

# Troubleshooting Cisco IP Phone Registration Problems with Cisco CallManager 3.x and 4.x

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## Introduction

This document discusses and solves the most common problems that cause Cisco IP phones to fail to register with the Cisco CallManager. Once you implement these troubleshooting steps, your IP phone must be fully functional and must communicate normally with the Cisco CallManager. This document discusses Cisco 12 SP+, 30 VIP, 7910, 7940, and 7960 model IP phones.

# Prerequisites

## Requirements

This document assumes that the majority of phones in the network work properly. In other words, it is assumed that one phone or a small number of phones do not register properly. The remainder of the phones function properly. If you have a problem that affects most of or all your phones, this document probably does not help in the resolution.

This document also assumes that you use one of the Cisco CallManager servers in the network, such as the TFTP server. The use of a non-CallManager TFTP server is beyond the scope of this document.

## Components Used

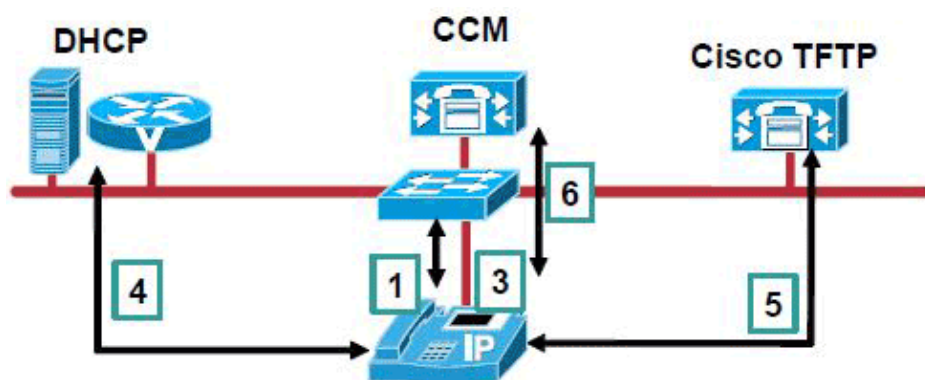
This document is not restricted to specific software and hardware versions.

## Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

# Phone Registration Process

When IP phones do not need to load a newer or different image, all IP phones follow these normal bootup and registration steps:



1. Cisco prestandard PoE switch sends FLP
2. Phone loads stored image
3. Switch provides VLAN information to IP Phone
4. Phone sends DHCP request; receives IP information and TFTP server address
5. IP Phone gets configuration from TFTP server
6. IP Phone registers with Cisco CallManager server

1. Load the image, and start the configuration process.
2. Obtain IP information through DHCP, if the phones have not gone through static configuration.
3. Obtain the configuration file.
4. Obtain other configuration parameters and files (such as speed dial numbers and ring files), and finish

registration with the Cisco CallManager server.

**Note:** The IP phones could need an image upgrade. This is true of phones that register with a Cisco CallManager server with a newer version of CallManager than the version with which the phones previously registered. In addition, the server administrator could have changed the default image for a type of phone, or for a specific phone. Any time a phone needs to load a new image, the phone must reboot and reregister with the new image. For more information on this subject, refer to the *Understanding Device Loads* section of Understanding Device Support (part of the Cisco CallManager 3.0 Administration Guide). Also refer to the Device Support and Cisco TFTP sections of the Cisco CallManager System Guide, Release 4.0(1).

**Note:** If you have your Cisco CallManager servers set up in a cluster, every server has the configuration files for every phone that is in the Publisher database. Therefore, any Cisco CallManager server can serve as a TFTP server for the phones. The device pools to which you have assigned the phones determine the server with which the phones register. A phone can obtain the configuration file from a different server than the server with which the phone registers.

## Step 1: Phone Loads Software (Image) and Starts the Configuration Process

If an IP phone cannot perform the bootup process correctly, the phone is not able to register with the Cisco CallManager server. When you plug in an IP phone, the phone will attempt to boot and configure itself. The LCD screen provides an indication of the current phase of the bootup process as the bootup progresses. The phone cannot successfully complete the bootup process until the phone connects to the Ethernet network and registers with a Cisco CallManager server. Registration with a Cisco CallManager server is successful only when the server adds the phone or when the server has Auto-Registration enabled. (The default for Auto-Registration is disabled.)

A phone normally cycles through the bootup sequence when either of these two Cisco CallManager conditions have not been met.

**Note:** If the phone LCD screen does not light up, you could have a faulty phone. The phone also could be faulty if the message the phone displays never changes after you plug in the phone. Contact Cisco Technical Support to request a replacement if your phone is under warranty.

If your phones do not use DHCP, see the Step 3a: Phone Sends TFTP Request for a Configuration File section of this document.

## Step 2a: Phone Sends DHCP Request

If you have properly configured the phone to use DHCP, it sends out a DHCP request. This is the *Configuring IP* section of the registration process.

If you are not certain that you have properly configured your phone for DHCP, use these instructions in order to verify the DHCP configuration:

### Cisco 7910

Complete these steps on the Cisco 7910:

1. Choose **Settings**.
2. Choose **6** (Network).
3. Scroll down to the **DHCP Enabled** parameter.

The selection must be Yes.

## Cisco 7940 and 7960

Complete these steps on the Cisco 7940 and 7960:

1. Choose **Settings**.
2. Choose **3** (Network).
3. Scroll down to the **DHCP Enabled** parameter.

The selection must be Yes.

## Cisco 12 SP+ and 30 VIP

Complete these steps on the Cisco 12 SP+ and 30 VIP:

1. Enter **\*\*#**.
2. Enter **1**.
3. Set all parameters to zero (**0**).

### Note:

- Cisco 7910G supports only 10 MB speed, but 7910G+SW supports 10/100. If you have a 7910G, be sure to set the switch port that connects to the phone to 10 MB or Auto.
- Any IP parameters that you have hard coded on the phones override the parameters that the DHCP server provides. In particular, the Alternate TFTP Server option overrides the TFTP server IP address that the DHCP provides. For information on how to reset your phone configuration to the original factory defaults, refer to either of these documents:

- ◆ [Resetting 7900 Series IP Phones to Factory Defaults](#)

Refer to RFC 1541: Dynamic Host Configuration Protocol [↗](#) in order to better understand DHCP.

## Step 2b: DHCP Server Sends DHCP Response

The DHCP response contains the phone IP address and the IP address of the TFTP server (which is usually a Cisco CallManager server). The response can also contain any of or all these common options:

- IP address of the default router (gateway)
- IP address of the Domain Name System (DNS) server
- Domain name

In order to verify that you have properly set up your Windows 2000 DHCP server, refer to [Configuring Windows 2000 DHCP Server for Cisco CallManager](#). This document discusses the IP parameters that each phone needs from the DHCP server. This includes option 150 for the TFTP server. The document also covers setup of the scope to provide the IP address of the DNS server (option 6) as well as the correct domain name (option 15).

For more details, refer to [Understanding Device Support](#) (part of the Cisco CallManager 3.0 Administration Guide) or the [Redundancy](#) section in the Cisco CallManager System Guide, Release 4.0(1). These documents cover the methods that are available to provide the TFTP server address and how Cisco CallManager devices determine which TFTP server to use.

## Step 3a: Phone Sends TFTP Request for a Configuration File

The configuration file contains several pieces of information that a phone requires in order to function. At this stage in the bootup and registration process, the most important configuration elements are the list of Cisco CallManager servers with which the phone can register and the device pool to which the phone belongs. In this way, a phone can obtain the configuration from a different Cisco CallManager (TFTP) server than that with which the phone ultimately registers. For more information, refer to the Understanding Redundancy (part of the Cisco CallManager 3.0 Administration Guide) or the Redundancy section in the Cisco CallManager System Guide, Release 4.0(1).

The phone requests a specific configuration file. The name for this file is *SEPMAC–Address.cnf*. For example, the file name for a phone with the MAC address 0030.94C2.D5CA is *SEP003094C2D5CA.cnf*. If the file exists on the Cisco CallManager server, see the Step 4a: TFTP Server Sends the Specific Configuration File of the Phone section of this document.

If the phone is not in the Cisco CallManager database, the request for the specific configuration file results in a TFTP `File Not Found` response from the TFTP server. The phone then requests the file with the name *SEPDEFAULT.cnf*. If you have configured the Cisco CallManager server for Auto–Registration, this file exists and the server sends it to the phone. See the Step 3b: TFTP Server Sends the Default Configuration File section of this document.

Otherwise, the TFTP server of the Cisco CallManager server sends another `File Not Found` TFTP response. At this point, the phone restarts the configuration process.

Cisco CallManager 3.3(x) provides an additional TFTP file "caching" feature. For more information, refer to Cisco TFTP.

## Step 3b: TFTP Server Sends the Default Configuration File

**Note:** This step only occurs if you have enabled Auto–Registration and the phone has not already registered with the Cisco CallManager server.

If you have configured the Cisco CallManager server for Auto–Registration, it sends the *SEPDEFAULT.cnf* file in response to the phone request. After the Cisco CallManager server database adds a phone by Auto–Registration, the phone has a *SEPMAC–Address.cnf* file. It does not reference the *SEPDEFAULT.cnf* again. See the Step 4b: Phone Registration Finishes section of this document.

## Step 4a: TFTP Server Sends the Specific Configuration File of the Phone

**Note:** This step only takes place if the phone creation occurred on the Cisco CallManager server.

The configuration file contains several parameters for the phone. These include the device pool, the Cisco CallManager servers to use, configured speed dials, and other parameters. In general, any time you make a change in Cisco CallManager that requires the phone (device) to be reset, you have made a change to the phone configuration file.

## Step 4b: Phone Registration Finishes

The Cisco CallManager server sends the phone additional configuration elements during the final phases of the registration process. In general, the registration process must complete successfully if the process goes this far. To learn what takes place at this point, you need to set up a network analyzer to capture the IP packets that the phone sends to and receives from the server.

# 7961G Phone does not Register until it is Configured as a 7961

IP phones CP-7961 and CP-7961G are basically the same platform. The **G** stands for global use that supports all languages. So when you add a 7961G phone, you should add it as a regular 7961 phone. CP-7961G-GE is another IP phone with two gigabit Ethernet ports (10/100/1000). If IP phone 7961G is added as 7961G-GE, it does not register with Cisco CallManager.

## Disable DHCP and DNS to Test a Phone

Your phone can display one of these messages:

- DNS Error or Configuring IP
- Opening <IP address of Call Manager>
- Configuring CM List

You can easily determine if you have a faulty phone or a faulty configuration. Reset the phone to the factory default configuration, and then hard code all the necessary IP parameters into the phone. This eliminates the possibility of DHCP and DNS issues.

**Note:** If possible, connect the phone to an IP subnet on which other phones operate normally. Use the same TFTP server IP address and default router IP address that the functional phones use.

Refer to *Resetting 7900 Series IP Phones to Factory Defaults* for information on how to reset your phone configuration to the original factory defaults.

1. Manually configure the IP parameters on a phone.

For the Cisco 79xx:

- a. To unlock the phone, enter the **\*\*\*#** key sequence.

**Note:** You must reboot the 7910 to finish the unlock of the network settings.

- b. Choose **Settings**, and choose **6** (Network).
- c. Scroll down to **DHCP Enabled**, and choose **No**.
- d. Scroll up and enter a static IP address in the TFTP server field.

**Note:** Use the numbers on the keypad to enter the IP addresses. Use the "\*" key for the "." between the sections of the IP addresses.

- e. Configure the IP address/mask, Default Router 1, and any other IP parameters that you require.
- f. Choose **Save** when you finish.

For information on how to configure the network settings on Cisco 79xx IP phones, refer to *Cisco IP Phone Model 7960, 7940, and 7910 Administration Guide for Cisco CallManager Release 3.0 and 3.1*. Or, refer to the appropriate *Cisco IP Phone Administration Guide for Cisco CallManager, Models 7960, 7940, and 7910*.

For the Cisco 12 SP+ and the 30 VIP:

- a. Press \* \* to display the status.
- b. As the status displays, press #.

The keypad configuration appears. The message `Press 1 to disable DHCP or # to skip` appears.

- c. Press **1**.
- d. Enter the phone IP address, with asterisks instead of periods.

For example, enter **10\*0\*10\*100\***.

- e. Enter the subnet mask, with asterisks instead of periods.

For example, enter **255\*255\*255\*0\***.

- f. Enter the IP address of the default gateway/router, with asterisks instead of periods.

For example, enter **10\*0\*10\*0\***.

- g. Enter the IP address of the DNS server, with asterisks instead of periods.

For example, enter **10\*0\*10\*0\***.

- h. Type the IP address of the TFTP server, with asterisks instead of periods.

For example, enter **10\*0\*0\*100\***.

The message `Press * to exit, or 1 to disable DHCP` appears.

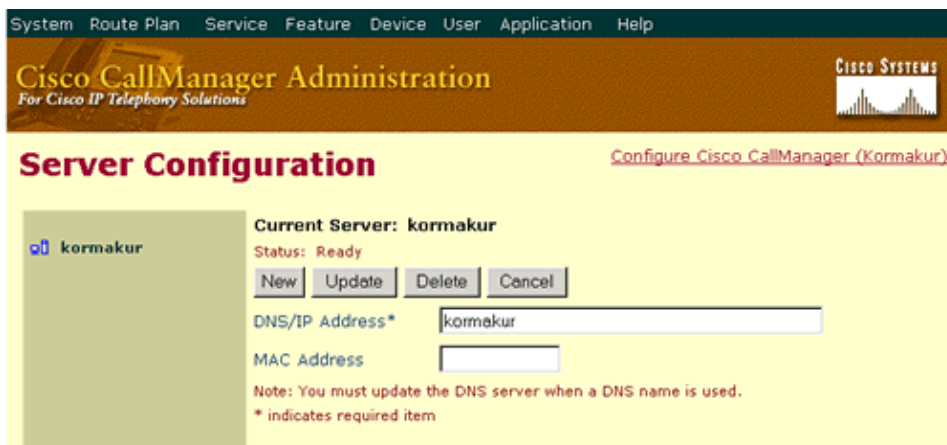
- i. Press **1**.

The phone programs the new information into flash memory and resets. This disables DHCP.

See the [Manually Configure the IP Parameters on a 12 SP+ or 30 VIP Phone](#) section of this document for information on how to set the IP parameters on a Cisco 12 SP+ or 30 VIP phone.

- 2. On the Cisco CallManager server, check to be certain that the local host files map the correct Cisco CallManager server name to the IP address. Refer to [Configuring The IP Hosts File on a Windows 2000 CallManager Server](#) for more information.
- 3. In Cisco CallManager Administration, choose **System > Server** to check that the server IP address appears (and not the server DNS name).

In this window, you need to change the DNS name *kormakur* to the IP address of the server.



- 4. In Cisco CallManager, choose **Device > Phone** in order to verify that you have entered the correct MAC address for the phone that does not properly operate.

**Phone Configuration** [Update Speed Dial buttons](#)  
[Back to Find/List Phones](#)

Line 1 - 7002  
Line 2 - click to add

Phone: SEP003094C25D4E (Lab Phone)  
Status: Ready

New Copy Update Delete Reset Phone Cancel

**Phone Configuration (Model = Cisco 7960)**

**Device Information**

MAC Address\* 003094C25D4E

Description Lab Phone

Device Pool\* Default [\(View details\)](#)

Location < None >

Calling Search Space < None >

Button Template\* Default 7960 [\(View button list\)](#)

Load Information (Leave blank to use default load.)

5. Power cycle the phone.

## Check for the Incorrect MAC Address on the Phone Label

The MAC address sticker on the back of your phone does not necessarily display the correct MAC address. To check this, complete these steps:

### Cisco 7960, 7940, and 7910

1. Choose **Settings > Network Configuration**.
2. Scroll down to the entry for MAC address.

### Cisco 12 SP+ and 30 VIP

1. Press **\*\*#**.
2. Press **1** until you see the MAC address field.

You cannot change this entry. Therefore, you must use this entry as the MAC address when you add the phone into the Cisco CallManager.

Verify that you have entered the correct MAC address in the Cisco CallManager Phone Configuration window for the IP phone that does not properly work.

**Phone Configuration** [Update Speed Dial buttons](#)  
[Back to Find/List Phones](#)

Line 1 - 7002  
Line 2 - click to add

Phone: SEP003094C25D4E (Lab Phone)  
Status: Ready

New Copy Update Delete Reset Phone Cancel

**Phone Configuration (Model = Cisco 7960)**

**Device Information**

MAC Address\* 003094C25D4E

Description Lab Phone

Device Pool\* Default [\(View details\)](#)

Location < None >

Calling Search Space < None >

Button Template\* Default 7960 [\(View button list\)](#)

Load Information (Leave blank to use default load.)

After you have completed these steps, power cycle the phone.



# Cisco CallManager and TFTP Services Do Not Run

Another possible problem is that the Cisco CallManager service, the Cisco TFTP services, or both do not currently run. A phone can complete the registration process only if both of these services are operational.

**Note:** A run failure of the Cisco CallManager service affects all devices on the network that rely on the service to make phone calls. If the TFTP service does not run, many devices do not boot successfully. Some devices, such as H.323 gateways, are able to boot because the devices do not require the TFTP server for this process. If any of your phones can boot successfully from this server and make calls, this section probably cannot help you resolve the problem with your phone.

1. In Cisco CallManager, choose **Service > Control Center** to verify that the Cisco CallManager and TFTP services are operational.

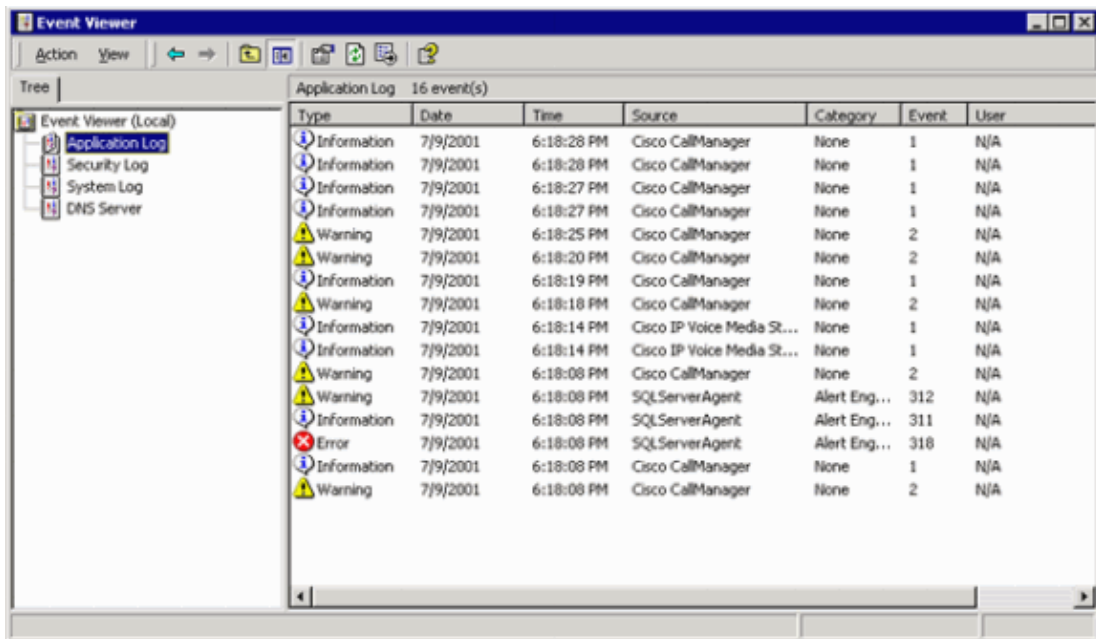
In this window, the Cisco CallManager and the TFTP services are operational. The red triangle next to the service name indicates that the service currently runs. A red box indicates that a service is not operational. If either the Cisco CallManager or the TFTP service is not operational, click the **Start** option beside the service name.



After you click Start, the service can appear to start (the Service Status triangle appears) but then stop again. The service can also fail to start at all. In either case, move on to Step 2.

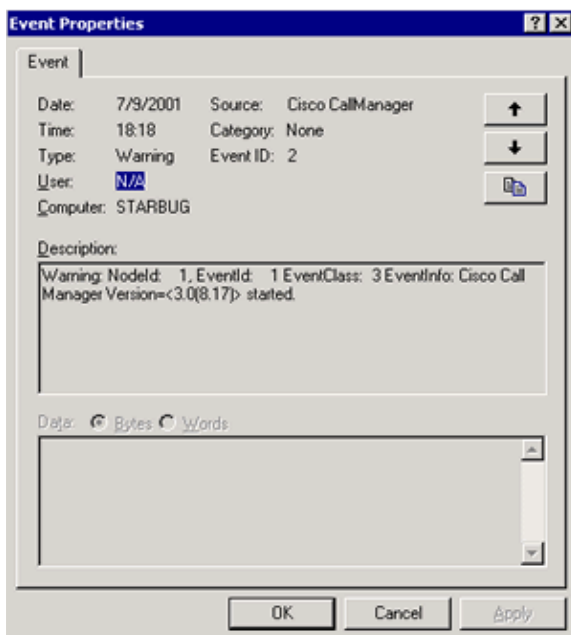
2. On the Cisco CallManager server, choose **Administrative Tools > Event Viewer** and examine the entries under the application log.

Every time a service starts, stops, or encounters an error, the system logs the event in the Event Viewer window.



3. Double-click any event to view its properties.

The Event Properties window provides details.



4. If either your Cisco CallManager or your TFTP service still fails to start, reboot the Cisco CallManager server.

## Delete and Recreate a Phone

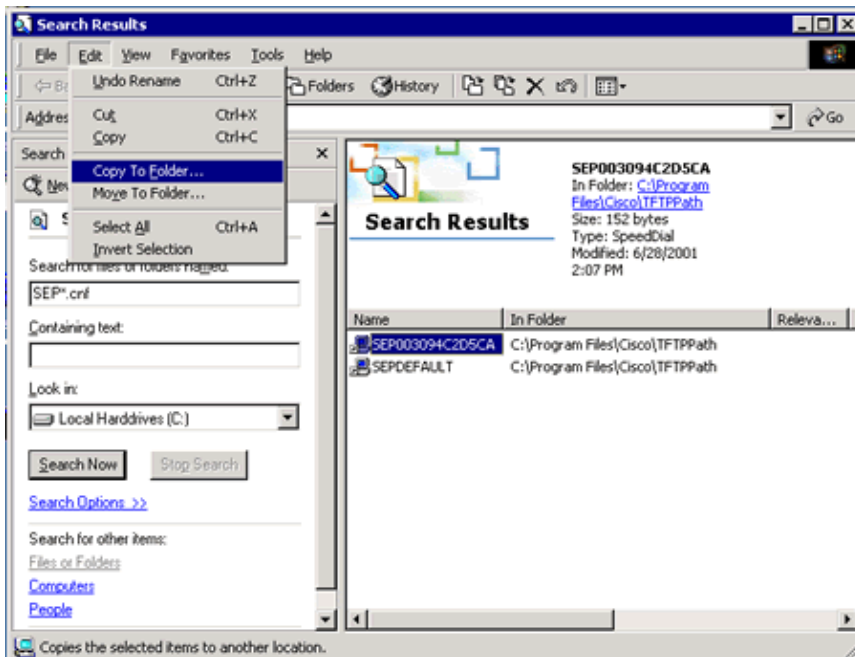
If you have followed all these procedures and you still have problems with a phone, you could have a configuration file corruption. To create a new configuration file manually, complete these steps:

1. In Cisco CallManager, choose **Device > Phone > Find** to locate the phone with which you have problems.
2. Choose **Delete**.

This removes the phone from the Cisco CallManager database.



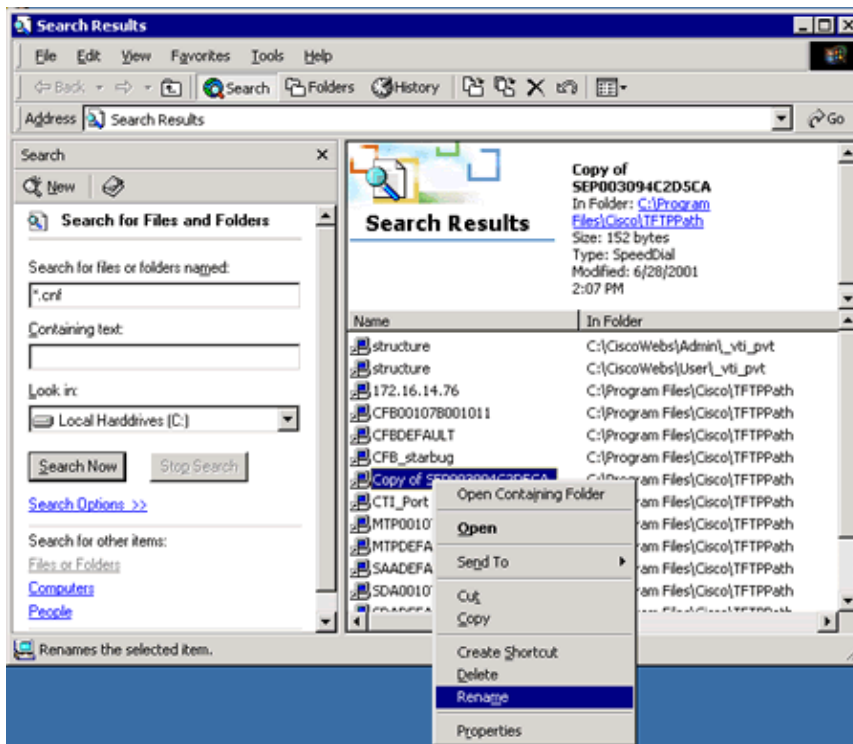
3. Search the hard drive of the Cisco Media Convergence Server (MCS) 78xx for files with the names SEP\*.cnf and SEP\*.cnf.xml.
4. Make a copy of a configuration file for an operational phone of the same type, and place it in the same folder.



5. Navigate to the correct folder (C:\Program Files\Cisco\TFTPPath).

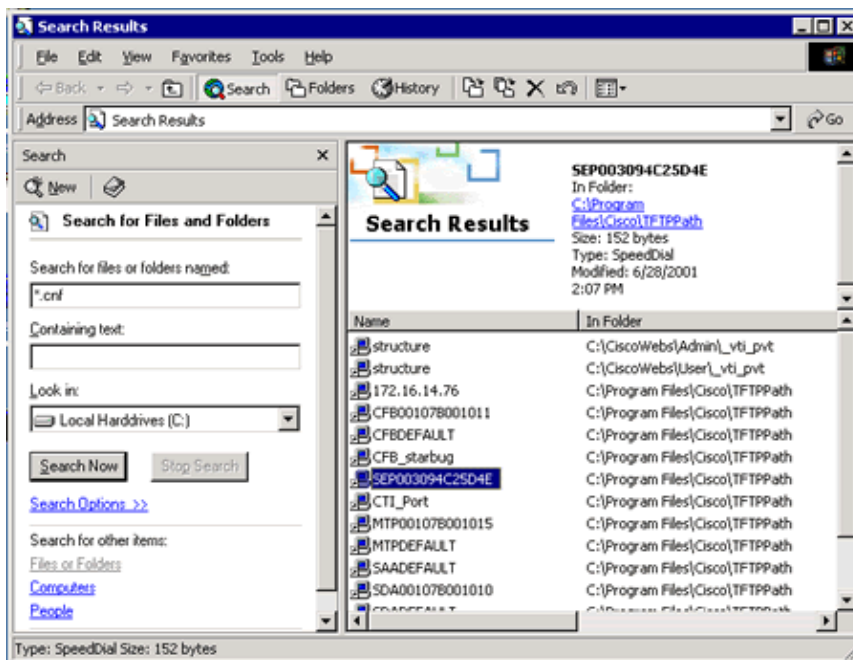


6. Right-click the new file name, and choose **Rename**.



7. Change the name to match that of the phone that you deleted previously.

In this window, the file name is now SEP003094C25D4E. The ".bin" extension is hidden because the file type is known and you have the option "Hide extensions for known file types" enabled.



8. Recreate the phone in the Cisco CallManager database.

This causes the Cisco CallManager server to modify the configuration file that you copied with the information that you enter when you recreate the phone. See the Add Phones to Cisco CallManager section of this document if you require assistance with this step.

9. Power cycle the phone.

# Understand a Network Trace File

It could be helpful to learn more about the process a phone follows when the phone boots and configures itself. Use a network analyzer set to filter on the MAC address of the phone in question. Capture the packets that the phone sends and receives during the boot process. There must be packets that correspond to each step in the Phone Registration Process section of this document.

Determine if you can ping the Cisco CallManager server from a device on the same subnet as the nonfunctional phone. If you can ping the server, you have a minimum level of IP connectivity between the two devices. This allows you to see all the packets that the phone sends and receives during the boot and registration process.

**Note:** Many network administrators filter **ping** and **traceroute** packets to prevent denial of service (DOS) attacks. If you cannot ping a device, do not assume that the device does not function properly or that there is a fault in the network. A successful **ping** or **traceroute** tells you that the network is at least minimally operational. However, a **ping** that fails does not necessarily tell you anything.

If you do not see examples of the packets that appear in the trace shown, look for:

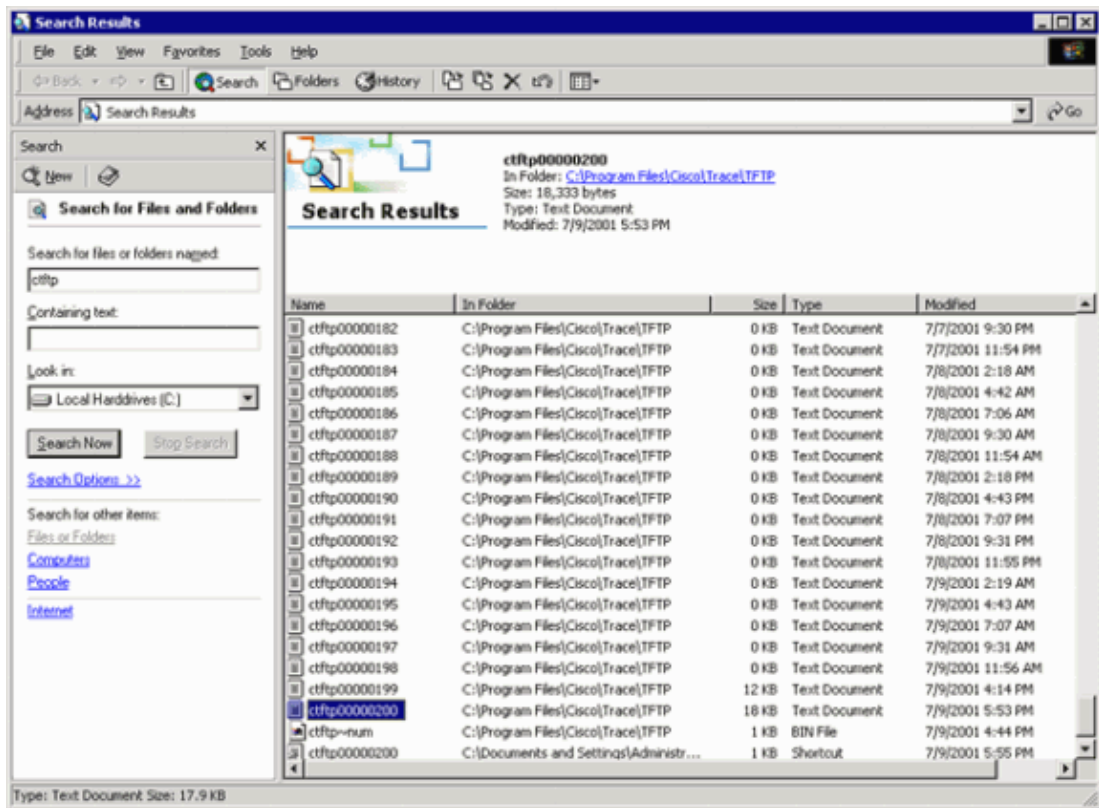
- Network congestion problems
- Ports with high cyclic redundancy check (CRC) errors
- Access lists that can block TFTP.
- IP gateway or VLAN configuration issues (if the phone and Cisco CallManager server are on different subnets/VLANs).

**Note:** The fact that the Cisco CallManager server sends TFTP responses to the phone does not mean that the phone receives the responses. Access lists are often different in each direction. In addition, the Cisco CallManager server can send the responses back to the phone through an alternate, equal-cost path that experiences congestion. There is only one true test of packet level connectivity for devices on different subnets/VLANs; you must take a network trace from the subnet/VLAN for each device.

Source	Dest	Summary	Len
[144.]	[171.]	SCCP: MsgLen = 8 StationKeypadButton *	70
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352689 WIN=16516	60
[144.]	[171.]	SCCP: MsgLen = 8 StationKeypadButton *	70
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352705 WIN=16500	60
[144.]	[171.]	SCCP: MsgLen = 8 StationKeypadButton #	70
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352721 WIN=16484	60
[144.]	[171.]	SCCP: MsgLen = 8 StationKeypadButton *	70
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352737 WIN=16468	60
[144.]	[171.]	SCCP: MsgLen = 8 StationKeypadButton *	70
[144.]	[171.]	SCCP: MsgLen = 4 StationUnregister	66
[144.]	[171.]	TCP: D=2000 S=51097 FIN ACK=909316165 SEQ=1115352765	60
[144.]	[171.]	TCP: D=2000 S=51098 FIN ACK=394908920 SEQ=1116241065	60
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352765 WIN=16440	60
[171.]	[144.]	SCCP: MsgLen = 8 StationUnregisterAck	70
[171.]	[144.]	TCP: D=139 S=1762 SYN SEQ=1293397981 LEN=0 WIN=16384	62
[144.]	[171.]	TCP: D=1762 S=139 SYN ACK=1293397982 SEQ=586045844 I	62
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352766 WIN=16440	60
[171.]	[144.]	TCP: D=51098 S=2000 ACK=1116241066 WIN=16496	60
[0.0.]	[255.]	DHCP: Request, Message type: DHCP Request	359
[144.]	[255.]	DHCP: Reply, Message type: DHCP Ack	353
00309	Broad	ARP: C PA=[144.254.195.25] PRO=IP	60
00B0C	00309	ARP: R PA=[144.254.195.25] HA=00B0C2886760 PRO=IP	60
[144.]	[171.]	TCP: D=2000 S=51098 FIN ACK=394908920 SEQ=1116241065	60
[171.]	[144.]	TCP: D=51098 S=2000 ACK=1116241066 WIN=16496	60
[144.]	[171.]	Expert: Retransmission	82
[171.]	[144.]	SCCP: MsgLen = 8 StationKeypadButton *  SCCP MsgL	60
[171.]	[144.]	Expert: Window Frozen	60
[171.]	[144.]	TCP: D=51097 S=2000 ACK=1115352766 WIN=16440	60
00500	Broad	ARP: C PA=[144.254.195.25] PRO=IP	60
00B0C	00500	ARP: R PA=[144.254.195.25] HA=00B0C2886760 PRO=IP	60
[144.]	[198.]	TCP: D=110 S=2131 SYN SEQ=84199591 LEN=0 WIN=8192	62
[144.]	[171.]	DNS: C ID=13 OP=QUERY NAME=CiscoCM1.cisco.com	78
[171.]	[144.]	DNS: R ID=13 STAT=Name error NAME=CiscoCM1.cisco.com	142
[144.]	[171.]	TFTP: Read request File=OS79XX.TXT	62
[171.]	[144.]	TFTP: Data packet NS=1 (Last)	60
[144.]	[171.]	TFTP: Ack NR=1	60
[144.]	[171.]	TFTP: Read request File=SEP003094C26E7C.cnf	71
[198.]	[144.]	TCP: D=2131 S=110 SYN ACK=84199592 SEQ=1533312000 IE	60
[144.]	[198.]	TCP: D=110 S=2131 ACK=1533312001 WIN=8576	60
[171.]	[144.]	TFTP: Data packet NS=1 (Last)	226
[144.]	[171.]	TFTP: Ack NR=1	60
[144.]	[171.]	TCP: D=2000 S=51097 ACK=909316165 WIN=1000	60

If you do not have a network analyzer, you can view some of these packets in the trace files that the Cisco CallManager server creates and stores.

1. Search the Cisco CallManager file system for file names that start with "ctftp".



2. Find the most recent file, and double-click the file name to open the file.
3. Search for the IP address of the phone with which you have problems.

Look for TFTP packets that lead to and from the phone. If you see this activity, you know that your network connectivity at least allows TFTP packets from the phone to the Cisco CallManager server.

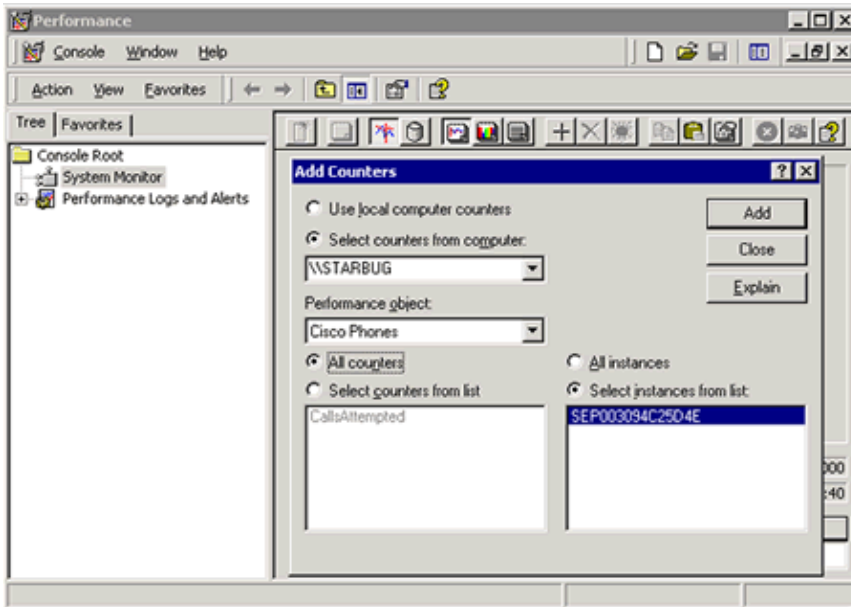
For traces with more detail, set TFTP traces on the TFTP server to detailed.

Refer to the Set Up Cisco CallManager Traces for Cisco Technical Support for more information on Cisco CallManager trace features.

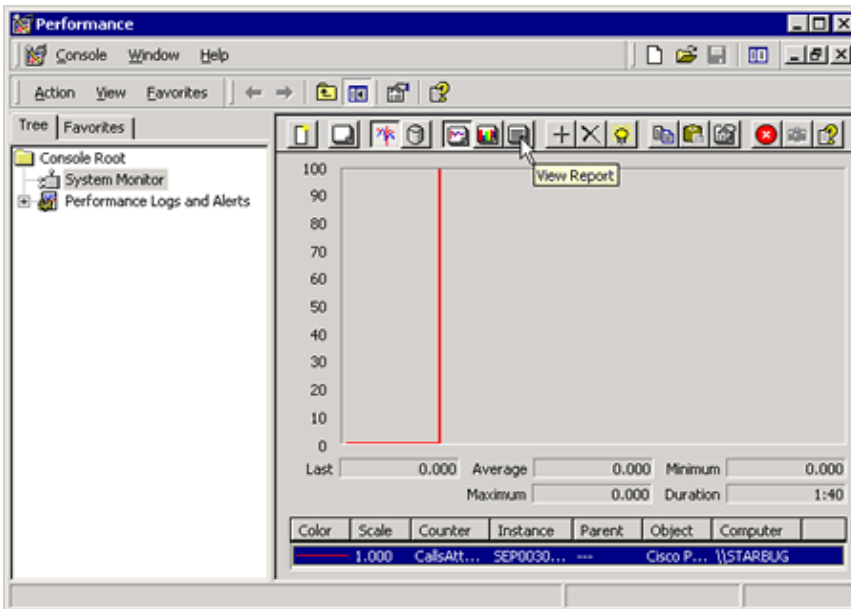
## Use Performance Monitor to Analyze Phone Activity

You can use Performance Monitor to determine if the Cisco CallManager sees your phone. You can also use Performance Monitor to watch what happens when the phones make or receive calls.

1. Click the + option.
2. Choose **Cisco Phones** as the Performance Object.
3. Select the phone with which you have problems, and click **Add** and **Close**.

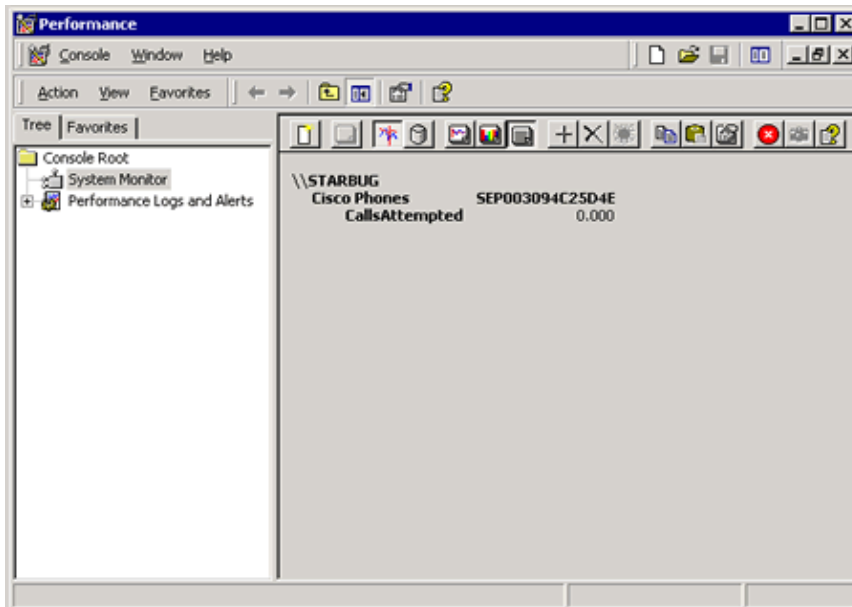


4. When this window appears, click the **View Report** icon:



5. When this window appears, make some calls and watch the statistics change:





In this way, you can determine if the phones that you created successfully registered with the Cisco CallManager server.

## Manually Configure the IP Parameters on a 12 SP+ or 30 VIP Phone

By default, Cisco phones are DHCP-enabled. If you do not use DHCP, you need to disable DHCP on the phone and manually assign the phone an IP address. In order to disable DHCP on a phone, use the phone keypad to program the phone IP address and other network addresses.

**Note:** Always use DHCP with Cisco 12 S and 12 SP phones. Although you can disable DHCP and manually assign IP addresses on a 12 S or 12 SP, the process is very difficult without a display.

Use these rules when you manually configure a Cisco 12 SP+ or 30 VIP phone with an IP address:

- Use 0.0.0.0 for IP addresses that you do not use. The values that appear in the examples are not valid.
- You can use 0.0.0.0 for the subnet mask only if the Default Gateway is also 0.0.0.0.
- The TFTP server must have a nonzero IP address.
- The Default Gateway IP address must be on the same subnet as the Host IP address.
- The Default Gateway can be 0.0.0.0 only if the TFTP or DNS server IP addresses are on the same subnet as the Host IP address.

In order to disable DHCP and manually assign IP addresses on a Selsius Phone, complete these steps:

**Note:** During configuration, use "\*" instead of ".". Use "#" to leave the IP address that appears and move on to the next IP address. Press \* \* during the configuration to abort all changes and reset the phone. If you make a mistake on any of the steps, press \* \* to start over. (All of your changes are lost when you do this.)

1. Gather this information:

- ◆ Phone IP address
- ◆ Subnet mask
- ◆ Default Gateway for the subnet (Use 0.0.0.0 if this is not necessary.)
- ◆ DNS server IP address (Use 0.0.0.0 if this is not necessary).
- ◆ TFTP server IP address

2. Press \* \* to display the status.
3. As the status displays, press #.

The keypad configuration appears. The message `Press 1 to disable DHCP or # to skip` appears.

4. Press 1.
5. Enter the phone IP address, with asterisks instead of periods.

For example, enter `10*0*10*100*`.

6. Enter the subnet mask, with asterisks instead of periods.

For example, enter `255*255*255*0*`.

7. Enter the default gateway/router IP address, with asterisks instead of periods.

For example, enter `10*0*10*0*`.

8. Enter the DNS server IP address, with asterisks instead of periods.

For example, enter `10*0*10*0*`.

9. Enter the TFTP server IP address, with asterisks instead of periods.

For example, enter `10*0*0*100*`. The `Press * to exit, or 1 to disable DHCP` message appears.

10. Press 1.

The phone programs the new information into flash memory and resets. This disables DHCP.

## Add Phones to Cisco CallManager

For Cisco CallManager version 2.4, refer to Adding a Cisco IP Phone. This document covers both auto-registration and manual registration of individual phones.

### Enable, Configure, and Disable Auto-Registration

In Cisco CallManager 3.0x, you must set up Auto-Registration according to the Understanding Auto-Registration section of the Cisco CallManager Administration Guide, Release 3.0(9), and the Auto-Registration section of the Cisco CallManager System Guide, Release 4.0(1).

Follow the steps and explanations that these documents provide.

### Manual Registration (Add an IP Phone Manually)

For an explanation of how to manually add an IP phone to Cisco CallManager 3.x and 4.0, refer to Creating Users, Phones, and Associations in Cisco CallManager. Follow the instructions that the document provides.

**Note:** If IP phones are not added properly to the Cisco CallManager, then CallManager might frequently toggle between the registered and unregistered states.

## IP Phone Registration Toggles between Primary and Secondary CallManagers

Devices and IP phones connected and registered with the primary Cisco CallManager server reset and register with their secondary server. After sometime, the IP phones fallback to the primary Cisco CallManager again.

This condition can occur due to incorrect QoS settings, which can cause improper network utilization and results in dropped or delayed traffic at the port which connects the CallManager servers. In a Cisco Catalyst Switch, the **mls qos** command enabled in global configuration mode leaves all ports in an untrusted state. So the ports that need to be trusted must be enabled with the **mls qos trust** command in the interface configuration mode of each port.

In this case, the switch port which connects the Cisco CallManager server must be configured with the **mls qos trust** command, as it can solve the issue described.

This condition can also occur when the IP phones miss keepalives from the primary Cisco CallManager. In the case of off-premises IP phones, the problem can be solved by increasing the keepalive interval. In order to increase the keepalive interval between the Cisco CallManager and IP phones, complete these steps:

1. Go to Cisco CallManager Administration page and choose **Service > Service Parameters**.
2. Select the server and service as **Cisco CallManager**.
3. Locate the service parameter **StationKeepaliveInterval** and change the value to **90 seconds** (or another appropriate value for your network). The default value is 30 and the maximum is 1000.

## Registration Rejected

With Cisco CallManager 4.1(3) SR1, Cisco IP phones can get Registration Rejected and never come up. While installing Cisco CallManager 4.1(3) SR1, the installer can fail to update a stored procedure while SQL has briefly locked it. This issue is tracked by Cisco bug ID CSCsb76677 (registered customers only) . Re-installing the Cisco CallManager 4.1(3) SR1 or later service release will enable the Cisco IP phones to successfully register with Cisco CallManager. The service releases for Cisco CallManager version 4.1 can be downloaded at Software Download – Cisco CallManager Version 4.1 (registered customers only) .

If Cisco IP Phones are unable to register to the Cisco CallManager with the error `Registration Rejected Database Config Error`, and if the DBLHelper shows no issues with the replication, it could be due to the blank hosts file and lmhosts file. Make sure that you enter the required information in these files followed by a factory reset on the IP phone in order to resolve the issue.

Also, make sure that the Cisco CallManager publisher and subscriber run the same version of CallManager. If they are on different versions, the IP phone registration fails, and the *Registration Rejected* error occurs.

If Cisco IP phones are unable to register to the Cisco CallManager, as well as show the error file `not found registration rejected`, even with the Autoregistration enabled on the Cisco CallManager server, you can delete all the unassigned DN's and then restart the TFTP service on the CallManager server to fix the issue.

If you receive the *Registration Rejected* error message in the Cisco IP phone, this can be due to a corrupted .XML configuration file. Regenerate a new configuration file to resolve the problem with this procedure:

1. From the CallManager Administration page, choose **Service > Service Parameters**
2. Choose your TFTP server from the drop-down list; choose **Cisco TFTP service**; click the **Advanced** tab, and then set these parameters:

- a. Set Build CNF Files to **Build All**.

**Note:** This recreates the configuration files and can take a long time if many devices exist on the network. You can also build CNF files for selected phones.

- b. Set Enable Caching of Constant and Bin Files at Startup to **False**.
- c. Set Enable Caching of Configuration Files to **False**.

Clusterwide Parameters(Parameters that apply to all servers)		
Parameter Name	Parameter Value	Suggested Value
Build CNF Files*	Build All	Build Selective
Enable Caching of Constant and Bin Files at Startup*	False	True
Enable Caching of Configuration Files*	False	True

If you get the `Registration Rejected` error when you try to add the 7931G IP Phone in Cisco CallManager 3.x or 4.x or 5.x, it is because the 7931G requires CUCM 6.x or higher. The 7931G does not support previous CallManager versions.

## Cisco IP Phones Not Registered But seems to be working fine

Cisco IP Phones show a status of **Not Found** or **Unregistered** on the Cisco CallManager Administration page. This error message is displayed on the Cisco CallManager Administration Find and List Phones page, even though the Cisco IP Phone seems to work fine:

```
Real-time Information Service is not responding.
Check to make sure the service is running.
```

The Real-time Information Server (RIS) maintains real-time Cisco CallManager information and provides an interface through which this information can be retrieved by another service known as the RIS Data Collector. Cisco CallManager Administration retrieves this information for display on pages such as the Find and List Phones page of Cisco CallManager Administration.

In order to resolve the issue, restart the Cisco RIS Data Collector service as this procedure shows:

1. From the Cisco CallManager Administration page, go to the **Application** menu and select **Cisco CallManager Serviceability**.
2. Go to the **Tools** menu and select **Control Center**.
3. Select the server, choose the **Cisco RIS Data Collector** service, and click **Restart**.

**Control Center** [Service Activation](#)

**Servers**  
172.16.2.201

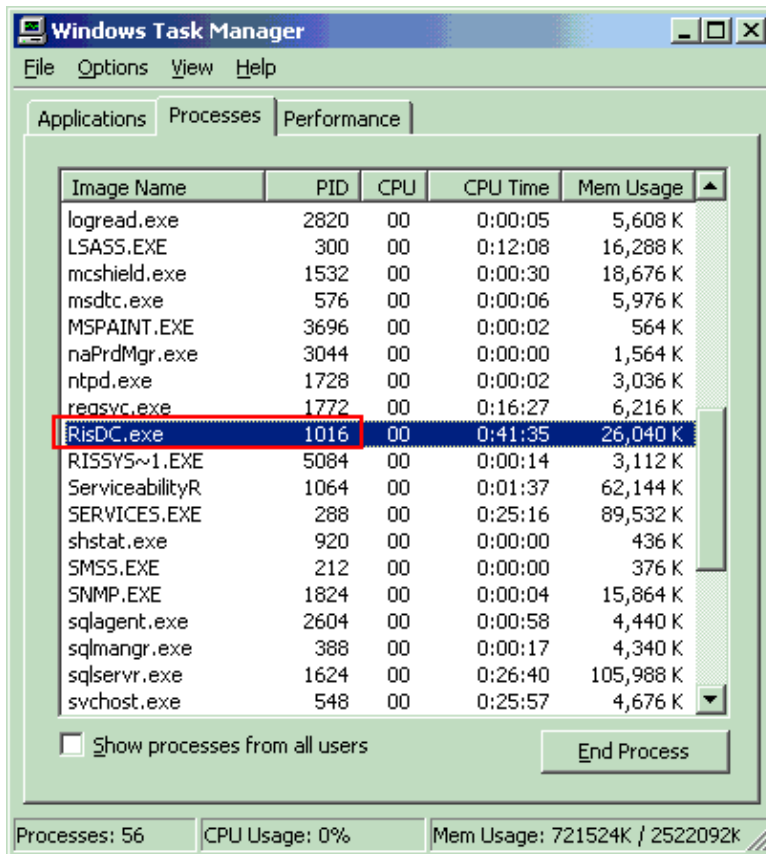
Server: 172.16.2.201  
Status: Ready

Start Stop **Restart**

Service Name	Status	Activation Status
<b>NT Service</b>		
<input type="radio"/> Cisco CallManager	▶	Activated
<input type="radio"/> Cisco Tftp	▶	Activated
<input type="radio"/> Cisco Messaging Interface	▶	Activated
<input type="radio"/> Cisco IP Voice Media Streaming App	▶	Activated
<input type="radio"/> Cisco CTIManager	▶	Activated
<input type="radio"/> Cisco Telephony Call Dispatcher	▶	Activated
<input type="radio"/> Cisco MOH Audio Translator	▶	Activated
<input checked="" type="radio"/> Cisco RIS Data Collector	▶	Activated
<input type="radio"/> Cisco Database Layer Monitor	▶	Activated

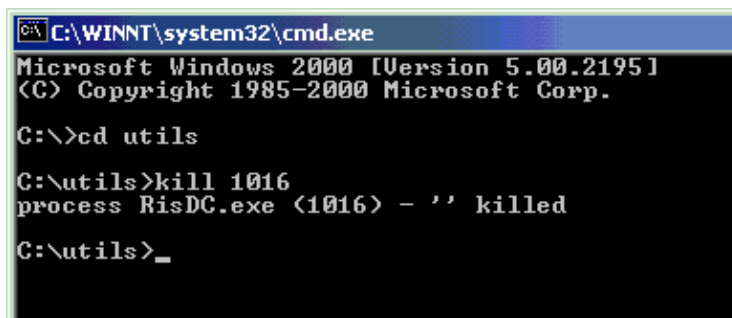
If Cisco RIS Data Collector service does not respond to the 'Restart', follow these steps to forcibly stop and start the service:

1. On the Cisco CallManager server, open the Windows Task Manager. In the Processes tab, look for the PID of the process **RisDC.exe**.



2. Open a Command Prompt and go to the directory **C:\utils**.
3. Execute this command to end the process.

```
kill <PID of RisDC.exe>
```



4. From the Cisco CallManager Administration page, go to the **Application** menu and select **Cisco CallManager Serviceability**.
5. Go to the **Tools** menu and select **Control Center**.
6. Select the server and choose the **Cisco RIS Data Collector** service and **Start** the service.

## Control Center

[Service Activation](#)

**Servers**

172.16.2.201

**Server: 172.16.2.201**  
Status: Ready

Service Name	Status	Activation Status
<b>NT Service</b>		
<input type="radio"/> Cisco CallManager	▶	Activated
<input type="radio"/> Cisco Tftp	▶	Activated
<input type="radio"/> Cisco Messaging Interface	▶	Activated
<input type="radio"/> Cisco IP Voice Media Streaming App	▶	Activated
<input type="radio"/> Cisco CTIManager	▶	Activated
<input type="radio"/> Cisco Telephony Call Dispatcher	▶	Activated
<input type="radio"/> Cisco MOH Audio Translator	▶	Activated
<input checked="" type="radio"/> Cisco RIS Data Collector	■	Activated
<input type="radio"/> Cisco Database Layer Monitor	▶	Activated

Cisco CallManager servers running on OS 2000.2.7 with a known Microsoft vulnerability could also cause the RIS Data Collector to fail. Apply Service Release 1 or later to fix the issue. The Cisco CallManager OS Service releases are available for download at CallManager and Voice Apps Crypto Software (registered customers only) . Refer to the Microsoft article entitled "Performance monitoring tools may experience a memory leak if Terminal Services is disabled" [↗](#) for detailed information.

If this issue occurs intermittently, collect the RIS traces and check the traces for these error messages:

```
RisNodeMgr::getPrimaryCollector() Invalid PrimaryCollector/FailoverCollector
RisNodeMgr::collectInformation Primary Collector name is NULL
```

These messages imply that the Primary Collector does not have a name. This parameter specifies the Cisco CallManager server that runs as the Primary RIS Collector node to collect clusterwide, real-time information. The Primary Collector gathers the status information of your cluster. This is a required field. If this field is empty, it cannot gather the information, which is why the IP phone status is shown as **not found**.

In order to resolve the issue, perform these steps:

1. Open the CCM Administration page, and go to **Service > Service Parameters**.
2. Choose the server to which the IP phones are registered, and choose the **Cisco RIS Data Collector** service.
3. In the **Primary Collector** field, enter the hostname/IP address of the publisher. For failover, you can enter the hostname/IP address of one of the subscribers in the **Failover Collector** field.
4. Make sure that **Data Collection Enabled** is set to **True**, and click **Update**.
5. Restart the RIS service in all servers that start with the publisher, followed by the TFTP, and then the subscribers.

## Cisco IP Phones Take Too Long to Register

If Cisco IP phones take a long time to register, check whether the DHCP server works properly. In order to check this, first disable the DHCP on the IP phone, and then manually assign all the IP parameters, such as the IP address, TFTP, DNS, subnet mask, etc. If the IP phone registers fine, the issue is with the DHCP server. You need to check the DHCP server configuration in order to resolve this issue.

# Cisco IP Phone Always Get Registered to the Publisher Server

The Cisco CallManager group is configured in such a way that the Cisco IP phones register with the subscriber first and then to the publisher, but the phones do not follow that order. They get registered to the publisher every time.

On the CallManager Administration page, go to **System > Server** and use the IP address instead of the hostname for servers to resolve the issue.

## Get "version error" on the Cisco IP Phone screen When Try to Register

When an attempt is made to register a new phone, the Cisco IP phone screen displays `version error`, and the phone gets stuck in this stage.

This issue occurs when the wrong phone type is chosen on the **Device > Phone** configuration on the CallManager Administration page. Choose the correct phone type to resolve the issue.

## Cisco phones causing excessive DHCP requests

### Problem

For a phone that is connected to the network but not configured with CUCM, the phone will keep cycling through the boot up process sending registration requests to CUCM; if no response is received, it will cycle again and continue this until the phone is configured in CUCM.

### Solution

The following steps were performed to troubleshoot the issue:

1. Confirmed that the configuration of the CallManager group is correct, and it is reflecting on the Phone.
2. Check with sniffers that the phone sends a TCP Syn message to the correct IP address. The result was as follows:
  - ◆ The very next packet is a Reset/ACK from that address. This means there is not even TCP connectivity because the CUCM is resetting it.
  - ◆ The packets are less than half-a-millisecond apart; in fact, they are next to each other in the sequence. Thus it is not likely to be a timeout.

Based on the above result follow the step below to resolve the issue:

The standard process is to delete an unused phone from CUCM. This is documented in the Cisco Bug ID .

If DHCP is enabled on a device, DHCP automatically assigns IP addresses to the device when you connect it to the network. The DHCP server directs the device to a TFTP server (or to a second TFTP server, if available for the device). For example, you can connect multiple Cisco Unified IP Phones anywhere on the IP network, and DHCP automatically assigns IP addresses to them and provides them with the path to the appropriate TFTP server.

If DHCP is not enabled on a device, you must assign it an IP address and configure the TFTP server locally on the device.

The IP Phone broadcasts a request to a DHCP server. The DHCP server responds to the IP Phone with a minimum of an IP address, a subnet mask, and the IP address of the Cisco TFTP server.

For further details refer [CUCM IP Phone \(SCCP\) Keepalive and Failover Architecture](#) [CUCM IP Phone \(SCCP\) Keepalive and Failover Architecture](#)

## Related Information

- [Voice Technology Support](#)
- [Voice and Unified Communications Product Support](#)
- [Troubleshooting Cisco IP Telephony](#)
- [Technical Support & Documentation – Cisco Systems](#)

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