

Removing Cable Modem and CPE Entries from the CMTS

Document ID: 4663

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Introduction

A Cisco Cable Modem Termination System (CMTS) provides a variety of methods for being able to monitor the condition and state of Cable Modems and Customer Premise Equipment (CPE) devices connected to it. The CMTS stores information about Cable Modems and CPEs in an internal database so that CLI commands, such as **show cable modem** and **show interface cable X/Y modem Z**, as well as SNMP queries, are able to reveal information about the Cable Modems and CPE. This document talks about the conditions under which a cable modem or CPE device will be removed from the CMTS's internal database.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

The information in this document is relevant for the Cisco uBR series of CMTS products, which includes:

- uBR10000
- uBR7100
- uBR7200
- uBR7200VXR

The session displays in this document were captured from a Cisco uBR7114 CMTS running 12.1(8)EC Cisco IOS® software.

Reasons for a Cable Modem being Removed from the show cable modem Display

The **show cable modem** command is the primary Cisco IOS CLI command that is used to monitor the state of Cable Modems connected to a Cisco CMTS. There are a number of other CLI commands that also display the state of cable modems, as well as a number of SNMP MIB variables. This section of the document talks about reasons that a Cable Modem can be removed from the output, or results of these commands.

A sample display from the **show cable modem** command is shown below. Note that on a heavily populated CMTS the output of this command can be quite long.

```
uBR7114# show cable modem
Interface  Prim Online   Timing Rec   QoS CPE IP address   MAC address
          Sid  State      Offset Power
Cable1/0/U1 3  online(pt) 2809   0.25  5  0  10.111.111.11  0001.9659.44a3
Cable1/0/U0 4  online(pt) 2809   0.75  5  1  10.111.111.10  0001.9649.4445
```

Cable Modem is Offline for More Than 24 Hours

A Cable Modem will remain listed in the **show cable modem** display until it has been marked as offline for over 24 hours. This time period is not configurable.

It is possible to see how long a cable modem has been marked as offline by executing the **show cable modem offline** command.

In the session below, we see a cable modem with MAC address 0001.9659.44a3 that has been marked as offline for almost 24 hours.

```
uBR7114# show cable modem
Interface  Prim Online   Timing Rec   QoS CPE IP address   MAC address
          Sid  State      Offset Power
Cable1/0/U0 1  online(pt) 2812   0.25  5  1  10.111.111.10  0001.9649.4445
Cable1/0/U1 2  offline    2815  -0.25  2  0  10.111.111.11  0001.9659.44a3

uBR7114# show cable modem offline
Interface  MAC address   Prim Previous Offline      Rx   Rx   SM
          Sid  State      Time          Power SNR   Exhaust
          Sid  State      Time          Power SNR   Count
Cable1/0/U0 0001.9659.44a3 2  online    Sep 27 11:10:03 -0.25 26.52 1

uBR7114# show clock
11:09:27.672 UTC Fri Sep 28 2001
```

Note: The time the modem went offline is just a little less than 24 hours ago compared to the current clock time. If we wait for a few minutes for the Cable Modem to be offline for more than 24 hours, the Cable Modem will be removed from the CMTS's internal tables and from the show cable modem command output.

```
uBR7114# show clock
11:15:39.512 UTC Fri Sep 28 2001

uBR7114# show cable modem
Interface  Prim Online   Timing Rec   QoS CPE IP address   MAC address
          Sid  State      Offset Power
Cable1/0/U1 1  online(pt) 2812   0.25  5  1  10.111.111.10  0001.9649.4445

uBR7114# show cable modem offline
Interface  MAC address   Prim Previous Offline      Rx   Rx   SM
          Sid  State      Time          Power SNR   Exhaust
          Sid  State      Time          Power SNR   Count
```

Now that the cable modem has been offline for over 24 hours the CMTS has removed it from its internal database and it is no longer seen in the show cable modem display.

Cable Interface or Upstream Port is Shutdown or CMTS is Reloaded

The other circumstances where a cable modem will be removed from the **show cable modem** display is where:

- The interface or upstream port that the Cable Modem is connected to is shutdown
- The interface is physically removed from the CMTS
- The CMTS is reloaded
- The CMTS is power cycled

In the sequence of events shown below, a Cable interface is shutdown and then re-activated. The Cable Modems associated with that Cable interface will disappear from the **show cable modem** display until they are able to come online again.

```
uBR7114# show cable modem
Interface  Prim Online      Timing Rec      QoS CPE IP address      MAC address
          Sid  State           Offset Power
Cable1/0/U1 3   online(pt) 2809    0.25  5   0   10.111.111.11  0001.9659.44a3
Cable1/0/U0 4   online(pt) 2809    0.75  5   1   10.111.111.10  0001.9649.4445
```

All of the active Cable Modems are connected to downstream interface cable 1/0.

```
uBR7114# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
uBR7114(config)# interface cable 1/0
uBR7114(config-if)# shutdown
```

!--- Interface cable 1/0 is administratively shutdown.

```
uBR7114(config-if)# end
```

```
uBR7114# show cable modem
Interface  Prim Online      Timing Rec      QoS CPE IP address      MAC address
          Sid  State           Offset Power
Cable1/0/U1 3   online(pt) 2809    0.25  5   0   10.111.111.11  0001.9659.44a3
Cable1/0/U0 4   online(pt) 2809    0.75  5   1   10.111.111.10  0001.9649.4445
```

Now no cable modems appear in the show cable modem display.

In the sequence of events shown below, the Cable Interface Upstream port associated with a Cable Modem and CPE device is shutdown. This causes the entries for only the Cable Modems connected to the shutdown Upstream port to disappear.

```
uBR7114# show cable modem
Interface  Prim Online      Timing Rec      QoS CPE IP address      MAC address
          Sid  State           Offset Power
Cable1/0/U1 3   online(pt) 2809    0.25  5   0   10.111.111.11  0001.9659.44a3
Cable1/0/U0 4   online(pt) 2809    0.75  5   1   10.111.111.10  0001.9649.4445
```

One of the Cable Modems shown is connected to Upstream Port 0, and the other is connected to Upstream Port 1.

```
uBR7114# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
uBR7114(config)# interface cable 1/0
uBR7114(config-if)# cable upstream 1 shutdown
```

!--- Upstream port 1 has been shutdown but Upstream port 0 is still active.

```
uBR7114(config-if)# end
```

```
uBR7114# show cable modem
```

Interface	Prim	Online	Timing	Rec	QoS	CPE	IP address	MAC address
	Sid	State	Offset	Power				
Cable1/0/U0	4	online(pt)	2809	0.75	5	1	10.111.111.10	0001.9649.4445

The Cable Modem connected to Upstream Port 1 has been removed from the show cable modem display.

Reasons for a CPE being Removed from the show interface cable X/Y modem Z Display

The **show interface cable X/Y modem Z** command is a hidden Cisco IOS command that shows the CPE on cable interface X/Y connected to cable modem with Service ID Z. If Z is set to the special value of 0, then the command will display all CPEs connected to cable interface X/Y.

Here is a sample output showing both forms of the command.

First we use the form of the command that shows all Cable Modems and CPE connected to the Cable 1/0 Interface. The output of this command can be quite lengthy on a heavily populated CMTS.

```
uBR7114# show interface cable 1/0 modem 0
```

SID	Priv bits	Type	State	IP address	method	MAC address
3	11	modem	up	10.111.111.11	dhcp	0001.9659.44a3
4	11	host	unknown	192.168.111.10	dhcp	0050.7307.a34e
4	11	modem	up	10.111.111.10	dhcp	0001.9649.4445

Next we see the form of the command that shows only the Cable Modem and CPE devices belonging to SID 4. This form of the command produces much less output than the form above on a heavily populated CMTS.

```
uBR7114# show interface cable 1/0 modem 4
```

SID	Priv bits	Type	State	IP address	method	MAC address
4	11	host	unknown	192.168.111.10	dhcp	0050.7307.a34e
4	11	modem	up	10.111.111.10	dhcp	0001.9649.4445

The clear cable host Command

The best way to manually remove an entry for a CPE device from the **show interface cable X/Y modem Z** display is to use the **clear cable host <mac-address | ip-address>** command.

In the sequence of events shown below, the Cable Modem with SID 4 has one CPE device with MAC address 0050.7307.a34e connected to it.

```
uBR7114# show cable modem 10.111.111.10
```

Interface	Prim	Online	Timing	Rec	QoS	CPE	IP address	MAC address
	Sid	State	Offset	Power				
Cable1/0/U0	4	online(pt)	2809	0.50	5	1	10.111.111.10	0001.9649.4445

```
uBR7114# show interface cable 1/0 modem 4
```

SID	Priv bits	Type	State	IP address	method	MAC address
4	11	host	unknown	192.168.111.10	dhcp	0050.7307.a34e
4	11	modem	up	10.111.111.10	dhcp	0001.9649.4445

```
uBR7114# clear cable host 0050.7307.a34e
```

!--- Could have specified CPE IP address instead.

```
uBR7114# show interface cable 1/0 modem 4
SID   Priv bits  Type      State      IP address  method  MAC address
4     11          modem     up         10.111.111.10 dhcp    0001.9649.4445
```

Now that the clear cable host command has been executed, the CPE device has disappeared from the show interface cable X/Y modem Z display.

```
uBR7114# show cable modem 10.111.111.10
Interface  Prim Online  Timing Rec  QoS CPE IP address  MAC address
          Sid  State    Offset Power
Cable1/0/U0 4  online(pt) 2809 0.50 5 0 10.111.111.10 0001.9649.4445
```

Additionally, the show cable modem command now shows that there are 0 CPE connected to the cable modem.

CPE ARP Entry Expiration due to ARP Timeout

A CPE device may remain registered with the CMTS and listed in the **show interface cable X/Y modem Z** command for as long as the CMTS has a valid ARP entry for the CPE device. Therefore, when the ARP entry for the CPE device expires due to ARP timeout, the entry for the CPE will also disappear from the **show interface cable X/Y modem Z** command. The default ARP timeout for a CMTS cable interface is 4 hours, or 240 minutes. This timer can be modified using the **arp timeout <seconds>** router interface command.

In the sequence of events below, the Cable Modem with SID 1 has a CPE device connected to it with MAC address **0050.7307.a34e**. This CPE device has been disconnected from the cable modem or has been turned off for almost 4 hours. The ARP entry for that CPE device is about to expire. Once the ARP entry expires the CMTS will remove its entry for this CPE device from the **show interface cable X/Y modem Z** display.

```
uBR7114# show cable modem
Interface  Prim Online  Timing Rec  QoS CPE IP address  MAC address
          Sid  State    Offset Power
Cable1/0/U0 1  online(pt) 2812 -0.75 5 1 10.111.111.10 0001.9649.4445
Cable1/0/U1 2  online(pt) 2810 0.50 5 0 10.111.111.11 0001.9659.44a3
```

The Cable Modem with SID 1 has one CPE device connected.

```
uBR7114# show interface cable 1/0 modem 1
SID   Priv bits  Type      State      IP address  method  MAC address
1     10          host      unknown    192.168.111.10 dhcp    0050.7307.a34e
1     10          modem     up         10.111.111.10 dhcp    0001.9649.4445
```

The CPE device has an IP address of 192.168.111.10 and a MAC address of 0050.7307.a34e

```
uBR7114# show ip arp 192.168.111.10
Protocol  Address          Age (min)  Hardware Addr  Type  Interface
Internet  192.168.111.10  238       0050.7307.a34e ARPA  Cable1/0
```

Since the age of the ARP entry associated with the CPE device is 238 minutes, and the default ARP timeout for the Cable 1/0 interface is 240 minutes (4 hours), in 2 minutes time the CMTS will try to refresh the ARP entry for the CPE device. If the CMTS fails to refresh the ARP entry because the CPE has been turned off or has been disconnected, then the ARP entry for the device will disappear. Note that we have deliberately disconnected the CPE device.

```
uBR7114# show clock
00:39:50.152 UTC Sat Sep 29 2001
uBR7114# show clock
00:45:54.472 UTC Sat Sep 29 2001
```

```
uBR7114# show ip arp 192.168.111.10
```

```
uBR7114#
```

After waiting for five minutes we see that the ARP timeout has expired for the CPE device because there is no longer an entry in the ARP table for the CPE.

```
uBR7114# show interface cable 1/0 modem 1
SID   Priv bits  Type      State   IP address  method  MAC address
1     10         modem     up      10.111.111.10  dhcp    0001.9649.4445
```

Removal of the Cable Modem Associated with the CPE

The final circumstance under which a CPE entry may be removed from the the **show interface cable X/Y modem Z** display is if the cable modem associated with the CPE is removed from the **show cable modem** list for one of the reasons listed in the section above that deals with Cable Modems. This includes shutting down the Cable interface or upstream port a CPE device is connected to, physically removing the Cable interface from the CMTS, or reloading the CMTS.

Summary

A Cable Modem will remain as an entry in a Cisco CMTS's internal databases until the Cable Modem has been offline for greater than 24 hours straight, or until the cable port it is associated with is shutdown.

A CPE device will remain as an entry in a Cisco CMTS's internal databases until it's ARP entry expires or it is removed using the clear cable host command. In addition, if the Cable Modem a CPE device is associated with is removed, then the CPE device will be removed as well.

Related Information

- [CPE Not Able To Connect In](#)
- [Troubleshooting uBR Cable Modems Not Coming Online](#)
- [Technical Support – Cisco Systems](#)

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Updated: Oct 04, 2005

Document ID: 4663
