



Understanding Device Support

Cisco CallManager controls Cisco voice devices (such as IP telephones and gateways), allowing you to configure voice to ensure proper call routing.

These sections provide general information about how Cisco CallManager interacts with voice devices in your network:

- Using DHCP and TFTP, page 7-1
- Understanding Device Loads, page 7-6
- Adding Devices to Cisco CallManager, page 7-10

Using DHCP and TFTP

Cisco telephony devices require IP addresses that are assigned manually or by using Dynamic Host Configuration Protocol (DHCP). Devices also require access to a TFTP server that contains device loads and device configuration name files (.cnf file format). The .cnf files provide parameters for connecting to Cisco CallManager.

Related Topics

- Understanding DHCP and TFTP, page 7-2
- Accessing the TFTP Server, page 7-3
- Understanding How Devices Identify the TFTP Server, page 7-4

Understanding DHCP and TFTP

DHCP automatically assigns IP addresses to devices whenever you plug them in. For example, you can connect multiple Cisco IP Phones anywhere on the IP network and DHCP automatically assigns IP addresses to them. If DHCP is not enabled on a device, you must assign it an IP address.

- Cisco IP Phones are DHCP-enabled by default. If you are not using DHCP, you need to disable DHCP on the phone and manually assign it an IP address.
- DHCP is always enabled for Cisco Analog Access and Cisco Digital Access gateways.
- For Cisco Catalyst 6000 8 Port Voice T1/E1 and Services Modules, the Network Management Processor (NMP) on the Catalyst 6000 may or may not have DHCP enabled. If DHCP is not enabled, you will need to configure the IP address through the Cisco IOS command-line interface on the Cisco Catalyst 6000.

Obtaining an IP Address

If the device is using DHCP to obtain an IP address, the device queries the DHCP server to obtain one. If not, the statically configured IP address is used.

Accessing the TFTP Server

If DHCP is enabled on the phone, in addition to assigning an IP address, the DHCP server also directs the device to a TFTP Server. If the device has a statically defined IP address, you must configure the TFTP server locally on the device and then it will go to the TFTP server directly.

Requesting the Configuration File

The TFTP server has configuration files (.cnf file format) for devices that define parameters for connecting to Cisco CallManager.

If auto-registration is enabled in Cisco CallManager, the phones access a default configuration file (sepdefault.cnf) from the TFTP server. If a phone has been manually added into the Cisco CallManager database, the phone accesses a .cnf file corresponding to its device name. For Cisco IP Phone 7960 and 7940 models, the .cnf file also contains phone button URL information.

Gateways and other devices do not have default configuration files and they do not auto-register. All devices except phones must be manually added to the Cisco CallManager configuration database.

Contacting Cisco CallManager

The configuration file for a device specifies a list of Cisco CallManagers to contact, in priority order. After obtaining the configuration file from the TFTP server, the device next attempts to make a TCP connection to the highest priority Cisco CallManager on the list.

If the device was manually added to the database, Cisco CallManager identifies the device. If the device is a phone that was not manually added to the database and auto-registration is enabled in Cisco CallManager, the phone attempts to auto-register itself in the Cisco CallManager database.

When a device connects to a Cisco CallManager, it is informed of its device load ID. If the device load ID differs from the load ID that is currently executing on the device, the device requests the load associated with the new load ID from the TFTP server and resets itself.

Accessing the TFTP Server

You can enable the IP phones and gateways to discover the TFTP server IP address in one or more of the following ways, depending on the device type:

- Gateways and phones can use DHCP custom option 150.
This is the method Cisco recommends. The TFTP server IP address is configured as the option value.
- Gateways and phones can use DHCP option 066.
Either the DNS Host Name or IP address of the TFTP server may be configured as the option value.
- Gateways and phones can query CiscoCM1.
The Domain Name Server (DNS) must be able to resolve this name to the IP address of the TFTP server.
- Phones can be configured with the IP address of the TFTP server. If DHCP is enabled on the phone, an alternate TFTP server IP address can still be configured locally on the phone that will override the TFTP address obtained through DHCP.

- Gateways and phones also accept the DHCP Optional Server Name (sname) parameter.
- The phone or gateway can use the value of Next-Server in the boot processes (siaddr).

The TFTP server address is saved in non-volatile memory. If one of the above methods was available at least once, but is not currently available, the address saved in memory will be used.

The TFTP server must subscribe to the Cisco CallManager Publisher (master database). For small systems, the TFTP server can co-exist with a Cisco CallManager on the same server.

Related Topics

- Understanding DHCP and TFTP, page 7-2
- Understanding How Devices Identify the TFTP Server, page 7-4

Understanding How Devices Identify the TFTP Server

Phones and gateways have an order of precedence that they use for selecting the address of the TFTP server if they receive conflicting or confusing information from the DHCP server. The order of precedence is based on the method used to specify the TFTP server (method 1 in the following list has the highest precedence):

1. The phone or Catalyst 6000 gateway uses a locally configured TFTP server address.

This address overrides any TFTP address sent by the DHCP server.

2. The phone or gateway queries the DNS name CiscoCM1 and it is resolved.

The phone or gateway always tries to resolve the DNS name CiscoCM1. If this name is resolved, then it overrides all information sent by the DHCP server.

It is not necessary to name the TFTP server CiscoCM1, but you must enter a DNS CName record to associate CiscoCM1 with the address or name of the TFTP server.

3. The phone or gateway uses the value of Next-Server in the boot processes.
This DHCP configuration parameter has traditionally been used as the address of the TFTP server. When configuring BOOTP servers, this field is typically referred to as the address of the TFTP server.
This information is returned in the siaddr (server IP address) field of the DHCP header. Use this option, if available, because some DHCP servers will place their own IP address in this field when it is not configured.
4. The phone or gateway uses the site-specific option 150.
This option resolves the issue that some servers do not allow the Next-Server configuration parameter. Some servers allow access to the Next-Server parameter only when IP addresses are statically assigned.
5. The phone or gateway uses the Optional Server Name parameter.
This DHCP configuration parameter is the DNS name of a TFTP server. Currently only a DNS name can be configured in this parameter; a dotted decimal IP address should not be used.
6. The phone or gateway uses the 066 option, which is the name of the boot server.
Option 066 is normally used to replace the sname (server name) field when option overloading occurs. This name field can contain a DNS name or a dotted decimal IP address.
The 066 option should not be used with the 150 option.
If they are sent together, then the device prefers the IP address over the name given by the 066 option. However, if both a dotted decimal IP address and a 150 option are sent, then order of preference is dependent on the order that they appear in the option list. The device chooses the last item in the option list. To reiterate, option 066 and option 150 are mutually exclusive.

Related Topics

- Understanding DHCP and TFTP, page 7-2
- Accessing the TFTP Server, page 7-3

Understanding Device Loads

There are four types of loads: phone loads, gateway loads, MTP loads, and conference bridge loads. Loads are files that contain updated firmware for devices. During installation or upgrade, the latest loads are automatically provided. However, you can also receive a load between releases that can contain patches or other information important to the devices that use loads, such as phones or gateways.

Loads are stored in the ...Cisco\TFTPPath subdirectory as *.bin files, for example, D501A022.bin. During installation or upgrade, the latest loads are stored in this location. New loads you receive between releases must be copied to this location for the system to access them.

See Table 7-1 for a description of the loads for each device type.

Table 7-1 Device Load Descriptions

Device	Description
Cisco IP Phone models 12S, 12SP, 12SP+, and 30VIP	Loads for these devices begin with P002..., for example, P002K202.
Cisco IP Phone model 30SP+	Loads for these devices begin with P001..., for example, P001K202.
Cisco IP Phone 7960, 7940, 7910	Loads for these devices begin with P003..., for example, P003AM30.
Cisco Analog Access gateways	Loads for these devices begin with A001..., for example, A001P022.
Cisco Digital Access gateways	Loads for these devices begin with D003..., for example, D003C202.
Cisco Voice Gateway 200	Not applicable.

Table 7-1 Device Load Descriptions (continued)

Device	Description
Cisco Catalyst 6000 8 Port T1/E1 and Services Module	Loads for these devices vary depending on how the device is being used: <ul style="list-style-type: none">• Conference Bridge loads begin with C001.• Digital Gateway loads begin with D004.• Transcoder loads begin with M001.
Cisco Catalyst 6000 24 Port FXS Analog Interface Module	Loads for these devices begin with A002.

Related Topics

- Updating Device Loads, page 7-7
- Verifying the Load on Cisco IP Phones, page 7-9

Updating Device Loads

You can apply a new load to a single device before applying it as a system-wide default. This is useful for testing purposes. Remember, however, that only the device you have updated with the new load will use that load. All other devices of that type use the old load until you update the system-wide defaults for that device with the new load.

Related Topics

- Updating a Load on a Cisco IP Phone, page 7-8
- Updating the Load on a Cisco Gateway, page 7-9
- Updating Device Defaults, page 15-2

Updating a Load on a Cisco IP Phone

Follow these instructions to update a load on a particular Cisco IP phone.

Procedure

- Step 1** Open Cisco CallManager Administration.
- Step 2** Select **Devices > Phone**.
The Find and List Phones page displays.
- Step 3** Enter search criteria to locate a specific phone.
- Step 4** A list of discovered devices appears.
- Step 5** Click **Device Name**.
The Phone Configuration window appears.
- Step 6** Enter the appropriate load in the Load Information field. Use uppercase for letters.
For example, a phone might use load P002K202.
- Step 7** Click **Update**.
The information is saved in Cisco CallManager Administration. For the change to take effect, you must reset the phone.
Only the phone you updated with the new load uses that load.
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Related Topics

- Updating a Phone, page 46-13
- Verifying the Load on Cisco IP Phones, page 7-9
- Updating Device Defaults, page 15-2

Updating the Load on a Cisco Gateway

Follow these steps to update a load on a particular Cisco gateway.

Procedure

- Step 1** Open Cisco CallManager
- Step 2** Select **Device > Gateway**.
- Step 3** Enter search criteria to locate a specific gateway.
- Step 4** A list of discovered gateways appears.
- Step 5** Click **Device Name**.
The gateway configuration page displays.
- Step 6** In the Load Information field, enter the appropriate load.
- Step 7** Click **Update**.

The information is saved in Cisco CallManager Administration. For the change to take effect, you must reset the gateway.

Only the gateway you updated with the new load uses that load. To update all gateways of a specific type with a new load, you must update the device defaults for that type of gateway.

Related Topics

- Updating Device Defaults, page 15-2
- Configuring Gateways, page 45-1

Verifying the Load on Cisco IP Phones

You can verify the load locally on the Cisco IP phones. Follow these procedures to verify the load on the different phone types.

Cisco IP Phone 7960/7940

Using the Cisco IP Phone 7960/7940, follow these steps to verify the load version.

Procedure

- Step 1** Press **settings**.
- Step 2** Scroll to select **Status**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to Firmware Versions.
- Step 5** Press **Select**.

The **Application Load ID** indicates the current firmware version.

Related Topics

- Updating a Load on a Cisco IP Phone, page 7-8

Cisco IP Phone Models 12 SP+ and 30 VIP

On the phone whose load has been changed, press *. The display shows the letter and the last three digits of the phone load in use. For example, if you configured the phone with load P002K202, the display would read k2.02.

Adding Devices to Cisco CallManager

Before you can use devices, such as gateways and IP phones in your IP telephony network, you must add them to the Cisco CallManager configuration database.

Refer to these sections for assistance in adding telephony devices to the Cisco CallManager's configuration database:

- Adding a Phone, page 46-7
- Adding Phone Button Templates, page 47-5
- Adding Cisco uOne Ports, page 43-12
- Adding Gateways to Cisco CallManager, page 45-7