Cisco TelePresence Conductor Clustering with Cisco TelePresence Video Communication Server

Deployment Guide

XC2.0

X6.0 and later

D14828.04

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Introduction

About Cisco TelePresence Conductor Clustering

Clusters of Cisco 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.

The process to create clusters 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 (Cisco Unified CM).

If the call control platform is the Cisco VCS and this has been configured to use the TelePresence Conductor, the configuration and conference status data is shared between all peers in the TelePresence Conductor cluster. When the Cisco VCS detects that one TelePresence Conductor has failed, it automatically contacts a different TelePresence Conductor, which responds exactly as the failed one would.

This process is transparent to the user and offers virtually no interruption in service.

About this document

This document will provide details on how to successfully integrate TelePresence Conductor clustering with the Cisco VCS by:

- Creating an initial cluster peer.
- Adding a peer to a cluster.
- Removing a peer from an existing cluster.
- Upgrading a cluster.

Out of Scope

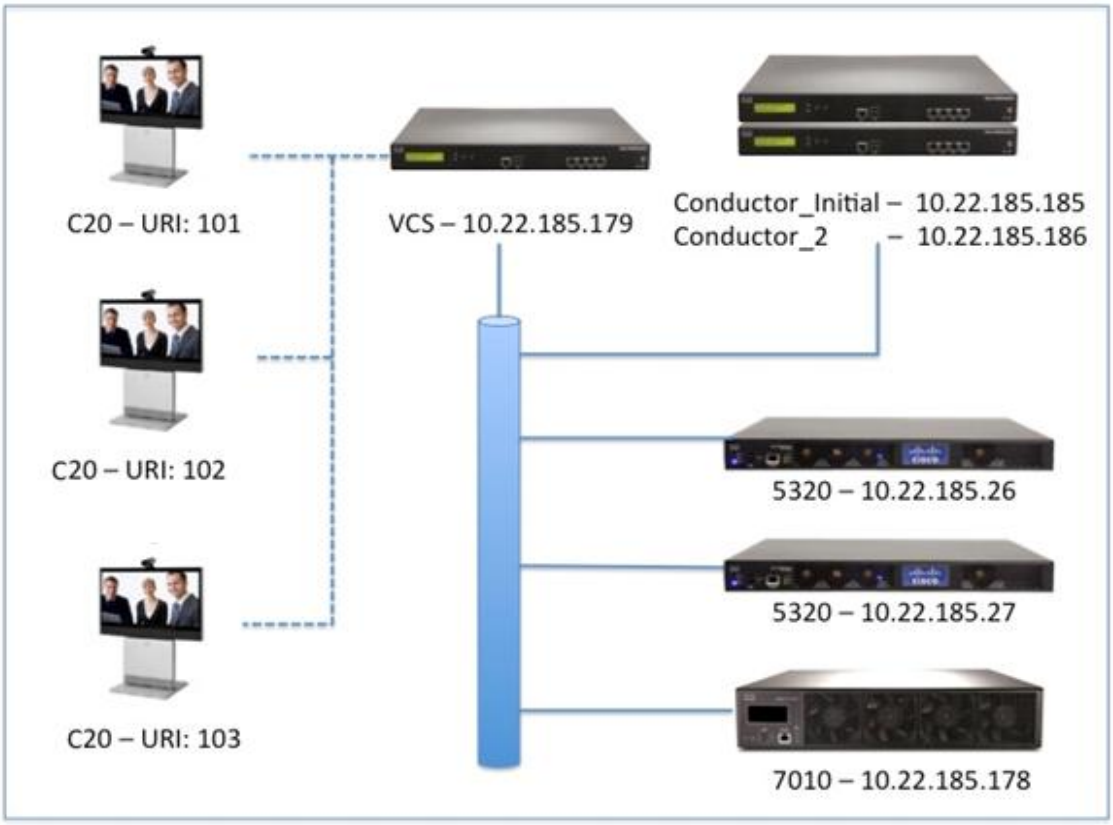
This document does not describe how to integrate a TelePresence Conductor cluster with Cisco Unified CM. For details on this deployment see *Cisco TelePresence Conductor Clustering with Cisco Unified Call Manager Deployment Guide* (D15000).

This document does not describe how to integrate a TelePresence Conductor cluster into Cisco TelePresence Management Suite (Cisco TMS) nor describe how to schedule meetings with the Conductor using TMS. For more details on this deployment see *Cisco TelePresence Conductor with Cisco TMS Deployment Guide* (D15001).

This document does not describe how to deploy Cisco VCS, TelePresence Conductor, and the Conference bridges in an end-to-end secure network. For details on this deployment see *Cisco TelePresence Conductor with Cisco TelePresence Video Communication Server Deployment Guide* (D14827).

Example network deployment

This document uses the example network shown in the diagram below as the basis for the deployment configuration described.



Cisco TelePresence network elements

Cisco VCS

The Cisco Video Communication Server (VCS) acts as a call processor for video devices. It has a built in Gatekeeper, SIP Registrar, performs IPv4 to IPv6 conversions, performs H323 to SIP and SIP to H323 interworking, and provides H460 firewall traversal support. The VCS works with other infrastructure devices in the network to process the calling requests and direct or route them to the appropriate destination.

Conference bridges

Conference bridges are network devices that enable multipoint conferences for endpoints by decoding and re-encoding the streams from the different endpoints and sending a single stream to each endpoint. 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.

Prerequisites

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

- TelePresence Conductor clustering with Cisco VCS is supported with versions XC1.1 or later. Each TelePresence Conductor in the cluster must be running the same version of XC software. Refer to *Upgrading a cluster of TelePresence Conductors* for information on the recommended process to upgrade a cluster.
- Cisco VCS must be version X6.0 or higher.
- 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 have a maximum round trip time of 30 milliseconds between the peers.
- All TelePresence Conductor cluster peers must be reachable using HTTPS from the Cisco VCS(s) from which they are going to receive conferencing requests.
- Conference bridges in use by TelePresence Conductor must be reachable over HTTPS and/or HTTP on a per-conference-bridge basis.
- 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

Note: For details on installing a TelePresence Conductor onto a network please refer to the *Cisco TelePresence Conductor Getting Started Guide* (D14829). This guide takes you through basic network configuration so your TelePresence Conductor can be contacted over the network.

Summary of the deployment process

The process of deploying a Cisco TelePresence Conductor with a Cisco VCS consists of the following steps. Each step is described in a separate section:

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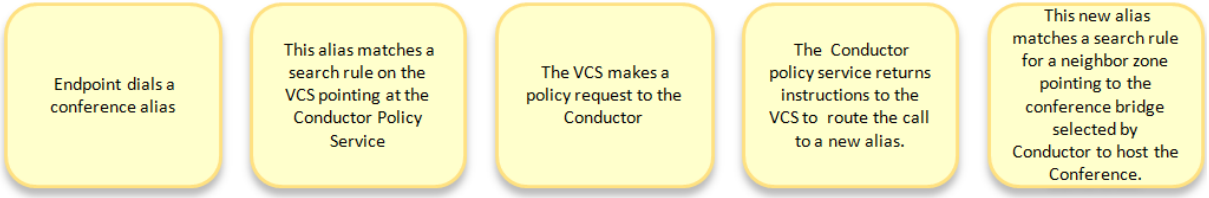
Integration overview

The Cisco TelePresence Conductor integrates tightly with the Cisco TelePresence Video Communication Server (Cisco VCS). The Cisco VCS uses the TelePresence Conductor as a policy server for calls. The Cisco VCS configuration can assign a policy server to a search rule match and ask that policy server to allow or deny the request when that search rule is matched.

Within the policy server configuration of the VCS, up to three IP addresses or FQDNs can be specified as servers that are available to use for policy requests.

These three IP addresses can point to a single TelePresence Conductor or a single TelePresence Conductor cluster. The diagram below explains the call flow including the relationship between the Cisco VCS and TelePresence Conductor.



The following steps in this document will focus on what needs to be configured in the TelePresence Conductor to create the initial peer of a cluster, add an additional peer to the cluster, and removing a peer from the cluster.

Creating an initial cluster peer

Step 1: Checking 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_Initial**.
2. Ensure that no other TelePresence Conductor is using **Conductor_Initial**'s IP address in their clustering peers list. To do this:
   a. Log into every TelePresence Conductor as a user with administrator rights.
   b. Go to the **Clustering** page **(System > Clustering)**.
   c. Ensure that all **Peer X IP address** fields (x = 1, 2, and 3) on this page do not have **Conductor_Initial**'s IP address. If they do, delete that Peer IP address.
   d. Click **Save**.
   e. Go to the **Restart** page (**Maintenance > Restart)**.
   f. Click **Restart system**.
3. Log into **Conductor_Initial** as a user with administrator rights.
4. Ensure that **Conductor_Initial** has a valid and working NTP server configured:
   a. Go to the **Time** page (**System > Time**).
   b. In the **Status** section at the bottom of the page, the **State** should be *Synchronized*:

5. Ensure that **Conductor_Initial** has at least one valid DNS server configured:
   a. Go to the **DNS** page (**System > DNS**) to verify DNS settings.
6. Ensure that **Conductor_Initial** has the correct **Domain name** and **System host name** configured:

Note: <System host name>.<domain name> = FQDN of this TelePresence Conductor.

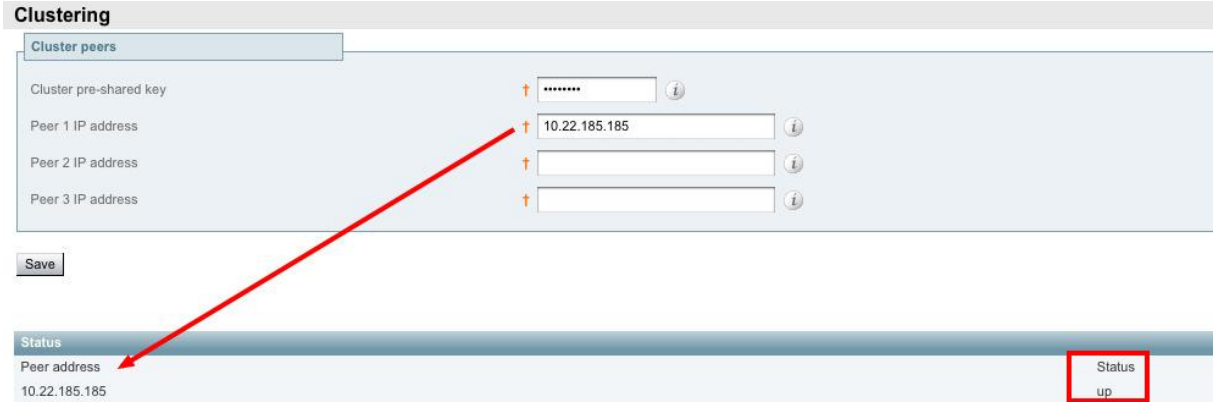
   a. Go to the **DNS** page (**System > DNS**) to verify DNS settings.
7. Ensure that **Conductor_Initial** has no other TelePresence Conductor peers configured on this system:
   a. Go to the **Clustering** page (**System > Clustering**).
   b. Ensure that all **Peer x IP address** fields (x = 1, 2, and 3) on this page are blank. If not, delete any entries.
   c. Click **Save**.
8. Ensure that **Conductor_Initial** has no Cluster pre-shared key configured:
   a. Go to the **Clustering** page (**System > Clustering**).
   b. If a value is in **Cluster pre-shared key** field, delete the entry.
   c. Click **Save**.
   d. Go to the **Restart** page (**Maintenance > Restart**).
   e. Click **Restart system**.

Step 2: Configuring IP addresses

1. On **Conductor_Initial**, go to the **Clustering** page (**System > Clustering**).
2. Enter the following values in the relevant fields:

Field	Values
Cluster pre-shared key	Enter a password (this will be the same for all peers).
Peer 1 IP address	Enter the IP address of this Conductor peer, **Conductor_Initial** (this is the initial peer in the cluster from which the initial configuration will be replicated from to all other peers in the cluster).
Peer 2 IP address	Leave blank at this point in the configuration.
Peer 3 IP address	Leave blank at this point in the configuration.

3. Click **Save**.
4. Go to the **Restart** page (**Maintenance > Restart**).
5. Click **Restart system**.
6. Log into **Conductor_Initial** as a user with administrator rights.
7. Go to the **Clustering** page (**System > Clustering**).
8. Verify the status of this peer is *Up*.

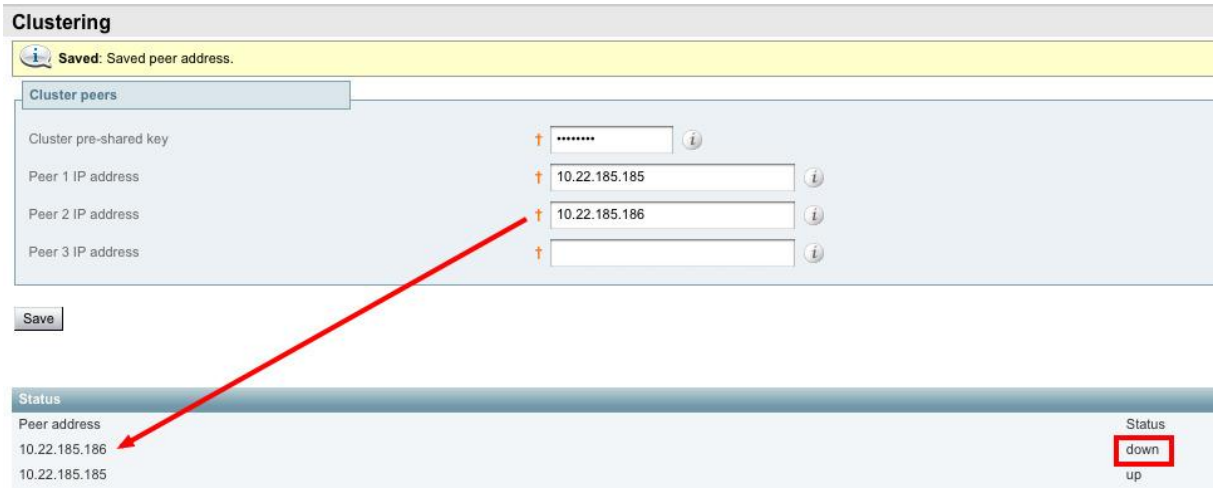


Adding a peer to a cluster

Step 1: Configuring the cluster to accept the new peer

On each existing cluster peer (i.e. the initial peer and any other peer that has already been added to the cluster):

1. Log into the initial TelePresence Conductor, **Conductor_Initial**, as a user with administrator rights.
2. Go to the **Clustering** page (**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 *down*. This is normal for this stage of the configuration process.



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

Step 2: Checking configuration

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 the **Time** page (**System > Time**).
   b. In the **Status** section at the bottom of the page, the **State** should be *Synchronized*:

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

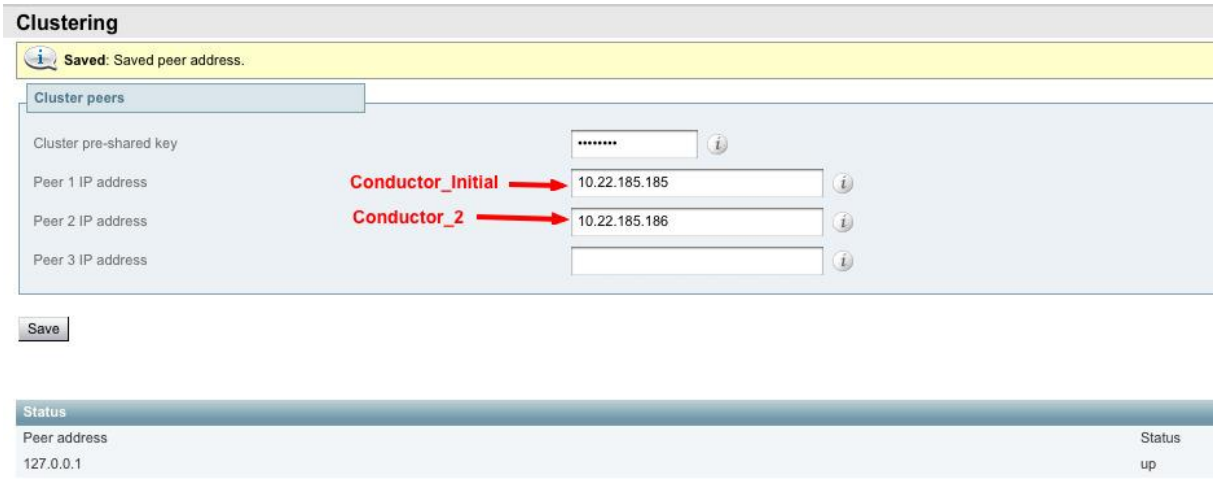
Note: <System host name>.<domain name> = FQDN of this TelePresence Conductor.

   a. Go to the **DNS** page (**System > DNS**) to verify DNS settings.

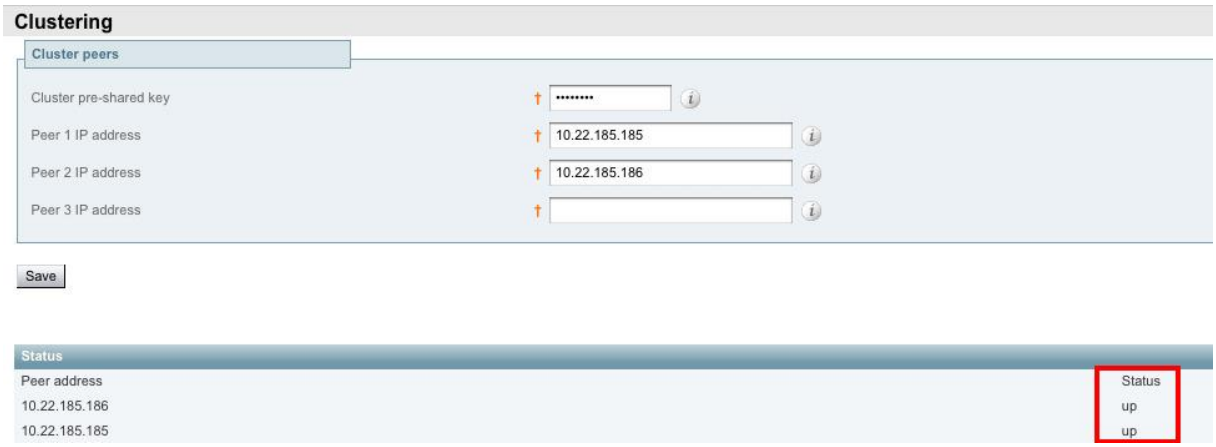
5. Ensure that **Conductor_2** has no other TelePresence Conductor peers configured on this system:
   a. Go to the **Clustering** page (**System > Clustering**).
   b. Ensure that all **Peer x IP address** fields on this page are blank. If not, delete any entries and click **Save**.
6. Ensure that **Conductor_2** has no Cluster pre-shared key configured:
   a. Go to the **Clustering** page (**System > Clustering**).
   b. If a value is in **Cluster pre-shared key** field, delete the entry.
   c. Click **Save**.
   d. Go to the **Restart** page (**Maintenance > Restart**).
   e. Click **Restart system**.

Step 3: Configuring the new peer to join the cluster

1. On this peer, go to the **Clustering** page (**System > Clustering**).
2. In the **Cluster pre-shared key** field, enter the same password that was used for the initial peer, **Conductor_Initial**.
3. In the **Peer 1 IP address** field, enter the IP address of the initial peer, **Conductor_Initial**.
4. In the **Peer 2 IP address** field, enter the IP addresses of the local TelePresence Conductor, **Conductor_2**.



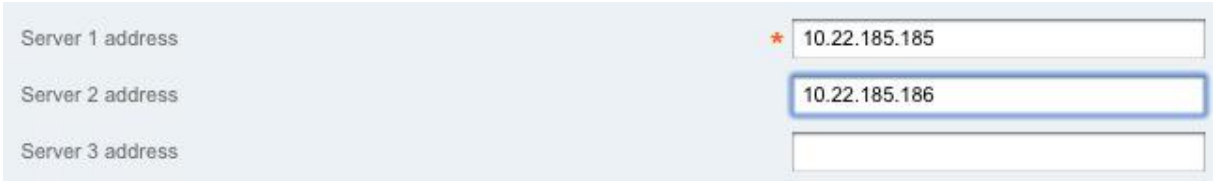
5. Click **Save**.
6. Go to the **Restart** page (**Maintenance > Restart**).
7. Click **Restart system**.
8. Log into **Conductor_2** as a user with administrator rights.
9. Go to the **Clustering** page (**System > Clustering**).
10. Verify the **Status** of each peer is *up*.



Step 4: Configuring the Cisco VCS to use the new cluster peer

For every VCS that communicates with the TelePresence Conductor cluster directly:

1. Log into the VCS (or if the VCS is clustered, the master VCS in the cluster) as a user with administrator privileges.
2. Go to the **Policy services** page (**VCS configuration > Dial plan > Policy services**).
3. Click on the policy service for the TelePresence Conductor cluster.
4. In the uppermost blank **Server x address** field (x = 1, 2, or 3), enter the IP address of the TelePresence Conductor peer you have added to the cluster.



5. Click **Save**. You will be taken back to the **Policy services** page.
6. Wait for about a minute and then click on the policy service again.
7. If there is proper connectivity between the VCS and each TelePresence Conductor in the cluster, next to each peer IP address a green message will appear saying *Active*.

If the message is in red and says *Failed*, then:

a. check the IP address used in the **Server x address** field (x = 1, 2, or 3)
b. check the user credentials
c. ensure that the default admin and root passwords have been changed on that TelePresence Conductor.

Removing a peer from an existing cluster

Step 1: Removing the cluster peer from the VCS

1. Log into the VCS (or if the VCS is clustered the master VCS in the cluster) as a user with administrator privileges.
2. Go to the **Policy services** page (**VCS configuration > Dial plan > Policy services**).
3. Click on the policy service for the TelePresence Conductor cluster.
4. From the relevant **Server x address** field (x = 1, 2, or 3) delete the IP address of the TelePresence Conductor peer that is to be removed from the cluster.
5. Click **Save**.

Step 2: Placing 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 3: Updating 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 the **Clustering** page (**System > Clustering**).
3. Delete the **Cluster pre-shared key** value.
4. Delete all entries from the **Peer IP address** fields.
5. Click **Save**.
6. Go to the **Restart** page (**Maintenance > Restart**).
7. Click **Restart system**. When the TelePresence Conductor has restarted, it will be in standalone mode.
8. Log in to the TelePresence Conductor as a user with administrator privileges.
9. Go to the **Conference bridges** page (**Conference configuration > Conference bridges > View all conference bridges**).
10. Delete all conference bridge entries.
11. Log into the VCS (or if the VCS is clustered the master VCS in the cluster) as a user with administrator privileges.
12. Go to the **Policy Service** page (**VCS Configuration > Dial Plan > Policy Services**).
13. Click on the policy service for the TelePresence Conductor cluster.
14. From the relevant **Server x address** (x = 1, 2, or 3) field, delete the IP address of the TelePresence Conductor that is being place in standalone mode.

Step 3: Updating 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 the **Clustering** page (**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**.
4. Repeat these steps on each remaining peer.

Creating a system backup

To create a system backup:

1. Log into the TelePresence Conductor as a user with administrator rights.
2. Go to the **Backup and restore** page (**Maintenance > Backup and restore**).
3. Click **Create system backup file**.
4. Wait for the file download dialog to appear.
5. 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.

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 VCSs until all peers have been upgraded and re-clustered.

Step 1: Reconfiguring the policy service on the VCS

This step involves choosing one peer in the cluster to be the last to be upgraded. This cluster peer will service conference requests from the VCSs until the other peers have been upgraded and re-clustered.

For every VCS that communicates directly with TelePresence Conductor:

1. Go to the Cisco VCS web interface and log in as a user with administrator privileges.
2. Go to the **Policy services** page (**VCS configuration > Dial plan > Policy services**).
3. Click **View/Edit** for the TelePresence Conductor cluster policy service.
4. Delete all but one of the **Server x addresses** (x = 1, 2, and 3), leaving only the address of the peer to be upgraded last.
5. Click **Save**.

Step 2: Removing the peers from the cluster

The purpose of this step is to remove from the cluster all the TelePresence Conductor peers that are going to be upgraded first.

For each peer in the cluster that is to be upgraded first, complete the steps outlined in *Step 2: Placing the peer in standalone mode* and *Step 3: Updating all other peers in the cluster*.

Step 3: Upgrading the peers that have been removed from the cluster

For each TelePresence Conductor peer that has been removed from the cluster:

1. Log in as a user with administrator privileges.
2. Go to the **Upgrade** page (**Maintenance > Upgrade**).
3. Click **Browse** and select the TelePresence Conductor software image.
4. Click **Upgrade**.
5. Follow the onscreen prompts.

Step 4: Reclustering the upgraded peer(s)

If you have only one upgraded peer (i.e. you started with a cluster of two) follow the steps outlined in *Creating an initial cluster peer*.

If you have two upgraded peers (i.e. you started with a cluster of three):

1. For the first peer, follow the steps outlined in *Creating an initial cluster peer* , then

2. For the second peer, follow the steps outlined in *Step 1: Configuring the cluster to accept the new peer* and *Step 2: Checking configuration* in the section *Adding a peer to a cluster*.

Step 5: Configuring the VCS(s) to point at the upgraded TelePresence Conductor peer(s)

For every VCS that communicates directly with TelePresence Conductor:

1. Go to the Cisco VCS web interface and log in as a user with administrator privileges.
2. Go to the **Policy services** page (**VCS configuration > Dial plan > Policy services**).
3. Click on the TelePresence Conductor cluster policy service.
4. Delete the **Server x addresses** (x =1, 2, or 3) of the peer that has not been upgraded, and insert the addresses of the peers that have been upgraded.
5. Click **Save**.

Step 6: Upgrading the remaining cluster peer

On the TelePresence Conductor peer that has not been upgraded:

1. Go to the web interface and log in as a user with administrator privileges.
2. Go to the **Clustering** page (**System > Clustering**).
3. Delete the **Cluster pre-shared key** value.
4. Delete all entries from the **Peer IP address** fields.
5. Click **Save**.
6. Go to the **Restart** page (**Maintenance > Restart**).
7. Click **Restart system**. When the TelePresence Conductor has restarted, it will be in standalone mode.
8. Log in as user with administrator privileges.
9. Go to the **Upgrade** page (**Maintenance > Upgrade**).
10. Click **Browse** and select the TelePresence Conductor software image.
11. Click **Upgrade**.
12. Follow the onscreen prompts.

Step 7: Adding the remaining peer back into the cluster

Follow the steps outlined in *Adding a peer to a cluster*.

Document revision history

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

Revision	Date	Description
D14828.01		Initial release
D14828.02	May 2012	Updated for XC1.1
D14828.03	May 2012	Updated for XC1.2
D14828.04	December 2012	Updated for XC2.0. Information regarding clustering with Cisco Unified Call Manager split out into D15000.