Oracle® Communications
Diameter Signaling Router

Full Address Based Resolution (FABR) User's Guide

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Oracle® Communications Full Address Based Resolution (FABR) User's Guide

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1

Introduction

Topics:

This chapter contains an overview of procedures to use to configure the FABR application. The contents include sections on the scope, audience, and organization of the documentation, and how to contact Oracle for assistance.

Overview

The Full Address Based Resolution (FABR) documentation provides information about FABR functions, and how to use the FABR GUI and the following procedures to configure the FABR DSR Application:

- Applications
- Exceptions
- Default Destinations
- Address Resolutions
- System Options

Scope and Audience

The FABR documentation is intended for anyone responsible for configuring and using the Full Address Based Resolution application. Users of this manual must have a working knowledge of telecommunications, of network installations, and of the product that is using the FABR functions.

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

Icon	Description
DANGER	**Danger**: (This icon and text indicate the possibility of *personal injury*.)
WARNING	**Warning**: (This icon and text indicate the possibility of *equipment damage*.)
CAUTION	**Caution**: (This icon and text indicate the possibility of *service interruption*.)
TOPPLE	**Topple**: (This icon and text indicate the possibility of *personal injury* and *equipment damage*.)

Manual Organization

This manual is organized into the following chapters:

- *Introduction* contains general information about the FABR help documentation, the organization of this manual, and how to get technical assistance.
- *Full Address Based Resolution* describes the function of the FABR application.
- *Configuration* describes how to configure the FABR application, including Applications, Exceptions, Default Destinations, Address Resolutions, and System Options.

Customer Care Center

Oracle's Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Technical Assistance Centers are located around the globe in the following locations:

Related - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

  Phone:

  1-888-367-8552 (toll-free, within continental USA and Canada)

  1-919-460-2150 (outside continental USA and Canada)

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

  Phone:

  +1-919-460-2150

  TAC Regional Support Office Hours (except Brazil):

  10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

- **Argentina**

  Phone:

  0-800-555-5246 (toll-free)

- **Brazil**

  Phone:

  0-800-891-4341 (toll-free)

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

  Phone:

  1230-020-555-5468

- **Colombia**

  Phone:

  01-800-912-0537

- **Dominican Republic**

  Phone:

  1-888-367-8552

- **Mexico**

  Phone:

  001-888-367-8552

- **Peru**

  Phone:

  0800-53-087

- **Puerto Rico**

  Phone:

  1-888-367-8552

- **Venezuela**

  Phone:

  0800-176-6497

- **Europe, Middle East, and Africa**

  Regional Office Hours:

  8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

  - **Signaling**

Phone:

+44 1784 467 804 (within UK)

- **Software Solutions**

  Phone:

  +33 3 89 33 54 00

- **Asia**

  - **India**

    Phone:

    +91-124-465-5098 or +1-919-460-2150

    TAC Regional Support Office Hours:

    10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

  - **Singapore**

    Phone:

    +65 6796 2288

    TAC Regional Support Office Hours:

    9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

In the event of a critical service situation, emergency response is offered by Oracle's Tekelec Customer Care Center 24 hours a day, 7 days a week. 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's Tekelec Customer Care Center.

Related Publications

The Diameter Signaling Router (DSR) documentation set includes the following publications, which provide information for the configuration and use of DSR and related applications.

Getting Started includes a product overview, system architecture, and functions. It also explains the DSR GUI features including user interface elements, main menu options, supported browsers, and common user interface widgets.

Feature Notice describes new features in the current release, provides the hardware baseline for this release, and explains how to find customer documentation on the Oracle Customer Support Site.

Roadmap to Hardware Documentation provides links to access manufacturer online documentation for hardware related to the DSR.

Operation, Administration, and Maintenance (OAM) Guide provides information on system-level configuration and administration tasks for the advanced functions of the DSR, both for initial setup and maintenance.

Communication Agent User's Guide explains how to use the Communication Agent GUI pages to configure Remote Servers, Connection Groups, and Routed Servers, and to maintain configured connections.

Diameter User's Guide explains how to use the Diameter GUI pages to manage the configuration and maintenance of Diameter Configuration components, including Local and Peer Nodes, Connections, Configuration Sets, Peer Routing Rules, Application Route Tables, System Options, and DNS options; describes the functions of Diameter Message Copy; and describes DSR capacity and congestion controls.

Diameter Mediation User's Guide describes the functions of Diameter Mediation, and explains how to use the Diameter Mediation GUI pages (nested inside the Diameter GUI folder) to configure and test Rule Templates, how to use the Formatting Value Wizard, and how to configure Rule Sets.

IP Front End (IPFE) User's Guide explains how to the use the IPFE GUI pages to configure IPFE to distribute IPv4 and IPv6 connections from multiple clients to multiple nodes.

Range-Based Address Resolution (RBAR) User's Guide explains how to use the RBAR GUI pages to configure RBAR to route Diameter end-to-end transactions based on Diameter Application ID, Command Code, Routing Entity Type, and Routing Entity address ranges and individual addresses.

Full-Address Based Resolution (FABR) User's Guide explains how to use the FABR GUI pages to configure FABR to resolve designated Diameter server addresses based on Diameter Application ID, Command Code, Routing Entity Type, and Routing Entity addresses.

Charging Proxy Application (CPA) and Offline Charging Solution User's Guide describes the Offline Charging Solution and explains how to use the CPA GUI pages to set System Options for CPA, configure the CPA's Message Copy capability, and configure the Session Binding Repository for CPA.

Policy DRA User's Guide describes the topology and functions of the Policy Diameter Routing Agent (Policy DRA) DSR Application and the Policy Session Binding Repository, and explains how to use the GUI pages to configure Policy DRA.

Gateway Location Application (GLA) User's Guide describes the functions of retrieving subscriber data stored in Policy Session Binding Repository (pSBR) provided by Policy DRA and explains how to use the GUI pages to configure GLA.

DSR Alarms, KPIs, and Measurements Reference provides detailed descriptions of alarms, events, Key Performance Indicators (KPIs), and measurements; indicates actions to take to resolve an alarm, event, or unusual Diameter measurement value; and explains how to generate reports containing current alarm, event, KPI, and measurement information.

DSR Administration Guide describes DSR architecture, functions, configuration, and tools and utilities (IPsec, Import/Export, DIH, and database backups); and provides references to other publications for more detailed information.

Locate Product Documentation on the Customer Support Site

Oracle customer documentation is available on the web at the Oracle Technology Network (OTN) 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 *www.adobe.com*.

1. Log into the Oracle Customer Support site at *http://docs.oracle.com*.
2. Under **Applications**, click the link for **Communications**.
   The **Oracle Communications Documentation** window opens with Tekelec shown near the top.
3. Click **Oracle Communications Documentation for Tekelec Products**.
4. Navigate to your Product and then the Release Number, and click the **View** link (the **Download** link will retrieve the entire documentation set).
5. To download a file to your location, right-click the PDF link and select **Save Target As**.

Chapter

2

Full Address Based Resolution

Topics:

This section provides an overview of the function of the Full Address Based Resolution (FABR) application.

Full Address Based Resolution overview

Full Address Based Resolution (FABR) is a DSR enhanced routing application that enables network operators to resolve the designated Diameter server (IMS HSS, LTE HSS, PCRF, OCS, OFCS, and AAA) addresses based on Diameter Application ID, Command Code, Routing Entity Type, and Routing Entity Addresses, and route the Diameter Request to the resolved destination. The FABR DSR Application validates the ingress Diameter Request message, retrieves the Application ID and Command Code from it, and determines the desired Routing Entity Type to be decoded from the message, based on the configuration. The FABR application extracts the Routing Entity Address from user-configured Attribute-Value Pairs (AVPs) in the ingress message and sends the Routing Entity Address, if extracted successfully, to an off-board DP that is running the Subscriber Database Server (SDS) for destination address resolution.

A Routing Entity can be

- A User Identity:
  - International Mobile Subscriber Identity (IMSI)
  - Mobile Subscriber Integrated Services Digital Network (Number) (MSISDN)
  - IP Multimedia Private Identity (IMPI)
  - IP Multimedia Public Identity (IMPU)

- An IP Address associated with the User Equipment
  - IPv4
  - IPv6-prefix

- A general-purpose data type: UNSIGNED16

The resolved Destination address can be any combination of a Realm and Fully Qualified Domain Name (FQDN); Realm-only, FQDN-only, or Realm and FQDN.

FABR will replace the Destination-Host and/or Destination-Realm AVP in the ingress Request message with the corresponding values of the resolved Destination, and forward the message to the Diameter Relay Agent for egress routing into the network.

Routing Based on Blacklist Lookup

A Blacklist search, performed prior to the full address search, can be enabled for a combination of Application-Id, Command Code and Routing Entity Type. A Blacklist lookup can be enabled on a system-wide basis. If the Blacklist lookup is disabled system wide, the Blacklist lookup is not performed and the Blacklist lookup configuration associated with the combination of Application-Id, Command Code and Routing Entity Type is ignored.

If a match is found during the Blacklist search, FABR can be configured, on a per Application-Id basis, either to respond to the Diameter Request with a configurable Result-Code/Experimental Result-Code, or to forward the Request to a default destination, or to forward the Request unchanged. If a match is not found during the Blacklist search, FABR continues to perform the full address lookup.

Routing Based on IMSI/MSISDN Prefix Lookup

If configured, FABR will perform prefix based lookups after the full address lookup is performed. The prefix and range based lookup will only be performed if the full address lookup does not find a match and can be enabled by the operator for a combination of Application-Id, Command-Code and Routing Entity Type.

If a match is found in the prefix database, that FABR application will populate the Destination-Host AVP and/or the Destination-Realm AVP based on configuration settings (similar to the full address lookups).

If a match is not found in the prefix database, then FABR will perform the routing exception handling procedure.

The IMSI/MSISDN Prefix and Range lookup can be enabled or disabled on a system wide basis.

DP Query Bundling

FABR DP Query Bundling enhances the FABR-to-DP interface by supporting the bundling of multiple queries into a single "bundled query" stack event if bundling is enabled.

When "bundled query" is received by the DP, the corresponding "bundled response" will have responses to all the queries that constitute the "bundled query".

Reserved MCC Ranges

Mobile Country Code (MCC) ranges that are reserved for future use are defined in a system-wide **MCC Ranges** table. If the MCC digits portion of decoded IMSI digits fall within one of the ranges designated in the **MCC Ranges** table, the IMSI digits will NOT be used for further Address Resolution. FABR will continue decoding the digits using other AVP instances, or next Priority AVP (if provisioned), or next Routing Entity (if provisioned).

Routing Exception Handling

When an ingress FABR Request message cannot be resolved to a Destination (no address matched, no valid digits decoded, or any other error is returned), FABR will invoke a routing exception handling procedure based on user-defined configuration.

The following routing exception handling procedures are supported:

- Forward the message unchanged
- Forward the message using a user-defined default Destination
- Send an Answer response with a user-defined Result-Code AVP value
- Send an Answer response with user-defined Experimental-Code AVP values
- Abandon Request

The following types of routing exceptions will be supported:

- Unknown Application ID
- Unknown Command Code
- No valid Routing Entity addresses were found
- A valid Routing Entity address did not resolve to a configured address
- Blacklisted Subscriber
- DP congestion
- DP errors

Chapter

3

Configuration

Topics:

This section describes the procedures used to configure the FABR application.

Pre-Configuration Activities

Before FABR configuration can be performed, the following activities need to be performed in the system:

- Verify Server status
- Gather information that is required for Diameter and FABR configuration
- Configure Diameter components that are required for FABR configuration
- Configure SDS DP Remote Servers in ComAgent

Verifying Server status

Use this task to verify Server status prior to FABR configuration.

1. From the active SOAM in a 3-tiered DSR topology or from the NOAM in a 2-tiered DSR topology, select **Status & Manage** > **Server**.
2. Verify that for each Server, the **Appl State** field is **Disabled**, and the **DB**, **Reporting Status**, and **Proc** fields are **Norm**.

Diameter Configuration for FABR

The following Diameter configuration must be done before FABR configuration can be performed.

All Diameter Configuration is done from the SOAM GUI in a 3-tiered DSR topology or from the NOAM GUI in a 2-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 FABR.

1. **MP Profiles**

   Use the **Diameter** > **Configuration** > **DA-MPs** > **Profile Assignments** page to assign an **MP Profile** for each configured FABR DA-MP shown in the **DA-MP** list.

   From the pulldown list, select the MP Profile that is for the correct blade and for a Database application, for example **G6:Database** or **G8:Database**.

2. **Application Ids**

   Diameter Application Ids must be configured prior to making them available for use in a FABR Address Resolution. Use the **Diameter** > **Configuration** > **Application Ids [Insert]** page to configure Diameter Application Ids.

   The Application Ids that need to be configured depend on the types of Diameter Servers being supported, including HSS, PCRF, OFCS, OCS, and AAA.

3. **Command Codes**

   Diameter Command Codes must be configured prior to using them in a FABR Address Resolution. Use the **Diameter** > **Configuration** > **Command Codes [Insert]** page to configure Diameter Command Codes.

Configure any Command Codes that need to be handled by FABR. 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 FABR. For example, the combination of Application Id = S6a and Command Code = ULR/ULA might be relevant for HSS.

4. **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 FABR and other DSR Applications.

5. **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** so that messages with Diameter Application ID = 4 are directed to FABR.

   When defining the **Application Routing Rule**:

   - In the **Conditions** field, set the **Application-Id Operator** to **Equals** and the **Value** to **4**. For all other Parameters, set the **Operator** to **Always True**.
   - Set the **Application Name** to **FABR**.

6. **Reserved MCC Ranges**

   Use the **Diameter** > **Configuration** > **MCC Ranges[Insert]** page to specify up to 10 distinct, non-overlapping **MCC Ranges.**

   The following two **MCC Ranges** are reserved by telephony standards and are recommended to be created in addition to other specified ranges:

   1. 000-199
   2. 800-899

SDS DP Remote Server Configuration

Use this procedure to configure SDS DP Remote Servers to allow FABR to use SDS for address lookup and resolution.

Remote Servers are configured using the ComAgent Remote Server Configuration GUI. Repeat the steps for each SDS DP in your system.

1. From the active NOAM, select **Communication Agent** > **Configuration** > **Remote Servers**. The **Communication Agent > Configuration > Remote Servers** page is displayed.
2. Click **Insert**. The **Communication Agent > Configuration > Remote Servers [Insert]** page is displayed.
3. Enter a unique **Remote Server Name**.
4. Enter the **Remote Server IP Address**.

   Specify the IP address that can be reached via a server's Internal Management Interface (IMI). The IP address uniquely identifies the Remote Server and provides the means by which Communication Agent can establish transport connections to/from the Remote Server.

5. For **Remote Server Mode**, select **Server**.

6. Assign the Remote Server to one of the **Available Local Server Groups**.

7. Click **Ok**.
   The **Communication Agent > Configuration > Remote Servers** is displayed with the new Remote Server now listed.

8. Select **Communication Agent** > **Configuration** > **Connection Groups**
   The **Communication Agent > Configuration > Connection Groups** page is displayed.

9. Select the DPSvcGroup and click **Edit**.
   The **Communication Agent > Configuration > Connection Groups [Edit]** page is displayed.

10. Assign the Remote Server you just created to the DPSvcGroup Connection group.

11. Click **Ok**.
    The **Communication Agent > Configuration > Connection Groups** page is displayed.

12. Expand the **Servers** assigned to the DPSvcGroup to see that the new Remote Server is now included.

The operational status of what was provisioned can be verified by using the **Communication Agent > Maintenance** pages.

- Select **Communication Agent** > **Maintenance** > **Connection Status** to verify that all remote server connections added are shown as "InService" on all local servers.

- Select **Communication Agent** > **Maintenance** > **Routed Service Status** to verify that the status is "Available" for all local servers that are provisioned to connect.

FABR Configuration

The **FABR** > **Configuration** pages allow you to manage FABR application configuration.

FABR configuration typically occurs in the following order:

1. Add Diameter **Applications** to a list of FABR supported Diameter Applications.
2. If necessary, configure **Default Destinations**.
3. If necessary, edit routing **Exceptions**.

   Note: If a **Routing Exception Action** of **Forward Unchanged** is configured, configure a **Default Destination**.

4. Configure **Address Resolutions**.
5. If necessary, change the **System Options**.

Applications configuration

The **FABR > Configuration > Applications** page allows you to access a list of Diameter applications supported by FABR.

From the **FABR > Configuration > Applications** page, you can:

- Filter the list of supported Diameter applications to display only the desired application(s).
- View a list of supported Diameter applications.
- Insert a supported Diameter application.

Note: When an Application entry is added, Routing Exceptions (**Unknown Command Code**, **No valid Routing Entity Address**, **No Address Match**) are automatically inserted with the **Routing Exception Action** value as Forward Unchanged.

• Delete a Diameter application from the list of supported Diameter applications.

Note: When an Application entry is deleted, the associated Routing Exceptions are automatically deleted.

Applications configuration elements

Table 2: Applications Configuration Elements describes the fields on the Applications View, Insert, and Edit pages. Data Input Notes only apply to the Insert and Edit pages; the View page is read-only.

Table 2: Applications Configuration Elements

Field	Description	Data Input Notes
Application ID	Diameter Application ID which can be used by FABR, along with Command Code and Routing Entity Type, to determine Address Resolution for routing Request messages.	Format: Pulldown list Range: Configured Diameter Application IDs
Routing Mode (Read only)	Method of routing for Request messages received containing the Diameter Application ID	Format: Disabled pulldown list with a value of **Proxy**.

Viewing supported Diameter applications

Use this task to view currently configured supported Diameter applications.

Select **FABR** > **Configuration** > **Applications**.
The **FABR > Configuration > Applications** page appears.

The Applications page appears with a list of supported Diameter applications. This list of applications can be filtered to display only desired applications. The fields are described in *Applications configuration elements*.

Inserting a supported Diameter application

Use this task to add a new Diameter application.

Inserting a supported Application automatically adds Routing Exceptions (**Unknown Command Code**, **No valid Routing Entity Address**, **No Address Match Found**, **DP Errors**, and **DP Congestion**) with the **Routing Exception Action** set to Forward Unchanged.

1. Select **FABR** > **Configuration** > **Applications**.
   The **FABR > Configuration > Applications** page appears.
2. Click **Insert**.
   The **FABR > Configuration > Applications [Insert]** page appears.
3. Click on a Radio button to choose how the Application ID is selected.

- Text box to manually enter an Application ID.
- Drop down list, select the Application ID in the Diameter message.

  Note: The Application IDs presented in this list are those created using **Main Menu** > **Diameter** > **Application Ids**.

4. Note that the **Routing Mode** field is disabled.
5. Perform one of the following actions:

   - Click **OK** to save the application and return to the **FABR > Configuration > Applications** page.
   - Click **Apply** to save the application and stay on this page.

     Note: If field validations succeed after clicking either **OK** or **Apply**, the new Application is saved and an informational message about the automatic addition of the Routing Exceptions appears.

   - Click **Cancel** to return to the **FABR > Configuration > Applications** page without saving the changes.

   If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

   - The **Application ID** is empty; no value was entered or selected
   - The **Application ID** is not unique; it already exists in the system
   - The entry in any field is not valid (wrong data type or out of the valid range)
   - The maximum number of supported Diameter applications (16) is already defined in the system

Editing a supported Diameter application

A supported Diameter Application entry cannot be edited. Selecting a supported Diameter Application, clicking **Edit**, and changing the **Application ID** value results in an error message.

To change a supported Diameter Application entry:

- Use the procedure in *Inserting a supported Diameter application* to insert the Diameter Application you want.
- Use the procedure in *Deleting a Diameter application from the list of supported Diameter applications* to delete the Diameter Application you do not want.

Deleting a Diameter application from the list of supported Diameter applications

Use this task to delete a Diameter application from the list of supported Diameter applications.

An application cannot be deleted if it is being used by an Address Resolution. Before you perform this task, delete any Address Resolution that uses the Application.

1. Select **FABR** > **Configuration** > **Applications**.
   The **FABR > Configuration > Applications** page appears.
2. Select the Application you want to delete, then click **Delete**.
   A popup window appears.

   Note: An error message appears if the Application has already been removed.

3. Perform one of the following actions:

   - Click **OK** to delete the application.

- Click **Cancel** to cancel the delete function and return to the **FABR > Configuration > Applications** page.

If **OK** is clicked, an error message appears if the following condition exists:

- The Application is in use by an Address Resolution

Exceptions configuration

The **FABR > Configuration > Exceptions** page allows you to specify the routing procedure to invoke when FABR is unable to resolve an address to a Destination for each supported Diameter Application and Routing Exception Type.

There are Routing Exception entries automatically inserted with the **Routing Exception Action** set to Forward Unchanged as the default action for a supported Diameter application entry when that application entry is added.

- **Unknown Command Code**
- **No valid Routing Entity Address**
- **No Address Match Found**
- **DP Errors**
- **DP Congestion**
- **Blacklist**

Similarly, these Routing Exceptions that are associated with an application entry are automatically deleted when that application entry is deleted.

From the **FABR > Configuration > Exceptions** page, you can:

- Filter the list of exceptions to display only the desired exceptions.
- View a list of supported Diameter applications and their associated Routing Exception Types and Routing Exception Actions.
- Edit the Routing Exception Action and its associated attributes for a supported Diameter application.

Exceptions configuration elements

Table 3: Exceptions Configuration Elements describes the fields on the Exceptions View and Edit pages.

Table 3: Exceptions Configuration Elements

Field	Description	Data Input Notes
Application ID (Read only)	Application ID in a Diameter message	N/A
Application Name (Read only)	Name of the application corresponding to the Application ID	N/A
Routing Exception Type (Read only)	The routing exception that prevented address resolution. This field displays one of the following values: • Unknown Application ID • Unknown Command Code	N/A

Field	Description	Data Input Notes
	• No Valid Routing Entity Address • No Address Match Found • DP Errors • DP Congestion • Blacklisted Subscriber	
Routing Exception Action	Action that FABR takes associated with the **Routing Exception Type**	Format: Radio buttons Range: • Forward Unchanged • Forward to Destination • Send Answer with Result-Code AVP • Send Answer with Experimental-Result AVP • Abandon Request
Destination	Destination to where the message is forwarded associated with the **Routing Exception Type**. This field is enabled when the **Routing Exception Action** is set to Forward to Destination.	Format: Pulldown list Range: Available user-configured destinations
Result-Code Value	Result code associated with this **Routing Exception Type**. This field is enabled when the **Routing Exception Action** is set to either Send Answer with Result-Code AVP or Send Answer with Experimental-Result AVP.	Format: • Selection text box; numeric • Selection pulldown list Range: • Selection box: 1000–5999 • Selection pulldown list: available Diameter result codes
Vendor-ID	Value returned in the Vendor-ID AVP of the answer message associated with this **Routing Exception Type**. This field is enabled when the **Routing Exception Action** is set to Send Answer with Experimental-Result AVP.	Format: Text box; numeric Range: 1–4294967295
Error Message	Value returned in the Error-Message AVP of the answer message. This field is enabled when the **Routing Exception Action** is set to either Send	Range: 0–64 characters Default: Null string

Field	Description	Data Input Notes
	Answer with Result-Code AVP or Send Answer with Experimental-Result AVP.	

Viewing Exceptions

Use this task to view currently configured Exceptions.

> Select **FABR** > **Configuration** > **Exceptions**.
> The **FABR > Configuration > Exceptions** page appears. This list of applications and associated Routing Exception information can be filtered to display only desired items.

Editing a Routing Exception

Use this task to edit a Routing Exception.

1. Select **FABR** > **Configuration** > **Exceptions**.
   The **FABR > Configuration > Exceptions** page appears.

2. Select the Application ID/Name you want to edit, then click **Edit**.
   The **FABR > Configuration > Exceptions [Edit]** page appears.

   Note: An error message appears if the Application has already been removed.

3. Update the relevant fields.

   For more information about each field, see *Exceptions configuration elements*.

   - An error is displayed if "Vendor-ID" is not configured when "Send Answer with Experimental-Result AVP" is selected as a value for "Routing Exception Action".

   - An error is displayed if "Destination" is not configured when "Forward to Destination" is selected as a value for "Routing Exception Action".

   - An error is displayed if "Result-Code Value" is not configured when "Send Answer with Result-Code AVP" or "Send Answer with Experimental-Result AVP" is selected as a value for "Routing Exception Action".

4. Perform one of the following actions:

   - Click **OK** to save the edited exception entry and return to the **FABR > Configuration > Exceptions** page.
   - Click **Apply** to save the edited exception entry and stay on this page.
   - Click **Cancel** to return to the **FABR > Configuration > Exceptions** page without saving the changes.

Default Destinations configuration

The **FABR > Configuration > Default Destinations** page contains the attributes associated with a Default Destination to which FABR routes a message. FABR uses these attributes to modify the contents of a received message before forwarding the message.

Each Default Destination can be configured with any combination of a Realm and FQDN such as Realm-only, FQDN-only, or Realm and FQDN.

From the **FABR > Configuration > Default Destinations** page, you can:

- Filter the list of Default Destinations to display only the desired destinations.
- View a list of Default Destinations.
- Insert a Default Destination.
- Edit a Default Destination.
- Delete a Default Destination.

Default Destinations configuration elements

Table 4: Destinations Configuration Elements describes the fields on the Default Destinations View, Insert, and Edit pages.

Table 4: Destinations Configuration Elements

Field	Description	Data Input Notes
Name	Unique name of the Destination If a duplicate Name is entered or the Name is not specified, an error message appears.	Format: Alphanumeric and underscore (_) Range: 1–32 characters; cannot start with a digit and must contain at least one alphabetic character
Realm	Realm of the Default Destination The **Realm** and **Fully Qualified Domain Name** cannot both be empty; otherwise, an error message appears.	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 Realm must be at most 255 characters long. At least Realm or Fully Qualified Domain Name is required to configure a Destination.[Default =
Fully Qualified Domain Name	Unique Fully Qualified Domain Name of the Default Destination If a duplicate FQDN is entered, an error message appears. The **Fully Qualified Domain Name** and **Realm** cannot both be empty; otherwise, an error message appears.	

Field	Description	Data Input Notes
		n/a; Range = A valid Realm.]

Viewing Default Destinations

Use this task to view currently configured Default Destinations.

Select **FABR** > **Configuration** > **Default Destinations**.
The **FABR > Configuration > Default Destinations** page appears. This list of destinations can be filtered to display only desired items.

Inserting a Default Destination

Use this task to add a new Default Destination.

1. Select **FABR** > **Configuration** > **Default Destinations**.
   The **FABR > Configuration > Default Destinations** page appears.
2. Click **Insert**.
   The **FABR > Configuration > Default Destinations [Insert]** page appears.
3. Enter a unique name for the destination in the **Name** field.
4. Enter the realm in the **Realm** field.
5. Enter a unique FQDN in the **Fully Qualified Domain Name** field.
6. Perform one of the following actions:

   - Click **OK** to save the destination and return to the **FABR > Configuration > Default Destinations** page.
   - Click **Apply** to save the destination and stay on this page.
   - Click **Cancel** to return to the **FABR > Configuration > Default Destinations** page without saving the data.

   If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

   - Both the **Realm** and **Fully Qualified Domain Name** are empty; no value was entered
   - The **Name** or **Fully Qualified Domain Name** is not unique; it already exists in the system
   - The entry in any field is not valid (wrong data type or out of the valid range)
   - The required **Name** is empty
   - The number of Default Destinations (128) is already defined in the system

Editing a Default Destination

Use this task to edit a Default Destination.

1. Select **FABR** > **Configuration** > **Default Destinations**.
   The **FABR > Configuration > Default Destinations** page appears.
2. Select the Destination you want to edit, then click **Edit**.
   The **FABR > Configuration > Default Destinations [Edit]** page appears.

   Note: An error message appears if the Destination has already been removed.

3. Update the relevant fields.

    For more information about each field, see *Default Destinations configuration elements*.

    The **Name** field is read-only and cannot be edited.

4. Perform one of the following actions:

    *   Click **OK** to save the changes and return to the **FABR > Configuration > Default Destinations** page.
    *   Click **Apply** to save the changes and stay on this page.
    *   Click **Cancel** to return to the **FABR > Configuration > Default Destinations** page without saving the changes.

    If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

    *   Both the **Realm** and **Fully Qualified Domain Name** are empty; no value was entered
    *   The **Fully Qualified Domain Name** is not unique; it already exists in the system
    *   The entry in any field is not valid (wrong data type or out of the valid range)

Deleting a Default Destination

Use this task to delete a Default Destination. A Default Destination cannot be deleted if it is being used by a Routing Exception. Before this task is performed, delete the association with any Routing Exception either by changing the Routing Exception Action to something other than "Forward To Destination", or by deleting the Supported Application, thereby deleting the associated Routing Exceptions.

1. Select **FABR** > **Configuration** > **Default Destinations**.
    The **FABR > Configuration > Default Destinations** page appears.

2. Select the Default Destination you want to delete, then click **Delete**.
    A popup window appears.

3. Perform one of the following actions:

    *   Click **OK** to delete the destination.
    *   Click **Cancel** to cancel the delete function and return to the **FABR > Configuration > Default Destinations** page.

    If **OK** is clicked and the following condition exists, an error message appears:

    *   The Default Destination is in use by a Routing Exception.

Address Resolutions configuration

FABR performs off-board database lookups for user identities decoded from Diameter messages. The **FABR > Configuration > Address Resolutions** page allows you to configure which (and how) user identities are to be decoded from the messages. You can provision combinations of Diameter Application ID, and Command Code (the key that is matched to the messages) and configure the Routing Entity Type(s) to be decoded and a prioritized list of AVPs from which to decode these entity types. An Address Resolution supports up to two prioritized Routing Entity Types for each Application ID and Command Code.

*   Primary Routing Entity Type (highest priority)
*   Secondary Routing Entity Type (lowest priority)

.

From the **FABR > Configuration > Address Resolutions** page, you can:

• Filter the list of address resolutions to display only the desired records.
• View a list of address resolutions.
• Insert an address resolution.
• Edit an address resolution.
• Delete an address resolution.

Address Resolutions configuration elements

Table 5: Address Resolutions Configuration Elements describes the fields on the Address Resolutions View, Insert, and Edit pages. Data Input Notes only apply to the Insert and Edit pages; the View page is read-only.

Table 5: Address Resolutions Configuration Elements

Field	Description	Data Input Notes
Application ID	Application ID in a Diameter message. The Application ID is an IANA-assigned Diameter Application ID, which is a 32-bit field that is mandatory in all Diameter messages. It is commonly used for screening and routing messages between Diameter nodes. If a combination of the Application ID and Command Code already exists, an error message appears.	Format: Pulldown list Range: Application IDs configured for FABR
Command Code	Command Code in a Diameter message If a combination of the Application ID and Command Code already exists, an error message appears.	Format: Pulldown list Range: Command Codes configured for Diameter
Primary Routing Entity and Secondary Routing Entity sections		
Routing Entity	Routing Entity type. The same Routing Entity Type cannot be selected for both the Primary and the Secondary Routing Entity; if the same type is selected, an error message appears. If the Routing Entity Type is not specified for the Primary Routing Entity, an error message appears.	Format: Pulldown list Range: • IMSI • MSISDN • IMPI • IMPU
Primary AVP	Primary AVP used for extracting the Routing Entity address. The same Primary AVP and Secondary AVP cannot be selected for either the Primary Routing	Format: Pulldown list Will be used for extracting the Routing Entity address. Range of User Identity routing entity types include:

Field	Description	Data Input Notes
	Entity or for the Secondary Routing Entity; if the same AVP is selected, an error message appears. If Primary AVP is not selected for the Primary Routing Entity, an error message appears.	• Public Identity • ServiceInfo.Subscription-Id(0) • ServiceInfo.Subscription-Id(1) • ServiceInfo.Subscription-Id(2) • ServiceInfo.Subscription-Id(3)
Secondary AVP	Secondary AVP used for extracting the Routing Entity address. The same Primary AVP and Secondary AVP cannot be selected for either the Primary Routing Entity or for the Secondary Routing Entity; if the same AVP is selected, an error message appears.	• Subscription-Id(0) • Subscription-Id(1) • Subscription-Id(2) • Subscription-Id(3) • UserIdentity.MSISDN • UserIdentity.Public-Identity • UserName • Wildcarded-Public-Identity
Destination Type	Type of Destination for this Routing Entity Type.	Format: Pulldown list Range: • IMS-HSS • LTE-HSS • PCRF • OCS • OFCS • AAA • USERDEF1 • USERDEF2
Prefix Search Enabled	Enables the IMSI/MSISDN prefix based lookup to be performed if the full address lookup did not find a match.	Format: Radio box
Blacklist Search Enabled	Enables the IMSI/MSISDN blacklist lookup to be performed prior to the full address lookup.	Format: Radio box

Viewing Address Resolutions

Use this task to view currently configured Address Resolutions.

> Select **FABR** > **Configuration** > **Address Resolutions**.
> The **FABR > Configuration > Address Resolutions** page appears. This list of Address Resolutions can be filtered to display only desired records.

Inserting an Address Resolution

Use this task to add a new Address Resolution.

Before this task is performed, make sure there is at least one supported Diameter Application configured in the system.

1. Select **FABR** > **Configuration** > **Address Resolutions**.

The **FABR > Configuration > Address Resolutions** page appears.

2. Click **Insert**.
   The **FABR > Configuration > Address Resolutions [Insert]** page appears.

3. Select an application ID from the **Application ID** pulldown list.

   Note: The Application IDs presented in this list are those created using **Main Menu** > **FABR** > **Configuration** > **Applications**.

4. Select the appropriate Command Code from the **Command Code** pulldown list.

   Note: The Command Codes presented in this list are those created using **Main Menu** > **Diameter** > **Command Codes** .

5. For the Primary Routing Entity section, perform the following:
   a) Select the appropriate Routing Entity type from the **Routing Entity** pulldown list.
   b) Select the Primary AVP from the **Primary AVP** pulldown list.
   c) If needed, select the Secondary AVP from the **Secondary AVP** pulldown list.
   d) Select the type of destination from the **Destination Type** pulldown list.

6. If needed, for the Secondary Routing Entity section, perform the following:
   a) Select the appropriate Routing Entity type from the **Routing Entity Type** pulldown list.
   b) Select the Primary AVP from the **Primary AVP** pulldown list.
   c) If needed, select the Secondary AVP from the **Secondary AVP** pulldown list.
   d) Select the type of destination from the **Destination Type** pulldown list.

7. Perform one of the following actions:

   • Click **OK** to save the address resolution and return to the **FABR > Configuration > Address Resolutions** page.
   • **Apply** to save the address resolution and stay on this page.
   • Click **Cancel** to return to the **FABR > Configuration > Address Resolutions** page without saving the data.

   If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

   • The combination of **Application ID** and **Command Code Value** is not unique; it already exists in the system
   • The entry in any field is not valid (wrong data type or out of the valid range)
   • Any required field is empty
   • An **Address Resolution** with the **Primary Routing Entity** missing **Routing Entity**,**Primary AVP**, or **Destination Type**.
   • Duplicate Routing Entity Types were selected in the **Primary** and **Secondary** Routing Entity sections
   • Duplicate AVPs were selected in the **Primary AVP** and **Secondary AVP** fields
   • The maximum number of Address Resolutions (128) is already defined in the system

Editing an Address Resolution

Use this task to edit an Address Resolution.

1. Select **FABR** > **Configuration** > **Address Resolution**.
   The **FABR > Configuration > Address Resolutions** page appears.

2. Select the Address Resolution you want to edit, then click **Edit**.
   The **FABR > Configuration > Address Resolutions [Edit]** page appears.

   Note: An error message appears if the Address Resolution has already been removed.

3. Update the relevant fields.

   For more information about each field, see *Address Resolutions configuration elements*.

   The following fields are read-only and cannot be edited:

   - **Application ID**
   - **Command Code**

4. Perform one of the following actions:

   - Click **OK** to save the changes and return to the **FABR > Configuration > Address Resolutions** page.
   - Click **Apply** to save the changes and stay on this page.
   - Click **Cancel** to return to the **FABR > Configuration > Address Resolutions** page without saving the changes.

   If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

   - The entry in any field is not valid (wrong data type or out of the valid range)
   - Any required field is empty
   - An **Address Resolution** with the **Primary Routing Entity** missing **Routing Entity**,**Primary AVP**, or **Destination Type**.
   - Duplicate Routing Entity Types were selected in the **Primary** and **Secondary** Routing Entity sections
   - Duplicate AVPs were selected in the **Primary AVP** and **Secondary AVP** fields

Deleting an Address Resolution

Use this task to delete an Address Resolution.

1. Select **FABR** > **Configuration** > **Address Resolutions**.
   The **FABR > Configuration > Address Resolutions** page appears.

2. Select the Address Resolution you want to delete, then click **Delete**.
   A popup window appears.

   Note: An error message appears if the Address Resolution has already been removed.

3. Perform one of the following actions:

   - Click **OK** to delete the Address Resolution.
   - Click **Cancel** to cancel the delete function and return to the **FABR > Configuration > Address Resolutions** page.

System Options configuration

The **System Options** page allows you to modify the default system values for FABR global parameters, for example, FQDN/Realm, Allow Subsequent FABR Invocation, or Application Unavailable action.

System Options elements

Table 6: System Options Elements describes the fields on the System Options page.

Table 6: System Options Elements

Field	Description	Data Input Notes
ASCII Excluded Digits	List of ASCII characters to ignore while parsing MSISDN digits from a raw AVP data field of AVP Type UTF8String. If an invalid character is entered, an error message appears.	Format: Text boxes Default = n/a Range = ASCII printable characters except '%', '@', ':' and ';'
Exclude Space	Defines whether ASCII character space is ignored while parsing MSISDN digits from a raw AVP data field of AVP Type UTF8String If checked, ASCII character space is ignored. If not checked, ASCII character space is not ignored.	Format: Check box Range: Checked, unchecked Default: Unchecked
TBCD Excluded Digits	Defines whether the associated digits is ignored while parsing digits from a raw AVP data field of AVP Type OctetString encoded as a TBCD-string If checked, digits is ignored. If not checked, digits is not ignored.	Format: Check boxes Range: Checked, unchecked for each option: *(1010), #(1011), a(1100), b(1101), c(1110) Default: Unchecked
Allow Subsequent FABR Invocation	Enables the subsequent invocation of FABR on a different DSR node in the network	Format: Check box Range: Checked, unchecked Default: Unchecked
Remove Destination-Host	If checked, FABR deletes any instance of "Destination-Host" AVPs in the message when performing "Realm only" resolution.	Format: Check box Range: Checked, unchecked Default: Unchecked
Realm	Value to be placed in the Origin-Realm AVP of the Answer message generated by FABR. A Realm must be paired with a Fully Qualified Domain Name. If entering a value for Realm, then a value for Fully Qualified Domain Name must also be entered; otherwise, an error message appears.	Format: string consisting of a list of labels separated by dots. A label can contain letters, digits, dash (-),and underscore (_). A label must begin with a letter, digit, or underscore, and must

Field	Description	Data Input Notes
	If a value is not entered, the local node Realm for the egress connection is used.	end with a letter or digit. Underscore can be used only as the first character. Range = A valid Realm - up to 255 characters; label-up to 63 characters.
Fully Qualified Domain Name	Value to be placed in the Origin-Host AVP of the Answer message generated by FABR A Fully Qualified Domain Name must be paired with a Realm. If entering a value for Fully Qualified Domain Name, then a value for Realm must also be entered; otherwise, an error message appears. If not configured, local node FQDN for the egress connection is used.	Format: string consisting of a list of labels separated by dots. A label can contain letters, digits, dash (-),and underscore (_). A label must begin with a letter, digit, or underscore, and must end with a letter or digit. Underscore can be used only as the first character. Range = A valid FQDN - up to 255 characters; label-up to 63 characters.
Resource Exhaustion Result-Code	Result-Code or Experimental-Result-Code value to be returned in an Answer message when a message is not successfully routed because of internal resource being exhausted If Vendor-Id is configured, this result-code value is encoded as Experimental-Result-Code AVP; otherwise the result-code is encoded as Result-Code AVP.	Format: • Selection text box; numeric • Selection pulldown list Range: • Selection box: 1000–5999 • Pulldown list: available Code values Default: 3004
Resource Exhaustion Error Message	Error-Message AVP value to be returned in an Answer message when a message is not successfully routed because of internal resource being exhausted	Range: 0–64 characters Default: FABR Resource Exhausted

Field	Description	Data Input Notes
Resource Exhaustion Vendor-Id	Vendor-Id AVP value to be returned in an Answer message when a message is not successfully routed because of internal resource being exhausted	Format: Text box; numeric Range: 1–4294967295
Application Unavailable Action	Defines action to be taken when FABR is not available to process messages If the Default Route option is selected, an entry must be provided for the Application Unavailable Route List.	Format: Radio buttons Range: • Continue Routing • Default Route • Send Answer with Result-Code AVP • Send Answer with Experimental-Result AVP Default: Continue Routing
Application Unavailable Route List	Defines where the requests will be routed when FABR is not available. Peer Routing Rules will be bypassed. A route list must be entered if Default Route is selected as the **Application Unavailable Action**.	Format: Pulldown list Range: Available Route List entries
Application Unavailable Result-Code	Result-Code or Experimental-Result-Code value to be returned in an Answer message when a message is not successfully routed because FABR is not available. If Vendor-Id is configured, this result-code value is encoded as Experimental-Result-Code AVP; otherwise the result-code is encoded as Result-Code AVP. A code must be entered if either the Send Answer with Result-Code AVP or the Send Answer with Experimental Result-Code AVP option is selected as the **Application Unavailable Action**.	Format: • Selection Text box; numeric • Selection pulldown list Range: • Selection box: 1000–5999 • Pulldown list: available Code values Default: 3002
Application Unavailable Error Message	Error-Message AVP value to be returned in an Answer message when a message is not successfully routed because FABR is not available. A message can be entered, if needed, when either the Send Answer with Result-Code AVP or the Send Answer with Experimental Result-Code AVP option is selected as the **Application Unavailable Action**.	Range: 0–64 characters Default: FABR Unavailable

Field	Description	Data Input Notes
Application Unavailable Vendor-Id	Vendor-Id AVP value to be returned in an Answer message when a message is not successfully routed because FABR is not available. A vendor-Id must be entered if the Send Answer with Experimental Result-Code AVP option is selected as the **Application Unavailable Action**.	Format: Text box; numeric Range: 1–4294967295
Bundling Enabled	If enabled, allows FABR to bundle DP query Events to form a DP Bundled query Event to send to DP Server.	Format: Check box
Maximum Bundle Size	Maximum number of individual DP query Events that can be bundled.	Format: Text box; numeric Range: 2-20 Default: 5
Prefix Search Enabled	If enabled, IMSI/MSISDN prefix based lookup is performed if the full address lookup did not find a match.	Format: Check box
Blacklist Search Enabled	If enabled, IMSI/MSISDN blacklist lookup is performed prior to the full address lookup.	Format: Check box

Editing System Options

Use this task to edit System Options.

1. Select **FABR** > **Configuration** > **System Options**.
   The **FABR > Configuration > System Options** page appears.
2. Update the relevant fields.
   For more information about each field, see *System Options elements*.
3. Perform one of the following actions:
   - Click **Apply** to save the changes and stay on this page.
   - Click **Cancel** to return to the **FABR > Configuration > System Options** page without saving the changes.

   If **Apply** is clicked and any of the following conditions exist, an error message appears:
   - Either the **Realm** or **Fully Qualified Domain Name** is empty; no value was entered; these fields must be configured as a pair
   - Any required field is empty; no value was entered
   - The entry in any field is not valid (wrong data type or out of the valid range)

Post-Configuration Activities

After FABR configuration is complete, the following activities need to be performed to make FABR fully operational in the system:

- Enabling the FABR application, if it has not already been enabled.
- Status Verification

Enabling the FABR Application

Use this task to enable the FABR application.

1. From each active SOAM in a 3-tiered DSR topology or from the NOAM in a 2-tiered DSR topology, select **Diameter** > **Maintenance** > **Applications**.
   The **Diameter > Maintenance > Applications** page appears.

2. Under **DSR Application Name**, select each **FABR** 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**.

Status Verification

Use this task to verify FABR status after configuration is complete.

1. Verify Communication Agent (ComAgent) Connection status.
   a) From the active SOAM in a 3-tiered DSR topology or from the NOAM in a 2-tiered DSR topology, select **Communication Agent** > **Maintenance** > **Connection Status**.
   b) Verify that the **Automatic Connections Count** field displays **X of X in service** where X is the number of peer server connections.

2. Verify Server status.
   a) From the active SOAM in a 3-tiered DSR topology or from the NOAM in a 2-tiered DSR topology, select **Status & Manage** > **Server**.
   b) Verify that for each Server, the **Appl State** field is **Enabled**, and the **DB**, **Reporting Status**, and **Proc** fields are **Norm**.

DSR Bulk Import and Export

The following documents describe the use and operation of DSR Bulk Import and Export functions:

- *Diameter User's Guide*, "Diameter Configuration", "DSR Bulk Import", "DSR Bulk Export"
- **Help** > **Diameter** > **Configuration** > **DSR Bulk Import**
- **Help** > **Diameter** > **Configuration** > **DSR Bulk Export**

The DSR Bulk Import and Export functions can be used to export Diameter, IPFE, and DSR 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.

Configuration data refers to any data that is configured for one of the Export **Export Application** types (FABR, RBAR, Policy DRA, GLA , or CPA and SBR DSR Applications; IPFE; and the Diameter Configuration components).

DSR Bulk Export

The DSR Bulk Export operation creates ASCII Comma-Separated Values (CSV) files (.csv) containing Diameter , IPFE, and DSR Application configuration data. Exported configuration data can be edited and used with the DSR 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 DSR 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.

The following configuration data can be exported in one Export operation:

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

Exported files can be written to the File Management Directory in the local File Management area (**Status & Manage > File** 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 will not be logged.

DSR Bulk Import

The DSR 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 Diameter Configuration, IPFE Configuration, or DSR Applications (FABR, RBAR, Policy DRA, GLA, and CPA/SBR) 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 "DSR Bulk Import" section of the *Diameter User's Guide* or the **Diameter > Configuration > Import** Help for valid Import operations.

Import CSV files can be created by using a DSR 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 DSR release that is used to import the file.

Files that are created using the DSR 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 on a computer; 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.

The following 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.

Glossary

A

AAA

Authentication, Authorization, and Accounting (Rx Diameter command)

ASCII

American Standard Code for Information Interchange

AVP

Attribute-Value Pair

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 (e.g., routing information) as well as authentication, authorization or accounting information.

B

Blacklist

Provisioning Blacklist.

An indication that a call from the calling party is not valid.

C

Communication Agent

See ComAgent.

D

DP

Data Processor

The repository of subscriber data on the individual DSR node elements. The DP hosts the full address resolution database.

DSR

Diameter Signaling Router

D

A set of co-located Message Processors which share common Diameter routing tables and are supported by a pair of OAM servers. A DSR Network Element may consist of one or more Diameter nodes.

F

FABR

Full Address Based Resolution

Provides an enhanced DSR routing capability to enable network operators to resolve the designated Diameter server addresses based on individual user identity addresses in the incoming Diameter request messages.

Full Address Based Resolution

See FABR.

G

GUI

Graphical User Interface

The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands.

H

HSS

Home Subscriber Server

A central database for subscriber information.

I

IANA

Internet Assigned Numbers Authority

An organization that provides criteria regarding registration of values related to the Diameter protocol.

I

IMPI

IP Multimedia Private Identity

IMPU

IP Multimedia Public Identity

IMS

IP Multimedia Subsystem

These are central integration platforms for controlling mobile communications services, customer management and accounting for mobile communications services based on IP. The IMS concept is supported by 3GPP and the UMTS Forum and is designed to provide a wide range of application scenarios for individual and group communication.

IMSI

International Mobile Subscriber Identity

International Mobile Station Identity

L

LTE

Long Term Evolution

The next-generation network beyond 3G. In addition to enabling fixed to mobile migrations of Internet applications such as Voice over IP (VoIP), video streaming, music downloading, mobile TV, and many others, LTE networks will also provide the capacity to support an explosion in demand for connectivity from a new generation of consumer devices tailored to those new mobile applications.

M

MCC

Mobile Country Code

M

A three-digit number that uniquely identifies a country served by wireless telephone networks. The MCC is part of the International Mobile Subscriber Identity (IMSI) number, which uniquely identifies a particular subscriber. See also MNC, IMSI.

MSISDN

The MSISDN is the network specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.

Mobile Subscriber Integrated Services Digital Network [Number]

Mobile Station International Subscriber Directory Number. The unique, network-specific subscriber number of a mobile communications subscriber. MSISDN follows the E.164 numbering plan; that is, normally the MSISDN is the phone number that is used to reach the subscriber.

N

NOAM

Network Operations, Administration, and Maintenance

O

OCS

Online Charging Server

OFCS

Offline Charging Server

P

PCRF

Policy and Charging Rules Function. The ability to dynamically control access, services, network capacity, and charges in a network.

P

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.

pSBR

Policy SBR

R

Relay Agent

Diameter agent that forwards requests and responses to other Diameter nodes based on routing-related AVPs (such as Destination-Realm) and routing configuration. Because relays do not make policy decisions, they do not examine or alter non-routing AVPs. As a result, relays never originate messages, do not need to understand the semantics of messages or non-routing AVPs, and are capable of handling any Diameter application or message type.

S

SDS

Subscriber Database Server

Subscriber Database Server (SDS) provides the central provisioning of the Full-Address Based Resolution (FABR) data. The SDS, which is deployed geo-redundantly at a Primary and Disaster recovery site, connects with the Query Server and the Data Processor System Operations, Administration, and Maintenance (DP SOAM) servers at each Diameter Signaling Router (DSR) site or a standalone DP site to

S

replicate and recover provisioned
data to the associated components.

SOAM

System Operations,
Administration, and Maintenance

Site Operations, Administration,
and Maintenance

Subscriber Database Server

See SDS.

T

TBCD

Telephony Binary Coded Decimal

An expansion to BCD where the
remaining (unused) bit
combinations are used to add
specific telephony characters. It is
backward compatible to BCD.