Cisco CMTS Static CPE Override

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Note Cisco IOS Release 12.2(33)SCA integrates support for this feature on the Cisco CMTS routers. This feature is also supported in Cisco IOS Release 12.3BC, and this document contains information that references many legacy documents related to Cisco IOS 12.3BC. In general, any references to Cisco IOS Release 12.3BC also apply to Cisco IOS Release 12.2SC.

This document describes the commands and guidelines for using the Cisco CMTS Static CPE Override feature. This feature enables service technicians to override Dynamic Host Configuration Protocol (DHCP) settings on a subscriber's Customer Premise Equipment (CPE) devices. This feature is used for troubleshooting purposes and to assign static IP addresses at a customer's facility while retaining full and uninterrupted support from the Cisco CMTS.

The cable submgmt default command enables Multiple Service Operators (MSOs) to override network DHCP settings in the Cisco Cable Modem Termination System (CMTS) when performing troubleshooting with a laptop computer from end user facilities.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://tools.cisco.com/ITDIT/CFN/. An account on http://www.cisco.com/ is not required.

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Prerequisites for CMTS Static CPE Override

- Cisco IOS software release 12.3(9a)BC or a later BC train release
- A laptop computer
- Ethernet connection cabling
- Remote console access to the Cisco CMTS

Restrictions for CMTS Static CPE Override

Cisco CMTS Static CPE Override is disabled by default, and is enabled with the cable submgmt default command. This feature has the following intentional restrictions:

- This feature supports additional CPE devices with additional MAC addresses to share the IP address and service ID (SID) with the original CPE device. However, CPE devices are limited to 1024 and beyond that, are not supported nor allowed.
- The original CPE device (with the original MAC address and SID) is not allowed behind a different cable modem with the original IP address. If this restriction were not in place, the original cable modem (with the original IP address and SID) would experience interrupted service.
- The original CPE device (with the original MAC and IP address) is not allowed to support a second SID or IP address through a second cable modem.

The impact of this restriction is as follows:

- ◦ A field technician's laptop is allowed to assume an existing IP address and service ID (SID) behind a cable modem on-site.
- At the end of an on-site service session, the CPE device must reclaim its IP address again via DHCP. If this does not occur, the Cisco CMTS presumes that the technician's laptop remains behind the previous cable modem, and the Static CPE override feature will not be available for a future on-site session at another location.

You can override this state with either of the following two methods:

- ◦ Clear the technician's CPE device information from the host routing tables on the Cisco CMTS.
  ◦ Ensure that at the end of an on-site troubleshooting session, the original CPE device reclaims its IP address using DHCP. The technician's (temporary) CPE entry is automatically deleted.

Information About CMTS Static CPE Override

One typical scenario in which DHCP is used with the Cisco CMTS and CPE devices would include the following:

- A CPE device is configured with a dynamic IP address via DHCP from the Cisco CMTS.
- A CPE MAC address is configured behind the cable modem with a service ID (SID) assigned to the IP address.

In this scenario, the cable submgmt default command can be used on the Cisco CMTS to accomplish the following (temporary) changes between the CPE devices and the Cisco CMTS:

- The original CPE device continues to receive service, but is assigned a static IP address from the Cisco CMTS.
- This static IP address overrides the DHCP IP address without first clearing the DHCP CPE device from the CMTS routing tables.
- The original CPE device automatically changes from dhcp cpe to static cpe in the CMTS host routing tables, and the CPE device continues to receive service with the same SID.
- Additional CPE devices can now share the same IP address and SID as the original CPE device.

How to Configure Cisco CMTS Static CPE Override

This section contains the following procedures for the Cisco CMTS Static CPE Override feature:

Enabling and Using Cisco CMTS Static CPE Override

Perform the following steps to enable Cisco CMTS Static CPE Override, and to enable network access of a second CPE device behind a subscriber's cable modem at the customer facility.

Before You Begin

This procedure requires that the field technician already have connected and started a laptop computer at the customer facilities, is connected through the customer's cable modem, and has accessed the Cisco CMTS with remote router console.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# config t`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	cable submgmt default active **Example:** `Router(config)# cable submgmt default active`	Enables the Cisco CMTS Static CPE Override feature behind the subscriber's cable modem. Additional CPE devices (with additional MAC addresses) are supported behind the subscriber's cable modem, and they inherit the subscriber's current SID settings. **Note** The subscriber's CPE device changes from dhcp cpe to static CPE in the CMTS host table.
Step 4	cable submgmt default filter-group cm (downstream | upstream) **Example:** `Router(config)# cable submgmt default filter group cm downstream`	Enables one or more temporary CPE devices behind a subscriber's cable modem to operate within the cable modem's downstream or upstream filter group.
Step 5	cable submgmt default filter-group cpe {downstream | upstream} **Example:** `Router(config)# cable submgmt default filter-group cpe upstream`	Enables one or more temporary CPE devices behind a subscriber's cable modem to operate within the subscriber's CPE downstream or upstream filter group.
Step 6	cable submgmt default learnable **Example:** `Router(config)# cable submgmt default learnable`	Enables one or more temporary CPE devices behind a subscriber's cable modem to learn and operate within the routing table defined on the Cisco CMTS.
Step 7	cable submgmt default max-cpe n **Example:** `Router(config)# cable submgmt default max-cpe 1024`	Sets the maximum number of CPE devices to be allowed behind a subscriber's cable modem. • n—The number of allowable CPE devices in addition to the subscriber's CPE device(s), with a range from 0 to 1024 devices. Each device inherits the SID settings as defined by the subscriber's current SID.
Step 8	interface slot/[subslot]/port **Example:** `Router(config)# interface 8/1/0`	Enters interface configuration mode for the specified interface. The subslot is required syntax for the Cisco uBR10012 router, but is not used for the Cisco uBR7246VXR or Cisco uBR7100 series routers.
Step 9	(no) ip address ip-address mask [secondary] **Example:** `Router(config-if)# ip address 131.108.1.27 255.255.255.0`	Sets a primary or secondary IP address for a CPE device, use the ip address command in interface configuration mode. To remove an IP address or disable IP processing, use the no form of this command. ip address ip-address mask [secondary] no ip address ip-address mask [secondary] • ip-address—Static IP address for the CPE device. • mask—Mask for the associated IP subnet.

	Command or Action	Purpose
		• secondary—(Optional) Specifies that the configured address is a secondary IP address. If this keyword is omitted, the configured address is the primary IP address.
Step 10	Conduct on-site CPE troubleshooting, as required.	For additional troubleshooting guidelines, refer to the Troubleshooting Tips.
Step 11	Ctrl-Z **Example:** `Router(config-if)# Ctrl^z`	As required, return to global configuration mode.

Step 12	Do one of the following:
	• no cable submgmt default
	•
	• clear cable host
	
	Example:
	
	`Router(config)# cable submgmt default`
	
	Example:
	
	`Router(config)# clear cable host`
		Disables Static CPE override, and returns the on-site CPE device(s) and cable modem to their original DHCP state (dynamic IP address with associated SID).
		To clear the CPE cable modem host from the Cisco router's internal address tables, use the clear cable host command in privileged EXEC mode.
		clear cable host {ip-address | mac-address}
		• ip-address—IP address for the device to be cleared.
		• mac-address—MAC address for the device to be cleared.
		For additional command information, refer to the clear cable command in the Cisco Broadband Cable Command Reference Guide on Cisco.com.

Step 13	exit **Example:** `Router(config)# exit`	Returns the prompt to privileged EXEC mode.
Step 14	**quit**	Proper Telnet reconnection to the Cisco router requires proper disconnect during the current Telnet session. Common Telnet disconnect methods are as follows: • Press Ctrl+Break. • Press Ctrl+]. • Type quit or send break. Another Telnet disconnect method is as follows: Press Ctrl+Shift 6 6 x. For additional Telnet break sequences, refer to the document Standard Break Key Sequence Combinations During Password Recovery on Cisco.com.

	Command or Action	Purpose
Step 15	Type disc 1 from the router command-line interface.	

Examples

The command in the following example enables Cisco CMTS Static CPE Override in the field, enabling more or more additional CPE devices to be added behind a subscriber's cable modem:

```
Router(config)# cable submgmt default active
```

The command in the following example configures the Cisco CMTS to accept a temporary CPE device which inherits and filters by the subscriber's default downstream cable modem group:

```
Router(config)# cable submgmt default filter-group cm downstream
```

The command in the following example configures the Cisco CMTS to accept a temporary CPE device, and to update the temporary CPE device with the current routing table from the Cisco CMTS:

```
Router(config)# cable submgmt default learnable
```

The command in the following example configures the Cisco CMTS to accept a maximum of five temporary CPE devices behind a subscriber's cable modem:

```
Router(config)# cable submgmt default max-cpe 5
```

Troubleshooting with Cisco CMTS Static CPE Override

When Cisco CMTS Static CPE Override has been enabled at the subscriber's facilities, troubleshooting depends on the service or network needs of the situation. For additional information about troubleshooting the Cisco CMTS or customer CPE devices, refer to the Additional References, on page 6.

Additional References

The following sections provide references related to CPE troubleshooting with the Cisco CMTS.

Related Documents

Related Topic	Document Title
Cisco CMTS command reference	*Cisco IOS CMTS Cable Command Reference* http://www.cisco.com/c/en/us/td/docs/cable/cmts/cmd_ref/b_cmts_cable_cmd_ref.html

Related Topic	Document Title
CPE troubleshooting information	• *Cisco TAC Technical Notes for the Cisco CMTS:* http://www.cisco.com/c/en/us/tech/broadband-cable/cable-modem-termination-systems-cmts/tech-tech-notes-list.html • *Removing Cable Modem and CPE Entries from the Cisco CMTS, TAC Document ID 4663* http://www.cisco.com/c/en/us/support/docs/broadband-cable/cable-modems/4663-cm-cpe-entries-removed.html • *Troubleshooting Slow Performance in Cable Modem Networks, TAC Document ID 12551:* http://www.cisco.com/c/en/us/support/docs/broadband-cable/cable-modems/12551-troubleshooting-slow-perf.html • Troubleshooting uBR Cable Modems Not Coming Online, TAC Document ID 16510 http://www.cisco.com/c/en/us/support/docs/broadband-cable/cable-modems/16510-troubleshooting-cm-online.html
DHCP configuration information	• "DHCP, ToD, and TFTP Services for the Cisco CMTS" in the Cisco Cable Modem Termination System Feature Guide: http://www.cisco.com/univercd/cc/td/doc/product/cable/cab_rout/cmtsfg/ufg_dhcp.htm

Standards

Standards	Title
SP-RFIv1.1-I09-020830	Data-over-Cable Service Interface Specifications Radio Frequency Interface Specification, version 1.1 (http://www.cablemodem.com)

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature.	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://tools.cisco.com/ITDIT/MIBS/servlet/index

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for CMTS Static CPE Override

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Note The below table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1: Feature Information for Phrase Based on Module Title

Feature Name	Releases	Feature Information
Cisco CMTS Static CPE Override	12.2(33)S	The following command is introduced or modified in the feature or features documented in this module. • **cable submgmt default**