

## Cisco 10K Helpful Commands & Info

By Brian Wilson

(When Trouble Shooting it really helps to know what each registration stage is and how it affects the next stage in the process.)

MAC State Value	Description
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the CM and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed.  <b>Note</b> If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the <b>cable load-balance group</b> commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address.  <b>Note</b> If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not

	trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands).</p> <p><b>Note</b> If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.</p>
online(pk)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned.</p> <p><b>Note</b> This state is equivalent to the online(d) and online(pk) states.</p>
online(ptd)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed.</p> <p><b>Note</b> This state is equivalent to the online(d) and online(pt) states.</p>
online(pk)	The CM registered, BPI is enabled and KEK is assigned.
online(pt)	<p>The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed.</p> <p><b>Note</b> If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.</p>
<p><b>Note</b> If an exclamation point (!) appears in front of one of the online states, it indicates that the <b>cable dynamic-secret</b> command has been used with either the <b>mark</b> or <b>reject</b> option, and that the cable modem has failed the dynamic secret authentication check.</p>	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
expire(pk)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.</p> <p><b>Note</b> This state is equivalent to the online(d) and expire(pk) states.</p>
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.

	<b>Note</b> This state is equivalent to the online(d) and expire(pt) states.
reject(m)	<p>The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the <b>cable shared-secret</b> command.</p> <p>In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the <b>cable tftp-enforce</b> command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.</p>
reject(c)	<p>The CM attempted to register, but registration was refused due to a a number of possible errors:</p> <ul style="list-style-type: none"> <li>• The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the <b>cable upstream admission-control</b> command.</li> <li>• The CM has been disabled because of a security violation.</li> <li>• A bad class of service (COS) value in the DOCSIS configuration file.</li> <li>• The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes.</li> <li>• The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)</li> </ul>
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected.</p> <p><b>Note</b> This state is equivalent to the online(d) and reject(pk) states.</p>
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	<p>The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected.</p> <p><b>Note</b> This state is equivalent to the online(d) and reject(pt) states.</p>
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.

reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.
w-online	The WCM has registered and is enabled to pass data on the network.
w-online(d)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the WCM can continue to communicate with the WCM using DOCSIS messages and IP traffic (such as SNMP commands).  <b>Note</b> If BPI was enabled in the DOCSIS configuration file sent to the WCM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
w-online(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned.  <b>Note</b> This state is equivalent to the w-online(d) and w-online(pk) states.
w-online(pt)	The WCM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed.  <b>Note</b> If network access was disabled in the DOCSIS configuration file sent to the WCM, the network disabled status takes precedence, and the MAC status field shows w-online(d) instead of w-online(pt) even when BPI encryption is enabled and operational.
w-online(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed.  <b>Note</b> This state is equivalent to the w-online(d) and w-online(pt) states.
w-online(pk)	The WCM registered, BPI is enabled and KEK is assigned.
w-expire(pk)	The WCM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the WCM could successfully renew a new KEK value.
w-expire(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.  <b>Note</b> This state is equivalent to the w-online(d) and w-expire(pk) states.
w-expire(pt)	The WCM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.
w-expire(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.  <b>Note</b> This state is equivalent to the w-online(d) and w-expire(pt) states.

w-reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
w-reject(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected.  <b>Note</b> This state is equivalent to the w-online(d) and w-reject(pk) states.
w-reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
w-reject(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected.  <b>Note</b> This state is equivalent to the w-online(d) and w-reject(pt) states.

**Here are a few very useful commands and explanations on what they do:**

Command	Description
show cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem summary	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

Shows sample output for the summary option for all enabled cable interface line cards:

**Slimjim\_Router# show cable modem summary total**

Interface	Total Modems	Active Modems	Registered Modems
Cable5/0	746	714	711
Cable6/0	806	764	759
Total:	1552	1478	1470

Shows sample output for the summary option for all enabled upstreams on a specific cable interface line card:

**Slimjim\_Router# show cable modem summary c5/0 total**

Interface	Total Modems	Active Modems	Registered Modems
Cable5/0/U0	294	272	271
Cable5/0/U1	256	248	246
Cable5/0/U2	196	194	194
Total:	746	714	711

Shows sample output for the phy option for a particular cable modem:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 phy**

MAC Address	USPwr (dBmV)	USSNR (dBmV)	Timing Offset (dBc)	MicroReflec (dBmV)	DSPwr (dBmV)	DSSNR (dBmV)
0010.7bb3.fcd1 0	25.16	0	0	----		

Shows sample output for the maintenance option for a particular CM:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 maintenance**

MAC Address	I/F	Prim Sid	SM Count	Exhausted Time	SM Aborted Count
0010.7bb3.fcd1	C5/0/U5	1	3	Jun 1 10:24:52 0	Jan 1 00:00:00

Shows sample output for the connectivity option for a particular cable modem:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 connectivity**

Prim Sid	1st time online	Times Online	%online	Online time min	Online time avg	Online time max	Offline time min	Offline time avg	Offline time max
1	May 30 2000	4	99.85	48:20	11h34m	1d2h23m	00:01	00:59	03:00

Shows sample output for the flap option for a particular cable modem:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 flap**

MAC Address	I/F	Ins	Hit	Miss	CRC	P-Adj	Flap Time
0010.7bb3.fcd1	C5/0/U5	0	36278 92	0	369	372	Jun 1 13:05:23

Shows sample output for the qos option for a particular cable modem:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 qos**

Sfid	Dir	Curr State	Sid Type	Sched	Prio	MaxSusRate	MaxBrst	MinRsvRate	Throughput
3	US	act	1	BE	7	2000000	1522	100000	0
4	DS	act	N/A	BE	0	4000000	1522	0	0

Shows sample output for the errors option for a particular cable modem:

**Slimjim\_Router# show cable modem 0010.7bb3.fcd1 errors**

```
MAC Address      I/F      CRC      HCS
0010.7bb3.fcd1  C5/0/U5  0        0
```

Shows sample output for the cpe option for a particular cable modem:

```
Slimjim_Router# show cable modem 0010.7bb3.fcd1 cpe
SID Priv bits Type State IP address method MAC address
1 00 modem up 10.20.113.2 dhcp 0010.7bb3.fcd1
```

### Other useful commands are:

1. “[show cable call](#)” This command will let you see the active calls on the CMTS. This command is important because it will let you see how many calls are on the interfaces and 1. this can help you plan capacity. This command also shows you active E-911 calls, this will lets you know if the nodes is safe for maintenance or not.

```
CMTK01#show cable call

Interface ActiveHiPriCalls ActiveAllCalls PostHiPriCallCMs RecentHiPriCMs
Cable5/0/0 0 6 0 0
Cable5/0/1 0 4 0 0
Cable5/0/2 0 4 0 0
Cable5/0/3 0 6 0 0
Cable5/0/4 0 5 0 0
Cable5/1/0 0 0 0 0
Cable5/1/1 0 0 0 0
Cable5/1/2 0 0 0 0
Cable5/1/3 0 0 0 0
Cable5/1/4 0 0 0 0
Total 0 25 0 0
CMTK01#
```

2. “[show interfaces cable 5/0/0 modem 0 | include \[Mac address or IP address\]](#)” This command will let you get the status of a modem. When you add the last line of this command [include] you can use a part of the whole MAC or IP Address.

```

CMTK01#show interfaces cable 5/0/0 modem 0 | include 8.101.
20    10    host    unknown  8.101.47.50    static  0006.25e3.8fa3
126   11    host    unknown  8.101.50.37    static  0009.5ba1.f3e3
127   10    host    unknown  8.101.49.228   static  0030.1b27.e410
135   10    host    unknown  8.101.49.238   static  0008.00c0.cd33
150   10    host    unknown  8.101.50.57    static  0013.106b.ff86
360   11    host    unknown  8.101.47.51    static  0006.b104.737e
419   10    host    unknown  8.101.50.49    static  000f.6667.83a0
421   10    host    unknown  8.101.51.179   static  0012.1723.057a
431   10    host    unknown  8.101.50.56    static  000f.66e5.7976
723   10    host    unknown  8.101.51.170   static  0006.b122.76a6
771   11    host    unknown  8.101.50.47    static  000f.6667.513c
853   10    host    unknown  8.101.49.254   static  0013.10fe.6f51
CMTK01#

```

3. “[show controllers cable 5/0/0 upstream 0 | include SNR](#)” This command allows you to see the signal to noise ratio (SNR) on a cable upstream. With most upstream’s now 1-to-1 this command will help you see the SNR the CMTS is seeing back from the node in real time.

```

CMTK01#show controllers cable 5/0/0 upstream 0 | include SNR
US phy SNR_estimate for good packets - 25.462 dB
CMTK01#show controllers cable 5/0/0 upstream 0 | include SNR
US phy SNR_estimate for good packets - 26.960 dB
CMTK01#show controllers cable 5/0/0 upstream 0 | include SNR
US phy SNR_estimate for good packets - 26.7647 dB
CMTK01#

```

“[clear cable modem \[MAC or IP\]](#)” or “[clear cable modem \[MAC or IP\] Delete](#)” This command will allow you to clear out a cable modem that has been removed from the system or that might be hung up. FSR’s might need this command ran after swapping a cable modem.

```

CMTK01#clear cable modem 0000.39c1.7863 delete
CMTK01#

```

4. “[show cable modem \[IP or MAC\] flap](#)” This command will let you see if the cable modem has been taking hits, Misses, and flaps. Edgehealth has this information but for some reason it is not accurate so use this command to get the flap numbers. This command also lets you see the last time the modem had a flap. Flaps can help you to see if there are plant issues like bad drops or issues with line extenders.

```

CMTK01#sho cable modem 10.0.117.64 flap
MAC Address    I/F      Ins  Hit  Miss  CRC  P-Adj  Flap  Time
000f.9faa.754c C5/0/0/U0 0    43680 213  0    0      2    Jun 1 00:11:48
CMTK01#

```

.” [Show cable modem \[IP or MAC\] Verbose](#)” This command gives you a lot of information on the cable modem like the numbers of CEP IP’s, Flaps, bandwidth, errors, IP address, MAC address, RX/TX Power, time online and DOCSIS version.

```
CNTK01#sho cable modem 10.0.117.64 verbose
MAC Address           : 000f.9faa.754c
IP Address            : 10.0.117.64
Prim Sid              : 22
Interface             : C5/0/0/U0
sysDescr              :
Upstream Power        : 0.00 dBmV (SNR = 26.96 dB)
Downstream Power      : 0.00 dBmV (SNR = ----- dB)
Timing Offset         : 2683
Initial Timing Offset : 2683
Received Power        : 1.25 dBmV
MAC Version           : DOC1.1
QoS Provisioned Mode  : DOC1.1
Enable DOCSIS2.0 Mode : Y
Phy Operating Mode    : tdma
Capabilities          : (Frag=Y, Concat=Y, PHS=Y, Priv=BPI+)
Sid/Said Limit        : (Max US Sids=4, Max DS Sids=15)
Optional Filtering Support : (802.1P=N, 802.1Q=N)
Transmit Equalizer Support : (Taps/Symbol= 1, Num of Taps= 24)
Number of CPE IPs     : 1(Max CPE IPs = 16)
CFG Max-CPE           : 1
Flaps                 : 2 (Jun 1 00:11:48)
Errors                : 0 CRCs, 0 HCSes
Stn Mtn Failures     : 0 aborts, 2 exhausted
Total US Flows        : 2 (2 active)
Total DS Flows        : 2 (2 active)
Total US Data         : 5188091 packets, 1527730438 bytes
Total US Throughput   : 342601 bits/sec, 54 packets/sec
Total DS Data         : 9088184 packets, 491308274 bytes
Total DS Throughput   : 44835 bits/sec, 44 packets/sec
Active Classifiers    : 3 (Max = NO LIMIT)
DSA/DSX messages     : permit all
Total Time Online     : 11h10m
CNTK01#
```