Oracle® Communications

Diameter Signaling Router Communication Agent

Release 8.3

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Oracle Communications Diameter Signaling Router Communication Agent, Release 8.3

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Introduction

The *Communications Agent User's Guide* and Help provide an overview of ComAgent functions and of procedures to use to configure Communication Agent. The contents of this chapter include sections on the scope, audience, and organization of the documentation, and how to contact My Oracle Support for assistance.

Revision History

Date	Description
June 2016	Accessibility changes throughout

Overview

Communication Agent (ComAgent) includes infrastructure features and services for enabling inter-server communication. ComAgent provides the connection management, reliable routing services and software compatibility management, and supports mechanisms for exchange of Stack Events between stacks hosted on different Message Processors (MPs). ComAgent successfully routes messages between layers across processes and servers.

The ComAgent's Routed Service provides a means by which local applications hosted on an MP can send traffic to applications on other MPs. The ComAgent's Routed Service has Connection Groups associated with the service assigned with different priorities. When an application sends events to other servers using a routed service, the ComAgent chooses a connection in the highest priority group for that routed service and sends the event on that connection. The load-balancing accounts for:

- Connection Group status (an aggregation of member connection status)
- Connection availability status (same as server availability status)
- Connection Egress Congestion Level (CL)
  - Transport Connection Congestion Level (TCL)
  - MP Overload Level (OL) of peer server
- Ingress Message Rate
- Provider State (State of the service published by the Service Provider)

Note: ComAgent supports one Connection Group per Routed Service.

The ComAgent menu also provides you with a means to monitor the operational status of High-Availability (HA) Services Sub-Resources. The HA Services enables a server application to load-share its active functions across a set of servers and to notify clients of the placement of its active functions onto servers in a manner that allows the clients to send stack events to the active functions. The set of active functions is called a Resource and each active function instance is called a Sub-Resource.

Scope and Audience

The Communication Agent documentation is intended for anyone responsible for configuring and using the Communication Agent application. Users of this manual must have a working knowledge of telecommunications, of network installations, and of the product that is using the ComAgent functions.

Manual Organization

The Communication Agent documentation provides information about Communication Agent (ComAgent) functions, how to use the ComAgent GUI, and procedures to configure and maintain ComAgent.

This manual is organized into the following chapters:

- Introduction contains an overview of ComAgent, the organization of this manual, and how to get technical assistance.
- User Interface Introduction describes how to use the GUI interface.
- Configuration describes how to configure ComAgent, including Remote Servers, Connection Groups, and Routed Services.
- Maintenance describes how to view, enable/disable, and block connection status of ComAgent; and view reports on the status of routed and HA services.

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 1-1 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.)

Locate Product Documentation on the Oracle Help Center Site

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

1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click **Industries**.
3. Under the Oracle Communications subheading, click **Oracle Communications documentation** link.

   The Communications Documentation page displays. Most products covered by these documentation sets display under the headings Network Session Delivery and Control Infrastructure and Platforms.
4. Click on your product and then the release number.

   A list of the documentation set for the selected product and release displays.
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 at http://education.oracle.com/communication

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site at www.oracle.com/education/contacts

My Oracle Support

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

Call the Customer Access Support 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 My Oracle Support, select **2**

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support 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.

2

User Interface Introduction

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)

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 2-1 describes elements of the user interface.

Table 2-1 User Interface Elements

Element	Location	Function
Identification Banner	Top bar across the web page	The left side of the banner provides the following information: • Displays the company name, • Oracle 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, under banners	A tree-structured menu of all operations that can be performed through the user interface. The plus character (+) indicates a menu item contains subfolders. • 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.

Table 2-1 (Cont.) User Interface Elements

Element	Location	Function
Work Area	Right side of panel under status	Consists of three sections: Page Title Area, Page Control Area (optional), and Page Area. • 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 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

Table 2-1 (Cont.) User Interface Elements

Element	Location	Function
		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 2-2 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 2-2 Main Menu Options

Menu Item	Function
Administration	The Administration menu allows the user to: • 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 • Set up and manage user accounts • Configure group permissions • View session information • Manage sign-on certificates • Authorize IP addresses to access the user interface • Configure SFTP user information • View the software versions report • Upgrade management including backup and reporting • Authenticate LDAP servers • Configure SNMP trapping services • Configure an export server • Configure DNS elements
Configuration	On the NOAM, allows the user to configure: • Network Elements • Network Devices • Network Routes • Services • Servers • Server Groups • Resource Domains • Places • Place Associations • Interface and Port DSCP
Alarms and Events	Allows the user to view: • Active alarms and events • Alarm and event history • Trap log
Security Log	Allows the user to view, export, and generate reports from security log history.
Status and Manage	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.
Measurements	Allows the user to view and export measurement data.

Table 2-2 (Cont.) Main Menu Options

Menu Item	Function
Transport Manager (optional)	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.
Communication Agent (optional)	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.
SS7/Sigtran (optional)	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.
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.

Table 2-2 (Cont.) Main Menu Options

Menu Item	Function
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 • Options GLA can deploy with Policy DRA (in the same DA-MP or a separate DA-MP). This option only appears with the DSR application.
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.

Table 2-2 (Cont.) Main Menu Options

Menu Item	Function
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.

Mediation	Allows the user to make routable decisions to end the reply, drop the message, or set the destination realm.

Table 2-2 (Cont.) Main Menu Options

Menu Item	Function
Policy and Charging (optional)	On the NOAMP, allows the user to perform configuration tasks, edit options, and view elements for: • General Options • Access Point Names • Policy DRA – PCRF Pools – PCRF Sub-Pool Selection Rules – Network-Wide Options • Online Charging DRA – OCS Session State – Realms – Network-Wide Options • Alarm Settings • Congestion 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 – Policy Database Query On the SOAM, allows the user to perform configuration tasks, edit options, and view elements for: • General Options • Access Point Names • Policy DRA – PCRFs – Binding Key Priority – PCRF Pools – PCRF Pool to PRT Mapping – PCRF Sub-Pool Selection Rules – Policy Clients – Suspect Binding Removal Rules – Site Options • Online Charging DRA – OCSs – CTFs – OCS Session State – Realms • Error Codes • Alarm Settings • Congestion Options This option only appears with the DSR application.

Table 2-2 (Cont.) Main Menu Options

Menu Item	Function
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.

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 using 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.

Figure 2-1 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 2-3 Main Menu Icons

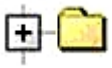
Icon	Name	Description
	Folder	Contains a group of operations. If the folder is expanded by clicking the plus (+) sign, all available operations and sub-folders are displayed. Clicking the minus (-) collapses the folder.

Table 2-3 (Cont.) Main Menu Icons

Icon	Name	Description
	Config File	Contains operations in an Options page.
	File with Magnifying Glass	Contains operations in a Status View page.
	File	Contains operations in a Data View page.
	Multiple Files	Contains operations in a File View page.
	File with Question Mark	Contains operations in a Query page.
	User	Contains operations related to users.
	Group	Contains operations related to groups.
	Task	Contains operations related to Tasks
	Help	Launches the Online Help.
	Logout	Logs the user out of the user interface.

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.

Figure 2-2 Paginated Table

Displaying Records 1-1 of 1 | First | Prev | Next | Last

Action	System ID	IP Address	Permission	Action
Edit Delete	lisa	10.25.62.4	READ_WRITE	Edit Delete

Displaying Records 1-1 of 1 | First | Prev | Next | Last

Scrollable 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. Scrollable tables also provide action buttons that operate on selected rows. For more information on buttons and other page controls, see Page Controls.

Figure 2-3 Scrollable Table

Sequence #	Alarm ID	Timestamp	Severity	Product	Process	NE	Server	Type
3498	31201	2009-Jun-11 18:07:41.214 UTC	MAJOR	MiddleWare	procmgr	OAMPNE	teks8011006	PROC
5445	31201	2009-Jun-11 18:07:27.137 UTC	MAJOR	MiddleWare	procmgr	SOAMP	teks8011002	PROC
5443	**31107**	**2009-Jun-11 18:07:24.704 UTC**	**MINOR**	**MiddleWare**	**inetmerge**	**SOAMP**	**teks8011002**	**COLL**
5444	31107	2009-Jun-11 18:07:24.704 UTC	MINOR	MiddleWare	inetmerge	SOAMP	teks8011002	COLL
5441	31209	2009-Jun-11 18:07:22.640 UTC	MINOR	MiddleWare	re.portmap	SOAMP	teks8011002	SW

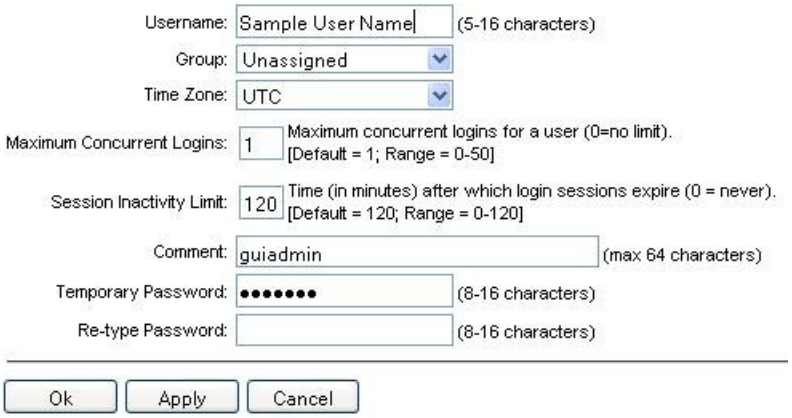
Export

Note: Multiple rows can be selected in a scrollable table. Add rows one at a time using CTRL-click. Add a span of rows using SHIFT-click.

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.

Figure 2-4 Form Page



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.

Figure 2-5 Tabbed Pages

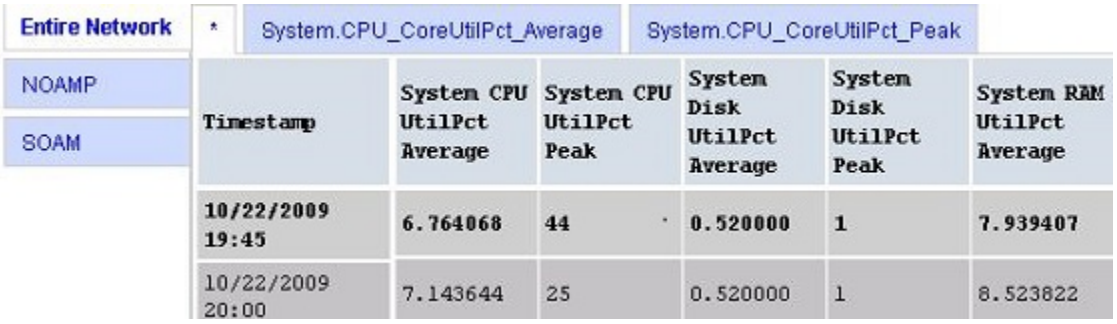
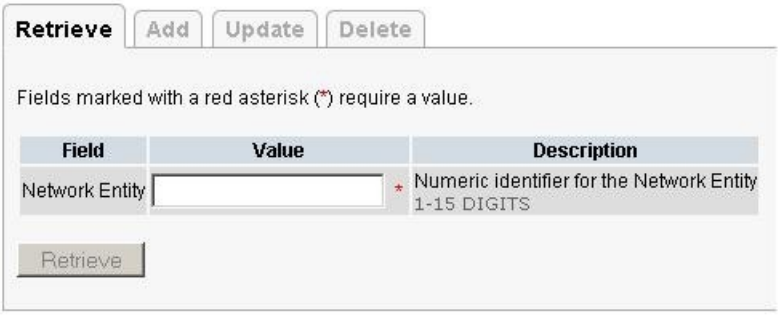


Figure 2-6 Tabbed Pages



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.

Figure 2-7 Report Output

```
==========================================================================================

User Account Usage Report

==========================================================================================

Report Generated: Fri Jun 19 19:30:55 2009 UTC
From: Unknown Network OAM&P on host teks5001701
Report Version: 1.0
User: guiadmin

------------------------------------------------------------------------------------------

Username          Date of Last Login    Days Since Last Login   Account Status
----------------  --------------------  -----------------------  ---------------
guiadmin          2009-06-19 19:00:17   0                        enabled

------------------------------------------------------------------------------------------

End of User Account Usage Report

==========================================================================================
```

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 2-8. Clicking the column header again reverses the direction of the sort.

Figure 2-8 Sorting a Table by Column Header

Local Node Name ▼	Realm	FQDN	SCTP Listen Port	TCP Listen Port	Connection Configuration Set	CEX Configuration Set	IP Addresses

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 2-4 contains examples of Action buttons.

Table 2-4 Example Action Buttons

Action Button	Function
Insert	Inserts data into a table.
Edit	Edits data within a table.
Delete	Deletes data from table.
Change	Changes the status of a managed object.

Some Action buttons take you to another page.

Submit buttons, described in Table 2-5, 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 2-5 Submit Buttons

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

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.

Figure 2-9 Clear Field Control X

Optional Layout Element Toolbar

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

Figure 2-10 Optional Layout Element Toolbar

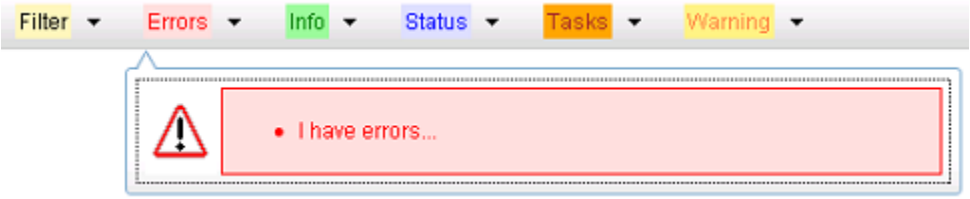
The toolbar displays different elements depending on which GUI page is selected. The elements of the toolbar that can appear include:

- 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 2-11 Automatic Error Notification



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.

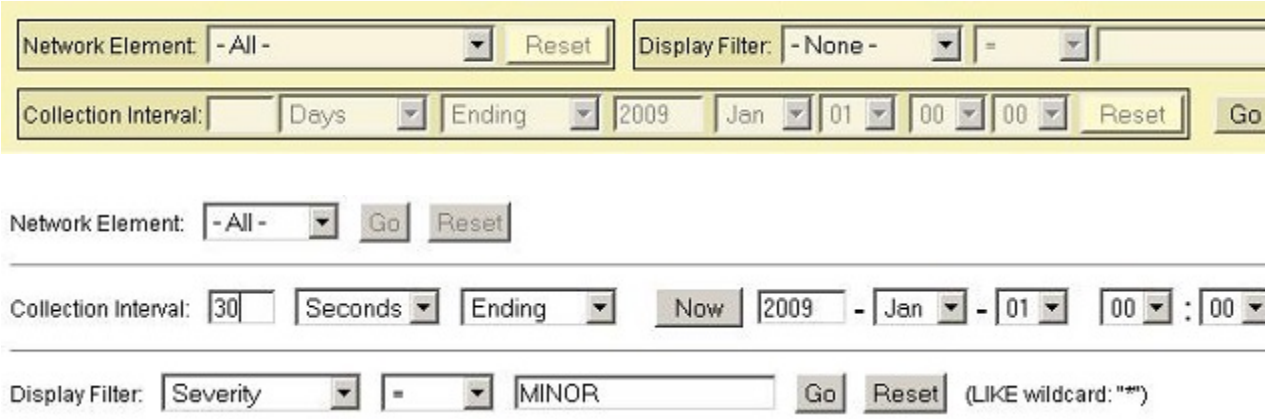
  Note: Once enabled, the Network Element filter affect all pages that list or display data relating to the Network Element.

- 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.

Figure 2-12 Examples of Filter Styles



Filter Control Elements

This table describes filter control elements of the user interface.

Table 2-6 Filter Control Elements

Operator	Description
=	Displays an exact match.
!=	Displays all records that do not match the specified filter parameter value.
>	Displays all records with a parameter value that is greater than the specified value.
>=	Displays all records with a parameter value that is greater than or equal to the specified value.

Table 2-6 (Cont.) Filter Control Elements

Operator	Description
<	Displays all records with a parameter value that is less than the specified value.
<=	Displays all records with a parameter value that is less than or equal to the specified value.
Like	Enables you to use an asterisk (*) as a wildcard as part of the filter parameter value.
Is Null	Displays all records that have a value of **Is Null** in the specified field.

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.

3

Configuration

This section describes the procedures used to configure ComAgent.

Configuration Overview

The ComAgent establishes the following connections:

- Automatic connections between all MPs having the same parent OAM server pair.
- Automatic connections between MPs that have different parent OAM servers, according to application-specific connection configuration rules. The application-specific connection configuration rules are provided with the system and augment the configuration rules built into ComAgent.
- Automatic connections between MPs with IP preference.
- Automatic connections between MPs and NOAM. The ComAgent application provides the configuration rules for these connections with the system.
- Manually configured connections between MPs and remote servers.

The automatic and configured connections can be grouped together as Connection Groups. Inserting remote server entries establishes connections to the servers.

Remote servers are configured using the **Communication Agent** > **Configuration** > **Remote Servers** GUI pages. The most important attribute of a Communication Agent Remote Server is an 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 the Communication Agent can establish transport connections to/from the remote server. The remote server attributes include:

- Name
- IPv4 Address
- IPv6 Address
- Connection Mode: {client, server}
- Local Server Group: group of servers that should connect to the remote server
- IP Address Preference

Note: Use **Communication Agent** > **Configuration** > **Remote Servers** and **Communication Agent** > **Configuration** > **Connection Group** to perform this configuration.

The **Communication Agent** > **Configuration** pages provide a way for you to create and configure Remote Servers and Connection Groups, and to assign a Connection Group to the services. This process can only be done from NOAM.

By default, Communication Agent has the Remote Servers and Connection Status screens enabled.

The configuration is performed in the following order:

1. Remote Servers
2. Connection Groups
3. Routed Services

Note: Default configuration of Routed Services has a pre-defined Connection Group associated with it. This screen can be used to manage user-defined Connection Groups associated with the service.

Remote Servers

The **Communication Agent** > **Configuration** > **Remote Servers** page is used to configure connections to remote servers. A remote server is a server that has a different parent OA&M server-pair relative to a local MP server group. The remote servers are associated with servers in a local server group. Connections are established between Remote server and local servers in the specified server group. A Remote server can be associated with a local server group.

The **Communication Agent** > **Configuration** > **Remote Servers** pages provide these actions to manage remote servers:

- Click **Insert**.

  You can create a Remote server entry that is accessible from the Remote server listing on the **Communication Agent** > **Configuration** > **Remote Servers** > **Insert** page.

- Select a Remote server and click **Edit**.

  You can change the mode of operation of a Remote server and the IP address on the **Communication Agent** > **Configuration** > **Remote Servers** > **Edit** page.

- Select a Remote server and click **Delete**.

  You can remove a Remote server from the Remote server listing. (A Remote server cannot be deleted if it is in a Connection Group.)

Remote Servers Elements

Remote Servers Elements describes elements on the **Communication Agent** > **Configuration** > **Remote Servers** View, Insert, and Edit pages. Data Input Notes apply only to Insert and Edit pages.

Table 3-1 Remote Server Elements

Name	Description	Data Input Notes
Remote Server Name	The **Remote Server Name** is a unique name within the system that can be repeated to associate it with multiple Local Server Groups	Format: Text box. Valid characters are alphabetic (a-z, A-Z), numeric (0-9), hyphens (-), underscores (_), and dots (.). Must contain at least one letter and cannot begin with a number. Range: Up to 32 characters
Remote Server IPv4 Address	The IPv4 address of the Remote Server	Format: Valid IP address Range: IPv4 address IPv4 addresses are 32 bits and represented in a dot-decimal notation like this: x.x.x.x where each x (called an octet) is a decimal value from 0 to 255. They are separated by periods. For example, 1.2.3.4 and 192.168.1.100 are valid IPv4 addresses.
Remote Server IPv6 Address	The IPv6 address of the Remote Server	Format: Valid IP address Range: IPv6 IP address IPv6 addresses are 128 bits and represented in a colon-hexdecimal notation like this: z:z:z:z:z:z:z:z where each z is a group of hexadecimal digits ranging from 0 to ffff. They are separated by colons. Leading zeros may be omitted in each group. "::" can be used (at most once) in an IPv6 address to represent a range of as many zero fields as needed to populate the address to eight fields. So the IPv6 address 2001:db8:c18:1:260:3eff:fe47:1530 can also be represented as 2001:0db8:0c18:0001:0260:3eff:fe47:1530 and the IPv6 address ::1 is the same as 0000:0000:0000:0000:0000:0000:0001
Remote Server Mode	The Mode in which the Remote Server operates.	Format: List Range: Client, Server

Table 3-1 (Cont.) Remote Server Elements

Name	Description	Data Input Notes
Local Server Group	Identifies the Local Server Group associated with the Remote Server. The name of the group of local servers that establish connections with this Remote Server.	Format: Drag and drop boxes containing Available server groups on the left side and Assigned on the right side Range: All named C-level server groups
IP Address Preference	Identifies the Preferred IP Address for connection establishment.	Format: List Range: IPv4 Preferred, IPv6 Preferred, or ComAgent Network Preference Default: ComAgent Network Preference

Insert

The **Communication Agent** > **Configuration** > **Remote Servers** > **Insert** page is used to create a Remote Server Name and to insert that name into a Remote Server listing.

The fields are described in Remote Servers Elements.

1. Click **Communication Agent** > **Configuration** > **Remote Servers**.
2. Click **Insert**.
3. Enter a unique name for the Remote server in the **Remote Server Name** field.

   The **Remote Server Name** should be a unique name within the system.

   Note: The **Remote Server Name** can be the same of an existing name but should be associated with a different local server group.

   The name must meet these requirements:

   - Maximum length of 32 characters
   - Valid characters are
     - Alphabetic (A through Z, uppercase or lowercase)
     - Numeric (0 through 9)
     - Hyphens (-)
     - Dots (.)
     - Underscore (_)
   - The name must contain at least one alphabetic character
   - The name cannot start with a numeric character

4. Enter the IPv4 address of the Remote server in the **Remote Server IPv4 Address** field.

   The IP address should be a valid IPv4 address in dot notation format (for example: 192.168.1.100).

   Note: This step is optional if the IPv6 address is specified.

5. Enter the IPv6 address of the Remote server in the **Remote Server IPv6 Address** field.

   The IP address should be a valid IPv6 address (for example: 2001:0db8:0000:0000:0000:ff00:0042:8329).

   Note: This step is optional if the IPv4 address is specified.

6. Choose a mode of operation from the **Remote Server Mode** drop down list.

   The Mode in which the Remote server operates can be configured as a:

   - **Client** – where the servers in the local server group accepts connections initiated by the Remote server
   - **Server** – where the servers in the local server group each initiate a connection to the Remote server

7. Choose an **IP Address Preference** from the drop down list.

   The connection in which the Remote server operates can be configured as a:

   - **ComAgent Network Preference** – default connection
   - **IPv4 Preference** – where the connection to the local server group is using IPv4 address
   - **IPv6 Preference** – where the connection to the local server group is using IPv6 address

8. Select a Local Server Group from the **Available Local Server Groups** list and add it to the **Assigned Local Server Groups** field.

   This local server group contains the MPs that send trace data to IDIH.

9. Perform one of these actions:

   - Click **OK** – If field validations succeed, the **Communication Agent** > **Configuration** > **Remote Servers** screen is displayed. An error message is displayed if:
     - The page contains any values that are not valid
     - A required field is empty (not entered)
     - The Remote server IP address is not unique
     - The Remote server name is not unique

- Click **Apply** – If field validations succeed, the **Communication Agent** > **Configuration** > **Remote Servers [Insert]** is displayed. The fields display the applied values.
- Click **Cancel** – to return to the previous page without saving any changes.

Edit

The **Communication Agent** > **Configuration** > **Remote Servers** > **Edit** page is used to modify the mode of operation for the Remote server.

The fields are described in Remote Servers Elements.

1. Click **Communication Agent** > **Configuration** > **Remote Servers**.
2. Click **Edit**.
3. Enter the IPv4 address of the Remote server in the **Remote Server IPv4 Address** field.

   The IP Address should be a valid IPv4 address in dot notation format (for example: 192.168.1.100).

   Note: This step is optional if the IPv6 address is specified.

4. Enter the IPv6 address of the Remote server in the **Remote Server IPv6 Address** field.

   The IP Address should be a valid IPv6 address (for example: 2001:0db8:0000:0000:0000:ff00:0042:8329).

   Note: This step is optional if the IPv4 address is specified.

5. Choose a mode of operation from the **Remote Server Mode** drop down list

   The Mode in which the Remote server operates can be configured as a:

   - **Client** – where the servers in the local server group accept connections initiated by the Remote server
   - **Server** – where the servers in the local server group each initiate a connection to the Remote server

6. Choose an **IP Address Preference** from the drop down list.

   The connection in which the Remote server operates can be configured as a:

   - **ComAgent Network Preference** – default connection.
   - **IPv4 Preference** – where the connection to the local server group is using IPv4 address.
   - **IPv6 Preference** – where the connection to the local server group is using IPv6 address.

7. Select a Local Server Group from the **Available Local Server Groups** list and add it to the **Assigned Local Server Groups** field.

This local server group contains the MPs that send trace data to IDIH.

8. Perform one of these actions:
   - Click **OK** – If field validations succeed, the **Communication Agent** > **Configuration** > **Remote Servers** screen is displayed. An error message appears if:
     - The page contains any values that are not valid
     - A required field is empty (not entered)
     - The Remote server IP is not unique
   - Click **Apply** – If field validations succeed, the **Communication Agent** > **Configuration** > **Remote Servers [Edit]** is displayed. The fields shall display the applied values.
   - Click **Cancel** – to return to the previous page without saving any changes.

Delete

The **Communication Agent** > **Configuration** > **Remote Servers** page **Delete** control displays a confirmation box to confirm or cancel **Remote Server** deletion.

The fields are described in Remote Servers Elements.

1. Click **Communication Agent** > **Configuration** > **Remote Servers**.
2. Select the Remote server you want to delete.
3. Click **Delete**.
4. Perform one of these actions:
   - Click **OK** – the Remote server is deleted.

     Note: If the Remote server is associated with a Connection Group or it has a connection in Enabled state then it cannot be deleted.

   - Click **Cancel** – to return to the previous page without deleting the Remote server.

Connection Groups

The **Communication Agent** > **Configuration** > **Connection Groups** page provides the means to group Communication Agent Connections for the purpose of traffic load balancing. The Connection Group page lists the Connection Groups available and the servers within that group.

There is at least one, and can be up to three, predefined Connection Groups.

A Connection Group can be associated with many peer servers. These peer servers can be Remote Servers or they can be on routable remote networks. A Connection Group can have up to 16 Remote Servers that are associated to a local **MP**.

The **Communication Agent** > **Configuration** > **Connection Groups** page provides the means to manage Connection Groups:

- Select a **Connection Group** and then click **Edit** to modify the list of servers in that Connection Group. Any Remote Server can be in the Connection Group.

Connection Group Elements

The Connection Group pages display information in a tabular format. This table describes elements on the Connection Group pages.

Table 3-2 Connection Group Elements

Name	Description
Connection Group	The name of the **Connection Group** within the system.
Available Servers	List of Servers that can be included in this group. Remote Servers are listed by their names. Servers already in the group are not listed. Default: N/A
Assigned Servers	List of Servers that are assigned to this group are listed by their names. Default: N/A

Edit

The **Communication Agent** > **Configuration** > **Connection Groups** > **Edit** page is used to modify the list of servers in that group. Any Remote server can be in the connection group. The same server can be in many connection groups. The server name represents the connection to that server.

The fields are described in Connection Group Elements.

1. Click **Communication Agent** > **Configuration** > **Connection Groups**.
2. Select a **Connection Group** and click **Edit**.

   The fields **Available Servers in Network Element** and **Existing Servers in Connection Group** are modifiable on the **Communication Agent** > **Configuration** > **Connection Groups** > **Edit** page.
3. Select a server name and transfer it To/From the **Available Servers in Network Element** or To/From the **Existing (Assigned) Connection Group**.

   A server can be in many connection groups. Server names assigned to the connection group (Assigned Servers) are not listed under **Available Servers**.
4. Perform one of these actions:
   - Click **OK** – If field validations succeed, the **Communication Agent** > **Configuration** > **Connection Groups** screen appears.
   - Click **Apply** – If field validations succeed, the **Communication Agent** > **Configuration** > **Connection Groups [Edit]** appears and the fields display the applied values.

Routed Services

The **Communication Agent** > **Configuration** > **Routed Services** page displays all the configured Routed Services and their associated connection groups. Each connection group is linked to the appropriate configuration page where you can make changes.

The fields are described in Routed Services ElementsRemote Servers Elements.

The ComAgent's Routed Service provides a means by which local applications hosted on an MP can send traffic to applications on other MPs. The ComAgent's Routed Service has Connection Groups associated with the service assigned with different priorities. When an application sends events to other servers using a routed service, the ComAgent chooses a connection in the highest priority group for that routed service and sends the event on that connection. The load-balancing accounts for:

- Connection Group status (an aggregation of member connection status)
- Connection availability status (same as server availability status)
- Connection Egress Congestion Level (CL)
  - Transport Connection Congestion Level (TCL)
  - MP Overload Level (OL) of peer server
- Ingress Message Rate
- Provider State (State of the service published by the Service Provider)

Note: ComAgent supports one Connection Group per Routed Service.

Routed Services Elements

Table 3-3 describes elements on the Routed Services page.

Table 3-3 Routed Services Elements

Name	Description
Name	The name of the **Service** within the system.
Connection Group Name	Summary View: Shows the number of Connection Groups used by this routed service. Detailed view: Lists all the servers in this Connection Group. The individual list item is hyperlinked to **Communication Agent** > **Configuration** > **Connection Groups**. The display is filtered to show only the Connection Group entry.
Priority	The priority of the Connection Group. The summary view displays "-" to indicate the data is not applicable in the summary view.

4

Maintenance

The **Communication Agent** > **Maintenance** pages display current status of groups and connections and provide the means to modify those connections.

Connection Status

The **Communication Agent** > **Maintenance** > **Connection Status** page shows the status of all connections to/from a local server. The un-expanded row shows Automatic and Configured connections from that server.

The page shows both configured connections and ad-hoc connections, which are created on demand by network request, and are automatically deleted when the requestor has completed processing.

Select a configured Peer Server and get a summary or detailed report, or expand the list in a server group, and you can toggle the Admin Connection State between:

- Enabled: The administrator has enabled this connection. This is the default value.
- Disabled: The administrator has disabled this connection. System does not try to establish this connection.
- Blocked: Application data messages are not exchanged. However, ComAgent uses heartbeat messages to monitor the health of connections and to share status.

The fields are described in Connection Status Elements.

Note: Ad-hoc connections cannot be modified. If you select an ad-hoc connection, an error message appears stating "Administrative changes are not allowed."

Connection Status Elements

The Connection Status page displays information in a multi-pane format. This table describes elements on the Connection Status page.

Table 4-1 Connection Status Top Pane View Grid Columns

Field Name	Description
Server Name	Name of the local MP server.
Automatic Connections Count	x of y in Service x = Number of Automatic Connections that are InService or Degraded y = Total number of Automatic Connections

Table 4-1 (Cont.) Connection Status Top Pane View Grid Columns

Field Name	Description
Configured Connections Count	x of y in Service x = Number of Configured Connections that are InService or Degraded y = Total number of Configured Connections

A report can be generated for any server on the Overall tab as described in Connection Status Report section.

When a server is selected from the top pane, associated peer servers are shown in the bottom pane as described in Table 4-2.

Table 4-2 Connection Status Bottom Pane View Grid Columns

Field Name	Description
Peer Server Name	All servers – local and remote – that have connections to this server are listed.
Peer Server IP Address	The IP address of the peer server that displays may be IPv4 or IPv6 based on the established connection.
Connection Status	Down – Connection is down. Forming – Connection attempt has been made. Aligning – Connection Alignment is in progress. LocallyBlocked – Connection is locally blocked. RemotelyBlocked – Connection is blocked at remote side. TotallyBlocked – Connection is locally as well as remotely blocked. InService – Connection is InService and available to send user traffic. Degraded – Connection is available to send user traffic but is congested.
Admin Connection State	Report – Enabled when a server is selected in the top pane. Select between a Summary report and a Detailed report.

Table 4-2 (Cont.) Connection Status Bottom Pane View Grid Columns

Field Name	Description
	Buttons are enabled when a peer server is selected in the bottom pane. Enabled – The administrator has enabled this connection. This is the default value. Disabled – The administrator has disabled this connection. System does not try to establish this connection. Blocked – Connections in Blocked state do not exchange Communication Agent messages.
Connection Type	The type of connection to this server. Auto – This is an automatic connection. Configured – This is a connection to a configured Remote server.
Date Last Updated	Time when the connection status was last updated.

Report

A Connection Status report provides the status of the services on each server. The summary or detailed report can then be saved to file.

The fields are described in Connection Status Elements.

1. Click **Communication Agent** > **Maintenance** > **Connection Status**.
2. Select a server from the top pane.

   The server is highlighted and the **Report** button at the bottom of the screen is enabled.
3. Select either **Detailed** or **Summary** from the list and click **Report**.
4. Perform one of these actions:
   - Click **Save** – From the option screen that appears, select to **Open**, **Save** the report, or **Cancel** the action.
   - Click **Back** – to return to the Overall Routed Services Status tab.

Enable

Enable on the **Communication Agent** > **Maintenance** > **Connection Status** page is used to administratively enable connections to/from a local server.

The fields are described in Connection Status Elements.

1. Click **Communication Agent** > **Maintenance** > **Connection Status**.

2. Select the local server in the top pane.

   The associated peer servers appear in the bottom pane.

3. Select a peer server in the bottom pane and click **Enable**.

4. Perform one of these actions:

   - Click **OK** – The connections to/from a local server and the peer server are enabled allowing communications.

   - Click **Cancel** – to cancel the enabling of the connection.

Disable

Disable on the **Communication Agent** > **Maintenance** > **Connection Status** page is used to administratively disable this connection. System does not try to establish this connection.

The fields are described in Connection Status Elements.

1. Click **Communication Agent** > **Maintenance** > **Connection Status**.

2. Select the local server in the top pane.

   The associated peer servers appear in the bottom pane.

3. Select a peer server in the bottom pane and click **Disable**.

4. Perform one of these actions:

   - Click **OK** – The connections to/from a local server and the peer server are disabled. System does not try to establish this connection.

   - Click **Cancel** – to cancel the disabling of the connection.

Block

Block on the **Communication Agent** > **Maintenance** > **Connection Status** page is used to administratively block connections with this server. Connections in Blocked state do not exchange Communication Agent messages.

The fields are described in Connection Status Elements.

1. Click **Communication Agent** > **Maintenance** > **Connection Status**.

2. Select the local server in the top pane.

   The associated peer servers appear in the bottom pane.

3. Select a peer server in the bottom pane and click **Block**.

4. Perform one of these actions:

   - Click **OK** – Data traffic is administratively blocked at local end and the connection is administratively enabled at the remote end. The system does not try to establish this connection.

   - Click **Cancel** – to cancel the blocking of the connection.

Routed Services Status

The ComAgent's Routed Service provides a means by which local applications hosted on an MP can send traffic to applications on other MPs. The ComAgent's Routed Service has Connection Groups associated with the service assigned with different priorities. When an application sends events to other servers using a routed service, the ComAgent chooses a connection in the highest priority group for that routed service and sends the event on that connection. The load-balancing accounts for:

- Connection Group status (an aggregation of member connection status)
- Connection availability status (same as server availability status)
- Connection Egress Congestion Level (CL)
  - Transport Connection Congestion Level (TCL)
  - MP Overload Level (OL) of peer server
- Ingress Message Rate
- Provider State (State of the service published by the Service Provider)

Note: ComAgent supports one Connection Group per Routed Service.

The fields are described in Routed Services Status Elements.

Routed Services Status Elements

Table 4-4 describes elements on the **Communication Agent** > **Maintenance** > **Routed Services Status** page. This page provides a tabbed view of all routed services on an Overall tab and the status of each service on subsequent tabs.

The values in the fields are color coded as shown in Table 4-3.

Table 4-3 Color Coding in Routed Services Status, Overall Tab

Column Name		Criteria	Description
User	Available	Value > 0	Number of users that have routed service as Available. Background color is green.
	Degraded	Value > 0	Number of users that have routed service as Degraded. Background color is yellow.
	Unavailable	Value > 0	Number of users that have routed service as Unavailable. Background color is red.

Table 4-3 (Cont.) Color Coding in Routed Services Status, Overall Tab

Column Name		Criteria	Description
Provider	Total MPs	Value > 0	Total number of providers in the system.
	Connection Groups - Total	Value > 0	Total number of providers in Connection Groups in the system. Field is not colored differently.
	Connection Groups - Available	Value > 0	Number of providers in Connection Groups that have routed service as Available. Background color is green.
	Connection Groups - Degraded	Value > 0	Number of providers in Connection Groups that have routed service as Degraded. Background color is yellow.
	Connection Groups - Unavailable	Value > 0	Number of providers in Connection Groups that have routed service as Unavailable. Background color is red.

Table 4-4 Routed Services Status, Overall Tab

Column Name		Description
Routed Service		Name of the Routed Service
User	Total MP	Total number of users in the system.
	Available	Number of users that have routed service as Available.
	Degraded	Number of users that have routed service as Degraded.
	Unavailable	Number of users that have routed service as Unavailable.

Table 4-4 (Cont.) Routed Services Status, Overall Tab

Column Name		Description
Provider	Total MPs	Total number of providers in the system.
	Total	Total number of providers in Connection Groups in the system.
	Available	Number of providers in Connection Groups that have routed service as Available.
	Degraded	Number of providers in Connection Groups that have routed service as Degraded.
	Unavailable	Number of providers in Connection Groups that have routed service as Unavailable.

A report can be generated for any Routed Service on the Overall tab as described in Routed Services Status Report section.

The Routed Services tabs contain information on the connection groups and are split into three panes: Connection Group, User, and Provider panes. From a Connection Group tab, select a connection group row in the top panel to see the information in the User and Provider panes.

Table 4-5 Connection Group Tabs

Column Name		Description
Connection Group		Name of the Routed Service. Sortable.
User	Total MPs	Total number of users in the system. Sortable.
	Available	Number of users that have routed service as Available. Sortable.
	Degraded	Number of users that have routed service as Degraded. Sortable.
	Unavailable	Number of users that have routed service as Unavailable. Sortable.
Provider	Total MPs	Total number of providers in Connection Groups in the system. Sortable.

Table 4-5 (Cont.) Connection Group Tabs

Column Name		Description
	Available	Number of providers in Connection Groups that have routed service as Available. Sortable.
	Degraded	Number of providers in Connection Groups that have routed service as Degraded. Sortable.
	Unavailable	Number of providers in Connection Groups that have routed service as Unavailable. Sortable.

Select a Connection Group row in the Top Pane, to see the associated users in the User Pane.

Table 4-6 Routed Services Status, Users Pane

Column Name	Description
User MP	The User Message Processor. Sortable
Routing Status	Displays routing status of Routed Service status of the corresponding user server. If a Routed Service exists, it displays routing status as Available or Degraded (Based on congestion level with that provider), otherwise it displays Unavailable. Sortable.
Active Provider	The number of Active Providers. Sortable.
Priority	Provides the configured Priority of that Connection Group. Sortable.
Update Time	Displays timestamp when update HA status was received from provider server. Sortable.

Select a row in the User Pane, to see the associated providers in the Provider Pane.

Table 4-7 Routed Services Status, Provider Pane

Column Name	Description
Provider MP	The Provider Message Processor. Sortable

Table 4-7 (Cont.) Routed Services Status, Provider Pane

Column Name	Description
Status	Displays routing status of Routed Service status of the corresponding provider server. When the server is selected in User pane, then it displays status available on the corresponding Provider server. If a Routed Service exists, it displays routing status as Available or Degraded (Based on congestion level with that provider), otherwise it displays Unavailable. Sortable.
Update Time	Displays timestamp when update HA status was received from provider server. Sortable.

Aggregate status of a Connection Group depends on the Operation Status of the connections in the group. Similarly, aggregate status of a collection of connection groups depends on the aggregate status of individual connection groups.

Table 4-8 Color Coding for Connection Group, Status Tabs

Pane	Field Name	Color Code	Criteria	Description
Sub Resource Pane (Top most pane)	Available - User Routing Status	Green	Count in Available = Total	All users registered for corresponding service and routing status is Available.
	Degraded - User Routing Status	Yellow	Value > 0	One or more users have routing status as Degraded for corresponding service.
	Unavailable - User Routing Status	Red	Value > 0	One or more users have routing status as Unavailable for corresponding service.
	Active - Provider Routing Status	Red	Value > 1	Indicates there exists multiple Active Providers for corresponding service.

Table 4-8 (Cont.) Color Coding for Connection Group, Status Tabs

Pane	Field Name	Color Code	Criteria	Description
User Pane (Lower left pane)	Routing Status	Red/Yellow	Red when value = Unavailable Yellow when value = Degraded	Indicates corresponding user server does not have healthy routing status with Active provider server for selected service.
	Multiple Active	Red	Value = Yes	Indicates corresponding user server has multiple Active provider servers for selected server.

Report

A Routed Service report provides a status of the services on each server. The summary or detailed report can then be saved to file. The Summary view shows the number of connection groups used by a routed service. The Detailed view lists all servers in the connection group.

The fields are described in Routed Services Status Elements.

1. Click **Communication Agent** > **Maintenance** > **Routed Services Status**.
2. Select the routed service.

   The service is highlighted and the **Report** button at the bottom of the screen is enabled.
3. Select either Detailed or Summary from the pull down list and click **Report**.
4. Perform one of these actions:
   - Click **Save** – From the option screen that appears, select to **Open**, **Save** the report, or **Cancel** the action.
   - Click **Back** – to return to the Overall Routed Services Status tab.

HA Services Status

The HA Services Status page allows you to monitor the operational status of HA Service Sub-Resources.

A server application configures the High-Availability (HA) Framework to manage its Resources and Sub-Resources, and based upon the configuration and on the health scores of participating servers, the HA Framework assigns states to each Sub-Resource on each server. If a Resource or Sub-Resource is Active on a given server, then the server application on that server is actively providing the software function associated

with the Resource or Sub-Resource. If a Resource or Sub-Resource is Standby, Spare, Observer, or Out-of-Service, then the server application is not actively providing the function, but instead is waiting to be promoted to Active should the Resource or Sub-Resource be demoted from Active on some other server due to failures that reduce the other server's health score.

The HA Services Status screen shows the status as seen from a reporting server. The reporting server may be a provider of the HA Service or it may be a user of HA Services.

The fields are described in HA Services Status Elements.

HA Services Status Elements

The values in the fields are color coded as shown in Table 4-9.

Table 4-9 Color Coding in HA Service Status, Overall Tab

Field Name	Criteria	Description
Available	Count in Available = Total SRs	Indicates that all ComAgent HA users have available routing status for all of their registered sub resources. Background color is green.
Degraded	Value > 0	One or more user has one or more sub resource in degraded state. Background color is yellow.
Unavailable	Value > 0	One or more user has one or more sub resource that has no Active Provider. Background color is red.
Alarms - Critical	Value > 0	Any HA resource alarm raised by HA User with Critical severity. (Refer to details of Alarms - Critical in Table for more details). Background color is red.
Alarms - Major	Value > 0	Any HA resource alarm raised by HA User with Major severity. Background color is orange.
Alarms - Minor	Value > 0	Any HA resource alarm raised by HA User with Minor severity. Background color is yellow.
Active SRs	Count in Active SRs = Registered SRs	One or more sub resources registered by any provider server(s) is not available. Background color is red.

Table 4-9 (Cont.) Color Coding in HA Service Status, Overall Tab

Field Name	Criteria	Description
Multiple Active	Value = Yes	There are multiple Active Providers for one or more sub resource. Background color is red.

Table 4-10 HA Service Status, Overall Tab

Column Name		Description
Sub Resource		Sub-resource IDs (of selected HA Resource from tab) registered by any HA user or provider server(s).
HA User Routing Status	Total SRs	Total number of HA Users registered for corresponding HA Resource + sub-resource pair. Sortable.
	Available	Total number of HA Users that have routing status as Available for corresponding HA Resource + sub-resource pair.
	Degraded	Total number of HA Users that have routing status as Degraded for corresponding HA Resource + sub-resource pair.
	Unavailable	Total number of HA Users that have routing status as Unavailable Used for corresponding HA Resource + sub-resource pair.
	Alarms - Critical	Number of HA resource alarms raised by HA User with Critical severity.
	Alarms - Major	Number of HA resource alarms raised by HA User with Major severity.
	Alarms - Minor	Number of HA resource alarms raised by HA User with Minor severity.
Registered SRs	Registered SRs	Total number of HA providers registered for corresponding HA Resource + sub-resource pair.

Table 4-10 (Cont.) HA Service Status, Overall Tab

Column Name		Description
	Active SRs	Total number of HA Providers publishing Active state for corresponding HA Resource + sub-resource pair.
	Multiple Active	Contains Yes when any HA User detects multiple Active Providers for corresponding HA Resource + sub-resource pair. Otherwise, contains No.

A report can generated for any HA resource on the Overall tab as described in HA Services Status Report section.

The Resource tabs contain information on sub resources and are split into three panes: Sub Resource, User, and Provider panes.

Table 4-11 HA Service Status, Sub Resource Pane

Column Name		Description
Sub Resource		Sub-resource IDs (of selected HA Resource from tab) registered by any HA user or provider server(s). Sortable.
HA User Routing Status	Total	Total number of HA Users registered for corresponding HA Resource + sub-resource pair. Sortable.
	Available	Total number of HA Users that have routing status as Available for corresponding HA Resource + sub-resource pair. Sortable.
	Degraded	Total number of HA Users that have routing status as Degraded for corresponding HA Resource + sub-resource pair. Sortable.
	Unavailable	Total number of HA Users that have routing status as Unavailable Used for corresponding HA Resource + sub-resource pair. Sortable.

Table 4-11 (Cont.) HA Service Status, Sub Resource Pane

Column Name		Description
	Multiple Active	Contains Yes when any HA User detects multiple Active Providers for corresponding HA Resource + sub-resource pair. Otherwise, contains No. Sortable.
HA Provider Routing Status	Total	Total number of HA providers registered for corresponding HA Resource + sub-resource pair. Sortable.
	Active	Total number of HA Providers publishing Active state for corresponding HA Resource + sub-resource pair. Sortable.

Table 4-12 HA Service Status, HA Users Pane

Column Name	Description
Hostname	Displays user servers that have registered for corresponding HA Resource (selected from Tabs) + sub-resource (selected in Sub Resource pane). When server is selected in provider pane, then it displays only those user servers that have status data available from selected provider server. Sortable.
Routing Status	Displays routing status of HA Resource + sub-resource pair at corresponding user server. If there exist a Provider with Active HA role, then it displays routing status as Available or Degraded (Based on congestion level with that provider), otherwise it displays Unavailable. When server is selected in Provider pane, then it displays Routing status available at corresponding user server with the selected provider server. Sortable.

Table 4-12 (Cont.) HA Service Status, HA Users Pane

Column Name	Description
HA Role	When corresponding user server has status data available from Provider server(s), then it displays HA Role from first Provider server, based on following order of their HA role. • Active • Standby • Spare • Observer • OutOfSrvc If the corresponding user server does not have status data from any Provider, then it displays HA Role as OutOfSrvc. When the server is selected in Provider pane, then it displays HA Role available at corresponding user server for the selected provider server. Sortable.
Provider	Displays name of the Provider server for which HA Role is being displayed. If the corresponding user server does not have status data from any Provider, then it displays "----". When the Provider server is selected in Provider pane, then it displays the name of that selected Provider server. Sortable.
Congestion Level	Displays congestion level with the provider server. Sortable.
Multiple Active	Contains Yes when there are multiple active providers known to corresponding user server. When Provider server is selected in Provider pane, then it displays "----" for this field. Sortable.
Update Time	Displays timestamp when update HA status was received from provider server. Sortable.

Table 4-13 HA Service Status, HA Providers Pane

Column Name	Description
Hostname	Displays provider server that have registered for corresponding HA Resource (selected from Tabs) + sub resource (selected in Sub Resource pane). When server is selected in user pane, then it displays list of provider server for which state data is available at selected user server. Sortable.
State	Displays HA state as published by corresponding provider server. When server is selected in user pane, then it displays HA status available at selected user server, from corresponding provider server. Sortable.
Update Time	Displays timestamp when application has updated HA status at corresponding provider server. When server is selected in user pane, then it displays timestamp when HA status was received at selected user server, from corresponding provider server. Sortable.

Table 4-14 Color Coding for HA Service Status, Sub Resource Tab

Pane	Field Name	Color Code	Criteria	Description
Sub Resource Pane (Top most pane)	Available - HA User Routing Status	Green	Count in Available = Total	All users registered for corresponding Resource + sub-resource pair has routing status as Available.
	Degraded - HA User Routing Status	Yellow	Value > 0	One or more users have routing status as Degraded for corresponding Resource + sub-Resource pair.

Table 4-14 (Cont.) Color Coding for HA Service Status, Sub Resource Tab

Pane	Field Name	Color Code	Criteria	Description
	Unavailable - HA User Routing Status	Red	Value > 0	One or more users have routing status as Unavailable for corresponding Resource + sub-resource pair.
	Active - HA Provider Routing Status	Red	Value > 1	Indicates there exists multiple Active Providers for corresponding Resource + sub-resource pair.
User Pane (Lower left pane)	Routing Status	Red/Yellow	Red when value = Unavailable Yellow when value = Degraded	Indicates corresponding user server does not have healthy routing status with Active provider server for selected HA resource + sub-resource pair.
	Multiple Active	Red	Value = Yes	Indicates corresponding user server has multiple Active provider servers for selected HA resource + sub-resource pair.

Report

A HA Services Status report provides a status of the services on each server. The summary or detailed report can then be saved to file.

The fields are described in Connection Status Elements.

1. Click **Communication Agent** > **Maintenance** > **HA Services Status**.
2. Select the HA service resource.

   The resource is highlighted and the **Report** button at the bottom of the screen is enabled.
3. Select either **Detailed** or **Summary** from the pull down list and click **Report**.
4. Perform one of these actions:

- Click **Save** – From the option screen that appears, select to **Open**, **Save** the report, or **Cancel** the action.
- Click **Back** – to return to the Overall Routed Services Status tab.