

# Oracle® Communications Diameter Signaling Router Communication Agent User Guide



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

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# Whats New in This Guide

This section introduces the documentation updates for DSR 9.0.0.0.0 release.

**Release 9.0.0.0.0 - F79498-01, April 2023**

There are no changes to this guide in this release.

# 1

## 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.

### 1.1 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.

## 1.2 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.

## 1.3 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.
- **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.

## 1.4 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.



# 2

## Configuration

This section describes the procedures used to configure ComAgent.

### 2.1 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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **Remote Servers** and **Communication Agent**, and then **Configuration**, and then **Connection Group** to perform this configuration.

The **Communication Agent**, and then **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.

## 2.2 Remote Servers

The **Communication Agent**, and then **Configuration**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **Remote Servers**, and then **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**, and then **Configuration**, and then **Remote Servers**, and then **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.)

### 2.2.1 Remote Servers Elements

[Remote Servers Elements](#) describes elements on the **Communication Agent**, and then **Configuration**, and then **Remote Servers** View, Insert, and Edit pages. Data Input Notes apply only to Insert and Edit pages.

Table 2-1 Remote Server Elements

Name	Description	Data Input Notes
Remote Server Name	The <b>Remote Server Name</b> 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-hexadecimal 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 0000:0000:0000:0000:0000:0000:0000:0001
Remote Server Mode	The Mode in which the Remote Server operates.	Format: List Range: Client, Server
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

Table 2-1 (Cont.) Remote Server Elements

Name	Description	Data Input Notes
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

## 2.2.2 Insert

The **Communication Agent**, and then **Configuration**, and then **Remote Servers**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **Remote Servers [Insert]** is displayed. The fields display the applied values.
- Click **Cancel** – to return to the previous page without saving any changes.

## 2.2.3 Edit

The **Communication Agent**, and then **Configuration**, and then **Remote Servers**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **Remote Servers [Edit]** is displayed. The fields shall display the applied values.
  - Click **Cancel** – to return to the previous page without saving any changes.

## 2.2.4 Delete

The **Communication Agent**, and then **Configuration**, and then **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**, and then **Configuration**, and then **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.

## 2.3 Connection Groups

The **Communication Agent**, and then **Configuration**, and then **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**, and then **Configuration**, and then **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.

## 2.3.1 Connection Group Elements

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

**Table 2-2 Connection Group Elements**

Name	Description
Connection Group	The name of the <b>Connection Group</b> 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

## 2.3.2 Edit

The **Communication Agent**, and then **Configuration**, and then **Connection Groups**, and then **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**, and then **Configuration**, and then **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**, and then **Configuration**, and then **Connection Groups**, and then **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**, and then **Configuration**, and then **Connection Groups** screen appears.
  - Click **Apply** – If field validations succeed, the **Communication Agent**, and then **Configuration**, and then **Connection Groups [Edit]** appears and the fields display the applied values.

## 2.4 Routed Services

The **Communication Agent**, and then **Configuration**, and then **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 Elements Remote 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.

## 2.4.1 Routed Services Elements

[Table 2-3](#) describes elements on the Routed Services page.

**Table 2-3 Routed Services Elements**

Name	Description
Name	The name of the <b>Service</b> 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 <b>Communication Agent</b> , and then <b>Configuration</b> , and then <b>Connection Groups</b> . 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.

# 3

## Maintenance

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

### 3.1 Connection Status

The **Communication Agent**, and then **Maintenance**, and then **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."

#### 3.1.1 Connection Status Elements

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

**Table 3-1 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 3-1 (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 3-2](#).

**Table 3-2 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. 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.

**Table 3-2 (Cont.) Connection Status Bottom Pane View Grid Columns**

Field Name	Description
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.

## 3.1.2 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**, and then **Maintenance**, and then **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.

## 3.1.3 Enable

**Enable** on the **Communication Agent**, and then **Maintenance**, and then **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**, and then **Maintenance**, and then **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.

## 3.1.4 Disable

**Disable** on the **Communication Agent**, and then **Maintenance**, and then **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**, and then **Maintenance**, and then **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.

## 3.1.5 Block

**Block** on the **Communication Agent**, and then **Maintenance**, and then **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**, and then **Maintenance**, and then **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.

## 3.2 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](#).

### 3.2.1 Routed Services Status Elements

[Table 3-4](#) describes elements on the **Communication Agent**, and then **Maintenance**, and then **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 3-3](#).

**Table 3-3 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.
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.

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

Column Name	Criteria	Description
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 3-4 Routed Services Status, Overall Tab**

Column Name	Description
Routed Service	Name of the Routed Service
User	Total MP
	Available
	Degraded
	Unavailable
Provider	Total MPs
	Total
	Available
	Degraded
	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 3-5 Connection Group Tabs**

Column Name	Description
Connection Group	Name of the Routed Service. Sortable.
User	Total MPs Available Degraded Unavailable
Provider	Total MPs Available Degraded Unavailable

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

**Table 3-6 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 3-7 Routed Services Status, Provider Pane**

Column Name	Description
Provider MP Status	The Provider Message Processor. Sortable 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 3-8 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 3-8 (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.

## 3.2.2 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**, and then **Maintenance**, and then **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.

## 3.3 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](#).

### 3.3.1 HA Services Status Elements

The values in the fields are color coded as shown in [Table 3-9](#).

**Table 3-9 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. 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.
Multiple Active	Value = Yes	There are multiple Active Providers for one or more sub resource. Background color is red.

**Table 3-10 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.
	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 3-11 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.
	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 3-12 HA Service Status, HA Users Pane**

Column Name	Description
Hostname	<p>Displays user servers that have registered for corresponding HA Resource (selected from Tabs) + sub-resource (selected in Sub Resource pane).</p> <p>When server is selected in provider pane, then it displays only those user servers that have status data available from selected provider server. Sortable.</p>

**Table 3-12 (Cont.) HA Service Status, HA Users Pane**

Column Name	Description
Routing Status	<p>Displays routing status of HA Resource + sub-resource pair at corresponding user server.</p> <p>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.</p> <p>When server is selected in Provider pane, then it displays Routing status available at corresponding user server with the selected provider server. Sortable.</p>
HA Role	<p>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.</p> <ul style="list-style-type: none"> <li>• Active</li> <li>• Standby</li> <li>• Spare</li> <li>• Observer</li> <li>• OutOfSrvc</li> </ul> <p>If the corresponding user server does not have status data from any Provider, then it displays HA Role as OutOfSrvc.</p> <p>When the server is selected in Provider pane, then it displays HA Role available at corresponding user server for the selected provider server. Sortable.</p>
Provider	<p>Displays name of the Provider server for which HA Role is being displayed.</p> <p>If the corresponding user server does not have status data from any Provider, then it displays "----".</p> <p>When the Provider server is selected in Provider pane, then it displays the name of that selected Provider server. Sortable.</p>
Congestion Level	<p>Displays congestion level with the provider server. Sortable.</p>
Multiple Active	<p>Contains Yes when there are multiple active providers known to corresponding user server.</p> <p>When Provider server is selected in Provider pane, then it displays "----" for this field. Sortable.</p>
Update Time	<p>Displays timestamp when update HA status was received from provider server. Sortable.</p>

**Table 3-13 HA Service Status, HA Providers Pane**

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

**Table 3-14 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.
	Unavailable - HA User Routing Status	Red	Value > 0	One or more users have routing status as Unavailable for corresponding Resource + sub-resource pair.

Table 3-14 (Cont.) Color Coding for HA Service Status, Sub Resource Tab

Pane	Field Name	Color Code	Criteria	Description
	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.

### 3.3.2 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 [HA Services Status Elements](#).

1. Click **Communication Agent**, and then **Maintenance**, and then **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.