the possibility of service interruption.) |
| ![TOPPLE](image) | Topple:  
(This icon and text indicate the possibility of personal injury and equipment damage.) |

Related Publications

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.

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.

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.

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training:
http://education.oracle.com/communication
To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site:
www.oracle.com/education/contacts

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.
Chapter 2

User Interface Introduction

Topics:

• User Interface Organization.....14
• Missing Main Menu options.....21
• Common Graphical User Interface Widgets.....21

This section describes the organization and usage of the application's user interface. In it you can find information about how the interface options are organized, how to use widgets and buttons, and how filtering and other page display options work.
User Interface Organization

The user interface is the central point of user interaction within an application. It is a Web-based graphical user interface (GUI) that enables remote user access over the network to an application and its functions.

The core framework presents a common set of Main Menu options that serve various applications. The common Main Menu options are:

- Administration
- Configuration
- Alarms and Events
- Security Log
- Status and Manage
- Measurements
- Help
- Legal Notices
- Logout

Applications build upon this framework to present features and functions. Depending on your application, some or all of the following Main Menu options may appear on the Network Operation, Administration, and Maintenance (NOAM) GUI:

- Communication Agent
- Diameter Common
- Diameter
- UDR (User Data Repository)
- MAP-Diameter IWF
- RADIUS (Remote Authentication Dial-In User Service)
- SBR (Session Binding Repository)
- Policy and Charging
- DCA (DOIC Capabilities Announcement) Framework

The DSR System OAM GUI may present even more Main Menu options as listed below. The end result is a flexible menu structure that changes according to the application needs and features activated.

- Transport Manager
- SS7/Sigtran
- RBAR (Range Based Address Resolution)
- FABR (Full Address Based Resolution)
- GLA (Gateway Location Application)
- MAP-Diameter IWF
- RADIUS
- SBR
- Mediation
- Policy and Charging
- DCA Framework
- IPFE (IP Front End)
User Interface Introduction

Note that the System OAM (SOAM) Main Menu options differ from the Network OAM (NOAM) options. Some Main Menu options are configurable from the NOAM server and view-only from the SOAM (SOAM) server. This remains true for other applications.

User Interface Elements

*Table 2: User Interface Elements* describes elements of the user interface.

**Table 2: User Interface Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Location</th>
<th>Function</th>
</tr>
</thead>
</table>
| Identification | Top bar across the web page   | The left side of the banner provides the following information:  
| Banner         |                               | • Displays the company name,  
|                |                               | • product name and version, and  
|                |                               | • the alarm panel.  
|                |                               | The right side of the banner:  
|                |                               | • Allows you to pause any software updates.  
|                |                               | • Links to the online help for all software.  
|                |                               | • Shows the user name of the currently logged-in user.  
|                |                               | • Provides a link to log out of the GUI.                                                                                                                                                                |
| Main Menu      | Left side of screen,          | A tree-structured menu of all operations that can be performed through the user interface. The plus character (+) indicates a menu item contains subfolders.  
|                | under banners                 | • To display submenu items, click the plus character, the folder, or anywhere on the same line.  
|                |                               | • To select a menu item that does not have submenu items, click on the menu item text or its associated symbol.                                                                                     |
| Work Area      | Right side of panel           | Consists of three sections: Page Title Area, Page Control Area (optional), and Page Area.  
|                | under status                  | • Page Title Area: Occupies the top of the work area. It displays the title of the current page being displayed, date and time, and includes a link to context-sensitive help.  
|                |                               | • Page Control Area: Located below the Page Title Area, this area shows controls for the Page Area (this area is optional). When available as an option, filter controls display in this area. The Page Control Area contains the optional layout element toolbar, which displays different elements depending on which GUI page is selected. For more information, see *Optional Layout Element Toolbar*.  
|                |                               | • Page Area: Occupies the bottom of the work area. This area is used for all types of operations. It displays all options, status, data, file, and query screens. Information |
FunctionLocationElement or error messages are displayed in a message box at the top of this section. A horizontal and/or vertical scroll bar is provided when the displayed information exceeds the page area of the screen. When a user first logs in, this area displays the application user interface page. The page displays a user-defined welcome message. To customize the message, see Customizing the Login Message.

Session Banner Across the bottom of the web page The left side of the banner provides the following session information:
• The name of the machine to which the user is connected, and whether the user is connected via the VIP or directly to the machine.
• The HA state of the machine to which the user is connected.
• The role of the machine to which the user is connected.
The right side of the banner shows the alarm panel.

Main Menu Options

Table 3: Main Menu Options describes all main menu user interface options.

Note: The menu options can differ according to the permissions assigned to a user's log-in account. For example, the Administration menu options do not appear on the screen of a user who does not have administrative privileges.

Note: Some menu items are configurable only on the Network OAM and view-only on the System OAM; and some menu options are configurable only on the System OAM.

Note: Some features do not appear in the main menu until the features are activated.

Table 3: Main Menu Options

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>The Administration menu allows the user to:</td>
</tr>
<tr>
<td></td>
<td>• General Options. Configure options such as password history and expiration, login message, welcome message, and the number of failed login attempts before an account is disabled</td>
</tr>
<tr>
<td></td>
<td>• Set up and manage user accounts</td>
</tr>
<tr>
<td></td>
<td>• Configure group permissions</td>
</tr>
<tr>
<td></td>
<td>• View session information</td>
</tr>
<tr>
<td></td>
<td>• Manage sign-on certificates</td>
</tr>
<tr>
<td></td>
<td>• Authorize IP addresses to access the user interface</td>
</tr>
<tr>
<td></td>
<td>• Configure SFTP user information</td>
</tr>
<tr>
<td></td>
<td>• View the software versions report</td>
</tr>
<tr>
<td></td>
<td>• Upgrade management including backup and reporting</td>
</tr>
</tbody>
</table>
## User Interface Introduction

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authenticate LDAP servers</strong></td>
<td>• Authenticate LDAP servers</td>
</tr>
<tr>
<td><strong>Configure SNMP trapping services</strong></td>
<td>• Configure SNMP trapping services</td>
</tr>
<tr>
<td><strong>Configure an export server</strong></td>
<td>• Configure an export server</td>
</tr>
<tr>
<td><strong>Configure DNS elements</strong></td>
<td>• Configure DNS elements</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td>On the NOAM, allows the user to configure:</td>
</tr>
<tr>
<td></td>
<td>• Network Elements</td>
</tr>
<tr>
<td></td>
<td>• Network Devices</td>
</tr>
<tr>
<td></td>
<td>• Network Routes</td>
</tr>
<tr>
<td></td>
<td>• Services</td>
</tr>
<tr>
<td></td>
<td>• Servers</td>
</tr>
<tr>
<td></td>
<td>• Server Groups</td>
</tr>
<tr>
<td></td>
<td>• Resource Domains</td>
</tr>
<tr>
<td></td>
<td>• Places</td>
</tr>
<tr>
<td></td>
<td>• Place Associations</td>
</tr>
<tr>
<td></td>
<td>• Interface and Port DSCP</td>
</tr>
<tr>
<td><strong>Alarms and Events</strong></td>
<td>Allows the user to view:</td>
</tr>
<tr>
<td></td>
<td>• Active alarms and events</td>
</tr>
<tr>
<td></td>
<td>• Alarm and event history</td>
</tr>
<tr>
<td></td>
<td>• Trap log</td>
</tr>
<tr>
<td><strong>Security Log</strong></td>
<td>Allows the user to view, export, and generate reports from security log history.</td>
</tr>
<tr>
<td><strong>Status and Manage</strong></td>
<td>Allows the user to monitor the individual and collective status of Network Elements, Servers, HA functions, Databases, KPIs, system Processes, and Tasks. The user can perform actions required for server maintenance, database management, data, and ISO file management.</td>
</tr>
<tr>
<td><strong>Measurements</strong></td>
<td>Allows the user to view and export measurement data.</td>
</tr>
<tr>
<td><strong>Transport Manager</strong></td>
<td>On the SOAM, allows the user to configure adjacent nodes, configuration sets, or transports. A maintenance option allows the user to perform enable, disable, and block actions on the transport entries. This option only appears with the DSR application.</td>
</tr>
<tr>
<td><strong>Communication Agent</strong></td>
<td>Allows the user to configure Remote Servers, Connection Groups, and Routed Services. The user can perform actions to enable, disable, and block connections. Also allows the user to monitor the status of Connections, Routed Services, and HA Services.</td>
</tr>
<tr>
<td><strong>SS7/Sigtran</strong></td>
<td>On the SOAM, allows the user to configure various users, groups, remote signaling points, links, and other items associated with SS7/Sigtran; perform maintenance and troubleshooting activities; and provides a command line interface for bulk loading SS7 configuration data. This option only appears with the DSR application.</td>
</tr>
<tr>
<td>Menu Item</td>
<td>Function</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| Diameter Common (optional) | Allows the user to view or configure:  
  - Dashboard, configure on the NOAM; view on both OAMs  
  - Network Identifiers on the SOAM - MCC Ranges  
  - Network Identifiers on the NOAM - MCCMNC and MCCMNC Mapping  
  - MPs (on the SOAM) - editable Profile parameters and Profile Assignments  
  The DSR Bulk Import and Export functions are available on both OAMs for the data configured on that OAM. |
| Diameter (optional) | Allows the user to configure, modify, and monitor Diameter routing:  
  - On the NOAMP, Diameter Topology Hiding and Egress Throttle List configuration  
  - On the SOAM, Diameter Configuration, Maintenance, Reports, Troubleshooting with IDIH, AVP Dictionary, and Diameter Mediation configuration |
| UDR (User Data Repository) (optional) | Allows the user to add, edit, store, and manage subscriber and pool data. The user can also monitor the import, export, and subscribing client status. This option only appears with the UDR application. |
| RBAR (Range-Based Address Resolution) (optional) | Allows the user to configure the following Range-Based Address Resolution (RBAR) settings:  
  - Applications  
  - Exceptions  
  - Destinations  
  - Address Tables  
  - Addresses  
  - Address Resolutions  
  - System Options  
  This is accessible from the SOAM only. This option only appears with the DSR application. |
| FABR (Full Address Based Resolution) (optional) | Allows the user to configure the following Full Address Based Resolution (FABR) settings:  
  - Applications  
  - Exceptions  
  - Default Destinations  
  - Address Resolutions  
  - System Options  
  This is accessible from the SOAM only. This option is only available with the DSR application. |
| Gateway Location Application (optional) | On the SOAM, allows the user to perform configuration tasks, edit options, and view elements for:  
  - Exceptions |
<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>• Options</strong></td>
<td>GLA can deploy with Policy DRA (in the same DA-MP or a separate DA-MP). This option only appears with the DSR application.</td>
</tr>
</tbody>
</table>
| **MAP-Diameter Interworking (optional)** | On the SOAM, allows the user to perform configuration tasks, edit options, and view elements for the DM-IWF DSR Application:  
- DM-IWF Options  
- Diameter Exception  
On the NOAMP, allows the user to perform configuration tasks, edit options, and view elements for the MD-IWF SS7 Application:  
- MD-IWF Options  
- Diameter Realm  
- Diameter Identity GTA  
- GTA Range to PC  
- MAP Exception  
- CCNDC Mapping  
This option only appears with the DSR application. |
| **RADIUS (Remote Authentication Dial-In User Service) (optional)** | Allows the user to perform configuration tasks, edit system options, and view elements for:  
- Network Options  
- Message Authenticator Configuration Sets  
- Shared Secret Configuration Sets  
- Ingress Status Server Configuration Sets  
- Message Conversion Configuration Sets  
- NAS Node  
This option only appears with the DSR application. |
| **SBR (Session Binding Repository) (optional)** | Allows the user to perform configuration tasks, edit system options, and view elements for:  
- SBR Databases  
- SBR Database Resizing Plans  
- SBR Data Migration Plans  
- Database Options  
Additionally, on the NOAMP, users are allowed to perform maintenance tasks, edit options, and view elements for:  
- Maintenance  
  - SBR Database Status  
  - SBR Status  
  - SBR Database Reconfiguration Status  
This option only appears with the DSR application. |
## User Interface Introduction

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediation</td>
<td>Allows the user to make routable decisions to end the reply, drop the message, or set the destination realm.</td>
</tr>
<tr>
<td>Policy and Charging (optional)</td>
<td>On the NOAMP, allows the user to perform configuration tasks, edit options, and view elements for:</td>
</tr>
<tr>
<td></td>
<td>• General Options</td>
</tr>
<tr>
<td></td>
<td>• Access Point Names</td>
</tr>
<tr>
<td></td>
<td>• Policy DRA</td>
</tr>
<tr>
<td></td>
<td>• PCRF Pools</td>
</tr>
<tr>
<td></td>
<td>• PCRF Sub-Pool Selection Rules</td>
</tr>
<tr>
<td></td>
<td>• Network-Wide Options</td>
</tr>
<tr>
<td></td>
<td>• Online Charging DRA</td>
</tr>
<tr>
<td></td>
<td>• OCS Session State</td>
</tr>
<tr>
<td></td>
<td>• Realms</td>
</tr>
<tr>
<td></td>
<td>• Network-Wide Options</td>
</tr>
<tr>
<td></td>
<td>• Alarm Settings</td>
</tr>
<tr>
<td></td>
<td>• Congestion Options</td>
</tr>
<tr>
<td></td>
<td>Additionally on the NOAMP, users are allowed to perform maintenance tasks, edit options, and view elements for:</td>
</tr>
<tr>
<td></td>
<td>• Maintenance</td>
</tr>
<tr>
<td></td>
<td>• SBR Database Status</td>
</tr>
<tr>
<td></td>
<td>• SBR Status</td>
</tr>
<tr>
<td></td>
<td>• SBR Database Reconfiguration Status</td>
</tr>
<tr>
<td></td>
<td>• Policy Database Query</td>
</tr>
<tr>
<td></td>
<td>On the SOAM, allows the user to perform configuration tasks, edit options, and view elements for:</td>
</tr>
<tr>
<td></td>
<td>• General Options</td>
</tr>
<tr>
<td></td>
<td>• Access Point Names</td>
</tr>
<tr>
<td></td>
<td>• Policy DRA</td>
</tr>
<tr>
<td></td>
<td>• PCRFs</td>
</tr>
<tr>
<td></td>
<td>• Binding Key Priority</td>
</tr>
<tr>
<td></td>
<td>• PCRF Pools</td>
</tr>
<tr>
<td></td>
<td>• PCRF Pool to PRT Mapping</td>
</tr>
<tr>
<td></td>
<td>• PCRF Sub-Pool Selection Rules</td>
</tr>
<tr>
<td></td>
<td>• Policy Clients</td>
</tr>
<tr>
<td></td>
<td>• Suspect Binding Removal Rules</td>
</tr>
<tr>
<td></td>
<td>• Site Options</td>
</tr>
<tr>
<td></td>
<td>• Online Charging DRA</td>
</tr>
<tr>
<td></td>
<td>• OCSs</td>
</tr>
<tr>
<td></td>
<td>• CTFs</td>
</tr>
</tbody>
</table>
### Menu Item | Function
--- | ---
|  | • OCS Session State
|  | • Realms
|  | • Error Codes
|  | • Alarm Settings
|  | • Congestion Options
|  | This option only appears with the DSR application.

### DCA Framework (optional)
Allows the user to perform configuration tasks, edit system options, and view elements for DCA applications:

- Custom MEALs (Measurements, Events, Alarms, and Logs)
- General Options
- Trial MPs assignment
- Application Control
- System Options

### IPFE (optional)
Allows the user to configure IP Front End (IPFE) options and IP List TSAs. This is accessible from the SOAM server only. This option only appears with the DSR application.

### Help
Launches the Help system for the user interface

### Legal Notices
Product Disclaimers and Notices

### Logout
Allows the user to log out of the user interface

---

### Missing Main Menu options
Permissions determine which Main Menu options are visible to users. Permissions are defined through the **Group Administration** page. The default group, **admin**, is permitted access to all GUI options and functionality. Additionally, members of the **admin** group set permissions for other users.

Main Menu options vary according to the group permissions assigned to a user’s account. Depending on your user permissions, some menu options may be missing from the Main Menu. For example, Administration menu options do not appear on your screen if you do not have administrative permissions. For more information about user permissions, see **Group Administration** in the OAM section of the online help, or contact your system administrator.

---

### Common Graphical User Interface Widgets
Common controls allow you to easily navigate through the system. The location of the controls remains static for all pages that use the controls. For example, after you become familiar with the location of the display filter, you no longer need to search for the control on subsequent pages because the location is static.
Supported Browsers

This application supports the use of Microsoft® Internet Explorer 8.0, 9.0, or 10.0. It is designed to work with most modern HTML5 compliant browsers and uses both JavaScript and cookies. Please refer to the Oracle Software Web Browser Support Policy for details.

System Login Page

Access to the user interface begins at the System Login page. The System Login page allows users to log in with a username and password and provides the option of changing the password upon login. The System Login page also features a date and time stamp reflecting the time the page was last refreshed. Additionally, a customizable login message appears just below the Log In button.

The user interface is accessed via HTTPS, a secure form of the HTTP protocol. When accessing a server for the first time, HTTPS examines a web certificate to verify the identity of the server. The configuration of the user interface uses a self-signed web certificate to verify the identity of the server. When the server is first accessed, the supported browser warns the user that the server is using a self-signed certificate. The browser requests confirmation that the server can be trusted. The user is required to confirm the browser request to gain access.

Customizing the Login Message

Before logging in, the System Login page appears. You can create a login message that appears just below the Log In button on the System Login page.
Oracle System Login

Log In
Enter your username and password to log in

Username: 
Password: 

[ ] Change password

Log In

Welcome to the Oracle System Login.

Unauthorized access is prohibited. This Oracle system requires the use of Microsoft Internet Explorer 8.0, 9.0, or 10.0 with support for JavaScript and cookies.

Oracle and Java are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

Copyright © 2010, 2015, Oracle and/or its affiliates. All rights reserved.

Figure 1: Oracle System Login

1. From the Main Menu, click Administration > General Options. The General Options Administration page appears.
2. Locate LoginMessage in the Variable column.
3. Enter the login message text in the Value column.
4. Click OK or Apply to submit the information.

A status message appears at the top of the Configuration Administration page to inform you if the operation was successful.

The next time you log in to the user interface, the login message text displays.

Accessing the DSR Graphical User Interface

In DSR, some configuration is done at the NOAM server, while some is done at the SOAM server. Because of this, you need to access the DSR graphical user interface (GUI) from two servers. Certificate Management (Single Sign-On) can be configured to simplify accessing the DSR GUI on the NOAM and the SOAM.

For information on configuring Single Sign-On certificates, see OAM > Administration > Access Control > Certificate Management in the DSR online help.
After the certificates have been configured, you can log into the DSR GUI on any NOAM or SOAM, and access the DSR GUI on other servers (NOAM or other SOAMs) without having to re-enter your login credentials.

1. In the browser URL field, enter the fully qualified hostname of the NOAM server, for example https://dsr-no.yourcompany.com.
   When using Single Sign-On, you cannot use the IP address of the server.

2. When prompted by the browser, confirm that the server can be trusted.
   The System Login page appears.

3. Enter the Username and Password for your account.
   The DSR GUI for the NOAM appears.

4. To access the DSR GUI for the SOAM, open another browser window and enter the fully qualified hostname of the SOAM.
   The DSR GUI for the SOAM appears

You can toggle between the DSR GUI on the NOAM and the DSR GUI on the SOAM as you perform configuration tasks.

Main Menu Icons

This table describes the icons used in the Main Menu.

Table 4: Main Menu Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Folder Icon" /></td>
<td>Folder</td>
<td>Contains a group of operations. If the folder is expanded by clicking the plus (+) sign, all available operations and sub-folders are displayed. Clicking the minus (-) collapses the folder.</td>
</tr>
<tr>
<td><img src="image" alt="Config File Icon" /></td>
<td>Config File</td>
<td>Contains operations in an Options page.</td>
</tr>
<tr>
<td><img src="image" alt="File with Magnifying Glass Icon" /></td>
<td>File with Magnifying Glass</td>
<td>Contains operations in a Status View page.</td>
</tr>
<tr>
<td><img src="image" alt="File Icon" /></td>
<td>File</td>
<td>Contains operations in a Data View page.</td>
</tr>
<tr>
<td><img src="image" alt="Multiple Files Icon" /></td>
<td>Multiple Files</td>
<td>Contains operations in a File View page.</td>
</tr>
<tr>
<td><img src="image" alt="File with Question Mark Icon" /></td>
<td>File with Question Mark</td>
<td>Contains operations in a Query page.</td>
</tr>
</tbody>
</table>
User Interface Introduction

<table>
<thead>
<tr>
<th>Icon</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![User Icon]</td>
<td>User</td>
<td>Contains operations related to users.</td>
</tr>
<tr>
<td>![Group Icon]</td>
<td>Group</td>
<td>Contains operations related to groups.</td>
</tr>
<tr>
<td>![Task Icon]</td>
<td>Task</td>
<td>Contains operations related to Tasks</td>
</tr>
<tr>
<td>![Help Icon]</td>
<td>Help</td>
<td>Launches the Online Help.</td>
</tr>
<tr>
<td>![Logout Icon]</td>
<td>Logout</td>
<td>Logs the user out of the user interface.</td>
</tr>
</tbody>
</table>

Work Area Displays

In the user interface, tables, forms, tabbed pages, and reports are the most common formats.

**Note:** Screen shots are provided for reference only and may not exactly match a specific application's GUI.

Tables

Paginated tables describe the total number of records being displayed at the beginning and end of the table. They provide optional pagination with **First** | **Prev** | **Next** | **Last** links at both the beginning and end of this table type. Paginated tables also contain action links on the beginning and end of each row. For more information on action links and other page controls, see *Page Controls*.

![Paginated Table](image)

Figure 2: Paginated Table

Scannable tables display all of the records on a single page. The scroll bar, located on the right side of the table, allows you to view all records in the table. Scannable tables also provide action buttons that operate on selected rows. For more information on buttons and other page controls, see *Page Controls*. 

![Scrollable Table](image)
**Forms**

Forms are pages on which data can be entered. Forms are typically used for configuration. Forms contain fields and may also contain a combination of lists, buttons, and links.

![Form Page](image)

**Tabbed pages**

Tabbed pages provide collections of data in selectable tabs. Click on a tab to see the relevant data on that tab. Tabbed pages also group Retrieve, Add, Update, and Delete options on one page. Click on the relevant tab for the task you want to perform and the appropriate fields populate on the page. Retrieve is always the default for tabbed pages.

![Tabbed Page](image)
Reports

Reports provide a formatted display of information. Reports are generated from data tables by clicking Report. Reports can be viewed directly on the user interface, or they can be printed. Reports can also be saved to a text file.

User Account Usage Report

Report Generated: Fri Jun 19 19:00:56 2009 UTC
From: Unknown Network SNMP on host teks501701
Report Version: 1.0
User: guadmin

<table>
<thead>
<tr>
<th>Username</th>
<th>Date of Last Login</th>
<th>Days Since Last Login</th>
<th>Account Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>guadmin</td>
<td>2009-06-19 19:00:17</td>
<td>0</td>
<td>enabled</td>
</tr>
</tbody>
</table>

End of User Account Usage Report

Figure 7: Report Output
Customizing the Splash Page Welcome Message

When you first log in to the user interface, the splash page appears. Located in the center of the main work area is a customizable welcome message. Use this procedure to create a message suitable for your needs.

1. From the Main Menu, click Administration > General Options.
2. Locate Welcome Message in the Variable column.
3. Enter the desired welcome message text in the Value column.
4. Click OK to save the change or Cancel to undo the change and return the field to the previously saved value.

A status message appears at the top of the page to inform you if the operation was successful.

The next time you log in to the user interface, the new welcome message text is displayed.

Column Headers (Sorting)

You can sort a table by a column by clicking the column header. However, sorting is not necessarily available on every column. Sorting does not affect filtering.

When you click the header of a column that the table can be sorted by, an indicator appears in the column header showing the direction of the sort. See Figure 8: Sorting a Table by Column Header. Clicking the column header again reverses the direction of the sort.

![Figure 8: Sorting a Table by Column Header](image)

Page Controls

User interface pages contain controls, such as buttons and links, that perform specified functions. The functions are described by the text of the links and buttons.

Note: Disabled buttons are grayed out. Buttons that are irrelevant to the selection or current system state, or which represent unauthorized actions as defined in Group Administration, are disabled. For example, Delete is disabled for users without Global Data Delete permission. Buttons are also disabled if, for example, multiple servers are selected for an action that can only be performed on a single server at a time.

Table 5: Example Action Buttons contains examples of Action buttons.

Table 5: Example Action Buttons

<table>
<thead>
<tr>
<th>Action Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert</td>
<td>Inserts data into a table.</td>
</tr>
<tr>
<td>Edit</td>
<td>Edits data within a table.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes data from table.</td>
</tr>
</tbody>
</table>
### Function Action Button

<table>
<thead>
<tr>
<th>Action Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>Changes the status of a managed object.</td>
</tr>
</tbody>
</table>

Some Action buttons take you to another page.

Submit buttons, described in *Table 6: Submit Buttons*, are used to submit information to the server. The buttons are located in the page area and accompanied by a table in which you can enter information. The Submit buttons, except for Cancel, are disabled until you enter some data or select a value for all mandatory fields.

**Table 6: Submit Buttons**

<table>
<thead>
<tr>
<th>Submit Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>Submits the information to the server, and if successful, returns to the View page for that table.</td>
</tr>
<tr>
<td>Apply</td>
<td>Submits the information to the server, and if successful, remains on the current page so that you can enter additional data.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Returns to the View page for the table without submitting any information to the server.</td>
</tr>
</tbody>
</table>

### Clear Field Control

The clear field control allows you to clear the value from a list. The clear field control is available only on some lists.

Click the X next to a list to clear the field.

![Clear Field Control X](image)

**Figure 9: Clear Field Control X**

### Optional Layout Element Toolbar

The optional layout element toolbar appears in the Page Control Area of the GUI.

![Optional Layout Element Toolbar](image)

**Figure 10: Optional Layout Element Toolbar**

The toolbar displays different elements depending on which GUI page is selected. The elements of the toolbar that can appear include:

- **Filter** – Allows you to filter data in a table.
- **Errors** – Displays errors associated with the work area.
- **Info** – Displays information messages associated with the work area.
- **Status** – Displays short status updates associated with the main work area.
- **Warning** – Displays warnings associated with the work area.
Notifications

Some messages require immediate attention, such as errors and status items. When new errors occur, the Errors element opens automatically with information about the error. Similarly, when new status items are added, the Status element opens. If you close an automatically opened element, the element stays closed until a new, unacknowledged item is added.

![Figure 11: Automatic Error Notification](image)

**Note:** Viewing and closing an error does not clear the Errors element. If you reopen the Errors element, previously viewed errors are still in the list.

When new messages are added to Warning or Info, the styling of the element changes to indicate new messages are available. The styling of the Task element changes when a task changes state (such as, a task begins or ends).

Opening an Element in the Toolbar

Use this procedure to open an element in the optional layout element toolbar.

1. Click the text of the element or the triangle icon to open an element.
   The selected element opens and overlays the work area.
2. Click X to close the element display.

Filters

Filters are part of the optional layout element toolbar and appear throughout the GUI in the Page Control Area. For more information about optional layout element toolbar functionality, see *Optional Layout Element Toolbar*.

Filters allow you to limit the data presented in a table and can specify multiple filter criteria. By default, table rows appear unfiltered. Three types of filters are supported, however, not all filtering options are available on every page. The types of filters supported include:

- **Network Element** – When enabled, the Network Element filter limits the data viewed to a single Network Element.

  **Note:** Once enabled, the Network Element filter affect all pages that list or display data relating to the Network Element.

- **Collection Interval** – When enabled, the collection interval filter limits the data to entries collected in a specified time range.

- **Display Filter** – The display filter limits the data viewed to data matching the specified criteria.
Once a field is selected, it cannot be selected again. All specified criteria must be met in order for a row to be displayed.

The style or format of filters may vary depending on which GUI pages the filters are displayed. Regardless of appearance, filters of the same type function the same.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>Displays an exact match.</td>
</tr>
<tr>
<td>!=</td>
<td>Displays all records that do not match the specified filter parameter value.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Displays all records with a parameter value that is greater than the specified value.</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Displays all records with a parameter value that is greater than or equal to the specified value.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Displays all records with a parameter value that is less than the specified value.</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Displays all records with a parameter value that is less than or equal to the specified value.</td>
</tr>
<tr>
<td>Like</td>
<td>Enables you to use an asterisk (*) as a wildcard as part of the filter parameter value.</td>
</tr>
<tr>
<td>Is Null</td>
<td>Displays all records that have a value of Is Null in the specified field.</td>
</tr>
</tbody>
</table>

Note: Not all filterable fields support all operators. Only the supported operators are available for you to select.

Filtering on the Network Element

The global Network Element filter is a special filter that is enabled on a per-user basis. The global Network Element filter allows a user to limit the data viewed to a single Network Element. Once enabled, the global Network Element filter affects all sub-screens that display data related to Network Elements. This filtering option may not be available on all pages.
1. Click **Filter** in the optional layout element toolbar.
2. Select a Network Element from the **Network Element** list.
3. Click **Go** to filter on the selection or click **Reset** to clear the selection.
4. For data tables that support compound filtering, click **Add** to add another filter condition and repeat steps 2 through 4.
   Multiple filter conditions are joined by an AND operator.

Records are displayed according to the specified criteria.

**Filtering on Collection Interval**

The Collection Interval filter allows a user to limit the data viewed to a specified time interval. This filtering option may not be available on all pages.

1. Click **Filter** in the optional layout element toolbar.
2. Enter a duration for the **Collection Interval** filter.
   The duration must be a numeric value.
3. Select a unit of time from the list.
   The unit of time can be seconds, minutes, hours, or days.
4. Select **Beginning** or **Ending** from the list.
5. Click **Go** to filter on the selection, or click **Reset** to clear the selection.

Records are displayed according to the specified criteria.

**Filtering Using the Display Filter**

Use this procedure to perform a filtering operation. This procedure assumes you have a data table displayed on your screen with the Display Filter field. This process is the same for all data tables. However, all filtering operations are not available for all tables.

**Note:** Display Filter does not support compound filtering. For example, you cannot filter on both severity and a server name. Try to filter on a single filter criteria, such as the server hostname for server-scoped metric cells; or the application name for St- and NE-scoped metric cells. You can also sort by congestion level (descending) to help improve your filter.

1. Click **Filter** in the optional layout element toolbar.
2. Select a field name from the **Display Filter** list.
   This selection specifies the field in the table that you want to filter on. The default is **None**, which indicates that you want all available data displayed.
3. Select an operator from the operation selector list.
4. Enter a value in the value field.
   This value specifies the data that you want to filter on. For example, if you specify Filter=Severity with the equals (=) operator and a value of MINOR, the table would show only records where Severity=MINOR.
5. Click **Go** to filter on the selection, or click **Reset** to clear the selection.

Records are displayed according to the specified criteria.

**Note:** PCA was known as PDRA and may still be seen in some filtering.
Pause Updates

Some pages refresh automatically. Updates to these pages can be paused by selecting the Pause updates checkbox. Uncheck the Pause updates checkbox to resume automatic updates. The Pause updates checkbox is available only on some pages.

Max Records Per Page Controls

Max Records Per Page is used to control the maximum number of records displayed in the page area. If a page uses pagination, the value of Max Records Per Page is used. Use this procedure to change the Max Records Per Page.

1. From the Main Menu, click Administration > General Options.
2. Change the value of the MaxRecordsPerPage variable.
   
   Note: Maximum Records Per Page has a range of values from 10 to 100 records. The default value is 20.

3. Click OK or Apply.

   OK saves the change and returns to the previous page.

   Apply saves the change and remains on the same page.

The maximum number of records displayed is changed.
Chapter 3

MAP-Diameter IWF Introduction

Topics:

- Overview.....35
- Diameter-to-MAP Transactions.....35
- MAP-to-Diameter Transactions.....36
- Address Translation.....37
- Request Routing with Chained DSR Applications.....39
- Transaction Metadata Recording for Integrated DIH (IDIH).....41

This section introduces applications, key concepts, and basic functionality related to the MAP-Diameter Interworking Function.

The MAP-Diameter Interworking Function is a feature of the Diameter Signaling Router (DSR) product, which is part of the Oracle product line of signaling products. The MAP-Diameter Interworking Function allows the DSR to support the bi-directional interworking between Diameter and SS7 (GSM MAP) messages.
Overview

The DSR MAP-Diameter Interworking Function feature allows the DSR to support bi-directional interworking between Diameter and SS7-MAP messages. This functionality is carried out by two applications: DM-IWF and MD-IWF.

DM-IWF is a DSR application that runs on each DA-MP. It manages Diameter transactions received from the Diameter network via DRL and MAP transactions received from SS7-MPs.

MD-IWF is a TCAP application which runs on each SS7-MP. It manages MAP transactions received from the SS7 network (via TCAP) and Diameter transactions received from DA-MPs.

The MAP-Diameter Interworking assumes things regarding the relationship between the two applications.

- All MAP-Diameter message and parameter interworking is performed on the SS7-MP.
- DM-IWF and MD-IWF exchange Diameter messages using ComAgent. No SS7/MAP message are exchanged between DA-MPs and SS7-MPs.
- When a transaction is initiated by either a DM-IWF or MD-IWF instance, it creates a Transaction ID which is unique to the DM-IWF/MD-IWF instance which is initiating the inter-MP transaction. The Transaction ID is sent that correlates the messages/responses exchanged between DM-IWF and MD-IWF associated with a transaction. When DM-IWF or MD-IWF sends a response to the request, it echoes the transaction ID from the Request to allow the recipient to correlate the response with the request it had previously sent.
- DM-IWF and MD-IWF will use ComAgent's Enhanced Routed Service for load sharing Request messages to MD-IWFs and DM-IWFs respectively. ComAgent Enhanced Routed Service self learns about the topology changes and enables deployment of transparent, elastic and scalable solutions.
- In this document, any reference to DM-IWF Routed Service or MD-IWF Routed Service implies ComAgent's Enhanced Routed Service for internal message exchange. It also indicates that the growth/degrowth of SS7-MPs and DA-MPs is non-impacting to MD-IWF and DM-IWF application instances and ensures guaranteed delivery.

Note: DM-IWF Routed Service and MD-IWF Routed Service is displayed as DMIWFSvc and MDIWFSsvc respectively on the ComAgent maintenance screens. Each DM-IWF instance acts as a service provider for the DM-IWF Routed Service and as a service user for the MD-IWF Routed Service, and vice versa.

Note: Service users and providers can now dynamically register against the Routed Service. Service Providers publish their own provider status. ComAgent Routed Service accounts for each registered service provider's status and congestion level when selecting service providers to distribute Requests.

Diameter-to-MAP Transactions

A Diameter-to-MAP transaction is a Diameter transaction that is initiated by a Diameter Node that is routed to a DSR for MAP-Diameter interworking. The operator is required to configure DRL ART rules which associate a Request message with the DM-IWF application.
Processing Diameter-to-MAP Transactions

The processing of a Diameter-to-MAP transaction involves various steps:

1. When DM-IWF receives a Request from DRL, it allocates a Pending Transaction Record (DM-IWF-PTR), starts a DM-IWF Pending Answer Timer and then forwards the unmodified Diameter Request message to a MD-IWF using the services of ComAgent.

2. When MD-IWF receives a Request message from a DM-IWF, it determines whether it can process the transaction and sends either a Success or Failure response to the ComAgent transaction.

3. If MD-IWF can process the transaction, it allocates a MD-IWF-PTR for storing the DA-MP’s address and Transaction ID, converts the Diameter Request message into a MAP request message and attempts to open a MAP dialogue to the destination SS7 Node (such as HSS).

4. When MD-IWF receives the final MAP ack message closing the MAP dialogue, MD-IWF converts the MAP ack message to a Diameter Answer message. The Diameter Answer message and Transaction ID stored in the MD-IWF-PTR are sent to the DM-IWF which initiated the transaction using the services of ComAgent and the MD-IWF-PTR is deallocated.

5. When DM-IWF receives an Answer response, it uses the Transaction ID to find the DM-IWF-PTR for the transaction. If a DM-IWF-PTR is found, then DM-IWF forwards the Answer back to DRL for backward routing to the Diameter Node which initiated the transaction and the DM-IWF-PTR is deallocated. Otherwise, DM-IWF will discard the Answer.

Note: If ComAgent (DM-IWF Routed Service) encounters an error or fails to receive a reliable acknowledgment from the SS7-MP to which the Request was originally sent, ComAgent can retry sending the Request to another MD-IWF (SS7-MP).

MAP-to-Diameter Transactions

A MAP-to-Diameter transaction starts as a MAP procedure that is initiated by a SS7 Node that is routed to a DSR SS7-MP for MAP-Diameter interworking.

Processing MAP-to-Diameter Transactions

The processing of a MAP-to-Diameter transaction involves various steps:

1. When an MD-IWF receives a MAP request message from an SS7 Node attempting to open a MAP dialogue that MD-IWF is able to process, it allocates a MD-IWF Pending Transaction Record (MD-IWF-PTR) for storing the MAP query message(s) for the MAP procedure.

2. MD-IWF converts one or more MAP request messages into a single Diameter Request message, starts a Diameter Transaction Timer and then forwards the Diameter Request message to a DM-IWF using the services of ComAgent.

3. When DM-IWF receives a Request message from an MD-IWF, it allocates a DM-IWF Pending Transaction Record (DM-IWF-PTR) for storing MD-IWF’s address (used for sending the Answer response), and attempts to forward the Diameter Request message to DRL. DM-IWF does not start a DM-IWF Pending Answer Timer as the ownership of the transaction is transferred to DRL.

4. If DM-IWF successfully enqueues the Diameter Request message on DRL’s Request Message Queue, it will send a Success Response to the ComAgent reliable transfer transaction. This frees the
ComAgent transaction. Otherwise, DM-IWF sends a Failure Response to the ComAgent transaction and DM-IWF processing of the transaction is complete.

5. When an Answer is received from the peer Diameter node, it is received by DRL and forwarded to DM-IWF on the DA-MP. When DM-IWF receives a Diameter Answer message response from DRL, it forwards the Answer message to the MD-IWF SS7-MP which initiated the transaction and DM-IWF processing of the transaction is complete.

6. When MD-IWF receives the Diameter Answer response, it uses the Transaction ID to find the MD-IWF-PTR for the transaction. If a MD-IWF-PTR is found, it converts the Diameter Answer message into a MAP ack message response and the MAP dialogue is closed and the MD-IWF-PTR is deallocated. Otherwise, MD-IWF will discard the Answer.

Address Translation

Address Translation is the process by which Diameter routing information is mapped to an SS7 network (for Diameter originated requests) or SS7 signaling data is mapped to a Diameter network (for MAP originated requests).

Diameter requests are mapped to the SS7 network by using the Destination-Host and Destination-Realm AVPs and a series of table look ups to derive an MTP3 layer OPC and DPC as well as the SCCP Called Party Address. The Destination-Host AVP is optional. If the Destination-Host is absent, the IMSI value from the User-Name AVP is used instead. The Origin-Host and Origin-Realm for the Diameter answer are derived from the SCCP Calling Party Address.
Figure 13: Diameter to MAP Requests

MAP requests are translated into the Diameter network by using the SCCP Calling Party Address to derive an Origin-Host and Origin-Realm AVP and using the SCCP Called Party Address to derive a Destination-Host and Destination-Realm AVP for the outgoing Diameter request. Address data from the MAP request is stored away for the life of the MAP Dialogue and used for populating the address information in the MAP response.
Request Routing with Chained DSR Applications

Application Chaining is a method for invoking multiple DSR Applications in sequence on the same DSR.

*Figure 15: Request Processing with Multiple DSR Applications* shows an example of Request processing for two DSR Applications executing in sequence. The Application Route Table in this example is executed three times:

1. When the Request enters the system at (1)
2. When DSR Application 1 sends the Request back to the Diameter Routing Function at (3)
3. When DSR Application 2 sends the Request back to the Diameter Routing Function at (5)
At (5) there is no matching Application Routing Rule for the Request, the Request is routed to Peer Route Table processing.

![Figure 15: Request Processing with Multiple DSR Applications](image)

- **Application Route Table (ART)**

  Application Route Tables are used for routing Request messages to DSR Applications. An ART contains a prioritized list of user-configurable Application Routing Rules. Each Application Routing Rule associates Request message content with a DSR Application.

  An ART is searched when a Request message is received from a Peer Node or a DSR Application. Searching an ART when a Request message is received from a DSR Application allows the operator to route the ingress Diameter transaction to multiple DSR Applications in sequence. The operator can create multiple ARTs to assign an ART to a Request message based upon a set of user-defined criteria.

- **Application Routing Rules**

  An Application Route Table (ART) consists of a set of prioritized Application Routing Rules that the Diameter Routing Function searches with the content of a Request message, to determine whether the message should be forwarded to a DSR Application for processing.

  One ART is searched each time a Request message is received from a Peer Node or a DSR Application. This method allows forwarding a Diameter transaction to one or more DSR Applications for processing.

  However, the Diameter Routing Function does not allow a DSR Application to process a Diameter transaction more than once. (The Diameter Routing Function internally keeps track of which DSR Applications have already processing the message.) When the Diameter Routing Function is searching an ART and encounters an Application Routing Rule that is associated with a DSR Application that has already processed the transaction, that Application Routing Rule will be bypassed.

  The system always contains a Default ART that cannot be removed using the configuration GUI. The user can create additional ARTs and then define, through configuration, which ART will be searched based on ART precedence selection rules.

  Each time that a Request message is received from a Peer Node or DSR Application, the Diameter Routing Function selects an ART to search based on the ART precedence selection rules (highest to lowest priority):
1. The ART provided by the DSR Application, if it exists (applies only when the Request message was received from a DSR Application)
2. The ART assigned to the ingress Peer Node from which the Request message was received, if it exists
3. The ART assigned to the Diameter Application ID in the Request message header, if it exists
4. The Default ART

The order of DSR Applications which can process an ingress Request message is determined by operator configuration of one or more Application Route Tables.

- Each time the Diameter Routing Function receives a Request message from a Peer Node or DSR Application, it searches the Application Route Tables to determine where to forward the message.
- The highest priority Application Routing Rule matched defines where to forward the message.
- If no Application Routing Rule match is found, the Diameter Routing Function begins Relay Agent routing to an upstream Peer Node.

When FABR or RBAR and the Diameter-MAP Interworking (DM-IWF) applications run in the same DA-MP, the same Diameter Request message can be processed by both applications.

For a Diameter-to-MAP Request message received from a Diameter Peer that needs to be processed by FABR or RBAR followed by DM-IWF, two Application Routing Rules are needed; one for routing the message first to FABR or RBAR and the second one to route the message to DM-IWF after FABR or RBAR processing is completed.

- After the Request is received from the Peer, the Diameter Routing Function searches the Application Routing Rules for the highest priority matching rule. This rule contains the FABR or RBAR application name, and will result in the Request being routed to FABR or RBAR.
- FABR or RBAR processes the message and returns it to the Diameter Routing Function.
- The Diameter Routing Function searches the Application Routing Rules for the highest priority matching rule (excluding all rules that would result in routing of the Request to FABR or RBAR again). This rule contains the DM-IWF application name, and will result in the Request being routed to DM-IWF.
- DM-IWF processes the message and sends it to an MD-IWF application (SS7-MP).

For a MAP-to-Diameter Request message received by DM-IWF from an MD-IWF application (SS7-MP) that needs to be processed by FABR or RBAR after DM-IWF processing, a single Application Routing Rule is needed for routing the message to FABR or RBAR after DM-IWF processing is completed.

- DM-IWF processes the message and sends it to the Diameter Routing Function.
- The Diameter Routing Function searches the Application Routing Rule for the highest priority matching rule (excluding all rules that would cause routing of the Request to DM-IWF again). This rule contains the FABR or RBAR application name, and will result in the Request being routed to FABR or RBAR for processing.
- FABR or RBAR returns the message to the Diameter Routing Function to complete the routing process.

**Transaction Metadata Recording for Integrated DIH (IDIH)**

Integrated DIH (IDIH) can be used to capture detailed information about selected Diameter transactions, and transmit this information to DIH for further analysis.
The Diameter Routing Function and invoked DSR Applications record detailed information about each Diameter transaction - called transaction metadata. Each metadata record describes an important event in the lifetime of a Diameter transaction. Metadata appears in the Trace Transaction Record (TTR) in the order that the metadata-generating events actually occurred. Together, all of the metadata records combine to document the processing performed on the entire transaction, and can later be used to provide diagnostic information when performing troubleshooting. Metadata is recorded to a TTR for each transaction so that, even if the transaction is selected to be sent to DIH at an Answer Troubleshooting Trigger Point (TTP-IA or TTP-EA), the metadata for all of the messages in the transaction will be present.

The functions of IDIH are described in the Integrated DIH User’s Guide and Help.

MD-IWF does not support IDIH.

DM-IWF will record the Application-specific metadata events described in Table 8: DM-IWF Metadata-Generating Events.

### Table 8: DM-IWF Metadata-Generating Events

<table>
<thead>
<tr>
<th>DM-IWF Event</th>
<th>Metadata Fields</th>
<th>When Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter-to-MAP Transactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sent Egress Request to SS7-MP</td>
<td>SS7-MP Request sent</td>
<td>App Data</td>
</tr>
<tr>
<td>D-to-M Request discarded</td>
<td>Message Discarded</td>
<td>App Data</td>
</tr>
<tr>
<td>Ingress Answer received from SS7-MP</td>
<td>SS7-MP Answer received</td>
<td>App Data</td>
</tr>
<tr>
<td>A received Answer did not match a pending transaction</td>
<td>SS7-MP Answer Matching Failed</td>
<td>App Data</td>
</tr>
<tr>
<td>DM-IWF Routing Exception</td>
<td>DM-IWF Routing Exception</td>
<td>App Data</td>
</tr>
</tbody>
</table>
## MAP-Diameter IWF Introduction

<table>
<thead>
<tr>
<th>DM-IWF Event</th>
<th>Metadata Fields</th>
<th>When Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-IWF Routing Exception</td>
<td>Type: MD-IWF Routing Exception Scope: App Data Instance Data: None</td>
<td>When DM-IWF applies Apply Unavailability Action routing exception on behalf of MD-IWF.</td>
</tr>
</tbody>
</table>

### MAP-to-Diameter Transactions

<table>
<thead>
<tr>
<th>Ingress Request received from SS7-MP</th>
<th>SS7-MP Request received</th>
<th>App Data</th>
<th>Transaction ID (such as 45631) SS7-MP address (such as 47.240.10.3) Payload</th>
<th>Immediately after a Request is received from SS7-MP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egress Answer sent to SS7-MP</td>
<td>SS7-MP Answer Sent</td>
<td>App Data</td>
<td>Transaction ID (such as 45631) SS7-MP address (such as 47.240.10.3) Payload</td>
<td>Immediately after DM-IWF sends a Diameter Answer to ComAgent successfully.</td>
</tr>
<tr>
<td>D-to-M Answer discarded</td>
<td>Message Discarded</td>
<td>App Data</td>
<td>Discard Reason (such as Failed to create IWF Answer)</td>
<td>DM-IWF discards an Answer message received from DRL.</td>
</tr>
</tbody>
</table>
Chapter 4

MAP-Diameter Interworking Function Configuration

Topics:

- MAP-Diameter IWF Configuration Overview..45
- Pre-Configuration Activities....45
- Post-Configuration Activities.....49

The MAP-Diameter IWF > Configuration GUI pages for MAP-Diameter components provide fields for entering the information needed to manage MAP-Diameter configuration in the DSR.
MAP-Diameter IWF Configuration Overview

The MAP-Diameter IWF > Configuration GUI pages for MAP-Diameter components provide fields for entering the information needed to manage MAP-Diameter configuration in the DSR.

The DSR 3-tiered Operations, Administration, and Maintenance (OAM) topology is required for the MAP-Diameter Interworking Function application. 3-tiered OAM topology consists:

- A pair of NOAM servers running in active/standby redundancy
  OAM configuration is performed on the NOAM.
  Network-wide MAP-Diameter IWF configuration is performed on the NOAM.
- A pair or triplet of SOAM servers at each site running in active/standby, or active/standby/spare redundancy
  Diameter protocol configuration is done on the SOAM.
  Most of the OAM configuration components are viewable on the SOAM.
  Most DSR Application configuration is done on the SOAM.
  Site-specific configuration for MAP-Diameter Interworking Function is performed on the SOAM.
- A set of MP servers, which can host signaling protocol stacks (for example, DA-MPs).
  The MD-IWF application is configured on the NOAM. The DM-IWF application is configured on the SOAM.

An optional pair of Disaster Recovery NOAMs can be configured to manually take over in the event of loss of both the active and standby NOAMs

The three tiers allow configured data to be replicated down to the MP servers, and measurements, events, and alarms to be merged up to the OAM servers.

3-tiered topology allows administrators to access all DSR GUI pages from a single sign-on. An administrator can access the DSR SOAM when logged into the DSR NOAM, without needing to re-enter login credentials.

Pre-Configuration Activities

Before MAP-Diameter IWF configuration can be performed, various activities need to be performed in the system:

- Verify that the NOAM configuration is complete for MAP-Diameter IWF:
  - Server Groups
    Select Configuration > Server Groups.
    Click Report to generate a report about the configured Resource Domains
    Click Print to print the report, or Save to save the report as a text file.
  - Places

E87966 Revision 01, July 2017 45
MAP-Diameter Interworking Function Configuration

Select **Configuration** > **Places**.

Click **Report** to generate a report about the configured Places.

Click **Print** to print the report, or **Save** to save the report as a text file.

- Gather component information that is required for Diameter, Diameter Common, and MAP-Diameter IWF configuration, including component item naming conventions and names, IP addresses, hostnames, and numbers of items to be configured.
- Configure Diameter Common components that are required for MAP-Diameter IWF configuration. See **Diameter Common Configuration for MAP-Diameter IWF** for more information.
- Configure Diameter Configuration components that are required for MAP-Diameter IWF configuration. See **Diameter Configuration for DM-IWF** for more information.

**Diameter Common Configuration for MAP-Diameter IWF**

Diameter Common configuration must be done before Map-Diameter IWF configuration can be performed.

Use the explanations and procedures in the Diameter Common configuration help and the Diameter Common User’s Guide to complete the Diameter Common configuration, including the Diameter Common components needed for use with Map-Diameter IWF.

**SOAM Diameter Common Configuration**

Diameter Common configuration for MCC Ranges Network Identifiers and MP Profile assignment for Map-Diameter IWF is done from the SOAM GUI in a 3-tiered DSR topology.

1. **MPs**

   Navigate to **Diameter Common** > **MPs** > **Profile Assignments** and verify the correct DA-MP Profiles and SS7 MP profiles have been assigned for Map-Diameter IWF DA-MPs and SS7-MPs shown in the DA-MP and SS7-MP lists. If assignments need to be made or changed, navigate to **Diameter Common** > **MPs** > **Profile Assignments** to assign the correct MP Profiles.

**NOAM Diameter Common Configuration**

Diameter Common configuration for MCCMNC and MCCMNC Mapping Network Identifiers for Map-Diameter IWF is done from the NOAM GUI in a 3-tiered DSR topology.

1. **Navigate to** **Diameter Common** > **Network Identifiers** > **MCCMNC [Insert]** to configure MCCMNC entries.
2. **Navigate to** **Diameter Common** > **Network Identifiers** > **MCCMNC Mapping [Insert]** to configure MCCMNC Mapping entries using the configured MCCMNC entries.

**Diameter Configuration for DM-IWF**

Diameter configuration must be done before DM-IWF configuration can be performed.

All Diameter Configuration for DM-IWF is done using the SOAM GUI in a 3-tiered DSR topology.

Use the explanations and procedures in the Diameter Configuration help and the Diameter User’s Guide to complete the Diameter configuration, including the Diameter components needed for use with MAP-Diameter IWF.
1. Application Ids
   Use the Diameter > Configuration > Application Ids [Insert] page to define an Application Id from the Application ID Value pulldown list for each DSR application that will be used by DM-IWF in the system.

2. Command Codes
   Diameter Command Codes must be configured prior to using them in DM-IWF. Use the Diameter > Configuration > Command Codes [Insert] page to configure Diameter Command Codes.
   Configure any Command Codes that need to be handled by DM-IWF. The Command Codes are associated with the Diameter Applications supported by the Diameter Servers (for example, HSS, PCRF, OCFS, OCS, or AAA) which are the destination of Diameter Requests being routed by DM-IWF. For example, the combination of Application Id = S6a and Command Code = ULR/ULA might be relevant for HSS.

3. Local Nodes
   Use the Diameter > Configuration > Local Nodes [Insert] page to configure the DM-IWF DA-MPs as Local Nodes in the system.
   The pulldown list of IP Addresses contains the XSI addresses configured on DSR MP Servers.

4. Peer Nodes
   Use the Diameter > Configuration > Diameter > Configuration > Peer Nodes [Insert] page to configure PCEFs, AFs, BBERFs, and any other types of nodes as Peer Nodes to the DM-IWF DA-MPs in the system

5. Connections
   Use the Diameter > Configuration > Connections [Insert] page to configure new connections

6. Route Groups
   Use the Diameter > Configuration > Route Groups [Insert] page to configure new route groups

7. Route Lists
   Use the Diameter > Configuration > Route Lists [Insert] page to configure new route lists

8. Peer Route Tables
   Use the Diameter > Configuration > Peer Route Tables [Insert] page to configure new Peer Route Tables if needed,

9. Peer Routing Rules
   Peer Routing Rules can be added to the Default Peer Route Table (PRT) or to new Peer Route Tables.

10. Application Route Tables
    Either use the default Application Route Table (always available), or use the Diameter > Configuration > Application Route Tables [Insert] page to configure one or more Application Route Tables in addition to the default. Application Route Tables contain Application Routing Rules that direct messages to DM-IWF and other DSR Applications.

11. Application Routing Rules
On the **Diameter > Configuration > Application Route Tables** page, select an **Application Route Table Name** and click **View/Edit Rules**.

Use the **Viewing Rules for Application Route Table** page to insert or edit an **Application Routing Rule**. Configure the ART rules by ensuring the Diameter Application ID is supported (for example S6a, S6d, S13 or, S13a) and ensuring the DSR Application ID for these Requests is configured as DM-IWF, so that these Requests get forwarded to DM-IWF.

**Transport Manager Configuration**

To properly use the MD-IWF application, it is necessary to configure the Transport Manager from the **Transport Manager > Configuration** GUI pages.

**Note:** Transport Manager must be configured prior to the configuration of the SS7 Networking.

Transport Manager configuration is performed on an Active SOAM.

The **Transport Manager > Configuration** GUI pages provide fields for entering the information needed to configure Adjacent Nodes, Configuration Sets, and Transports (SCTP associations with remote hosts over an underlying IP network).

Configured Adjacent Nodes and Configuration Sets are required in the configuration of Transports. Therefore, Adjacent Nodes and Configuration Sets must be configured before Transports can be configured.

For more detailed information on how to perform these tasks, refer to the **Transport Manager User’s Guide** and help.

**SS7 Network Configuration**

**Note:** Transport Manager must be configured prior to the configuration of the SS7 Networking.

To properly use the MD-IWF application, it is necessary to configure the SS7 Networking from the **SS7/Sigtran > Configuration** SOAM GUI pages.

The SS7 Networking components to be configured are:

- Adjacent Server Groups
- Local Signaling Points
- Local SCCP Users
- Remote Signaling Points
- Remote MTP3 Users
- Link Sets
- Links
- Routes
- SCCP Options

For more detailed information on how to perform these tasks, refer to the **SS7/Sigtran User’s Guide** and help.
Post-Configuration Activities

After MAP-Diameter Interworking configuration is complete, various activities need to be performed to make the MD-IWF and DM-IWF applications fully operational in the system:

• Enable the MD-IWF and DM-IWF DSR applications on SS7-MPs and DA-MPs respectively
• Enable Diameter Connections with Peer Nodes
• Status Verification

Enabling the MD-IWF and DM-IWF Applications

Use this task to enable the MD-IWF and DM-IWF applications.

1. From each active SOAM in a 3-tiered DSR topology, navigate to Diameter > Maintenance > Applications.
2. Under DSR Application Name, select each MD-IWF or DM-IWF row.
   To select more than one row, press and hold Ctrl while you click each row.
3. Click Enable.
4. Verify the application status on the page.
   The Admin State, Operational Status, Operational Reason, and Congestion Level in each of the selected rows should have changed respectively to Enabled, Available, Normal, and Normal.

Bulk Import and Export

The Diameter Common User’s Guide describes the use and operation of Bulk Import and Export functions:

• Help > Diameter Common > Bulk Import
• Help > Diameter Common > Bulk Export

The Bulk Import and Export functions can be used to export Diameter, IPFE, and Application configuration data in CSV files to a location outside the system, and to import the files (usually edited) into the system where the Import function is executed.

Bulk Import

The Bulk Import operations use configuration data in ASCII Comma-Separated Values (CSV) files (.csv), to insert new data into, update existing data in, or delete existing data from the configuration data in the system.

Note: Some configuration data can be imported only with the Update operation, and other data can be imported with Insert and Delete operations but not Update. Refer to the Diameter Common User’s Guide or the Diameter Common > Import Help for valid Import operations.

Import CSV files can be created by using a Bulk Export operation, or can be manually created using a text editor.

Note: The format of each Import CSV file record must be compatible with the configuration data in the release used to import the file. Across different release versions, column counts may not be compatible, and the import fails.
Files that are created using the Bulk Export operation can be exported either to the local Status & Manage File Management Directory (Status & Manage > Files page), or to the local Export Server Directory.

CSV files that are in the local File Management area can be used for Bulk Import operations on the local system.

Files can be created manually using a text editor; the files must be uploaded to the File Management area of the local system before they can be used for Import operations on the local system.

Multiple Import operations can be performed:

- Insert new configuration data records that do not currently exist in the system
- Update existing configuration data in the system
- Delete existing configuration data from the system

Each Import operation creates a log file. If errors occur, a Failures CSV file is created that appears in the File Management area. Failures files can be downloaded, edited to correct the errors, and imported to successfully process the records that failed. Failures files that are unchanged for more than 14 days and log files that are older than 14 days are automatically deleted from the File Management area.

**Bulk Export**

The Bulk Export operation creates ASCII Comma-Separated Values (CSV) files (.csv) containing Diameter, IPFE, and Application configuration data. Exported configuration data can be edited and used with the Bulk Import operations to change the configuration data in the local system without the use of GUI pages. The exported files can be transferred to and used to configure another system.

Each exported CSV file contains one or more records for the configuration data that was selected for the Export operation. The selected configuration data can be exported once immediately, or exports can be scheduled to periodically occur automatically at configured times.

Configuration data can be exported in one Export operation:

- All exportable configuration data in the system
- All exportable configuration data from the selected Application, IPFE, or Diameter (each component's data is in a separate file)
- Exportable configuration data from a selected configuration component for the selected Application, IPFE, or Diameter

Exported files can be written to the File Management Directory in the local File Management area (Status & Manage > Files page), or to the Export Server Directory for transfer to a configured remote Export server.

CSV files that are in the local File Management area can be used for Bulk Import operations on the local system.

If the export has any failures or is unsuccessful, the results of the export operation are logged to a log file with the same name as the exported file but with a .log extension. Successful export operations are not logged.
Chapter 5

MD-IWF Application Configuration

Topics:

- MD-IWF Options Configuration.....52
- Diameter Realm Configuration.....57
- Diameter Identity GTA Configuration.....60
- GTA Range to PC Configuration.....63
- MAP Exception Configuration.....67
- CCNDC Mapping Configuration.....70

The MAP-Diameter IWF > Configuration GUI pages for MD-IWF components provide fields for entering the configuration information for the MD-IWF application.
MD-IWF Options Configuration

The MAP-Diameter IWF > Configuration > MD-IWF Options page is used to configure MD-IWF application Options.

Note: DM-IWF configuration can be performed only on Active SOAM servers.

The fields are described in MD-IWF Options Elements.

On the MAP-Diameter IWF > Configuration > MD-IWF Options page, you can:

• Modify current Options values, and click Apply to save the changes.
• Click Cancel to remove and not save any changes you have made.

MD-IWF Options Elements

Table 9: MD-IWF Options Elements describes the fields on the MD-IWF Options page.

Table 9: MD-IWF Options Elements

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
</table>
| *Diameter Response Timeout | Timeout value, in seconds, to use when sending a Diameter Request message to the Diameter network (through DM-IWF) and waiting for the Diameter Answer message to arrive. It is suggested that this timer be greater than the Diameter Routing Function’s Transaction Lifetime configured under Diameter > Configuration > Routing Option Sets. Note: If the Diameter Pending Answer Timer is less than this value, the Diameter Error Responses from the DSR will be seen. | Format: text box; numeric  
Range: 3-30  
Default: 15 |
| *MAP Response Timeout | Timeout value, in seconds, to use when sending a MAP Request message to the SS7 network and waiting for the MAP Response message to arrive. This is the time from begin-dialog to close-dialog; it controls how long all of the dialogs within a transaction can continue until the dialog times out. It is suggested that this timer shall be greater than the | Format: text box; numeric  
Range: 5-30  
Default: 15 |
<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segmentation/Reassembly timeout value configured under the SCCP Options folder.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EIR Host Name</strong></td>
<td>When translating an incoming MAP-CheckIMEI (EIR) Request message to a Diameter Request message, the Destination-Host AVP will be populated with this FQDN value when the GTA that is derived from the SCCP Called Party Address cannot be mapped to a Diameter Host/Realm using Diameter Identity - GTA entries. If this value is not configured, then an error response is sent back to the SS7 network.</td>
<td>Format: text box  FQDN is a case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a FQDN must be at most 255 characters long.  Range: a valid FQDN or empty Default: N/A</td>
</tr>
<tr>
<td><strong>EIR Realm</strong></td>
<td>When translating an incoming MAP-CheckIMEI (EIR) Request message to a Diameter Request message, the Destination-Realm AVP will be populated with this value when the GTA that is derived from the SCCP Called Party Address cannot be mapped to a Diameter Host/Realm using Diameter Identity - GTA entries. If this value is not configured, then an error response is sent back to the SS7 network.</td>
<td>Format: text box  Realm is a case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a FQDN must be at most 255 characters long.  Range: a valid Realm or empty Default: N/A</td>
</tr>
<tr>
<td><strong>EIR Destination GTA</strong></td>
<td>When translating an incoming ECR (ME-Identity-Check) Diameter Request message to a MAP Request message, if the Destination-Host AVP is absent in the ECR message, then the SCCP Called Party GTA will be populated with this value when the ECR Request Message with no</td>
<td>Format: text box; numeric  Range: a valid Global Title Address in E.164 format, or empty Default: N/A</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Dest-Host AVP option is configured as Translate Using EIR Dest GTA.</strong></td>
<td>When translating an incoming (non-EIR) MAP Request message to a Diameter Request message, the Destination-Host AVP will be populated with this FQDN value when the GTA that is derived from the SCCP Called Party Address cannot be mapped to a Diameter Host/Realm using Diameter Identity - GTA entries. If this value is not configured, then MD-IWF will not populate the Destination-Host AVP; it could be resolved on the DSR by FABR or RBAR, or by another upstream Peer.</td>
<td>Format: text box FQDN is a case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a FQDN must be at most 255 characters long. Range: a valid FQDN or empty Default: N/A</td>
</tr>
<tr>
<td><strong>IWF HSS Destination Host</strong></td>
<td>When translating an incoming (non-EIR) MAP Request message to a Diameter Request message, the Destination-Realm AVP will be populated with this value when the GTA that is derived from the SCCP Called Party Address cannot be mapped to a Diameter Host/Realm using Diameter Identity - GTA entries. If this value is not configured, then an error response is sent back to the SS7 network.</td>
<td>Format: text box Realm is a case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a FQDN must be at most 255 characters long. Range: a valid Realm or empty Default: N/A</td>
</tr>
<tr>
<td><strong>IWF HSS Destination Realm</strong></td>
<td>When translating an incoming (non-EIR) MAP Request message to a Diameter Request message, the Destination-Realm AVP will be populated with this value when the GTA that is derived from the SCCP Called Party Address cannot be mapped to a Diameter Host/Realm using Diameter Identity - GTA entries. If this value is not configured, then an error response is sent back to the SS7 network.</td>
<td>Format: text box Realm is a case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a FQDN must be at most 255 characters long. Range: a valid Realm or empty Default: N/A</td>
</tr>
<tr>
<td><strong>Shutdown Mode</strong></td>
<td>Allows the operator to specify the shutdown method used when the Admin State is changed to Disabled. The application can be disabled using either a graceful or forced shutdown method. Graceful allows in-process transactions to continue for a configurable time period before disabling. Forced is an immediate shutdown.</td>
<td>Format: radio buttons Range: Forced or Graceful</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>*Shutdown Timer</td>
<td>Number of seconds that the Shutdown Timer will run during a Graceful shutdown.</td>
<td>Format: text box, numeric&lt;br&gt;Range: 1-30&lt;br&gt;Default: 15</td>
</tr>
</tbody>
</table>

**ECR Request Message with no Destination Host AVP**

<table>
<thead>
<tr>
<th>Action</th>
<th>When translating an incoming ECR (ME-Identity-Check) Diameter Request message to a MAP Request message, this indicates the action to take if the Destination-Host AVP is absent in the ECR message. If the Destination-Host AVP is present, it is used in the translation to derive the SCCP Called Party GTA.</th>
<th>Format: radio buttons&lt;br&gt;Range: Discard, Send Answer, Translate using EIR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Discard: The Diameter to MAP transaction is discarded; a Diameter Answer message is NOT sent back to the Diameter network.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Send Answer: A Diameter Answer message with Experimental- Result AVP or Result-Code is sent back to the Diameter network.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Translate Using EIR: Translate the ECR message to a MAP Request message using the configured EIR Destination GTA as the SCCP Called Party GTA.</td>
<td></td>
</tr>
</tbody>
</table>

| Response Result Code AVP | If the configured Action is Send Answer, this value is used in the Result-Code or Experimental-Result AVP of the Diameter Answer message | Format: text box, 4-digit numeric; or pulldown list of known Result Codes<br>Range: 1000-5999 |

| Response Vendor ID | If zero, then a Result-Code AVP will be sent when the DSR Application is not Available. If non-zero, then an Experimental-Result AVP will be sent with the Vendor-Id AVP set to this value. Available when Send Answer is selected for the Action. | Format: text box; numeric<br>Range: 0-4294967295 |

<p>| Response Error String | If a non-empty string, this configured string will be appended to the Error-Message AVP that is sent in the | Format: text box; string of printable ASCII characters.&lt;br&gt;Range 0-64 characters |</p>
<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter Answer message. Available when Send Answer is selected for the Unavailable Action field.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| ECR Request Message with Dest-Host present but Not Found in mapping table | **Action** When translating an incoming ECR (ME-Identity-Check) Diameter Request message to a MAP Request message, this indicates the action to take if the Destination-Host AVP is absent in the ECR message. If the Destination-Host AVP is present, it is used in the translation to derive the SCCP Called Party GTA.  
  - **Discard:** The Diameter to MAP transaction is discarded; a Diameter Answer message is NOT sent back to the Diameter network.  
  - **Send Answer:** A Diameter Answer message with Experimental-Result AVP or Result-Code is sent back to the Diameter network.  
  - **Translate Using EIR:** Translate the ECR message to a MAP Request message using the configured EIR Destination GTA as the SCCP Called Party GTA. | Format: radio buttons  
Range: Discard, Send Answer, Translate using EIR |
| **Response Result Code AVP** If the configured Action is Send Answer, this value is used in the Result-Code or Experimental-Result AVP of the Diameter Answer message. Available when Send Answer is selected for the associated Action. | Format: text box, 4-digit numeric; or pulldown list of known Result Codes  
Range: 1000-5999 |
| **Response Vendor ID** If zero, then a Result-Code AVP will be sent when the DSR Application is not Available. If non-zero, then an Experimental-Result AVP will be sent with the Vendor-Id AVP set to this value. Available when Send Answer is selected for the Action. | Format: text box; numeric  
Range: 0-4294967295 |
<p>| <strong>Response Error String</strong> If a non-empty string, this configured string will be appended to the Error-Message AVP that is sent in the message. | Format: text box; string of printable ASCII characters |</p>
<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter Answer message. Available when Send Answer is selected for the Unavailable Action field.</td>
<td>Diameter Answer message. Available when Send Answer is selected for the Unavailable Action field.</td>
<td>Range 0-65 characters</td>
</tr>
<tr>
<td>Shutdown Mode</td>
<td>Allows the operator to specify the shutdown method used when the Admin State is changed to Disabled. The application can be disabled using either a graceful or forced shutdown method. Graceful allows in-process transactions to continue for a configurable time period before disabling the application. Forced is an immediate shutdown.</td>
<td>Format: radio buttons Range: Forced, Graceful</td>
</tr>
<tr>
<td>*Shutdown Timer</td>
<td>Unique number of seconds that the Shutdown Timer will run during Graceful shutdown.</td>
<td>Format: text box, numeric Range: 1-30 Default: 15</td>
</tr>
<tr>
<td>Node GTA</td>
<td>Global Title Address associated with the Place. When translating incoming Diameter Request messages to MAP Request messages, the SCCP Calling Party GTA is always populated with this value. Configuration is mandatory. The MD-IWF application cannot be enabled if this field is empty.</td>
<td>Format: text box, numeric Range: a valid Global Title Address in E.164 format Default: N/A</td>
</tr>
<tr>
<td>Viper-place</td>
<td>Global Title Address associated with the Place. When translating incoming Diameter Request messages to MAP Request messages, the SCCP Calling Party GTA is always populated with this value. Configuration is mandatory. The MD-IWF application cannot be enabled if this field is empty.</td>
<td>Format: text box, numeric Range: a valid Global Title Address in E.164 format Default: N/A</td>
</tr>
</tbody>
</table>

### Diameter Realm Configuration

The MAP-Diameter IWF > Configuration > Diameter Realm page on an NOAM server is used to configure Diameter Realms.

The fields are described in Diameter Realm Elements.

On the MAP-Diameter IWF > Configuration > Diameter Realm page, you can:

- Filter the list of entries, to display only the desired entries.
- Sort the list entries in ascending or descending order by by clicking the column heading. By default, the list is sort in ascending alphabetical order by Signaling Network.
- Click Insert.

The MAP-Diameter IWF > Configuration > Diameter Realm [Insert] page opens. You can add new Diameter Realms.
• Select a Diameter Realm entry in the list, and click **Edit**.

The MAP-Diameter IWF > **Configuration** > **Diameter Realm [Edit]** page opens. The selected Diameter Realm entry can be edited.

• Select a Diameter Realm entry in the list, and click **Delete** to remove the selected entry.

### Diameter Realm Elements

*Table 10: Diameter Realm Elements* describes the fields on the MAP-Diameter IWF > **Configuration** > **Diameter Realm** page. Data Input Notes apply to Insert and Edit pages; the View page is Read-only.

**Table 10: Diameter Realm Elements**

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
</table>
| *Diameter Realm*                    | Realm that is specified in the Destination-Realm AVP of a Diameter Request message. This table describes the characteristics of the SS7 network that corresponds to a Diameter Realm. This information is used to translate a Diameter Request message to a MAP Request message that is sent to the SS7 network. | Format: text box  
Case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and a Realm must be at most 255 characters long.  
Range: A valid Realm  
Default: N/A |
| Signaling Network                   | Signaling network (ITU, ITUN or ANSI) of the SS7 network corresponding to the given Realm. | Format: radio buttons  
Range: ITU, ITUN, or ANSI  
Default: N/A |
| MGT (E.214) Conversion Needed       | Indicates whether the IMSI digits (User-Name AVP) need to be converted to MGT (E.214) format (using table MccMncMapping) when using these digits as the Called Party GTA in the MAP Request message. This is applicable for ITU and ITUN only. If set to Yes (Checked), this treatment will be applied only if (1) Destination-Host AVP is not present in the Diameter Request message; or (2) fail to map the | Format: check box  
Range = Yes, No, N/A  
Default: No (Unchecked) for ITU/ITUN; N/A for ANSI |
Adding Diameter Realm Entries

Use this task to configure new Diameter Realm entries.

**Diameter Realm** fields are described in *Diameter Realm Elements*.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Realm.
   The MAP-Diameter IWF > Configuration > Diameter Realm page appears.

2. Click Insert.
   The MAP-Diameter IWF > Configuration > Diameter Realm [Insert] page appears.

3. Enter a value for each field.

4. Click:
   - **OK** to save the new entry and return to the MAP-Diameter IWF > Configuration > Diameter Realm page.
   - **Apply** to save the new entry and remain on this page. The data displayed on the page is updated.
   - **Cancel** to return to the MAP-Diameter IWF > Configuration > Diameter Realm page without saving any changes.

Editing Diameter Realm Entries

Use this task to change Diameter Realm entries.

**Diameter Realm** fields are described in *Diameter Realm Elements*.

When the MAP-Diameter IWF > Configuration > Diameter Realm [Edit] page opens, the fields are populated with the current configured values.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Realm.
   The MAP-Diameter IWF > Configuration > Diameter Realm page appears.

2. Select the Diameter Realm entry to be changed.

3. Click **Edit**.
   The MAP-Diameter IWF > Configuration > Diameter Realm [Edit] page appears.

4. Edit the fields that need to be changed.

5. Click:
   - **OK** to save the changes and return to the MAP-Diameter IWF > Configuration > Diameter Realm page.
   - **Apply** to save the changes and remain on this page.
Deleting Diameter Realm Entries

Use this task to delete an Diameter Realm entry.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Realm.
   The MAP-Diameter IWF > Configuration > Diameter Realm page appears.

2. Select the Diameter Realm entry to be deleted.

3. Click Delete.
   A popup window appears to confirm the delete.

4. Click:
   - OK to delete the Diameter Realm entry.
   - Cancel to cancel the delete function and return to the MAP-Diameter IWF > Configuration > Diameter Realm page.

Diameter Identity GTA Configuration

The MAP-Diameter IWF > Configuration > Diameter Identity GTA page on an NOAM server is used to configure Diameter Identity GTAs.

A Diameter Identity GTA provides configuration to allow conversion between a Diameter identity (Diameter Host and Realm) in the Diameter network and a Global Title Address in the SS7 network. Its configuration is used to translate in both directions:

- Convert a Diameter Host/Realm to GTA while translating a Diameter message to a MAP message
- Convert a GTA to Diameter Host/Realm while translating a MAP message to a Diameter message

The fields are described in Diameter Identity GTA Elements.

On the MAP-Diameter IWF > Configuration > Diameter Identity GTA page, you can:

- Filter the list of entries, to display only the desired entries.
- Sort the list entries in ascending or descending order by by clicking the column heading. By default, the list is sorted in ascending alphabetical order.
- Click Insert.
   The MAP-Diameter IWF > Configuration > Diameter Identity GTA [Insert] page opens. You can add new Diameter IDs to GTA mapping.
- Select a Diameter Realm entry in the list, and click Edit.
   The MAP-Diameter IWF > Configuration > Diameter Identity GTA [Edit] page opens. The selected Diameter Identity GTA entry can be edited.
- Select a Diameter Identity GTA entry in the list, and click Delete to remove the selected entry.
Diameter Identity GTA Elements

*Table 11: Diameter Identity GTA Elements* describes the fields on the MAP-Diameter IWF > Configuration > Diameter Identity GTA page. Data Input Notes apply to Insert and Edit pages; the View page is Read-only.

**Table 11: Diameter Identity GTA Elements**

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
</table>
| *FQDN* | Fully Qualified Domain Name of this Peer Node | Format: text box  
Case-insensitive string consisting of a list of labels separated by dots, where a label may contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores may be used only as the first character. A label must be at most 63 characters long and an FQDN must be at most 255 characters long.  
Range: A valid FQDN  
Default: N/A |
| *Realm* | Diameter Realm that (along with the FQDN) is to be converted to/from a Global Title Address | Format: radio buttons  
Range: A valid Realm  
Default: N/A |
| *Global Title Address* | Global Title Address in the SS7 network that is to be converted to/from a Diameter Host and Realm in the Diameter network. | Format: text box  
Range: 1-21 digits  
Default: N/A |

Adding Diameter Identity GTA Entries

Use this task to configure new Diameter Identity GTA entries.

Diameter Identity GTA fields are described in Diameter Identity GTA Elements.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Identity GTA.

The MAP-Diameter IWF > Configuration > Diameter Identity GTA page appears.

2. Click Insert.

The MAP-Diameter IWF > Configuration > Diameter Identity GTA [Insert] page appears.

3. Enter a value for each field.

4. Click:
• **OK** to save the new entry and return to the MAP-Diameter IWF > Configuration > Diameter Identity GTA page.
• **Apply** to save the new entry and remain on this page. The data displayed on the page is updated.
• **Cancel** to return to the MAP-Diameter IWF > Configuration > Diameter Identity GTA page without saving any changes.

---

**Editing Diameter Identity GTA Entries**

Use this task to change Diameter Identity GTA entries.

**Diameter Identity GTA** fields are described in [Diameter Identity GTA Elements](#).

When the MAP-Diameter IWF > Configuration > Diameter Identity GTA [Edit] page opens, the fields are populated with the current configured values.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Identity GTA.
   The MAP-Diameter IWF > Configuration > Diameter Identity GTA page appears.
2. Select the Diameter Identity GTA entry to be changed.
3. Click **Edit**.
   The MAP-Diameter IWF > Configuration > Diameter Identity GTA [Edit] page appears.
4. Edit the fields that need to be changed.
5. Click:
   - **OK** to save the changes and return to the MAP-Diameter IWF > Configuration > Diameter Identity GTA page.
   - **Apply** to save the changes and remain on this page.
   - **Cancel** to return to the MAP-Diameter IWF > Configuration > Diameter Identity GTA page without saving any changes.

---

**Deleting Diameter Identity GTA Entries**

Use this task to delete an Diameter Identity GTA entry.

1. On the NOAM, select MAP-Diameter IWF > Configuration > Diameter Identity GTA.
   The MAP-Diameter IWF > Configuration > Diameter Identity GTA page appears.
2. Select the Diameter Identity GTA entry to be deleted.
3. Click **Delete**.
   A popup window appears to confirm the delete.
4. Click:
   - **OK** to delete the Diameter Identity GTA entry.
   - **Cancel** to cancel the delete function and return to the MAP-Diameter IWF > Configuration > Diameter Identity GTA page.
GTA Range to PC Configuration

The MAP-Diameter IWF > Configuration > GTA Range to PC page on an NOAM server is used to configure GTA Range to PCs.

A GTA Range to PC provides configuration to translate a Diameter Request message to a MAP Request message by identifying the destination Point Codes of the primary signaling Gateway (SGGTWY) and its mate SG corresponding to the derived Global Title Address.

The fields are described in GTA Range to PC Elements.

On the MAP-Diameter IWF > Configuration > GTA Range to PC page, you can:

• Filter the list of entries, to display only the desired entries.
• Sort the list entries in ascending or descending order by by clicking the column heading. By default, the list is sorted in ascending alphabetical order by Signaling Network.
• Click Insert.

The MAP-Diameter IWF > Configuration > GTA Range to PC [Insert] page opens. You can add new GTA Ranges to PC mapping.

• Select a Diameter Realm entry in the list, and click Edit.

The MAP-Diameter IWF > Configuration > GTA Range to PC [Edit] page opens. The selected GTA Range to PC entry can be edited.

• Select a GTA Range to PC entry in the list, and click Delete to remove the selected entry.

GTA Range to PC Elements

Table 12: GTA Range to PC Elements describes the fields on the MAP-Diameter IWF > Configuration > GTA Range to PC page. Data Input Notes apply to Insert and Edit pages; the View page is Read-only.

Table 12: GTA Range to PC Elements

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
</table>
| Default Configuration               | For each Signaling Network (ITUI, ITUN, or ANSI), a default Point Code configuration can optionally be specified. The default Point Codes will be used if Global Title Address digits are queried but no GTA Range to PC match is found. | Format: check box  
Range = Yes, No, N/A  
Default: No (Unchecked) for ITU/ITUN; N/A for ANSI |
| Global Title Start                  | Global Title Address (GTA) start digits. Along with the GTA End digits, this forms a GTA Range. The GTA Range (within a given Signaling Network) is mapped to the Point Codes of the primary Signaling | Format: text box  
Range: 1-21 digits  
Default: N/A |
<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway (SG) and the secondary (mate) SG. When translating a Diameter Request message to a MAP Request message, the configured GTA Ranges are queried to see if the derived GTA digits fall within a configured GTA Range.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Global Title End | Global Title Address (GTA) end digits. | Format: text box  
Range: 1-21 digits  
Default: N/A |
| Signaling Network | Signaling Network (ITUI, ITUN, or ANSI) that the given GTA Range (or default configuration) applies to. | Format: text box  
Range: ITUI, ITUN, or ANSI  
Default: ITUI |
| *Primary Point Code | Point Code of the primary Signaling Gateway (SG) that is associated with the given GTA Range (or default configuration). | Format: text box  
ITU International (ITUI) Point Code format: J-NNN-J  
ITU International Point (ITUI) Code range: Each J can be 0-7, Each NNN can be 0-255  
ITU National Point (ITUN) Code format: NNNNN  
ITU National (ITUN) Point Code range: NNNNN can be 0-16383  
ANSI Point Code format: NNN-NNN-NNN  
ANSI Point Code range: Each NNN can be 0-255 |
| Secondary Point Code | Point Code of the secondary (mate) Signaling Gateway (SG) that is associated with the given GTA Range (or default configuration). | Format: text box  
Range: A valid Point Code for the given Signaling Network type  
Default: N/A |
| Load Sharing | Load Sharing indicates, when translating Diameter Request messages, the algorithm to use when routing MAP messages to the Primary and Secondary (mate) Signaling Gateways. | Format: radio buttons  
Range: Active/Active, Active/Standby, Solitary |
### Field (* indicates a required field)

<table>
<thead>
<tr>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active/Active (Round Robin):</strong> when routing the MAP Request messages, alternate between the Primary and Secondary Point Codes in round-robin fashion if both PCs are configured and available. If there is only one Point Code configured, or only one Point Code is available, then messages are routed to only that Point Code.</td>
<td>Default: Solitary</td>
</tr>
<tr>
<td><strong>Active/Standby:</strong> MAP Request messages are routed to the Primary Point Code if it is available. If the Primary Point Code is not available, the messages are routed to the Secondary Point Code (assuming it is configured and available). If there is only one Point Code configured, the messages are routed to only that Point Code.</td>
<td></td>
</tr>
<tr>
<td><strong>Solitary:</strong> MAP Request messages are routed to a single Point Code. This will be the Primary Point Code.</td>
<td></td>
</tr>
</tbody>
</table>

### Adding GTA Range to PC Entries

Use this task to configure new **GTA Range to PC** entries.

**GTA Range to PC** fields are described in **GTA Range to PC Elements**.

1. On the NOAM, select **MAP-Diameter IWF > Configuration > GTA Range to PC**.

   The **MAP-Diameter IWF > Configuration > GTA Range to PC** page appears.

2. Click **Insert**.

   The **MAP-Diameter IWF > Configuration > GTA Range to PC [Insert]** page appears.

3. Enter a value for each field.

4. Click:
   - **OK** to save the new entry and return to the **MAP-Diameter IWF > Configuration > GTA Range to PC** page.
   - **Apply** to save the new entry and remain on this page. The data displayed on the page is updated.
   - **Cancel** to return to the **MAP-Diameter IWF > Configuration > GTA Range to PC** page without saving any changes.
Editing GTA Range to PC Entries

Use this task to change GTA Range to PC entries.

GTA Range to PC fields are described in *GTA Range to PC Elements*.

When the MAP-Diameter IWF > Configuration > GTA Range to PC [Edit] page opens, the fields are populated with the current configured values.

1. On the NOAM, select MAP-Diameter IWF > Configuration > GTA Range to PC.
   
   The MAP-Diameter IWF > Configuration > GTA Range to PC page appears.

2. Select the GTA Range to PC entry to be changed.

3. Click **Edit**.
   
   The MAP-Diameter IWF > Configuration > GTA Range to PC [Edit] page appears.

4. Edit the fields that need to be changed.

5. Click:
   
   - **OK** to save the changes and return to the MAP-Diameter IWF > Configuration > GTA Range to PC page.
   - **Apply** to save the changes and remain on this page.
   - **Cancel** to return to the MAP-Diameter IWF > Configuration > GTA Range to PC page without saving any changes.

Deleting GTA Range to PC Entries

Use this task to delete an GTA Range to PC entry.

1. On the NOAM, select MAP-Diameter IWF > Configuration > GTA Range to PC.
   
   The MAP-Diameter IWF > Configuration > GTA Range to PC page appears.

2. Select the GTA Range to PC entry to be deleted.

3. Click **Delete**.
   
   A popup window appears to confirm the delete.

4. Click:
   
   - **OK** to delete the GTA Range to PC entry.
   - **Cancel** to cancel the delete function and return to the MAP-Diameter IWF > Configuration > GTA Range to PC page.
MAP Exception Configuration

The MAP-Diameter IWF > Configuration > MAP Exception page on an NOAM server is used to configure MAP Exceptions.

The fields are described in MD-IWF Map Exception Elements.

MAP-Diameter IWF supports various MAP Exception types:

- Internal Processing Errors (internal to the DSR) such as:
  - Resource Exhaustion
  - ComAgent Routed Service Error, timeout, or NACK immediate response
  - Unexpected software validation error (such as NULL pointer)
- Diameter to MAP Transaction Timeout (a timeout occurred waiting for a response from the SS7 network)
- Translation Error (an error occurred while performing Message Translation or Address Translation, or while translating between a TCAP User error cause value and a Diameter Result-Code)
- Congestion (MD-IWF congestion)

On the MAP-Diameter IWF > Configuration > MAP Exception page, you can:

- Modify current Options values, and click Apply to save the changes.
- Click Cancel to remove and not save any changes you have made.

MD-IWF Map Exception Elements

Table 13: MD-IWF Map Exception Elements describes the fields on the MD-IWF Map Exception page.

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IWF Internal Processing Error</td>
<td></td>
<td>Format: radio buttons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Discard Send Error to SS7 Network</td>
</tr>
<tr>
<td>Action</td>
<td>Indicates the action to take if the given exception occurs.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: System Failure, Data Missing, Unexpected Data Value, Facility Not Supported, Incompatible Terminal, Resource Limitation</td>
</tr>
<tr>
<td>Error Cause</td>
<td>If the configured Action is Send Answer, this Error Cause value is used in those cases where a TC-U-ERROR message is sent to the SS7 network.</td>
<td>Format: radio buttons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Discard Send Error to SS7 Network</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| Abort Reason                       | If the configured Action is Send Answer, this Abort Reason value is used in those cases where a MAP-U-ABORT message is sent to the SS7 network. | Format: pulldown list  
Range: User Defined, Application Context Not Supported, Dialog Refused |
| Abort Choice                       | Abort Choice further qualifies the Abort action as either Specific Reason, Resource Limitation or Resource Unavailable when the reason is configured as User Defined. | Format: pulldown list  
Range: Resource Unavailable, User Specific Reason, Resource Limitation (Congestion) |
| Resource Unavailable Reason        | Unavailable Reason provides additional detail regarding whether the Resource Unavailable specified for the Abort Choice field is as a result of a short or long term limitation. | Format: pulldown list  
Range: Short Term or Long Term Limitation |
| MAP to Diameter Transaction Timeout | Action: Indicates the action to take if the given exception occurs. | Format: radio buttons  
Range: Discard Send Error to SS7 Network |
|                                     | Error Cause: If the configured Action is Send Answer, this Error Cause value is used in those cases where a TC-U-ERROR message is sent to the SS7 network. | Format: pulldown list  
Range: System Failure, Data Missing, Unexpected Data Value, Facility Not Supported, Incompatible Terminal, Resource Limitation |
|                                     | Abort Reason: If the configured Action is Send Answer, this Abort Reason value is used in those cases where a MAP-U-ABORT message is sent to the SS7 network. | Format: pulldown list  
Range: User Defined, Application Context Not Supported, Dialog Refused |
|                                     | Abort Choice: Abort Choice further qualifies the Abort action as either Specific Reason, Resource Limitation or Resource Unavailable when the reason is configured as User Defined. | Format: pulldown list  
Range: Resource Unavailable, User Specific Reason, Resource Limitation (Congestion) |
|                                     | Resource Unavailable Reason: Unavailable Reason provides additional detail regarding whether the Resource Unavailable specified for the Abort Choice field | Format: pulldown list  
Range: Short Term or Long Term Limitation |
<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>is as a result of a short or long term limitation.</td>
<td></td>
</tr>
</tbody>
</table>

**Translation Error**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
<td>Indicates the action to take if the given exception occurs.</td>
<td>Format: radio buttons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Discard, Send Error to SS7 Network</td>
</tr>
<tr>
<td><strong>Error Cause</strong></td>
<td>If the configured Action is Send Answer, this Error Cause value is used in those cases where a TC-U-ERROR message is sent to the SS7 network.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: System Failure, Data Missing, Unexpected Data Value, Facility Not Supported, Incompatible Terminal, Resource Limitation</td>
</tr>
<tr>
<td><strong>Abort Reason</strong></td>
<td>If the configured Action is Send Answer, this Abort Reason value is used in those cases where a MAP-U-ABORT message is sent to the SS7 network.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: User Defined, Application Context Not Supported, Dialog Refused</td>
</tr>
<tr>
<td><strong>Abort Choice</strong></td>
<td>Abort Choice further qualifies the Abort action as either Specific Reason, Resource Limitation or Resource Unavailable when the reason is configured as User Defined.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Resource Unavailable, User Specific Reason, Resource Limitation (Congestion)</td>
</tr>
<tr>
<td><strong>Resource Unavailable Reason</strong></td>
<td>Unavailable Reason provides additional detail regarding whether the Resource Unavailable specified for the Abort Choice field is as a result of a short or long term limitation.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Short Term or Long Term Limitation</td>
</tr>
</tbody>
</table>

**Congestion**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
<td>Indicates the action to take if the given exception occurs.</td>
<td>Format: radio buttons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Discard, Send Error to SS7 Network</td>
</tr>
<tr>
<td><strong>Error Cause</strong></td>
<td>If the configured Action is Send Answer, this Error Cause value is used in those cases where a TC-U-ERROR message is sent to the SS7 network.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: System Failure, Data Missing, Unexpected Data Value, Facility Not Supported, Incompatible Terminal, Resource Limitation</td>
</tr>
</tbody>
</table>
### CCNDC Mapping Configuration

The MAP-Diameter IWF > Configuration > CCNDC Mapping page is used to configure mapping of a Country Code (CC) plus National Destination Code (NDC) to a Diameter Realm in the MD-IWF application.

CCNDC Mapping is used when translating a MAP Request message to a Diameter Request message, when the MAP message Global Title Address (GTA) digits are in MGT format (for ITU, the SCCP CdPA Numbering Plan is E.214).

When a CCNDC Mapping entry matches the CCNDC in the GTA digits, the configured Diameter Realm from the entry is populated into the Destination-Realm AVP of the Diameter Request Message.

The fields are described in **CCNDC Mapping Elements**.

On the MAP-Diameter IWF > Configuration > CCNDC Mapping page, you can:

- Filter the list of entries, to display only the desired entries.
- Sort the list entries in ascending or descending order by by clicking the column heading. By default, the list is sorted by CCNDC in ascending ASCII order.
- Click **Insert**.

The Diameter Common > Network Identifiers > CCNDC Mapping page opens. You can add new CCNDC Mapping entries. If the maximum number of CCNDC Mapping entries (2500) already exists in the system, the Diameter Common > Network Identifiers > CCNDC Mapping [Insert] page will not open, and an error message is displayed.

- Select a CCNDC Mapping entry in the list, and click **Edit**.
The Diameter Common > Network Identifiers > CCNDC Mapping [Edit] page opens. The selected CCNDC Mapping entry can be edited.

- Select a CCNDC Mapping entry in the list, and click Delete to remove the selected entry.

CCNDC Mapping Elements

*Table 14: CCNDC Mapping Elements* describes the fields on the MAP-Diameter IWF > Configuration > CCNDC Mapping pages. Data Input Notes apply to Insert and Edit pages; the View page is Read-only.

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
</table>
| *CCNDC | Country Code (CC) plus National Destination Code (NDC) that is used when translating a MAP message received with a E.214 Global Title Address | Format: text box; numeric string; valid digits are 0-999999999999999  
Range: 0-15 digits |
| *Realm | Diameter Realm that is associated with the CCNDC. | Format: text box  
Case-insensitive string consisting of a list of labels separated by dots, where a label can contain letters, digits, dashes (-) and underscore (_). A label must start with a letter, digit or underscore and must end with a letter or digit. Underscores can be used only as the first character. A label can be at most 63 characters long, and a Realm can be at most 255 characters long.  
Range: A valid Realm, or empty |
| Description | Optional description of the mapping, or a note. | Format: text box  
Range: 0-255 characters |

Adding CCNDC Mapping Entries

Use this task to configure new CCNDC Mapping entries.

CCNDC Mapping fields are described in *CCNDC Mapping Elements*.

1. On the NOAM, select MAP-Diameter IWF > Configuration > CCNDC Mapping.
   
The MAP-Diameter IWF > Configuration > CCNDC Mapping page appears.

2. Click Insert.
   
The MAP-Diameter IWF > Configuration > CCNDC Mapping [Insert] page appears.
3. Enter a value for each field.
4. Click:
   • OK to save the new entry and return to the MAP-Diameter IWF > Configuration > CCNDC Mapping page.
   • Apply to save the new entry and remain on this page. The data displayed on the page is updated.
   • Cancel to return to the MAP-Diameter IWF > Configuration > CCNDC Mapping page without saving any changes.

**Editing CCNDC Mapping Entries**

Use this task to change CCNDC Mapping entries.

CCNDC Mapping fields are described in CCNDC Mapping Elements.

When the MAP-Diameter IWF > Configuration > CCNDC Mapping [Edit] page opens, the fields are populated with the current configured values.

1. On the NOAM, select MAP-Diameter IWF > Configuration > CCNDC Mapping.

   The MAP-Diameter IWF > Configuration > CCNDC Mapping page appears.

2. Select the CCNDC Mapping entry to be changed.
3. Click Edit.

   The MAP-Diameter IWF > Configuration > CCNDC Mapping [Edit] page appears.

4. Edit the fields that need to be changed.
5. Click:
   • OK to save the changes and return to the MAP-Diameter IWF > Configuration > CCNDC Mapping page.
   • Apply to save the changes and remain on this page.
   • Cancel to return to the MAP-Diameter IWF > Configuration > CCNDC Mapping page without saving any changes.

**Deleting CCNDC Mapping Entries**

Use this task to delete an CCNDC Mapping entry.

1. On the NOAM, select MAP-Diameter IWF > Configuration > CCNDC Mapping.

   The MAP-Diameter IWF > Configuration > CCNDC Mapping page appears.

2. Select the CCNDC Mapping entry to be deleted.
3. Click Delete.

   A popup window appears to confirm the delete.

4. Click:
   • OK to delete the CCNDC Mapping entry.
• **Cancel** to cancel the delete function and return to the MAP-Diameter IWF > Configuration > CCNDC Mapping page.

If **OK** is clicked and the selected **CCNDC Mapping** entry no longer exists (it was deleted by another user), an error message is displayed.
Chapter 6

DM-IWF Application Configuration

Topics:

- **DM-IWF Options Configuration**.....75
- **Diameter Exception Configuration**.....77

The MAP-Diameter IWF > Configuration SOAM GUI pages for DM-IWF components provide fields for entering the configuration information for the DM-IWF application.
DM-IWF Options Configuration

The MAP-Diameter IWF > Configuration > DM-IWF Options page is used to configure DM-IWF application Options.

Note: DM-IWF configuration can be performed only on Active SOAM servers.

The fields are described in DM-IWF Options Elements.

On the MAP-Diameter IWF > Configuration > DM-IWF Options page, you can:

- Modify current Options values, and click Apply to save the changes.
- Click Cancel to remove and not save any changes you have made.

DM-IWF Options Elements

Table 15: DM-IWF Options Elements describes the fields on the DM-IWF Options page.

Table 15: DM-IWF Options Elements

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Unavailable Action</td>
<td>Specifies what action to take if the DM-IWF application is unavailable</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: Continue Routing, Send Answer, Default Route</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Default: Send Answer</td>
</tr>
<tr>
<td>Application Unavailable Route List</td>
<td>Specifies the name of a configured Route List. This Route List is used if the Unavailability Action is set as Default Route and the DM-IWF application is not available. In this case, this Route List will be used for routing the request messages and the PRT Rules will be bypassed.</td>
<td>Format: pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: list of possible Route Lists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Default: Not Selected</td>
</tr>
<tr>
<td>Application Unavailable Result Code</td>
<td>Given that the Unavailable Action must be Send Answer, if the DSR application is not Available, then this value is used in the Result-Code or Experimental-Result AVP of the Answer message.</td>
<td>Format: text box, pulldown list</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: 1000-5999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Default: 3002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNABLE_TO_DELIVER</td>
</tr>
<tr>
<td>Application Unavailable Vendor ID</td>
<td>If zero, then a Result-Code AVP will be sent when the DSR Application is not Available. If non-zero, then an Experimental-Result AVP will be sent will the Vendor-Id AVP set to this value.</td>
<td>Format: text box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: 0-4294967295</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Default: 0</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| Application Unavailable Error Message | If a non-null string, then an Error-Message AVP will be sent in the Answer response containing this string when the DSR Application is not Available. | Format: text box  
Range: 0-64 characters  
Default: DM-IWF Unavailable |
| *DSR Application-Invoked AVP Insertion | If set to Yes, this AVP will be inserted into the Request message that is routed to prevent multiple invocations of the same DSR Application on different DSRs or MPs. | Format: radio buttons  
Range: Yes or No |
| *Shutdown Mode | Allows the operator to specify the shutdown method used when the Admin State is changed to Disabled. The application can be disabled using either a graceful or forced shutdown method. Graceful allows in-process transactions to continue for a configurable time period before disabling. Forced is an immediate shutdown. | Format: radio buttons  
Range: Forced or Graceful |
| *Shutdown Timer | Number of seconds that the Shutdown Timer will run during a Graceful shutdown. | Format: text box, 2-digit numeric  
Range: 1-30 seconds  
Default: 15 seconds |
| Realm | If the DM-IWF originates Answers, this value is used as Origin Realm. If no value is supplied the local node realm of the ingress connection is used. Realm and FQDN must either both be provisioned or must both be NULL. This applies to MAP to Diameter Requests only. | Format: text box  
Range: a valid Realm or empty |
| Fully Qualified Domain Name | If the DM-IWF originates Answers, this value is used as the Origin Host. If no value is supplied the local node FQDN of the ingress connection is used. Realm and FQDN must both be provisioned or must both be NULL. | Format: text box  
Range: a valid FQDN or empty |
| ART | Optional attribute which specifies which ART to search when DM-IWF forwards a Request message to DRL. If this value is NULL, DRL will select an ART to search based on a well-defined set of rules. | Format: pulldown list  
Default: N/A |
Diameter Exception Configuration

The MAP-Diameter IWF > Configuration > Diameter Exception page on an SOAM server is used to configure Diameter Exceptions.

The fields are described in Diameter Exception Elements.

MAP-Diameter IWF supports various Diameter Exception types:

- Internal Processing Errors (internal to the DSR) such as:
  - Resource Exhaustion
  - Congestion
  - Unexpected software validation error

- Diameter to MAP Transaction Timeout (a timeout occurred waiting for a response from the SS7 network)
- Translation Error (an error occurred while performing Message Translation or Address Translation, or while translating between a TCAP User error cause value and a Diameter Result-Code)

On the MAP-Diameter IWF > Configuration > Diameter Exception page, you can:

- Modifying current Options values, and clicking Apply to save the changes.
- Clicking Cancel to remove and not save any changes you have made.

Diameter Exception Elements

Table 16: DM-IWF Diameter Exception Elements describes the fields on the Diameter Exception page.

<table>
<thead>
<tr>
<th>Field (* indicates a required field)</th>
<th>Description</th>
<th>Data Input Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IWF Internal Processing Error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Indicates the action to take if the given exception occurs.</td>
<td>Format: radio buttons Range: Discard, Send Answer, or Apply Unavailability Action</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Response Result Code AVP</td>
<td>If the configured Action is Send Answer, this value is used in the Result-Code or Experimental-Result AVP of the Diameter Answer message.</td>
<td>Format: text box, pulldown list Range: 1000-5999</td>
</tr>
<tr>
<td>Response Vendor ID</td>
<td>If zero, then a Result-Code AVP will be sent in the Diameter Answer message. If non-zero, then an Experimental-Result AVP will be sent with the Vendor-Id AVP set to this value.</td>
<td>Format: text box Range: 0-4294967295</td>
</tr>
<tr>
<td>Response Error String</td>
<td>If a non-empty string, this configured string will be appended to the Error-Message AVP that is sent in the Diameter Answer message.</td>
<td>Format: text box Range: 0-64 characters</td>
</tr>
<tr>
<td>Diameter to MAP Transaction Timeout</td>
<td>Indicate the action to take if the given exception occurs.</td>
<td>Format: radio buttons Range: Discard, Send Answer, or Apply Unavailability Action</td>
</tr>
<tr>
<td>Action</td>
<td>If the configured Action is Send Answer, this value is used in the Result-Code or Experimental-Result AVP of the Diameter Answer message.</td>
<td>Format: text box, pulldown list Range: 1000-5999</td>
</tr>
<tr>
<td>Response Vendor ID</td>
<td>If zero, then a Result-Code AVP will be sent in the Diameter Answer message. If non-zero, then an Experimental-Result AVP will be sent with the Vendor-Id AVP set to this value.</td>
<td>Format: text box Range: 0-4294967295</td>
</tr>
<tr>
<td>Response Error String</td>
<td>If a non-empty string, this configured string will be appended to the Error-Message AVP that is sent in the Diameter Answer message.</td>
<td>Format: text box Range: 0-64 characters</td>
</tr>
<tr>
<td>Translation Error</td>
<td>Indicates the action to take if the given exception occurs.</td>
<td>Format: radio buttons Range: Discard, Send Answer, or Apply Unavailability Action</td>
</tr>
<tr>
<td>Field (* indicates a required field)</td>
<td>Description</td>
<td>Data Input Notes</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Response Result Code AVP</td>
<td>If the configured Action is Send Answer, this value is used in the Result-Code or Experimental-Result AVP of the Diameter Answer message.</td>
<td>Format: text box, pulldown list</td>
</tr>
<tr>
<td>Response Vendor ID</td>
<td>If zero, then a Result-Code AVP will be sent in the Diameter Answer message. If non-zero, then an Experimental-Result AVP will be sent with the Vendor-Id AVP set to this value.</td>
<td>Format: text box</td>
</tr>
<tr>
<td>Response Error String</td>
<td>If a non-empty string, this configured string will be appended to the Error-Message AVP that is sent in the Diameter Answer message.</td>
<td>Format: text box</td>
</tr>
</tbody>
</table>
Chapter 7

Maintenance for MD-IWF

Topics:

- Overview.....81
- MD-IWF Administrative State and Operational Status.....81
- MD-IWF Alarms, KPIs, and Measurements.....82

This section describes maintenance functions and information that can be used with the MD-IWF application.
Overview

The MD-IWF application has no maintenance GUI pages of its own. The **Diameter > Maintenance** GUI pages provide functions and information that can be used with the MD-IWF application:

- The **Diameter > Maintenance > Applications** page displays MD-IWF status information including Admin State, Operational Status, and Operational Reason. The page also provides functions to enable and disable the application. Refer to the *Diameter User Guide* and Help for explanations of the page and the status information.

- The **Communication Agent > Maintenance > Routed Services Status** page displays ComAgent Status information for MD-IWF Routed Service (MDIWFSvc) Service Providers and Users. Refer to the *Communication Agent User’s Guide* for explanations of the page and status information.

**MD-IWF Administrative State and Operational Status**

The MD-IWF application has an Administrative State and an Operational Status. The Administrative State (or Admin State - enabled or disabled) indicates the state that the operator desires the MD-IWF application to be in. The Admin State can be manually modified by the operator. The Operational Status indicates the actual status of the MD-IWF application.

**Table 17: MD-IWF Admin State and Operational Status** lists the MD-IWF Admin State and Operational Status related to the MD-IWF Routed Service State, MD-IWF Routed Service Congestion Level and MD-IWF (internal) congestion levels. It specifies the actions that MD-IWF will take in various situations.

ComAgent DM-IWF Routed Service presents an aggregated view of the all DM-IWF instances (one instance per DA-MP) that have registered as service providers for the DM-IWF Routed Service. ComAgent reports the DM-IWF Routed Service State and the DM-IWF Routed Service Congestion Level to each MD-IWF instance.

In the Diameter to MAP direction, the MD-IWF Operational Status and the DM-IWF Routed Service congestion level determine whether a given Request from DRL can be forwarded to an MD-IWF. The MD-IWF Operational Status is determined by multiple attributes including MD-IWF Admin State, MD-IWF (internal) congestion level, MD-IWF Routed Service State and MD-IWF Service Congestion Level. In **Table 17: MD-IWF Admin State and Operational Status**, MD-IWF Congestion Level is the maximum of the MD-IWF (internal) Congestion Level and MD-IWF Routed Service Congestion Level.

In **Table 17: MD-IWF Admin State and Operational Status**, the MD-IWF Admin State, DM-IWF ComAgent Provider Status, MD-IWF Congestion State, and SS7-MP isolated from SS7 network? are the inputs for calculating the MD-IWF Operational Status, MD-IWF Operational Reason, and MD-IWF Operational Color.
Table 17: MD-IWF Admin State and Operational Status

<table>
<thead>
<tr>
<th>MD-IWF Admin State</th>
<th>DM-IWF ComAgent Provider Status (rolled-up state of all DM-IWF providers)</th>
<th>MD-IWF Congestion State</th>
<th>SS7-MP isolated from SS7 network?</th>
<th>MD-IWF Operational Status</th>
<th>MD-IWF Operational Reason</th>
<th>MD-IWF Operational Color</th>
<th>MD-IWF ComAgent Provider Status (calculated on each SS7-MP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Unavailable</td>
<td>Not Initialized</td>
<td>Orange</td>
<td>Unregistered</td>
</tr>
<tr>
<td>Disabled</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Unavailable</td>
<td>Shut Down</td>
<td>Orange</td>
<td>Unregistered</td>
</tr>
<tr>
<td>Enabled</td>
<td>Down</td>
<td>N/A</td>
<td>No</td>
<td>Degraded</td>
<td>Diam Network Unavailable</td>
<td>Red</td>
<td>Available</td>
</tr>
<tr>
<td>Enabled</td>
<td>Degraded (CL1, CL2, CL3)</td>
<td>CL0</td>
<td>No</td>
<td>Degraded</td>
<td>Diam Network Degraded</td>
<td>Yellow</td>
<td>Available</td>
</tr>
<tr>
<td>Enabled</td>
<td>Degraded (CL1, CL2, CL3)</td>
<td>CL1, CL2, CL3</td>
<td>No</td>
<td>Degraded</td>
<td>Diam Network Degraded/Congested</td>
<td>Yellow</td>
<td>CL1, CL2, CL3</td>
</tr>
<tr>
<td>Enabled</td>
<td>Normal</td>
<td>CL1, CL2, CL3</td>
<td>No</td>
<td>Degraded</td>
<td>Congested</td>
<td>Yellow</td>
<td>CL1, CL2, CL3</td>
</tr>
<tr>
<td>Enabled</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Unavailable</td>
<td>Isolated from SS7 network</td>
<td>Red</td>
<td>Unavailable</td>
</tr>
<tr>
<td>Enabled</td>
<td>Normal</td>
<td>CL0</td>
<td>No</td>
<td>Available</td>
<td>Normal</td>
<td>Gray</td>
<td>Available</td>
</tr>
</tbody>
</table>

MD-IWF Alarms, KPIs, and Measurements

This section describes how to access alarm, KPI, and measurements information that is available for MD-IWF in the DSR GUI. For more detailed information, refer to the Alarms, KPIs, and Measurements Reference.

Active alarms and events, as well as alarm and event history can be displayed on the Alarms & Events > View Active and Alarms & Events > View History GUI pages.

Key Performance Indicators, or KPIs, provide a means to convey performance information to the user in near real-time. KPIs can be displayed on the Status & Manage > KPIs GUI page.

Measurements for MD-IWF are collected and reported in various measurement groups. A measurement report and measurement group can be associated with a one-to-one relationship. Measurement reports may be generated from the Measurements > Report GUI page.
Chapter 8

Maintenance for DM-IWF

Topics:

- Overview.....84
- DM-IWF Administrative State and Operational Status.....84
- DM-IWF Alarms, KPIs, and Measurements.....85

This section describes maintenance functions and information that can be used with the DM-IWF application.
Overview

The DM-IWF application has no maintenance GUI pages of its own. The Diameter > Maintenance GUI pages provide functions and information that can be used with the DM-IWF application:

- The Diameter > Maintenance > Applications page displays DM-IWF status information including Admin State, Operational Status, and Operational Reason. The page also provides functions to enable and disable the application. Refer to the Diameter User Guide and Help for explanations of the page and the status information.
- The Diameter > Maintenance > DA-MPs page displays status and connectivity information for the DA-MP that is running the DM-IWF application. Refer to the Diameter User Guide and Help for explanations of the page and the status information.
- The Communication Agent > Maintenance > Routed Services Status page displays ComAgent Status information for Service Providers and Users of DM-IWF Routed Service (DMIWFSvc) and MD-IWF Routed Service (MDIWFSvc). Refer to the Communication Agent User’s Guide for explanations of the page and status information.

DM-IWF Administrative State and Operational Status

The DM-IWF application has an Administrative State and an Operational Status. The Administrative State (or Admin State - enabled or disabled) indicates the state that the operator desires the DM-IWF application to be in. The Admin State can be manually modified by the operator. The Operational Status indicates the actual status of the DM-IWF application.

Table 18: DM-IWF Admin State and Operational Status lists the DM-IWF Admin State and Operational Status related to the MD-IWF Routed Service State, MD-IWF Routed Service Congestion Level and DM-IWF (internal) congestion levels. It specifies the actions that DM-IWF will take in various situations.

ComAgent MD-IWF Routed Service presents an aggregated view of the all MD-IWF instances (one instance per SS7-MP) that have registered as service providers for the MD-IWF Routed Service. ComAgent reports the MD-IWF Routed Service State and the MD-IWF Routed Service Congestion Level to each DM-IWF instance.

In the Diameter to MAP direction, the DM-IWF Operational Status and the MD-IWF Routed Service congestion level determine whether a given Request from DRL can be forwarded to an MD-IWF. The DM-IWF Operational Status is determined by multiple attributes including DM-IWF Admin State, DM-IWF (internal) congestion level, MD-IWF Routed Service State and MD-IWF Service Congestion Level. In Table 18: DM-IWF Admin State and Operational Status, DM-IWF Congestion Level is the maximum of the DM-IWF (internal) Congestion Level and MD-IWF Routed Service Congestion Level.

In Table 18: DM-IWF Admin State and Operational Status, the DM-IWF Admin State, DM-IWF Congestion State, DM-IWF Shuting Down State, and the MD-IWF Routed Service State are used as inputs for calculating the DM-IWF Operational Status, DM-IWF Operational Reason, and DM-IWF Operational Reason Color.
Table 18: DM-IWF Admin State and Operational Status

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Disabled</td>
<td>N/A</td>
<td>False</td>
<td>N/A</td>
<td>Unavailable</td>
<td>Shut down</td>
<td>Orange</td>
</tr>
<tr>
<td>Enabled</td>
<td>0</td>
<td>N/A</td>
<td>Available</td>
<td>Available</td>
<td>Normal</td>
<td>Gray</td>
</tr>
<tr>
<td>Enabled</td>
<td>1</td>
<td>N/A</td>
<td>Available</td>
<td>Available</td>
<td>Congested</td>
<td>Yellow</td>
</tr>
<tr>
<td>Enabled</td>
<td>2</td>
<td>N/A</td>
<td>Available</td>
<td>Degraded</td>
<td>Congested</td>
<td>Yellow</td>
</tr>
<tr>
<td>Enabled</td>
<td>3</td>
<td>N/A</td>
<td>Available</td>
<td>Unavailable</td>
<td>Congested</td>
<td>Red</td>
</tr>
<tr>
<td>Enabled</td>
<td>0</td>
<td>N/A</td>
<td>Degraded(^1)</td>
<td>Available</td>
<td>SS7 Degraded</td>
<td>Yellow</td>
</tr>
<tr>
<td>Enabled</td>
<td>1</td>
<td>N/A</td>
<td>Degraded</td>
<td>Available</td>
<td>SS7 Degraded / Congested</td>
<td>Yellow</td>
</tr>
<tr>
<td>Enabled</td>
<td>2</td>
<td>N/A</td>
<td>Degraded</td>
<td>Degraded</td>
<td>SS7 Degraded / Congested</td>
<td>Yellow</td>
</tr>
<tr>
<td>Enabled</td>
<td>3</td>
<td>N/A</td>
<td>Degraded</td>
<td>Unavailable</td>
<td>SS7 Degraded / Congested</td>
<td>Red</td>
</tr>
<tr>
<td>Enabled</td>
<td>0</td>
<td>N/A</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>SS7 Unavailable</td>
<td>Red</td>
</tr>
<tr>
<td>Enabled</td>
<td>1, 2, 3</td>
<td>N/A</td>
<td>Unavailable</td>
<td>Unavailable</td>
<td>SS7 Unavailable / Congested</td>
<td>Red</td>
</tr>
</tbody>
</table>

**DM-IWF Alarms, KPIs, and Measurements**

This section describes how to access alarm, KPI, and measurements information that is available for DM-IWF in the DSR GUI. For more detailed information, refer to the *Alarms, KPIs, and Measurements Reference*.

Active alarms and events, as well as alarm and event history can be displayed on the *Alarms & Events > View Active* and *Alarms & Events > View History* GUI pages.

Key Performance Indicators, or KPIs, provide a means to convey performance information to the user in near real-time. KPIs can be displayed on the *Status & Manage > KPIs* GUI page.

\(^1\) MD-IWF Route Service State of Degraded does not impact DM-IWF’s Operational Status.
Measurements for DM-IWF are collected and reported in various measurement groups. A measurement report and measurement group can be associated with a one-to-one relationship. Measurement reports may be generated from the Measurements > Report GUI page.
### Glossary

<table>
<thead>
<tr>
<th><strong>A</strong></th>
<th><strong>ART</strong></th>
<th>Application Routing Table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AVP</strong></td>
<td>Attribute-Value Pair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Diameter protocol consists of a header followed by one or more attribute-value pairs (AVPs). An AVP includes a header and is used to encapsulate protocol-specific data (for example, routing information) as well as authentication, authorization or accounting information.</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td><strong>ComAgent</strong></td>
<td>Communication Agent</td>
</tr>
<tr>
<td></td>
<td>A common infrastructure component delivered as part of a common plug-in, which provides services to enable communication of message between application processes on different servers.</td>
<td></td>
</tr>
<tr>
<td><strong>CTF</strong></td>
<td>Charging Trigger Function</td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td><strong>DA-MP</strong></td>
<td>Diameter Agent Message Processor</td>
</tr>
<tr>
<td></td>
<td>A DSR MP (Server Role = MP, Server Group Function = Diameter Signaling Router). A local application that can optionally be activated on the DA-MP. A computer or blade that is hosting a Diameter Signaling Router Application.</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>DCA</td>
<td>DOIC Capabilities Announcement</td>
<td></td>
</tr>
<tr>
<td>DM-IWF</td>
<td>Diameter MAP–Interworking DSR application that translates Diameter messages into MAP messages.</td>
<td></td>
</tr>
<tr>
<td>DNS</td>
<td>Domain Name System A system for converting Internet host and domain names into IP addresses.</td>
<td></td>
</tr>
<tr>
<td>DRA</td>
<td>Diameter Routing Agent A functional element in a 3G or 4G (such as LTE) wireless network that provides real-time routing capabilities to ensure that messages are routed among the correct elements in a network.</td>
<td></td>
</tr>
<tr>
<td>DSCP</td>
<td>Differentiated Services Code Point Provides a framework and building blocks to enable deployment of scalable service discrimination in the internet. The differentiated services are realized by mapping the code point contained in a field in the IP packet header to a particular forwarding treatment or per-hop behavior (PHB). Differentiated services or DiffServ is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying and managing network traffic and providing quality of service (QoS) on modern IP networks.</td>
<td></td>
</tr>
</tbody>
</table>
GLA

Gateway Location Application A DSR Application that provides a Diameter interface to subscriber data stored in the DSR’s Policy Session Binding Repository (pSBR). Subscriber data concerning binding and session information is populated in the pSBR-B by the Policy Diameter Routing Agent (Policy DRA). GLA provides methods for a Diameter node to query binding information stored in the pSBR-B. The query can be by either IMSI or MSISDN. GLA processes Diameter Requests and generates Diameter Answers.

GTA

Global Title Address

GUI

Graphical User Interface
The term given to that set of items and facilities which provides you with a graphic means for manipulating screen data rather than being limited to character based commands.

HA

High Availability
High Availability refers to a system or component that operates on a continuous basis by utilizing redundant connectivity, thereby circumventing unplanned outages.

IDIH

Integrated Diameter Intelligence Hub

IP

Internet Protocol - IP specifies the format of packets, also called datagrams, and the addressing
I

scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

K

KPI

Key Performance Indicator

L

LDAP

Lightweight Directory Access Protocol
A protocol for providing and receiving directory information in a TCP/IP network.

M

MAP

Mobile Application Part
An application part in SS7 signaling for mobile communications systems.

MD-IWF

MAP-Diameter Interworking SS7 Application, which translates MAP messages into Diameter messages

MEAL

Measurements, Events, Alarms, and Logs

MP

Message Processor - The role of the Message Processor is to provide the application messaging protocol interfaces and processing. However, these servers also have OAM components. All Message Processors replicate from their...
M
Signaling OAM's database and generate faults to a Fault Management System.

N
Network Access Server
A single point of access or gateway to a remote resource. NAS systems are usually associated with AAA servers.

NOAM
Network Operations, Administration, and Maintenance

NOAMP
Network Operations, Administration, Maintenance, and Provisioning

O
Operations, Administration, and Maintenance. These functions are generally managed by individual applications and not managed by a platform management application, such as PM&C.

Operations – Monitoring the environment, detecting and determining faults, and alerting administrators.

Administration – Typically involves collecting performance statistics, accounting data for the purpose of billing, capacity planning, using usage data, and maintaining system reliability.

Maintenance – Provides such functions as upgrades, fixes, new feature enablement, backup and restore tasks, and monitoring media health (for example, diagnostics).
O

OCS

Online Charging System

A system allowing a Communications Service Provider to charge customers in real time based on service usage.

P

PCRF

Policy and Charging Rules Function

The ability to dynamically control access, services, network capacity, and charges in a network.

Maintains rules regarding a subscriber’s use of network resources. Responds to CCR and AAR messages. Periodically sends RAR messages. All policy sessions for a given subscriber, originating anywhere in the network, must be processed by the same PCRF.

In the Policy Management system, PCRF is located in the MPE device.

Software node designated in real-time to determine policy rules in a multimedia network.

Peer Route Table

A set of prioritized Peer Routing Rules that define routing to Peer Nodes based on message content.

PRT

Peer Route Table or Peer Routing Table

R

RADIUS

Remote Authentication Dial-In User Service

A client/server protocol and associated software that enables remote access servers to communicate with a central server to authorize their access to the requested service. The MPE device
functions with RADIUS servers to authenticate messages received from remote gateways. See also Diameter.

Session Binding Repository
A highly available, distributed database for storing Diameter session binding data.

SSH File Transfer Protocol
(sometimes also called Secure File Transfer Protocol)
A client-server protocol that allows a user on one computer to transfer files to and from another computer over a TCP/IP network over any reliable data stream. It is typically used with version two of the SSH protocol.

An industry-wide standard protocol used for network management. The SNMP agent maintains data variables that represent aspects of the network. These variables are called managed objects and are stored in a management information base (MIB). The SNMP protocol arranges managed objects into groups.

System Operations, Administration, and Maintenance

Signaling System #7
S

A communications protocol that allows signaling points in a network to send messages to each other so that voice and data connections can be set up between these signaling points. These messages are sent over its own network and not over the revenue producing voice and data paths. The EAGLE is an STP, which is a device that routes these messages through the network.

T

TCAP

Transaction Capabilities Application Part

A protocol in the SS7 protocol suite that enables the deployment of advanced intelligent network services by supporting non-circuit related information exchange between signaling points using the Signaling Connection Control Part connectionless service. TCAP also supports remote control - ability to invoke features in another remote network switch.

TSA

Target Set Address

An externally routable IP address that the IPFE presents to application clients. The IPFE distributes traffic sent to a target set address across a set of application servers.

UDR

User-Data-Request

A user-identity and service indication sent by a Diameter client to a Diameter server in order to request user data.