



Cisco CMTS Static CPE Override

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.

Feature History for Cisco CMTS Static CPE Override

Release	Modification
12.3(9a)BC	This feature was introduced on Cisco uBR10012 and Cisco uBR7246VXR universal broadband routers.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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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” section on page 4](#)
- [“Troubleshooting with Cisco CMTS Static CPE Override” section on page 7](#)

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.

Prerequisites

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.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **cable submgmt default active**
4. **cable submgmt default filter-group cm (downstream | upstream)**
5. **cable submgmt default filter-group cpe {downstream | upstream}**
6. **cable submgmt default learnable**
7. **cable submgmt default max-cpe n**
8. **interface slot[/subslot]/port**
9. **ip address ip-address mask [secondary]**
10. Conduct on-site CPE troubleshooting, as required.
11. **Ctrl-Z**
12. **no cable submgmt default** or **clear cable host**
13. **exit**
14. **quit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example: Router> enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	<p>configure terminal</p> <p>Example: Router# config t</p>	<p>Enters global configuration mode.</p>
Step 3	<p>cable submgmt default active</p> <p>Example: Router(config)# cable submgmt default active</p>	<p>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.</p> <p>Note The subscriber's CPE device changes from dhcp cpe to static CPE in the CMTS host table.</p>
Step 4	<p>cable submgmt default filter-group cm {downstream upstream}</p> <p>Example: Router(config)# cable submgmt default filter group cm downstream</p>	<p>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.</p>
Step 5	<p>cable submgmt default filter-group cpe {downstream upstream}</p> <p>Example: Router(config)# cable submgmt default filter-group cpe upstream</p>	<p>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.</p>
Step 6	<p>cable submgmt default learnable</p> <p>Example: Router(config)# cable submgmt default learnable</p>	<p>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.</p>
Step 7	<p>cable submgmt default max-cpe n</p> <p>Example: Router(config)# cable submgmt default max-cpe 1024</p>	<p>Sets the maximum number of CPE devices to be allowed behind a subscriber's cable modem.</p> <ul style="list-style-type: none"> <i>n</i>—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	<p>interface slot/[subslot]/port</p> <p>Example: Router(config)# interface 8/1/0</p>	<p>Enters interface configuration mode for the specified interface. The <i>subslot</i> is required syntax for the Cisco uBR10012 router, but is not used for the Cisco uBR7246VXR or Cisco uBR7100 series routers.</p>

Command or Action	Purpose
<p>Step 9</p> <p>(no) ip address <i>ip-address mask</i> [secondary]</p> <p>Example: Router(config-if)# ip address 131.108.1.27 255.255.255.0</p>	<p>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.</p> <p>ip address <i>ip-address mask</i> [secondary] no ip address <i>ip-address mask</i> [secondary]</p> <ul style="list-style-type: none"> • <i>ip-address</i>—Static IP address for the CPE device. • <i>mask</i>—Mask for the associated IP subnet. • 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.
<p>Step 10</p> <p>Conduct on-site CPE troubleshooting, as required.</p>	<p>For additional troubleshooting guidelines, refer to the “Related Documents” section on page 8.</p>
<p>Step 11</p> <p>Ctrl-Z</p> <p>Example: Router(config-if)# Ctrl^z</p>	<p>As required, return to global configuration mode.</p>
<p>Step 12</p> <p>no cable submgmt default or clear cable host</p> <p>Example: Router(config)# cable submgmt default or Router(config)# clear cable host</p>	<p>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).</p> <p>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.</p> <p>clear cable host {<i>ip-address</i> <i>mac-address</i>}</p> <ul style="list-style-type: none"> • <i>ip-address</i>—IP address for the device to be cleared. • <i>mac-address</i>—MAC address for the device to be cleared. <p>For additional command information, refer to the clear cable command in the <i>Cisco Broadband Cable Command Reference Guide</i> on Cisco.com: http://www.cisco.com/univercd/cc/td/doc/product/cable/bbccmref/index.htm</p>

	Command or Action	Purpose
Step 13	<code>exit</code> Example: <code>Router(config)# exit</code>	Returns the prompt to privileged EXEC mode.
Step 14	<code>quit</code>	<p>Proper Telnet reconnection to the Cisco router requires proper disconnect during the current Telnet session.</p> <p>Common Telnet disconnect methods are as follows:</p> <ul style="list-style-type: none"> • Press Ctrl+Break. • Press Ctrl+]. • Type quit or send break. <p>Another Telnet disconnect method is as follows:</p> <ol style="list-style-type: none"> a. Press Ctrl+Shift 6 6 x. b. Type disc 1 from the router command-line interface. <p>For additional Telnet break sequences, refer to the document Standard Break Key Sequence Combinations During Password Recovery on Cisco.com.</p>

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 [“Related Documents”](#) section on page 8.

Additional References

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

Related Documents

Related Topic	Document Title
Cisco IOS command reference information	<ul style="list-style-type: none"> <i>Cisco Broadband Cable Command Reference Guide</i> http://www.cisco.com/univercd/cc/td/doc/product/cable/bbcmref/index.htm
CPE troubleshooting information	<ul style="list-style-type: none"> Cisco TAC <i>Technical Notes for the Cisco CMTS</i>: http://www.cisco.com/en/US/tech/tk86/tk804/tech_tech_notes_list.html <i>Removing Cable Modem and CPE Entries from the Cisco CMTS</i>, TAC Document ID 4663 http://www.cisco.com/en/US/tech/tk86/tk89/technologies_tech_note09186a00800948db.shtml <i>Troubleshooting Slow Performance in Cable Modem Networks</i>, TAC Document ID 12551: http://www.cisco.com/en/US/tech/tk86/tk89/technologies_tech_note09186a00800b123c.shtml <i>Troubleshooting uBR Cable Modems Not Coming Online</i>, TAC Document ID 16510 http://www.cisco.com/en/US/tech/tk86/tk89/technologies_tech_note09186a0080094eb1.shtml
DHCP configuration information	<ul style="list-style-type: none"> “DHCP, ToD, and TFTP Services for the Cisco CMTS” in the <i>Cisco Cable Modem Termination System Feature Guide</i>: http://www.cisco.com/univercd/cc/td/doc/product/cable/cab_router/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 IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents the new **cable submgmt static-cpe-override** command. All other commands used with DHCP in the Cisco CMTS are described on Cisco.com in the following documents:

- *Cisco Broadband Cable Command Reference Guide*
<http://www.cisco.com/univercd/cc/td/doc/product/cable/bbcmref/index.htm>
- “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

cable submgmt default

To enable the Cisco CMTS Static CPE Override feature on the Cisco Cable Modem Termination System (CMTS), use the **cable submgmt default** command in global configuration mode. To disable Cisco CMTS Static CPE Override on the Cisco CMTS, use the **no** form of this command.

```
cable submgmt default { active | filter-group { cm | cpe } | learnable | max-cpe }
```

```
no cable submgmt default
```

Syntax Description		
active		Enables Cisco CMTS Static CPE Override feature, granting local customer premise equipment (CPE) control for subscriber management filtering (as defined by existing service ID (SID) settings).
filter-group { cm cpe }		Enables one or more temporary CPE devices to inherit the characteristics of an existing filter group, either on the downstream or the upstream of the cable modem (cm) or the CPE device (cpe). <ul style="list-style-type: none"> filter-group cm {downstream upstream}—Enables one or more temporary CPE devices to inherit and filter by the default downstream cable modem group, or by the default upstream cable modem group. filter-group cpe {downstream upstream}—Enables one or more temporary CPE devices to inherit and filter by the default downstream CPE group, or by the default upstream CPE group.
learnable		Automatically enables one or more temporary CPE devices to learn and to operate within the CPE IP address(es) in the Cisco CMTS routing table.
max-cpe		Sets the maximum number of IP addresses to be permitted behind a cable modem while the Cisco CMTS Static CPE Override feature is enabled. This keyword enables multiple temporary CPE devices in the range of 0 to 1024.

Defaults This command is disabled by default.

Command Modes Global configuration mode

Command History	Release	Modification
	12.3(9a)BC	This feature was introduced on Cisco uBR10012 and Cisco uBR7200 series universal broadband routers.

Usage Guidelines This command enables field technicians to add a temporary CPE device behind the subscriber's cable modem. The temporary CPE device shares the same SID settings as the original CPE device, even though the temporary CPE device has a different MAC address. 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.

The **no** form of the command automatically updates the routing tables and enables the MAC address from the technician's laptop for a future field service connection at a different location.

Prior to using this command, the first (existing) Dynamic Host Configuration Protocol (DHCP) CPE device maintains its DHCP dynamic MAC address behind the cable modem. The SID is assigned to this IP address.

However, by enabling Static CPE override, you gain the following states and options on two CPE devices behind the cable modem.

- The SID definition on the first CPE device is assigned a different static IP address. This enables you to change the existing (dynamic) DHCP IP address to a static IP address without first clearing the DHCP CPE host entries from the Cisco CMTS. The CPE IP state changes from **dhcp** to **static** cpe.
- This static override allows a second CPE device with a second MAC address behind the same cable modem with SID1 to be assigned same IP address as the first CPE device.

**Note**

The second CPE device changes from **dhcp cpe** to **static CPE** in the CMTS host tables.

Examples

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
```

Related Commands

Command	Description
show cable host	Displays the CPE devices (hosts) residing behind a specified cable modem (MAC address).

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