CHAPTER 13

Dynamic Host Configuration Protocol

Dynamic Host Configuration Protocol (DHCP) server enables Cisco IP telephones, connected to either the customer's data or voice Ethernet network, to dynamically obtain their IP addresses and configuration information. It uses Domain Name System (DNS) to resolve host names both within and outside the cluster. For information on configuring DHCP servers and subnets refer to "DHCP Server Configuration" in the *Cisco CallManager Administration Guide*.

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DHCP Server

Only one DHCP server per Cisco CallManager cluster should exist. Different clusters can share one DHCP server, provided the Cisco CallManager clusters are not geographically separated. In the later case, it may need one DHCP server per location. If the DHCP server is shared, some Cisco CallManager clusters may have zero DHCP servers.

Because DHCP server is a standalone server, no backup server exists in case the Cisco CallManager that is configured as DHCP server fails.

Cisco CallManager administrator configures the DHCP servers and subnets. You can configure one server for each node and multiple subnets for each server.

Note You must update the DNS server with the appropriate Cisco CallManager name and address information before using that information to configure the Cisco CallManager server.

For Cisco CallManager, you must reboot the node, if an IP address changes. As long as the node is up, it will keep refreshing the lease period for which the DHCP server provides an IP address, and hence retain the same IP address. However, hostname of the node must remain the same, even if the IP address changes.

Additional Information

See the "Related Topics" section on page 13-4.

Domain Name System

Two types of implementations exist for DNS.

- Corporate DNS, if available
- Internal DDNS service transparent to the user

The Cisco CallManager administration provides support to configure different scopes for the DHCP server. For each scope, you can enter a range of IP addresses and subnet masks and you can also configure options.

For configuring DNS with Corporate DNS, the corporate DNS infrastructure is used, and default DNS configuration will act as a cache only service to this corporate DNS service.

When no corporate DNS service exists, Dynamic Domain Name System (DDNS) service, a service that allows dynamic updates to hostname and IP addresses, is used to implement a clusterwide DNS infrastructure. This also serves other devices on the network that are interacting with the cluster. Each node has DNS running on it. These DNS servers get configured with hostname and IP address information for all the nodes and any other devices in the cluster. The DNS on the first node in the cluster gets configured as primary DNS, while all other nodes get configured as secondary nodes.

When any change to DNS configuration occurs to the first node of Cisco CallManager, it automatically gets transferred to other nodes. Other devices in the network can point to any of the nodes in the cluster for the DNS lookups.

Note Any change to the hostname of a node will require the node to be reinserted in the cluster.

When nodes are being configured using by DHCP, the DHCP client on the node will get configured to dynamically update DDNS.

Whenever nodes are configured by using DHCP, one the following events occurs:

- The corporate DNS can accept dynamic updates.
- DNS gets updated within the cluster
- DHCP configuration for the nodes gets tied with their MAC addresses of the node for which you are requesting an IP address. If the node requests an IP address again, DHCP matches the MAC address to the previous request and provides the same IP address.

You must update the DNS server with the appropriate Cisco CallManager name and address information before using that information to configure the Cisco CallManager server.

Additional Information

See the "Related Topics" section on page 13-4.

DHCP Server Configuration Process

Use the following steps to configure DHCP Process:

1. Enable the DHCP functionality from the serviceability window.

2. Verify the DHCP monitor process is started on the node where the DHCP is enabled.
3. Use Cisco CallManager Administration to configure the scopes and options.
4. Verify that configuration is captured in the /etc/dhcpd.conf file of targeted Cisco CallManager.
5. Verify the DHCP server daemon is running with new configuration.
6. Make sure DHCP monitor process logs at the specific trace settings.
7. Make sure the error alarm is raised when the DHCP daemon is stopped and the info alarm is raised when the daemon is restarted.

Additional Information

See the "Related Topics" section on page 13-4.

Understanding How Devices Identify the TFTP Server

The phones have an order of preference that they use for selecting the address of the TFTP (Trivial File Transfer Protocol) server. If the devices receive conflicting or confusing information from the DHCP server, the device uses the following sequence to determine what information is valid:

1. You can locally configure the phone with a TFTP server. This address overrides any TFTP address sent by the DHCP server. The phone always tries to resolve the DNS name CiscoCM1.
2. 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 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 field of the DHCP header. You should always 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 uses the site-specific option 150.
5. The phone also accepts 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 also accepts the 66 option, which is the name of the boot server.
7. Option 66 is normally used to replace the sname field when option overloading occurs. It can be used on Windows NT DHCP servers and functions like the 150 option. This name field can contain a DNS name or a dotted decimal IP address.
8. The 66 option should not be used with the 150 option. If they are sent together, then the phone prefers the IP address over the name given by the 66 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 phone chooses the last item in the option list. To reiterate, option 66 and option 150 are mutually exclusive.

Additional Information

See the "Related Topics" section on page 13-4.

Migration

Because no migration is provided from Window 2000 based DHCP configuration to the DHCP configuration, the administrator needs to reconfigure the system.

Additional Information

See the "Related Topics" section on page 13-4.

Alarms

Two alarms are generated for DHCP.

- CiscoDhcpdFailure
- CiscoDhcpdRestarted

See *Cisco CallManager Serviceability Administration Guide* for more information on alarms.

Additional Information

See the "Related Topics" section on page 13-4.

Related Topics

- DHCP Server Configuration, *Cisco CallManager Administration Guide*
- DHCP Subnet Configuration, *Cisco CallManager Administration Guide*
- *Cisco CallManager Serviceability Administration Guide*
- *Cisco CallManager Security Guide*