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Introduction

About this document

This document assumes that a standalone Cisco TelePresence Conductor integration with Cisco Unified Communications Manager (Unified CM) Ad hoc and Rendezvous calls has been set up according to the Cisco TelePresence Conductor with Cisco Unified Communications Manager Deployment Guide (D14998). This guide provides details on how to:

- Extend the TelePresence Conductor integration with Unified CM to a cluster of TelePresence Conductors for Ad hoc and Rendezvous calls.
- Back up a TelePresence Conductor cluster.
- Remove a TelePresence Conductor peer from Unified CM for Ad hoc and Rendezvous calls.
- Upgrade a TelePresence Conductor cluster.

Further reading

For details on how to integrate a TelePresence Conductor cluster with Cisco VCS see Cisco TelePresence Conductor Clustering with Cisco Video Communications Server Deployment Guide (D14828).


For details on how to integrate the TelePresence Conductor into the Cisco TelePresence Management Suite (Cisco TMS) and how to schedule meetings with the TelePresence Conductor using TMS see Cisco TelePresence Conductor with Cisco TMS Deployment Guide (D15001).

About TelePresence Conductor clustering

Clusters of TelePresence Conductors are used to provide redundancy in the rare case of the failure of an individual TelePresence Conductor (for example, due to a network or power outage). Each TelePresence Conductor is a peer of the other TelePresence Conductors in the cluster. Each peer knows about all conferences. It can add callers to conferences created by other peers and it can create conferences that it or other peers can add calls to.

The process to integrate a cluster of TelePresence Conductors depends upon whether the TelePresence Conductor cluster is communicating with a Cisco Video Communication Server (VCS) or a Cisco Unified Communications Manager (Unified CM). This document explains the process of creating and integrating a cluster of TelePresence Conductor peers with Unified CM. See Cisco TelePresence Conductor Clustering with Cisco Telepresence Video Communication Server Deployment Guide (D14828) for clustering with Cisco VCS.

To handle a cluster of TelePresence Conductor peers the Unified CM will be configured to have direct links to all the TelePresence Conductors in the cluster. If one TelePresence Conductor fails, Unified CM will then route the call to a different TelePresence Conductor for call completion. This process is transparent to the user and offers virtually no interruption in service.
Example network deployment

This document uses the example network shown in the diagrams below as the basis for the deployment configuration described. During configuration, refer back to these diagrams to see the relationship between a Unified CM cluster and a redundant set of TelePresence Conductors.
Cisco TelePresence network elements

Unified CM

The Unified CM acts as a call processor for routing voice and video device calls. It works with other infrastructure devices in the network to process call requests.

Conference bridges

Conference bridges are network devices that enable multiple video calls to come together in a multipoint video conference. TelePresence Conductor version XC2.0 supports the conference bridge types TelePresence MCU and TelePresence Server.

Endpoints

Endpoints are devices that receive and make video calls. They can be software clients on PCs and Macs such as Jabber, desktop endpoints such as the 9971 and EX90, or room systems such as the MX300.
Creating a TelePresence Conductor cluster

Prerequisites

Before starting the configuration, ensure you have met the following criteria:

- A standalone TelePresence Conductor has been configured to work with a Unified CM and at least one conference bridge according to the Cisco TelePresence Conductor with Cisco Unified Communications Manager Deployment Guide (D14998).
- Every TelePresence Conductor to be used in the cluster must be running the same version of XC software. TelePresence Conductor clustering with Unified CM is supported in version XC2.0 and later.
- The Cisco Unified CM must be running Unified CM version 8.6.2 or later (version 9.0 or later preferred).
- Enough unique IP addresses are available to configure each TelePresence Conductor peer with addresses to fulfill the requirements for Ad hoc and Rendezvous type call configuration. Each cluster peer will need, at minimum, an IP address for management plus an IP address for Ad hoc conferences and another for Rendezvous conferences. Additional IP addresses for Ad hoc and Rendezvous conferences will be required if multiple locations are handled.
- All TelePresence Conductor cluster peers must be configured to use either the same NTP servers, or NTP servers that are very closely synchronized. The NTP servers can be viewed and configured on the Time page (System>Time).
- All TelePresence Conductor cluster peers must be located closely enough so that there is a maximum round trip time of 30 milliseconds between any pair of cluster peers.
- Every conference bridge in use by TelePresence Conductor must be reachable by every TelePresence Conductor peer over HTTP/HTTPS and SIP TLS.
- The following ports must be open between the TelePresence Conductor peers:
  - UDP port 500 (ISAKMP) for IPSec PKI (Public Key Infrastructure) key exchange
  - IP protocol 51 (IPSec AH) is used for database synchronization

Integration overview

As part of a solid network design, implementation of redundancy within the system is critical. This can be achieved for a Unified CM and TelePresence Conductor integration using additional TelePresence Conductors configured as additional options for Unified CM to use to place Ad hoc and Rendezvous calls. The diagram below depicts a resilient scenario in a single site design. We recommend that when configuring the Unified CM and TelePresence Conductor integration, to ensure that the primary TelePresence Conductor for Ad hoc calls, Cond_1, is the secondary TelePresence Conductor for Rendezvous calls and the opposite configuration for Cond_2, where it is the primary TelePresence Conductor for Rendezvous calls and secondary for the Ad hoc calls, or that Ad hoc and Rendezvous calls use round robin so that calls are load balanced across the TelePresence Conductor peers.
In a design where a single Unified CM cluster or multiple Unified CM clusters support multiple CAC locations, TelePresence Conductor must be configured with separate locations for each Unified CM CAC location. In addition, TelePresence Conductor must be configured to use conference bridge resources that are in the relevant Unified CM location; otherwise if this design is not followed the Unified CM CAC model will be broken.

Note: For Ad hoc conferences the conference bridges to use are indirectly configured by the template that is configured on the TelePresence Conductor’s Unified CM locations page (Template → Service Preference → Conference bridge pools → Conference bridges). The conference bridges to use for Rendezvous conferences are defined by the alias dialed (Alias → Template → Service Preference → Conference bridge pools → Conference bridges) – therefore for Rendezvous conferences the prefix must be location specific.

Configuring the TelePresence Conductor

Step 1: Check the configuration

1. Decide which TelePresence Conductor is to be the initial peer. The configuration of this system will be shared with all other peers as they are added to the cluster. For the purposes of this example, we shall refer to this peer as Conductor_1.
   
   Note: if you chose an un-configured Conductor as the initial peer it will wipe the configuration of other peers as they are added.

1. Verify that no other TelePresence Conductor already has Conductor_1’s IP address in their clustering peers list. To do this verification:
   a. Log into every TelePresence Conductor as a user with administrator rights.
   b. Go to System > Clustering.
c. Ensure that all **Peer X IP address** fields (X = 1, 2, and 3) on this page do not have **Conductor_1**’s IP address.
   If they do:
   i. Delete that Peer IP address.
   ii. Click **Save**.
   iii. Go to **Maintenance > Restart**.
   iv. Click **Restart system**.

2. Log into **Conductor_1** as a user with administrator rights.

3. Ensure that **Conductor_1** has a valid and working NTP server configured:
   a. Go to **System > Time**.
   b. In the **Status** section at the bottom of the page, the **State** should be **Synchronized**.

4. Ensure that **Conductor_1** has at least one valid DNS server configured:
   a. Go to **System > DNS** to verify DNS settings.

5. Ensure that **Conductor_1** has the correct **Domain name** and **System host name** configured:
   Note: `<System host name>.<domain name> = FQDN of this TelePresence Conductor.``
   a. Go to **System > DNS** to verify DNS settings.

6. Ensure that **Conductor_1** has no other TelePresence Conductor peers configured on this system:
   a. Go to **System > Clustering**.
   b. Ensure that all Peer X IP address fields (X = 1, 2, and 3) on this page are blank.
      If not:
      i. Delete any entries.
      ii. Click **Save**.

7. Ensure that **Conductor_1** has no Cluster pre-shared key configured:
   a. Go to **System > Clustering** to verify this setting.
   b. If a value is in **Cluster pre-shared key** field:
      i. Delete the entry.
      ii. Click **Save**.
      iii. Go to **Maintenance > Restart**.
      iv. Click **Restart system**.

**Step 2: Create a cluster of one peer**

1. On **Conductor_1**, go to **System > Clustering**.

2. Enter the following values in the relevant fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster pre-shared key</td>
<td>Enter a password (this will be the same for all peers).</td>
</tr>
<tr>
<td>Peer 1 IP address</td>
<td>Enter the IP address of this TelePresence Conductor peer, <strong>Conductor_1</strong> (this is the initial peer in the cluster from which the initial configuration will be replicated from to all other peers in the cluster).</td>
</tr>
<tr>
<td>Peer 2 IP address</td>
<td>Leave blank at this point in the configuration.</td>
</tr>
</tbody>
</table>
3. Click Save.
4. Go to Maintenance > Restart.
5. Click Restart system.
6. Log into Conductor_1 as a user with administrator rights.
7. Go to System > Clustering.
8. Verify the status of this peer. It should have This System in green next to the IP address.

**Step 3: Configure the cluster to accept the new peer**

These instructions specify how to add a second peer to the cluster. A third peer can be added in a similar manner using Peer 3 IP address, and configuring both peer 1 and peer 2 before configuring peer 3.

On the initial cluster peer (i.e. the initial peer which is configured as a cluster of one peer):

1. Log into the initial TelePresence Conductor, Conductor_1, as a user with administrator rights.
2. Go to System > Clustering.
3. In the Peer 2 IP address field, enter the new peer’s IP address. For the purposes of this example we shall refer to this peer as Conductor_2.
4. Click Save.
5. Notice the peer’s Status is failed. This is normal for this stage of the configuration process.

6. Click Save.
7. Go to the Restart page of Conductor_1 (Maintenance > Restart).
8. Click **Restart system**.

**Step 4: Check the configuration of the second peer**

1. Log into the new peer, **Conductor_2**, as a user with administrator rights.
2. Ensure that **Conductor_2** has a valid and working NTP server configured:
   a. Go to **System > Time**.
   b. In the **Status** section at the bottom of the page, the **State** should be **Synchronized**:

   ![Status (last updated: 09:22:48 EDT)](image)

3. Ensure that **Conductor_2** has at least one valid DNS server configured:
   a. Go to **System > DNS** to verify DNS settings.
4. Ensure that **Conductor_2** has the correct **Domain name** and **System host name** configured:
   a. Go to **System > DNS** to verify DNS settings.

   ![Note: <System host name>.<domain name> = FQDN of this TelePresence Conductor.](image)

5. Ensure that **Conductor_2** has no other TelePresence Conductor peers configured on this system:
   a. Go to **System > Clustering**.
   b. Ensure that all **Peer x IP address** fields on this page are blank.
      i. Delete any entries
      ii. Click **Save**.
6. Ensure that **Conductor_2** has no **Cluster pre-shared key** configured:
   a. Go to **System > Clustering** to verify this setting.
   b. If a value is in **Cluster pre-shared key** field
      i. Delete the entry.
      ii. Click **Save**.
      iii. Go to **Maintenance > Restart**.
      iv. Click **Restart system**.

**Step 5: Configure the new peer to join the cluster**

1. On this peer, go to **System > Clustering**.
2. In the **Cluster pre-shared key** field, enter the same password that was used for the initial peer, **Conductor_1**.
3. In the **Peer 1 IP address** field, enter the IP address of the initial peer, **Conductor_1**.
4. In the **Peer 2 IP address** field, enter the IP addresses of the local TelePresence Conductor, **Conductor_2**.
5. Click **Save**.
   **Note:** Ensure that the initial peer is accessible via the web and is not still restarting. If the second peer is restarted whilst the initial peer is restarting, the wrong peer may be selected as the initial peer and configuration may be lost.

6. Go to **Maintenance > Restart**.
7. Click **Restart system**.
8. Log back into **Conductor_2** as a user with administrator rights.
9. Go to **System > Clustering**.
10. Verify the **Status** of each peer. It should have **This system** in green next to this system’s IP address and show **Active** for the other peer.

### Step 6: Configure the Unified CM locations on the peer.

As a part of the clustering process the configuration of Unified CM locations, aliases, templates, Service Preferences and conference bridges are replicated. The Unified CM location’s IP address, however, needs to be configured on peer **Conductor_2**.

1. Log into the new peer, **Conductor_2**, as a user with administrator rights.
2. Go to **Conference Configuration > Unified CM Locations**.
3. Click **View/Edit** next to the existing location name. Also notice this location says **Address Missing** under the IP address fields. This is because a unique local IP address needs to be associated with these types of calls on this TelePresence Conductor.
4. Under the **Ad hoc section**, select the IP address from the drop down list.
5. Under the **Rendezvous** section, select the IP address from the drop down list.
6. Click **Save**.
7. Verify the proper IP addresses were saved and assigned to the appropriate type of calls.

8. Repeat for each Unified CM location configured.

### Configuring Unified CM for Ad hoc conferences

**Step 1: Add the secondary TelePresence Conductor as a bridge to the Unified CM for Ad hoc conferences**

**Note:** The instructions in this step are for Unified CM version 9.0. For version 8.6.2 go to Appendix 2, *Add the secondary TelePresence Conductor as a bridge to the Unified CM for Ad hoc conferences.*

To configure Unified CM version 9.0 with TelePresence Conductor:
1. Go to **Media Bridges > Conference Bridges**.
2. Click **Add New** to create a new conference bridge.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Bridge Type</td>
<td>Select <em>Cisco TelePresence MCU</em></td>
</tr>
<tr>
<td>Conference Bridge Name</td>
<td>Enter the TelePresence Conductor’s Name</td>
</tr>
<tr>
<td>Field</td>
<td>Input</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Destination Address</td>
<td>Enter the TelePresence Conductor’s IP address</td>
</tr>
<tr>
<td>Device Pool</td>
<td>Select the appropriate pool</td>
</tr>
<tr>
<td>MCU Conference bridge</td>
<td>Modify the SIP listening port, if appropriate for your design, otherwise leave the default.</td>
</tr>
<tr>
<td>SIP port</td>
<td>Modify the SIP listening port, if appropriate for your design, otherwise leave the default.</td>
</tr>
<tr>
<td>SIP Trunk Security</td>
<td>Select Secure SIP Conference Bridge</td>
</tr>
<tr>
<td>Profile</td>
<td>Select Standard SIP Profile for TelePresence Conferencing</td>
</tr>
<tr>
<td>Location</td>
<td>Select the appropriate location</td>
</tr>
<tr>
<td>Username</td>
<td>Enter the username of the TelePresence Conductor administration user. This appears on the TelePresence Conductor’s Administrator accounts page (Users &gt; Administrator accounts)</td>
</tr>
<tr>
<td>Password</td>
<td>Enter the password of the TelePresence Conductor administration user</td>
</tr>
<tr>
<td>HTTP Port</td>
<td>Enter ‘443’.</td>
</tr>
</tbody>
</table>

**Step 2: Add the secondary TelePresence Conductor to an MRG and MRGL for Ad hoc conferences**

To configure the Unified CM with the TelePresence Conductor in a Media Resource Group (MRG):

2. Click Find to list the Media Resource Groups.
3. Click on MRG_San_Jose_Bridges.
4. Move the TelePresence Conductor media bridge (the conference bridge configured in Step 1: Add the secondary TelePresence Conductor as a bridge to the Unified CM for Ad hoc conferences) down to the Selected Media Resources box. Make sure this conference bridge is the last bridge in the list as it is the redundant TelePresence Conductor.

5. Click Save.

**Configuring Unified CM for Rendezvous conferences**

**Step 1: Add a SIP trunk for the secondary TelePresence Conductor for Rendezvous conferences**

To configure a SIP trunk to the secondary TelePresence Conductor:

1. Go to Device > Trunk.
2. Click Add New to create a new SIP trunk.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk Type</td>
<td>Select SIP Trunk</td>
</tr>
<tr>
<td>Device Protocol</td>
<td>This should change to SIP with the trunk type selection</td>
</tr>
</tbody>
</table>

4. Click Next.
5. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Name</td>
<td>Enter a trunk name</td>
</tr>
<tr>
<td>Location</td>
<td>Select the appropriate Location from the dropdown list</td>
</tr>
<tr>
<td>Device Pool</td>
<td>Select the appropriate Device Pool</td>
</tr>
<tr>
<td>Destination Address</td>
<td>Enter the IP address of <strong>Conductor_2</strong> Ad hoc Unified CM location. This IP address is the one configured on the TelePresence Conductor’s Unified CM locations page (Conference configuration &gt; Unified CM locations) in the Ad hoc Conference settings section.</td>
</tr>
<tr>
<td>SIP Trunk Security Profile</td>
<td>Select the <strong>Secure SIP Trunk Profile</strong> from the dropdown list</td>
</tr>
<tr>
<td>SIP Profile</td>
<td>Select the <strong>Secure SIP Profile</strong> from the dropdown list</td>
</tr>
</tbody>
</table>

6. Click **Save**.
7. Click **Reset**.
8. There should now be two trunks set up to route rendezvous calls to the primary and secondary TelePresence Conductors.

**Step 2: Add a route group for the SIP trunks**

To configure a route group to use the SIP trunks to the TelePresence Conductor for rendezvous calls:
1. Go to **Call Routing > Route/Hunt > Route Group**.
2. Click **Add New** to create a new route pattern.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Group Name</td>
<td>Enter a route group name</td>
</tr>
<tr>
<td>Distribution Algorithm</td>
<td>Select <strong>Top Down</strong></td>
</tr>
</tbody>
</table>
4. Under the Route Group Member section, highlight **Trunk_Rendezvous_to_Conductor** and click **Add to Route Group**.

5. Under the Route Group Member section, highlight **Trunk_Rendezvous_to_Conductor_redundant** and click **Add to Route Group**.

6. Once both are added, they will appear in the **Current Route Group Members** section.

7. For load balancing Rendezvous calls to the opposite TelePresence Conductor to the one used for Ad hoc calls, ensure that **Trunk_Rendezvous_to_Conductor_redundant** is moved to the top of the list.

8. Click **Save**.
Step 3: Add a route list for the route group

To configure a route list to use the route group that contains the SIP trunks to the TelePresence
Conductor for rendezvous calls:

1. Go to Call Routing > Route/Hunt > Route List.
2. Click Add New to create a new route pattern.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter a route list name</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager Group</td>
<td>Select the appropriate group from the dropdown list</td>
</tr>
</tbody>
</table>

4. Click Save.
5. Click Add Route Group.
6. Next to the Route Group field select the route group created in Step 2: Add a route group for the SIP trunks.
7. Click Save.
8. Click Reset.

Step 4: Edit the route pattern that matches the SIP trunk to TelePresence Conductor for Rendezvous meetings

To configure a route pattern to match the SIP trunk to the TelePresence Conductor for rendezvous calls:

1. Go to Call Routing > Route/Hunt > Route Pattern.
2. Click Find and then select the relevant route pattern.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Pattern</td>
<td>Enter a route pattern to match against the destination string</td>
</tr>
<tr>
<td>Gateway/Route List</td>
<td>Select the route list used in Step 3: Add a route list for the route group from the dropdown list</td>
</tr>
</tbody>
</table>
4. Click **Save**.
Creating a system backup

To create a system backup:
1. Go to Maintenance > Backup and restore.
2. Click Create system backup file.
4. Click Save and save the backup file to an appropriate location.

Note: a system backup can only be restored to the peer from which the backup was taken.
Testing system configuration

Once you have completed the configuration described in the previous sections, you should test that the system is working correctly as follows. The diagrams below are references for the testing steps:
Create an Ad hoc conference

Perform the following test with both TelePresence Conductors operational, then with one switched on and the other off, then the first one off and second on.

To test that three Unified CM registered endpoints can join an Ad hoc conference, perform the following steps.

1. From the 9971 dial 3100. Verify a video and audio session is established between the 9971 and the second C20.

2. From the 9971, press the conference button and dial 3300. Verify a video and audio session is established between the 9971 and the second C20. Also note that the call between the 9971 and second C20 has been put on hold.
   
   **Note:** At this point the TelePresence Conductor is not involved.

3. From the 9971 press the Conference tab on the screen to join the participants and move the call to a conference bridge.
   
   The call is now established on the MCU via Cond_1’s B2BUA.

4. To verify the established call on the TelePresence Conductor, Cond_1, go to Status > Conferences.
5. To verify the established call on the MCU, go to the Conference Status page (Conferences on the main tab).
Create a Rendezvous conference

Perform the following test with both TelePresence Conductors operational, then with one switched on and the other off, then the first one off and second on.

To test that two or more Unified CM registered endpoints can join a Rendezvous conference, perform the following steps.

1. From the 9971 dial 5100. This will match the route pattern 5XXX that is associated with the SIP trunk to the TelePresence Conductor. Verify a video and audio session is established with the MCU. An audio response of “You are the first participant to join” will be heard.
2. From the first C20 dial 5100. Verify a video and audio session is established between the first C20 and the MCU.
3. From the second C20 dial 5100. Verify a video and audio session is established between the second C20 and the MCU.
4. Each participant should be seeing video of the other participants’ camera and hearing audio from the other endpoints.
5. To verify on the TelePresence Conductor, Cond_2, that the call been passed through the B2BUA, go to Status > Conferences.
6. To verify the established call on the MCU, go to the Conference Status page (Conferences on the main tab).
Removing a TelePresence Conductor peer

Removing a TelePresence Conductor from Unified CM

To remove a TelePresence Conductor from Ad hoc calls you must remove the TelePresence Conductor from the Media Resource Group (MRG), and optionally delete the TelePresence Conductor from the Unified CM Conference bridges.

Remove the TelePresence Conductor from the Media Resource Group

1. Go to the Unified CM web interface and log in as an admin user.
2. Go to Media Resources > Media Resource Groups.
3. Click Find to list the Media Resource Groups.
4. Click on MRG_San_Jose_Bridges.
5. Highlight the TelePresence Conductor that you want to remove from the group and click on the ^ to move it to the Available Media Resources box.
6. Click Save.

(Optional) Remove the TelePresence Conductor as a conference bridge

1. Go to the Unified CM web interface and log in as an admin user.
2. Go to Media Resources > Media Resource Groups.
3. Click Find to list the Conference Bridges.
4. Select the box next to the conference bridge and click Delete Selected.
Remove the SIP trunk to the TelePresence Conductor used for Rendezvous conferences

1. Go to Device > Trunk.
2. Click Find to show the configured trunks.
3. Select the trunk that is used for the Conductor being removed.
4. At the top of the page select the Cross (Delete).
5. Confirm the deletion by pressing OK.

Removing a peer from an existing cluster

Step 1: Place the peer in standalone mode

Before removing a live peer from a cluster, you must place the peer in standalone mode so that it no longer communicates with other peers in the cluster. If the peer is out of service and can no longer be accessed, you do not need to place it in standalone mode. However, you must still follow the instructions to remove it from the cluster in the next section: Step 2: Update all other peers in the cluster.

To place a peer into standalone mode:

1. Log in to the peer to be removed from the cluster as a user with administrator privileges.
2. Go to System > Clustering.
3. Delete the Cluster pre-shared key value.
4. Delete all entries from the Peer IP address fields.
5. Click Save.
7. Click Restart system.
   When the TelePresence Conductor has restarted, it will be in standalone mode.
8. Optional: Delete the configuration or reconfigure the TelePresence Conductor.

Step 2: Update all other peers in the cluster

After the peer to be removed has been placed in standalone mode (or if the peer is out of service and cannot be contacted), you must update all other peers in the cluster so they no longer consider the removed peer to be part of their cluster.

To do this, on each remaining peer in the TelePresence Conductor cluster:

1. Go to System > Clustering.
2. From the relevant Peer x IP address field (x = 1, 2, or 3), delete the IP address of the peer that has been removed from the cluster.
3. Click Save.
   Repeat these steps on each remaining peer
Upgrading a cluster of TelePresence Conductors

The process described here is essentially disbanding, upgrading and then reclustering a cluster of TelePresence Conductors. In order to prevent downtime, one peer in the cluster is upgraded separately to the others, so that there is always at least one peer active and able to service conference requests from the Unified CMs until all peers have been upgraded and re-clustered.

Step 1: Remove a peer from the cluster

Follow the steps in Removing a TelePresence Conductor peer to remove one peer from the TelePresence Conductor cluster.

Step 2: Upgrade the peer that has been removed from the cluster

On the TelePresence Conductor that has been removed from the cluster:
1. Go to the web interface and log in as a user with administrator privileges.
2. Go to Maintenance > Upgrade.
3. Click Browse and select the TelePresence Conductor software image.
4. Click Upgrade.
5. Follow the onscreen prompts.

Step 3: Configure the upgraded peer to be a cluster of one peer

Follow the steps in Configuring the TelePresence Conductor steps 1 and 2 to create a new cluster of one peer with the upgraded TelePresence Conductor.

Step 4: Configure Unified CM to use the upgraded peer

1. Follow the steps in Configuring Unified CM for Ad hoc conferences to add the upgraded TelePresence Conductor as a bridge to the Unified CM and to add it to an MRG and MRGL.
2. Follow the steps in Configuring Unified CM for Rendezvous conferences to remove the remaining TelePresence Conductors that have not yet been upgraded from Unified CM.

Step 5: Remove the other peers from the original cluster

Follow the steps in Removing a peer from an existing cluster to remove the remaining TelePresence Conductors that have not yet been upgraded from the original cluster.

Step 6: Upgrade the other peers

Follow the steps in Step 2: Upgrade the peer that has been removed from the cluster above to upgrade the remaining TelePresence Conductors.
Step 7: Add the remaining peers into the new cluster

Follow the steps in Configuring the TelePresence Conductor (steps 3 to the end) to create a new cluster of one peer with the upgraded TelePresence Conductor.

Step 8: Configure Unified CM to use the upgraded peer(s)

1. Follow the steps in Configuring Unified CM for Ad hoc conferences to add the upgraded TelePresence Conductor as a bridge to the Unified CM and to add it to an MRG and MRGL.
2. Follow the steps in Configuring Unified CM for Rendezvous conferences to remove the remaining TelePresence Conductors that have not yet been upgraded from Unified CM.

Step 9: Testing the system with calls

Follow the steps in Testing system configuration to make sure that the new cluster works properly with calls.
Appendix 1: Unified CM version 8.6.2 configuration

This section covers the differences between version 8.6.2 and version 9.0 of Unified CM when configuring it for use with the TelePresence Conductor. The individual steps in the section Configuring Unified CM for Ad hoc conferences are from a version 9.0 Unified CM and should be replaced with the relevant steps from this appendix for version 8.6.2 Unified CM configuration.

Add the secondary TelePresence Conductor as a bridge to the Unified CM for Ad hoc conferences

For Unified CM version 8.6.2, replace Add the secondary TelePresence Conductor as a bridge to the Unified CM for Ad hoc conferences with the following:

1. Go to Media Resources > Conference Bridges.
2. Click Add New to create a new conference bridge.
3. Input the following into the relevant fields, leave other fields as their default values:

<table>
<thead>
<tr>
<th>Field</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Bridge Type</td>
<td>Select Cisco TelePresence MCU</td>
</tr>
<tr>
<td>Conference Bridge Name</td>
<td>Enter the TelePresence Conductor's Name</td>
</tr>
<tr>
<td>Destination Address</td>
<td>Enter the TelePresence Conductor's IP address</td>
</tr>
<tr>
<td>Device Pool</td>
<td>Select the appropriate pool</td>
</tr>
<tr>
<td>Location</td>
<td>Select the appropriate location</td>
</tr>
<tr>
<td>Username</td>
<td>Enter the username of the TelePresence Conductor administration user. This appears on the TelePresence Conductor's Administrator accounts page (Users &gt; Administrator accounts)</td>
</tr>
<tr>
<td>Password</td>
<td>Enter the password of the TelePresence Conductor administration user</td>
</tr>
<tr>
<td>HTTP Port</td>
<td>Enter 80</td>
</tr>
</tbody>
</table>
4. Click **Save**.

5. Click **Reset** for the changes to take effect.

6. At the top right corner of the screen in the **Related Links** field, select **Back to Find/List** and click **Go**. You will be taken back to the **Conference Bridges** page.

7. Verify that the TelePresence Conductor is registered with Unified CM.
Appendix 2: IP ports and protocols

It is unusual to have any sort of firewall between cluster peers, but if there is, the following list documents the IP protocols and ports that must be open between each and every Conductor peer in the cluster.

For cluster communications between Conductor peers:

- UDP port 500 (ISAKMP) for PKI (Public Key Infrastructure) key exchange
- IP protocol 51 (IPSec AH) is used for database synchronization
## Document revision history

The following table summarizes the changes that have been applied to this document.

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>D15000.01</td>
<td>December 2012</td>
<td>Initial release</td>
</tr>
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