Troubleshoot VoD Configured with GQI And PowerKEY on cBR-8

Contents

Introduction

Prerequisites

- Requirements
- Components Used

Configure VoD Sessions with GQI And PowerKEY

Verify

Troubleshoot: VoD Sessions Do Not Get Initiated Or Get Stuck in PowerKey Pending

- Case 1. VoD Sessions Do Not Get Initiated
- Case 2. VoD Sessions Get Stuck in PowerKey Pending

Introduction

This document describes how to configure and troubleshoot Video on Demand (VoD) with Generic QAM Interface (GQI) protocol and PowerKEY encryption on the Cisco CBR-8 device.

Further information on how to configure, verify, and troubleshoot these featurescan be found in Cisco cBR Converged Broadband Routers Video Features.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco cBR-8
- Cable Video

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure

that you understand the potential impact of any command.

Configure VoD Sessions with GQI And PowerKEY

This is a configuration example on a CBR-8 for 1 line card, with 1 Logical Edge Device (LED), and 1 service group.

```
cable video
  [...]
  mgmt-intf VirtualPortGroup 0
  encryption
    linecard 1/0 ca-system powerkey scrambler des

  service-distribution-group SG1 id 1
    rf-port integrated-cable 1/0/0

  virtual-carrier-group SG1 id 1
    encrypt
    service-type narrowcast
    rf-channel 32 tsid 10188 output-port-number 1
    rf-channel 33-53 tsid 10189-10209 output-port-number 2-22

  bind-vcg
    vcg SG1 sdg SG1

  logical-edge-device LED1 id 1
    protocol gqi
      mgmt-ip 10.10.10.10
      mac-address aaaa.bbbb.cccc
      server 10.20.30.40
      keepalive retry 3 interval 10
      reset interval 8
      virtual-edge-input-ip 10.0.0.1 input-port-number 1
      vcg SG1
      active
```

Verify

Once a VoD session is started, its output on the cBR-8 must look like this:

<#root>

```
cBR-8#
```

show cable video session all

```
LED Session    Output Streaming   Sess Session Source                  UDP   Output  Input      Output
Id  Id         Port   Type        Type Ucast Dest IP/Mcast IP (S,G)    Port  Program State      State
```

```
------------------------------------------------------------------------------------------------------------
1   1          1      Remap       UDP  10.0.0.1                        1000  1       ACTIVE-PSI ON
```

Troubleshoot: VoD Sessions Do Not Get Initiated Or Get Stuck in PowerKey Pending

If a VoD request is valid, in a correctly working environment, it triggers a session creation on the cBR-8 from a video management system device as the Cisco Videoscape Session Resource Manager (VSRM).

Case 1. VoD Sessions Do Not Get Initiated

If you do not see the VoD session created on the cBR-8 under the command **show cable video session all**, other than external issues as connectivity, routing, VSRM misconfiguration, and so on, it is possible that the cBR-8 replied with an error code to the GQI Create Session Request coming from the VSRM.

For example, the Create Session Response Code 9002000 is the positive answer, while 9002000A is an error code which means that the channel bandwidth is unavailable. You can find a list of the response codes in this table, from the Time Warner Cable Switched Digital Video Channel Change Message Interface Specification (TWC-SDV-CCMIS):

Description	Code
GQI_NO_ERROR	0x90020000
GQI_ERROR_RPC_OUT_OF_MEMORY	0x90020001
GQI_ERROR_RPC_HARDWARE_FAILURE	0x90020002
GQI_ERROR_RPC_SESSION_NOT_FOUND	0x90020003
GQI_ERROR_RPC_MISSING_MSK	0x90020004
GQI_ERROR_RPC_SESSION_ALREADY_EXISTS	0x90020005
GQI_ERROR_RPC_INSUFFICIENT_MEMORY	0x90020006
GQI_ERROR_RPC_INSUFFICIENT_CAPACITY	0x90020007
GQI_ERROR_RPC_PROVISION_FAILURE	0x90020008
GQI_ERROR_RPC_PROGRAM_NUMBER_CONFLICT	0x90020009
GQI_ERROR_RPC_BANDWIDTH_UNAVAILABLE	0x9002000A
GQI_ERROR_RPC_SAME_GIGAIP	0x9002000B
GQI_ERROR_RPC_GIGAIP_INVALID	0x9002000C
GQI_ERROR_RPC_GIGAIP_FAILURE	0x9002000D

GQI_ERROR_RPC_GROUP_SDB_SESSION_FAILURE	0x9002000E
GQI_ERROR_RPC_INSUFFICIENT_OUTPUT_CAPACITY	0x9002000F
GQI_ERROR_RPC_ROUTE_CONFLICT_OUTPUT	0x90020010
GQI_ERROR_RPC_ROUTE_CONFLICT_INPUT	0x90020011
GQI_ERROR_RPC_ROUTE_NOT_FOUND	0x90020012
GQI_ERROR_RPC_ROUTE_ALREADY_EXISTS	0x90020013
GQI_ERROR_RPC_INVALID_MULTICAST_ADDRESS	0x90020014
GQI_ERROR_RPC_INVALID_SOURCE_ADDRESS	0x90020015
GQI_ERROR_RPC_STAT_MUX_GROUP_DEJITTER_FAILURE	0x90020016
GQI_ERROR_RPC_GIGE_TYPE_CONFLICT	0x90020017

You can check the GQI messages in the cBR-8 by enabling the platform traces to debug or noise level of verbosity, and restore it to notice level after the troubleshoot:

cBR-8#**set platform software trace led-01 rp active vgqi-mgmt noise**

cBR-8#**set platform software trace led-01 rp active vgqi-msg noise**

Once the traces are set, you can request a VoD session, and then check the output of the traces with **show platform software trace message led-01 rp active**.

Here is an example of the GQI transaction in the cBR-8 traces, with the 9002000A error code sent to the VSRM. In this case the VSRM does not initiate the session on the cBR-8:

<#root>

```
cBR-8#
```

```
show platform software trace message led-01 rp active
```

```
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug): abcdefghij
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-msg] [24599]: UUID: 0, ra: 0, TID: 0 (info):
abcdefghijklmnopabcdefghijklmnopabcdef -> Received GQI Create Session Request:
  Transaction Header:
    Transaction ID: 4F75000F
    Response Program Number: 30000082
  Session ID:
    Session ID Length: 10
    Session ID Value:  54 52 00 64 6A 7F 06 99 11 E1
  Incomming Program Number: 62351
  Outgoing  Program Number: 62351
  Input  Port Number: 1
  Output Port Number: 1
  Session Rate: 125000
  Is Multicast: 1
  Input UDP Port: PORT#
  Multicast Details:
    Source Address Len: 3
    Source IP Address Value: 10.20.31.40, 0.0.0.0, 0.0.0.0,
    Group IP Address: IP, IP, IP,
```

```
    UDP Port : 0, 0, 0,
  NO PID Remapping: 1
  Encryption: 0
  Override Session Flag 0
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug):
abcdefghijklmnopabcdefghijklmnopabcd - GQI Input Port 1 is mapped to LED IP Address 10.0.0.1   <<<<<<<<
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug):
abcdefghijklmnopabcdefghijklmnopa - GQI Output Port 1 maps to physical QAM -> slot 2 port 1 channel 32
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug):
abcdefghijklmnopabcdefghijklmnopabcd -> QAM Bandwidth request 125000 has exceeded the available bw 0 on
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug):
 Converting vgqi_rc_e (-22) to GQI Reponse Status code
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug): abcdefghij
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug): abcdefghij
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-mgmt] [24833]: UUID: 0, ra: 0, TID: 0 (debug):
abcdefghijklmnopabcdefghijk -> Client 0xfac14b422, conn_state = 4, req_type = 3, req version 2, conn ve
2019/01/10 09:02:59.618 {led1_RO-0}{1}: [vgqi-msg] [24833]: UUID: 0, ra: 0, TID: 0 (info):
abcdefghijklmnopabcdefghijklmnopabcdefgh -> Sending GQI Create Session Response:
  Result Code: 9002000A    <<<<<<< error code response
  Transaction Header:
    Transaction ID: 4F75000F
    Response Program Number: 30000082
  Session ID:
    Session ID Length: 10
    Session ID Value:  54 52 00 64 6A 7F 06 99 11 E1
2019/01/10 09:02:59.710 {led1_RO-0}{1}: [vgqi-mgmt] [24599]: UUID: 0, ra: 0, TID: 0 (debug):
abcdefghijklmnopabcdefghijkl -> ev_check_disconnect::remote fd 3 (0x0) has been disconnected
```

In this example, there is an incorrect bind in the cBR-8, possibly due to a misconfiguration or eventually a software defect to be further investigated by Cisco.

The internal bind in the cBR-8 can be verified with the commands described below.

This command shows a summary of the video databases for a single LED, where you can find information on each database name and ID, tables name and ID within a database, and key ID for each table. These indexes are needed for the next commands.

<#root>

```
acdc-cbr8-2#
```

show platform software vpm led1-ui rp active dbms data summary

```
Database Name: led-default-database      Database Id: 53

Database Name: Video Config Database     Database Id: 54   <<<<< Database name and ID

  Table: DS Channel Table           Table Id: 0      Record Count: 4   <<<< Table name, ID, and records
  ------------------------------------------------------------------------

    Table Options
    -------------------------------------------
    Snapshot:                 DISABLED
    Replication:              DISABLED
    Shadowing:                DISABLED
```

```
    Dynamic Mem Allocation:   ENABLED

    Key Name                          Engine      ID
    ------------------------------------------------------
    vcfg_dbms_qam_key                 AVL         1         <<<<<< key ID

--More--
```

Once you identify what database and table you want to dump, you can use the command **show platform software vpm led1-ui rp active dbms table dump <database ID> <table ID> <key ID>** to display the content of the records. In this case you want to inspect the database 54 “Video Config Database”, table 0 “DS Channel Table” which has only Key ID 1:

<#root>

```
acdc-cbr8-2#
```

```
show platform software vpm led1-ui rp active dbms table dump 54 0 1
```

```
Record: Slot: 1, Bay: 0, Port: 0, Channel: 32
Logical QAM id: 48, Previous LQAM Id: 65535
QRG Role: none
SD group id: 1, VC group id: 1
Admin state: 1, Operational state: 1, Previous Operation State: 0    TSID: 10188
    Override TSID: not configured
    Encryption Support: Powerkey
    Resource Id: 0
    ONID: 100
    PSI Interval: 100
    Output Port number: 1
    Power Adjust: 400 dBmV
    Annex Type: ANNEX A
    Modulation: 256QAM
    Interleaver: QAM_INTERLEAVER_I_12_J_17
    Frequency: 850000000
    Bandwidth: 51253960 bps
    Symbol Rate: 6952
    Low Latency: 0
    Channel Width: 8000000 Hz
    NIT Reference: 0
--More--
```

From this output, you can see that VCG 1 is correctly mapped to SDG 1, and that the first channel of LED 1 is 1/0/0:32 as per configuration.

Make always sure that the traffic that enters the session contains the expected parameters configured for that video session, like for example the TSID.

If you already know what record you want to access, you can obtain the same output displayed here with the command **show platform software vpm led1-ui rp active dbms record 54 0 1 1/0/0:32**

Case 2. VoD Sessions Get Stuck in PowerKey Pending

A session stuck in PowerKey Pending can look like this on the cBR-8:

<#root>

```
cBR-8#
```

show cable video session logical-edge-device id 1

```
Session    Output Frequency  Streaming   Sess Session Source                  UDP   Output  Input      
Id         Port   Hz         Type        Type Ucast Dest IP/Mcast IP (S,G)    Port  Program State      
-------------------------------------------------------------------------------------------------------
1          1      850000000  Remap       UDP  10.0.0.1                        1000  1       OFF        
```

The first parameters that need to be observed are the input and output bitrate.

If the input rate is 0, normally it means that there is really no traffic in input on the cBR-8 for this session, and the cause of the problem must be investigated outside the cBR-8.

Anyway, in order to verify this fact, you can create a packet capture on the incoming links in this way:

Step 1. Create an access list that permits all the input IPs configured under the affected LED, in this case you have only 1 IP address:

cBR-8(config)#**ip access-list extended TAC_VOD**

cBR-8(config)#**permit ip any host 10.0.0.1**

Step 2. Check on which interfaces of the cBR-8 you expect to receive the VoD traffic, sometimes on all the interfaces of the supervisor in slot 4 and slot 5. In this case you have to configure 2 different captures, as it is not possible to configure 8 interfaces in a single capture:

cBR-8#**monitor capture TAC_VOD interface range Te4/1/0, Te4/1/1, Te4/1/2, Te4/1/3 both access-list TAC_VOD buffer size 100**

Step 3. Verify the configuration and start the monitor capture:

cBR-8#**show monitor capture TAC_VOD**

cBR-8#**monitor capture TAC_VOD start**

Step 4. Request a new VoD session on LED 1 and check if there are packets being captured (you have different options for the level of detail for the packets display):

cBR-8#**show monitor capture TAC_VOD buff <brief/detail/dump>**

Step 5. Once done, these commands can be used to save the capture in the harddisk, stop the monitor capture, and remove it from the configuration:

cBR-8#**monitor capture TAC_VOD export harddisk:/TAC_VOD.pcap**

cBR-8#**monitor capture TAC_VOD stop**

cBR-8#**no monitor capture TAC_VOD**

In case the packet capture shows no packets, then perform the steps described in case 1 in order to debug the GQI protocol itself.

Otherwise, use these debugs in order to verify the proper operation of PowerKEY on the cBR-8:

set platform software trace led-01 rp active vsess-mgmt debug

set platform software trace led-01 rp active vsess-msg debug

show platform software trace message led-01 rp active

set platform software trace pk-ecmg 1/0 pk_ecmg-chnl debug

set platform software trace pk-ecmg 1/0 pk_ecmg-ipc debug

set platform software trace pk-ecmg 1/0 pk_ecmg-main debug

set platform software trace pk-ecmg 1/0 pk_ecmg-stream debug

show platform software trace message pk-ecmg 1/0

Note: Do not forget to restore all the platform traces to the notice level once you are done with the troubleshoot.
