

Hardware Conference Bridge Configuration and Use with CallManager and a Catalyst 6000/6500 WS-X6608 Port

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Introduction

This document explains how to configure a Cisco CallManager server and a Catalyst 6000/6500 WS-X6608 Blade for audio conferencing. Many of the steps you use in order to create the conference bridge and configure the associated parameters in Cisco CallManager also apply to the default software conference bridge that Cisco CallManager servers have, as well as other hardware-based conference bridges.

The Catalyst 6000/6500 Family 8-port T1/E1 PSTN Interface Module is a high-density, eight-port, T1 or E1 Voice over IP (VoIP) module that can support digital T1 or E1 connectivity to the public switched telephone network (PSTN). This module also supports transcoding and conferencing. The module requires an IP address, is registered with Cisco CallManager in its domain, and is managed by Cisco CallManager. You can download the module software from a TFTP server.

The way in which the WS-X6608 is configured as a device in Cisco CallManager determines whether the ports act as WAN interfaces (T1/E1 hardware-specific) or support transcoding and conferencing. Each of the eight ports on the blade has a separate MAC address that you can define for transcoder or conference functionality. Once the choice is made, the port is exclusive to that function and is not available for use with the other function. Any attempt made to double-assign the MAC address of a port is rejected with the MAC address already in use error.

Most of the configuration parameters are entered on the Cisco CallManager server. The WS-X6608 Blade in the Catalyst 6000/6500 Switch receives its configuration from the Cisco CallManager server through TFTP.

Note: If you do not configure or disable all of the ports on a WS-X6608 Blade, the `%SYS-4-MODHPRESET:Host process (860) mod_num/port_num got reset` asynchronously system message continually appears on your console screen and in your system logs (if you have them configured).

Note: This is the expected behavior for this blade. It does not affect system performance.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- Catalyst 6000 Switch running CatOS 6.1(3)
- WS-X6608 Blade
- MCS7835 Cisco CallManager 3.0(7)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Conferencing Terms and Functions

Cisco CallManager supports both Meet–Me conferences and Ad–Hoc conferences.

Meet–Me conferences allow users to dial into a conference.

Ad–Hoc conferences allow the conference controller to administer control of the conference and the participants. The conference controller individually calls and adds each participant to the conference. Participants can be added to the conference until the maximum number of participants specified for Ad–Hoc conferences is reached, provided that sufficient streams are available on the conference device.

Initiate an Ad–Hoc Conference Call

Complete these steps in order to initiate an Ad–Hoc conference call:

1. The conference controller dials the phone number of the first participant.
2. When the called party answers the phone, the controller presses the conference button on their phone and receives a dial tone.
3. When the second party answers the phone, the controller presses the conference button again in order to create the conference. You can add additional participants in this manner until the conference bridge runs out of resources.

Initiate a Meet–Me Conference Call

Meet–Me conferences require that a range of directory numbers (DNs) be allocated for their exclusive use. When a Meet–Me conference is set up, the conference controller selects a directory number and advertises the number to members of the group. The users call the directory number to join the conference. Anyone who calls the directory number while the conference is active joins the conference, as long as the maximum

number of participants specified for that conference type has not been exceeded and sufficient streams are available on the conference device.

Complete this procedure in order to initiate a Meet–Me conference call:

1. The controller picks up the phone or activates the speaker to obtain a dial tone.
2. The controller presses the **Meet–Me** button on the phone.
3. The phone beeps, and the controller dials an available Meet–Me DN.
4. The participants that remain dial the Meet–Me DN directly. Participants do not use the Meet–Me button in order to join the conference.

Note: Each Meet–Me and Ad–Hoc conference must be limited to six participants.



Caution: Although conference devices can be used on the same PC as the Cisco CallManager, this practice is not recommended for larger installations. If you find that hosting a software conference bridge affects the performance of your Cisco CallManager server, implement a hardware conference bridge or divide the user population among additional Cisco CallManager servers. In this document, a WS–X6608 port is used as a hardware conference bridge.

Note: Software conference devices only support G.711 codecs. Cisco CallManager 4.0 and later also support G.729 codecs. Still, the default codec is G.711. However, if the Meet–Me conference is initiated by a phone that has a G.711 codec, G.729 devices are not able to join the meeting unless there is a transcoder involved. A transcoder is needed to handle the translation from one codec to the other one. A similar issue arises with Ad–Hoc conferences. If the phone that initiates the conference tries to include a phone with a different codec, it fails. An error message is displayed on the traces. Hardware conference devices can provide transcoding for G.711, G.729, and G.723 codecs.

Configure the IP Settings on a WS–X6608 Port (Optional)

This section explains how to configure the IP parameters of a port on the WS–X6608 Blade. This procedure is not required if the configuration uses a DHCP server to provide this information.

If you plan to use DHCP but are not sure that your ports are currently configured properly, step 2 of this procedure provides the syntax to enable DHCP.

If you plan to set your IP parameters manually, step 3 of this procedure provides an example of how to do so.

1. Issue the **view port voice interface help** command in order to view the syntax used to set the IP parameters on a port.

This output from the Catalyst 6000/6500 Switch is provided as an example:

```
Console> (enable) view port voice interface help

Usage: view port voice interface <mod/port> dhcp enable [vlan <vlan>]
       view port voice interface <mod/port> dhcp disable <ipaddrspec>
           tftp <ipaddr> [vlan <vlan>]
           [gateway <ipaddr>] [dns [ipaddr] [domain_name]]
(ipaddr_spec: <ipaddr> <mask>, or <ipaddr>/<mask>
 <mask>: dotted format (255.255.255.0) or number of bits (0..31)
 vlan: 0..1000
 System DNS may be used if disabling DHCP without DNS parameters)
```

2. Issue the **set port voice interface 5/1 dhcp enable** command in order to enable DHCP on a port.

This output from the Catalyst 6000/6500 Switch is provided as an example:

```
Console> (enable) set port voice interface 5/1 dhcp enable

Port 5/1 DHCP enabled.
```

Repeat this step for each port that the configuration requires. If you use DHCP, skip the next steps and proceed to Create the Hardware Based Conference Bridge in Cisco CallManager.

For further information on the configuration and use of DHCP, refer to Configuring Windows 2000 DHCP Server for Cisco CallManager.

3. Issue the **set port voice interface 5/4 dhcp disable ip-address/mask tftp tftp-server-ip-address gateway gateway-ip-address** command in order to disable DHCP on a port and assign IP parameters manually.

In this example, the IP address and mask are **172.16.14.72** and **27**. The TFTP server (Cisco CallManager server, in this case) IP address is **172.16.14.66**. The gateway IP address is **172.16.14.65**.

This output from the Catalyst 6000/6500 Switch is provided as an example:

```
AV-6509-1 (enable) set port voice interface 5/4 dhcp disable
172.16.14.72/27 tftp 172.16.14.66
gateway 172.16.14.65

!--- Enter this command on one line.

Port 5/1 DHCP disabled.
System DNS configurations used.
```

Repeat this step for each port that the configuration requires.

Note: You cannot specify more than one port at a time on the WS-X6608 Blade because a unique IP address must be set for each port.

4. Issue the **reset module-number** command in order to reset the module after you set up the new IP parameters.

```
AV-6509-1 (enable) reset 5

This command will reset module 5 and may disconnect your telnet session.
Do you want to continue (y/n) [n]? y

2001 May 29 05:33:23 %SYS-5-MOD_RESET:
Module 5 reset from telnet/10.21.8.172/

!--- This timestamped line appears on one line.

Resetting module 5...
```

The WS-X6608 port cannot register with Cisco CallManager until the port is configured on the CallManager server and is reset from the server. The next procedure explains how to add the new conference bridge.

Create the Hardware Based Conference Bridge in Cisco CallManager

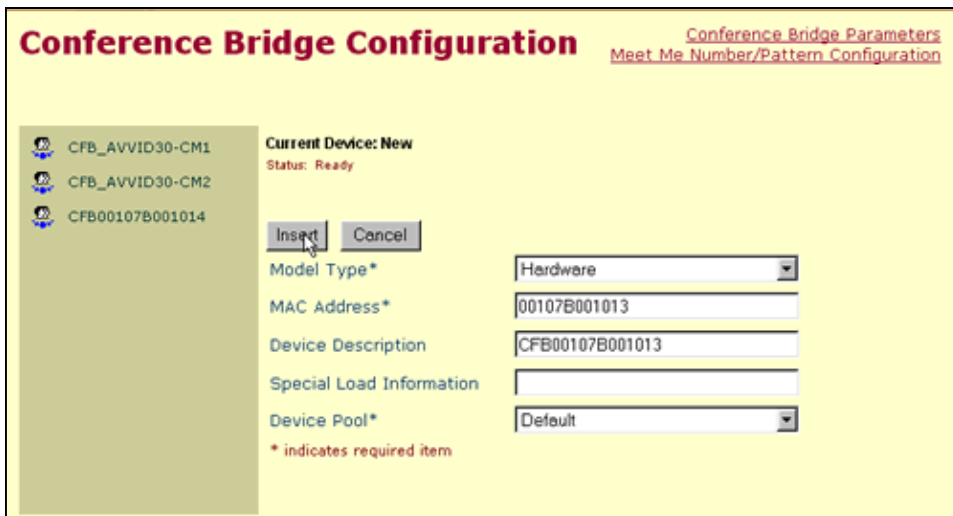
This section explains how to add a hardware conference bridge to the Cisco CallManager server, with a port on a WS-X6608 Blade.

Note: This procedure is similar to that used for other types of hardware conference bridges. The configuration of a hardware conference bridge disables the software conference bridge that is configured by default on a Cisco CallManager server.

1. In order to configure one of the ports of the WS–X6608 Blade as conference bridge resources, choose **Service > Conference Bridge** from the Cisco CallManager Administration menu.



A screen similar to this appears:



- a. Set the Model Type field to **Hardware**.
- b. Enter the MAC address of the WS–X6608 port that you want to configure as a conference bridge.

The MAC address in this example is from port 5/4 of the WS–6608–T1 Blade on the Catalyst 6000/6500 Switch. Issue the **show port** command to obtain this information.

```
AV-6509-1 (enable) show port 5
```

!--- Output is suppressed.

Port	DHCP	MAC-Address	IP-Address	Subnet-Mask
5/1	enable	00-10-7b-00-10-10	172.16.14.97	255.255.255.224
5/2	disable	00-10-7b-00-10-11	172.16.14.71	255.255.255.224
5/3	disable	00-10-7b-00-10-12	172.16.14.73	255.255.255.224
5/4	enable	00-10-7b-00-10-13	172.16.14.72	255.255.255.224
5/5	disable	00-10-7b-00-10-14	172.16.14.25	255.255.255.224

5/6	disable	00-10-7b-00-10-15	172.16.14.26	255.255.255.224
5/7	disable	00-10-7b-00-10-16	172.16.14.81	255.255.255.224
5/8	disable	00-10-7b-00-10-17	172.16.14.80	255.255.255.224

c. Click **Insert** when you complete this screen.

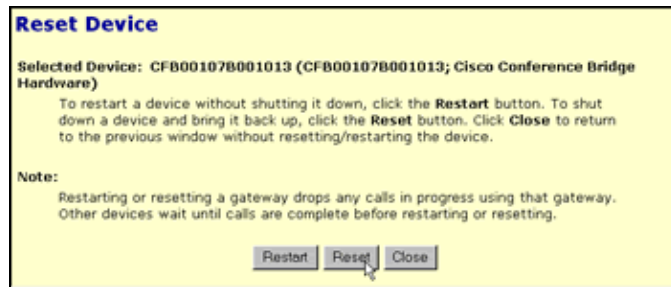
2. You can be notified that the device needs to be reset before it becomes active.

A screen similar to this then appears:



a. Click **Reset Device**.

A screen similar to this appears:



b. Click **Reset**.

3. Once the Cisco CallManager server resets the device, the device is registered on the switch.

a. You can verify that the port is configured for conferencing and display any active conference sessions with the **show port voice active module-number/port-number conference** command.

```
AV-6509-1 (enable) show port voice active 5/4 conference
```

```
Total: 0 conferencing session
```

b. You can also verify that the port is properly configured with the **show port module-number/port-number** command.

In this case, the port type is listed as Conf Bridge.

```
AV-6509-1 (enable) show port 5/4
```

Port	Name	Status	Vlan	Duplex	Speed	Type
5/4		enabled	64	full	-	Conf Bridge

Configure the Meet–Me DN and Other Related Parameters in Cisco CallManager

This section explains how to set up a single DN for one Meet–Me conference. Repeat this procedure as often as needed in order to create more DNs.



Caution: It is possible to configure more Meet–Me DNs than your system resources support.

1. Click the **Meet Me Number/Pattern Configuration** option in the Conference Bridge Configuration window.

A screen similar to this appears:

Meet Me Number / Pattern Configuration

Conference Bridge Configuration
Conference Bridge Parameters

Meet Me Number / Pattern: New

Status: Delete completed

Insert Cancel

Directory Number or Pattern* 42

Route Partition* < None >

* indicates required item

- a. Enter the Meet–Me DN.
- b. If you use Route Partitions, select the appropriate Route Partition. Otherwise leave the default of **None**.
- c. Click **Insert**.

A screen similar to this appears:

Meet Me Number / Pattern Configuration

Conference Bridge Configuration
Conference Bridge Parameters

Meet Me Number / Pattern: 42

Status: Insert completed

New Copy Update Delete Cancel

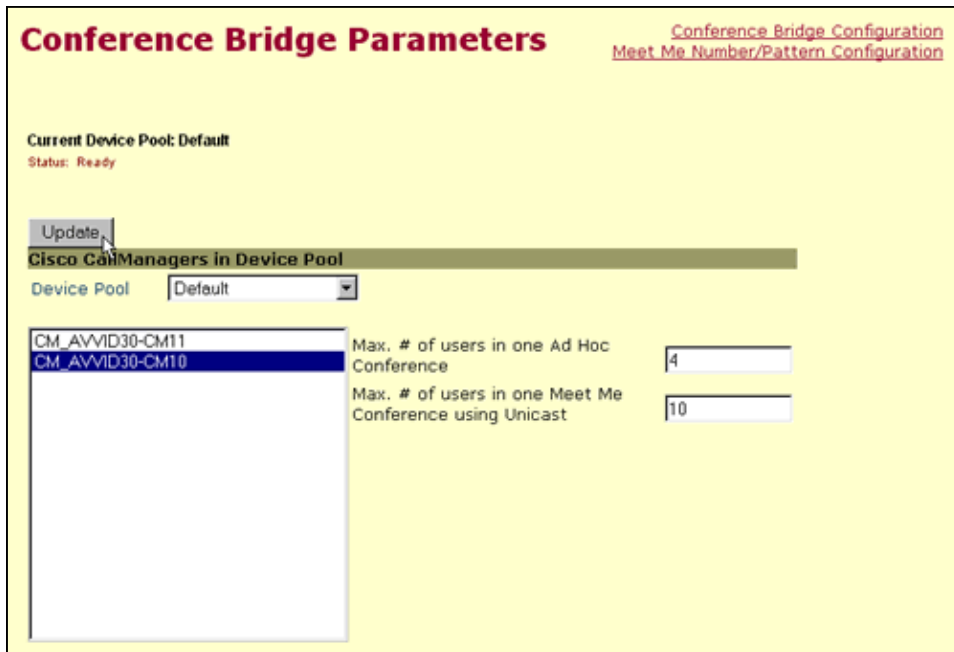
Directory Number or Pattern* 42

Route Partition* < None >

* indicates required item

2. Select the **Conference Bridge Parameters** option.

A screen similar to this appears:



- a. Select the server that you want to configure.
- b. Make any changes that your configuration requires.
- c. Click **Update**.

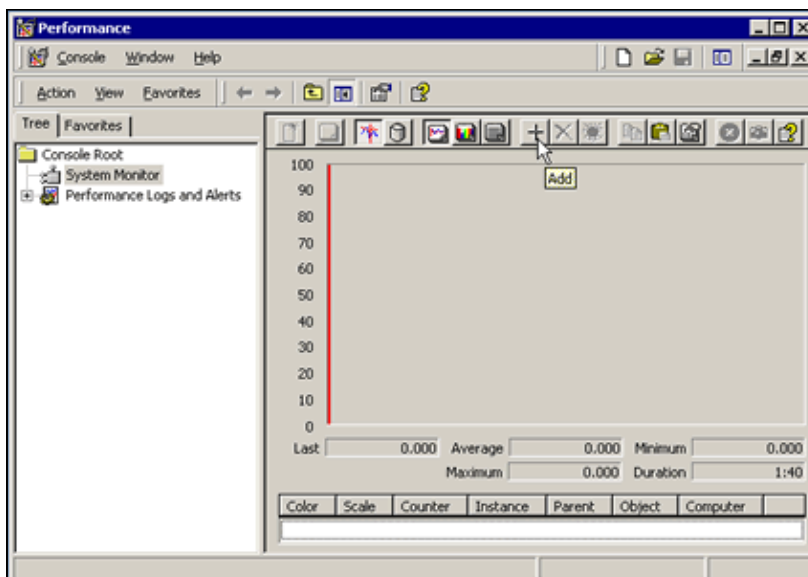
Verify the Catalyst and CallManager Configuration

Complete this procedure to use Performance Monitor in order to analyze conference calls and status changes:

1. Choose **Start > Programs > Administrative Tools > Performance** in order to start Performance Monitor.

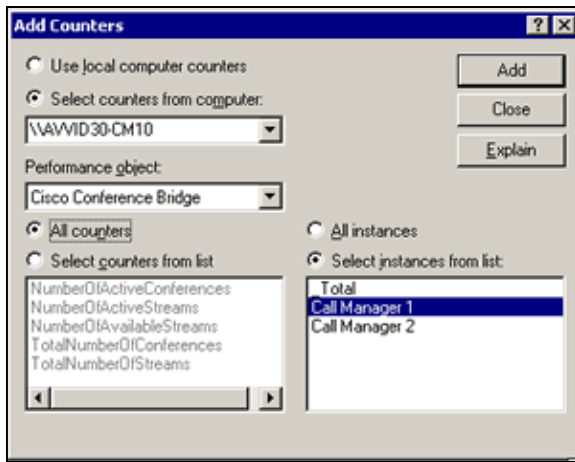
Note: You can also select **Start > Run** and enter **perfmon** in order to start Performance Monitor.

A screen similar to this appears:



2. Click the Add (+) icon.

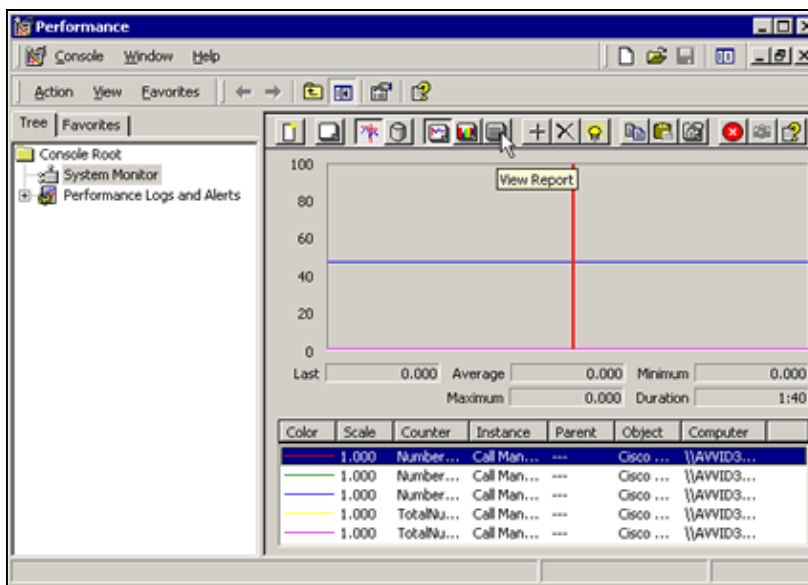
A screen similar to this appears:



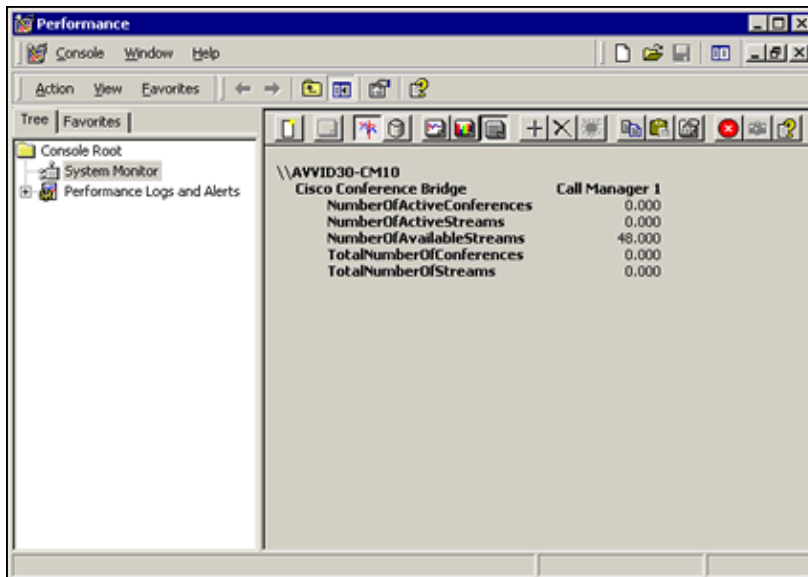
- a. Select the Cisco CallManager server that you want to configure.
- b. Set the Performance object field to **Cisco Conference Bridge**.
- c. Click **Add** and then click **Close**.

If you do not see the instance of the conference bridge that you created, then it is possible that it is not registered with the Cisco CallManager server. For a procedure to correct this problem, see the Troubleshoot section of this document.

3. Click the **View Report** button.



A screen similar to this appears:



- a. Try to create an Ad-Hoc conference and a Meet-Me conference.
- b. These parameters change to reflect the conferences that you currently use.

Troubleshoot

If you do not see the instance of the conference bridge that you created in step 2 of Verify the Catalyst and CallManager Configuration, then it is possible that it is not registered with the Cisco CallManager server.

The most common problem is that the MAC address of the port was entered incorrectly in the Cisco CallManager server conference bridge configuration. Verify that you have entered the correct MAC address before you proceed to troubleshoot.

If you continue to experience problems, issue the **reset module-number** command in order to try to reset the module from the Catalyst switch. Wait until the registration process is completed. In order to check this, issue the **show port module-number** command and look for the IP address of the Cisco CallManager server.

If you are not able to resolve the problem, continue to troubleshoot.

Make sure that the port has the correct IP addresses configured. At a minimum, the port needs its own IP address and mask, and the IP address of the TFTP (CallManager) server. If the IP address of the port is on a different subnet (VLAN), then it also requires a gateway address. If your network relies on DNS, then you must configure the DNS server address and domain name of the port. If you use DHCP, refer to Configuring Windows 2000 DHCP Server for Cisco Call Manager for further information on the configuration and use of DHCP. If you want to manually configure the IP parameters, see the Configure the IP Settings on a WS-X6608 Port (Optional) section of this document.

Log on to the Cisco CallManager server and check the IP addresses used under the **System > Server** menu in order to find the correct TFTP (CallManager) address.

For both DHCP and non-DHCP configurations, verify that the VLAN is correct. It is not possible to set the VLAN of the port with DHCP. This must be done at the command-line interface (CLI) of the switch with the **set vlan vlan-number module-number/port-number** command. Also, verify that the port status is not disabled. The syntax for enabling a port is **set port enable module-number/port-number**.

Note: Unlike the WS-X6624, you have to configure the IP parameters for each port on the WS-X6608 independently. This output shows the correct IP parameters for this example:

```
AV-6509-1 (enable) show port 5/4
```

```
Port  Name                Status      Vlan      Duplex Speed Type
-----
5/4                enabled     64        full     -   Conf Bridge

Port  DHCP      MAC-Address      IP-Address      Subnet-Mask
-----
5/4    disable  00-10-7b-00-10-13  172.16.14.72    255.255.255.224

Port  Call-Manager(s)  DHCP-Server      TFTP-Server      Gateway
-----
5/4    172.16.14.66    -                172.16.14.66    172.16.14.65

Port  DNS-Server(s)    Domain
-----
5/4    172.16.13.130    -

Port  CallManagerState DSP-Type
-----
5/4    registered        C549

Port  NoiseRegen NonLinearProcessing
-----
5/4    disabled          disabled

Port  Trap      IfIndex
-----
5/4    disabled  155
```

If you use DHCP or DNS and you continue to experience problems, try one or both of these solutions:

- Configure the IP parameters manually in order to eliminate DHCP from the equation.
- Use IP addresses instead of DNS host names.

If you are still unable to resolve the problem, open a service request with the support center that you use for Cisco support.

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- **Voice Technology Support**
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