Configuring Cable Modem Remote-query Command

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Introduction

The cable modem remote-query command was introduced in Cisco IOS® Software Release 12.0(7)XR and 12.1(2)T. This command allows you to query the cable modem (CM) performance statistics directly from the uBR Cable Modem Termination System (CMTS).

The idea is to poll the CMs periodically using Simple Network Management Protocol (SNMP), and to cache information, such as IP address, MAC address, S/N ratio, and Upstream Transmit Power on the CMTS (see output). This helps you know the state of a single modem, and have an overall status of the plant.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on this software version:

- IOS Software Release 12.0(7)XR and 12.1(2)T

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Configure

On the cable modem, an SNMP community string must be configured. This is performed using one of these methods:

- Manual configuration: add the `snmp-server community<string>` global configuration command
• Force the CM to download an IOS config file via Data-over-Cable Service Interface Specifications (DOCSIS) configuration file
• Configure the CM community via SNMP Object IDentifiers (OIDs) defined in the DOCSIS config file

On the CMTS, configure these global configuration commands:

1. `snmp-server community <community string>`
2. `snmp-server manager`

**Note:** In 12.2(33)SC, you cannot configure `snmp-server community <community string>` RO after configuring `cable modem remote-query <community string>`. It is redundant because IOS automatically adds the community noted in `cable modem remote <community string>` as an SNMP RO `<community string>` community. When you try to configure, you will get the error message which says `%Error: Community <Name> already exists and is used for cable modem remote-query, configure new community string for SNMP management.

The `cable modem remote-query [polling interval] [Community string]` is where `[polling interval]` defines the time interval at which the query is performed. For example, 30 means that the query is performed every 30 seconds. `[Community string]` defines the community string.

When configuring cable remote-query, all the community strings have to match:

• the `snmp-server community` string configured on the CM
• the `snmp-server community` string configured on the CMTS
• the `snmp` community string configured in the `cable modem remote-query [polling interval] [Community string]` command

Current configuration : 3473 bytes

! version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname big-cmts
!
!
cable modem remote-query 30 test

!--- This configures the CMTS to perform the remote
!--- query every 30 seconds with a community string of test.

no cable qos permission create
no cable qos permission update
cable qos permission modems

cable time-server

ip subnet-zero

no ip finger

no ip domain-lookup

ip dhcp relay information option

no ip dhcp relay information check

interface Ethernet2/0

ip address 10.200.68.3 255.255.255.0

!

interface Cable3/0

ip address 10.200.71.17 255.255.255.240 secondary

ip address 10.200.71.1 255.255.255.240

no keepalive

cable downstream annex B

cable downstream modulation 64qam

cable downstream interleave-depth 32

cable upstream 0 frequency 20000000

cable upstream 0 power-level 0

no cable upstream 0 shutdown

cable dhcp-giaddr policy

cable helper-address 10.200.68.200

!

ip classless

ip route 0.0.0.0 0.0.0.0 10.200.68.1

no ip http server

!

snmp-server community test RO

!--- The community string has to match the one
!--- set on the CM and the one configured above in the cable modem remote-query
!--- command.
snmp-server manager

!--- Needed to configure the CMTS as SNMP manager
!--- so that it is able to generate requests to the SNMP agents on the CM.

line con 0
transport input none
line aux 0
line vty 0 4
login
!
end

For the CMs, configure the factory defaults with the addition of the global command **snmp-server community test RO**.

**Verify**

This is the output of the information collected:

```
big-cmts#show cable modem remote-query

<table>
<thead>
<tr>
<th>IP address</th>
<th>MAC address</th>
<th>S/N</th>
<th>US</th>
<th>DS</th>
<th>Tx Time</th>
<th>Micro (dB)</th>
<th>Modem Ratio</th>
<th>Power</th>
<th>Power Offset</th>
<th>Reflection State</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.200.71.8</td>
<td>0001.9659.47af</td>
<td>36.6</td>
<td>31.0</td>
<td>0.0</td>
<td>12352</td>
<td>17</td>
<td>online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.200.71.4</td>
<td>0001.9659.47c7</td>
<td>36.6</td>
<td>37.0</td>
<td>0.0</td>
<td>12352</td>
<td>17</td>
<td>online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.200.71.6</td>
<td>0001.9611.b9a3</td>
<td>36.6</td>
<td>37.0</td>
<td>0.0</td>
<td>12353</td>
<td>15</td>
<td>online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.200.71.3</td>
<td>0001.9659.47a9</td>
<td>36.6</td>
<td>37.0</td>
<td>0.0</td>
<td>12351</td>
<td>16</td>
<td>online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.200.71.2</td>
<td>0001.9659.47c1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>online</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

!--- This modem does not answer to the SNMP query.
```

If the modem does not answer to SNMP query, you need some debugs to verify:

```
big-cmts#debug cable remote-query

CMTS remote-query debugging is on

*Sep 26 01:30:41.677:

For IP address 10.200.71.2

!--- The IP address of the modem showing all 0s in the show cable modem remote-query
!--- command output.
The preceding message indicates the modem has been queried, but no answer has been received. To receive further detail, view the SNMP level:

```
big-cmts# show snmp sessions
Destination: 10.200.71.2.161, V1 community: test

--- "V1": SNMP version - "test": community string used to query the modem.

Round-trip-times: 0/0/0 (min/max/last)
packets output
  2147 Gets, 0 GetNexts, 0 GetBulks, 0 Sets, 0 Informs

--- Number of SNMP GETS issued to the modem.

  2146 Timeouts, 0 Drops

--- All the SNMP GETS timed out.

packets input
  0 Traps, 0 Informs, 0 Responses (0 errors)
```

This is the **debug cable remote-query** command output for a modem answering to remote-query:

```
*Sep 26 01:30:49.709:
For IP address 10.200.71.8
*Sep 26 01:30:49.713:  docsIfSignalQualityEntry.5.3 = 366
*Sep 26 01:30:49.713:  docsIfMibObjects.2.2.1.3.2 = 310
*Sep 26 01:30:49.717:  docsIfDownstreamChannelEntry. 6.3 = 0
*Sep 26 01:30:49.717:  docsIfUpstreamChannelEntry.6. 4 = 12352
*Sep 26 01:30:49.721:  docsIfSignalQualityEntry.6.3 = 17
```

This is the SNMP session detail for the same modem. Notice that the number of **Gets** equals the number of responses with no **Timeouts** or **Drops**:

```
Destination: 10.200.71.8.161, V1 community: test, Expires in 581 secs
Round-trip-times: 1/1/1 (min/max/last)
packets output
  5421 Gets, 0 GetNexts, 0 GetBulks, 0 Sets, 0 Informs
```
This output shows a mismatch in the community strings defined for the remote-query, and in the CMTS snmp-server community line:

```
big-cmts#sh snmp
Chassis: 6888364
0 SNMP packets input
  0 Bad SNMP version errors
  30 Unknown community name

!--- Community string mismatch.

0 Illegal operation for community name supplied
0 Encoding errors
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
3944 SNMP packets output
  0 Too big errors (Maximum packet size 1500)
  0 No such name errors
  0 Bad values errors
  0 General errors
  0 Response PDUs
  0 Trap PDUs
```

**Troubleshoot**

The most common problem is that changing the **cable modem remote-query [polling interval] [Community string]** command parameters causes it to fail. It is recommended to perform these steps:

1. Remove the command with no **cable modem remote-query**.
2. Reinstate the command.
Another problem is when changing the community string defined with the command **snmp-server community <string>**. It is recommended to perform these steps:

1. Remove the **cable modem remote-query [polling interval] [Community string]** command.
2. Change the community string.
3. Reinstall the **cable modem remote-query [polling interval] [Community string]** command.

**Related Information**

- SNMP FAQs for Cable Networks (registered customers only)
- Technical Support & Documentation - Cisco Systems