Table Based Configuration

The table-based video is a local session management that provisions using CLI. The statically allocated local video sessions can be either unicast or multicast video stream.

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Information About Table Based Configuration

Table-based video session configuration can be performed for a range or an individual session under each Quadrature Amplitude Modulation (QAM) carrier that is being assigned to a table-based Logical Edge Device (LED). In cBR-8, you can create multiple LEDs for table-based video sessions; each LED manages one set of QAM carriers for table-based sessions. Table-based sessions can be configured as a pass-through, remap, or a data piping session.

Configuring Table Based Session

To configure the encryption type for a VOD session, perform the following steps:

```plaintext
enable
cable video
table-based
vcg vcg-name
rf-channel n-m
session sess-name input-port id start-udp-port udp port number
num-sessions-per-qam 1-80 processing-type remap start-program n jitter 10-200 msec [cbr | vbr]
ext
```
Configuration Example

The following is a sample in which two sessions are created per RF channel, HBO-1 and HBO-2 are for channel 0, HBO-3 and HBO-4 are for channel 1. The destination IP address is obtained from VCG (if any), otherwise from the LED broadcast.

Router(config)#cable video
Router(config-video)#table-based
Router(config-video-tb)#vcg bcast
Router(config-video-tb-vcg)#rf-channel 0-1
Router(config-video-tb-vcg-sess)# session HBO input-port 10 start-udp-port 1 num-sessions-per-qam 2 processing-type remap start-program 1 jitter 100 cbr
Router(config-video-tb-vcg-sess)# session HBO bundle-id 1 start-udp-port 49152 num-sessions-per-qam 2 processing-type program start-program 1 jitter 100 cbr

Virtual Edge Input Bundling

Virtual Edge Input Bundling assists with load balancing from the Head End. This allows multiple VEIs to be accessed via a gateway, since it is unknown at the time of configuration which VBI the stream will come in on. Thus, when the Head End sends a stream to the gateway, it enters the cBR-8 in on any VBI in the bundle. VEI bundling can be performed only if table based protocol is used for a particular LED.

To bundle the VEIs, perform the following steps:

Before You Begin

• All video sessions must have unique UDP ports for the Head End.
• Create two or more Virtual Edge Inputs using the following command:

virtual-edge-input-ip ipaddr vrf vrfname input-port-number #

Note

Same IP address cannot be used in more than one bundle.

enable
configure terminal
cable video
logical-edge-device
protocol table-based
vei-bundle id input-port-number #
exit

Verifying Virtual Edge Input Data

To verify the VEI data, use the following command:

Router# show cable video logical-edge-device [all | id | name]

Example:

Router# show cable video logical-edge-device id 1
Logical Edge Device: led-vei
Id: 1
Protocol: Table-based
Service State: Active
Discovery State: Disable
Number of Virtual Carrier Groups: 1
Number of Share Virtual Edge Input: 5
Number of Physical Qams: 5
Number of Sessions: 0
No Reserve PID Range

Virtual Edge Input:

<table>
<thead>
<tr>
<th>Input Port</th>
<th>VEI</th>
<th>Slot/Bay</th>
<th>Bundle</th>
<th>Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>IP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>11.11.11.11</td>
<td>7/0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>22.22.22.22</td>
<td>7/0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>66</td>
<td>66.66.66.66</td>
<td>7/0</td>
<td>40000</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>77</td>
<td>77.77.77.77</td>
<td>7/0</td>
<td>40000</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>222</td>
<td>222.222.222.222</td>
<td>7/0</td>
<td>40000</td>
<td>177.0.10.3</td>
</tr>
</tbody>
</table>

Virtual Carrier Group:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Total VEI</th>
<th>Total RF-channel</th>
<th>Service-Distribution-Group</th>
<th>Service-Distribution-Group ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>vcg-vei</td>
<td>5</td>
<td>5</td>
<td>sdg-vei</td>
<td>1</td>
</tr>
</tbody>
</table>

Integrated Physical Admin Operational TSID ONID Output VCG SDG Encryption Cable QAM ID State State Port ID ID Capable

<table>
<thead>
<tr>
<th>Cable</th>
<th>QAM ID</th>
<th>Admin</th>
<th>Operational</th>
<th>TSID</th>
<th>ONID</th>
<th>Output</th>
<th>VCG</th>
<th>SDG</th>
<th>Encryption</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/0/3:0</td>
<td>208</td>
<td>ON</td>
<td>UP</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>clear</td>
</tr>
<tr>
<td>7/0/3:1</td>
<td>209</td>
<td>ON</td>
<td>UP</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>clear</td>
</tr>
<tr>
<td>7/0/3:2</td>
<td>210</td>
<td>ON</td>
<td>UP</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>clear</td>
</tr>
<tr>
<td>7/0/3:3</td>
<td>211</td>
<td>ON</td>
<td>UP</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>clear</td>
</tr>
<tr>
<td>7/0/3:4</td>
<td>212</td>
<td>ON</td>
<td>UP</td>
<td>4</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>clear</td>
</tr>
</tbody>
</table>

Verifying VEI Bundles

To view the VEI bundles, use the following command:

Router# show cable video vei-bundle all

Example:

This is a sample output of the show command that displays the VEI bundle details.

<table>
<thead>
<tr>
<th>Bundle</th>
<th>LED</th>
<th>Input Port</th>
<th>VEI</th>
<th>Slot/Bay</th>
<th>Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>40000</td>
<td>1</td>
<td>33</td>
<td>33.33.33.33</td>
<td>7/0</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>40000</td>
<td>1</td>
<td>44</td>
<td>44.44.44.44</td>
<td>7/0</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>40000</td>
<td>1</td>
<td>66</td>
<td>66.66.66.66</td>
<td>7/0</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>40000</td>
<td>1</td>
<td>77</td>
<td>77.77.77.77</td>
<td>7/0</td>
<td>177.0.10.3</td>
</tr>
<tr>
<td>40000</td>
<td>1</td>
<td>222</td>
<td>222.222.222.222</td>
<td>7/0</td>
<td>177.0.10.3</td>
</tr>
</tbody>
</table>

Configuration Example

The following is a sample in which five VEIs are created on VCG and bundled:

cable video
  service-distribution-group sdg-vei id 1
rf-port integrated-cable 7/0/3
virtual-carrier-group vcg-vei id 1
    virtual-edge-input-ip 111.111.111.111 input-port-number 111
    virtual-edge-input-ip 222.222.222.222 input-port-number 222
    virtual-edge-input-ip 33.33.33.33 input-port-number 33
    virtual-edge-input-ip 44.44.44.44 input-port-number 44
    virtual-edge-input-ip 55.55.55.55 vrf Video-VOD-Vrf input-port-number 55
rf-channel 0-4 tsid 0-4 output-port-number 1-5
virtual-carrier-group vcg-vei1 id 2
    virtual-edge-input-ip 111.111.111.111 input-port-number 111
    virtual-edge-input-ip 222.222.222.222 input-port-number 222
    virtual-edge-input-ip 33.33.33.33 input-port-number 33
    virtual-edge-input-ip 44.44.44.44 input-port-number 44
rf-channel 5-10 tsid 5-10 output-port-number 5-10
bind-vcg
cvg vcg-vei sdg sdg-vei
cvg vcg-vei-sdg sdg-vei
logical-edge-device led-vei id 1
protocol table-based
    virtual-edge-input-ip 11.11.11.11 input-port-number 11
    virtual-edge-input-ip 22.22.22.22 input-port-number 22
    virtual-edge-input-ip 66.66.66.66 input-port-number 66
    virtual-edge-input-ip 77.77.77.77 input-port-number 77
    virtual-edge-input-ip 222.222.222.222 vrf Mgmt-MPEG-video-intf-vrf input-port-number 222
vcg vcg-vei
vei-bundle 40000 input-port-number 33,44,66,77,222
active

10-6 UDP Port Mapping

Starting from Cisco IOS XE Fuji 16.9.1, 10-6 UDP port mapping feature is supported in the table-based configuration for VOD.

To be consistent and compatible with the existing configuration, this feature adds a 10-6 UDP port mapping method to identify that this LED supports the feature, and change UDP port number to an optional parameter in the table-based session configuration.

If table-based session is not configured and 10-6 UDP port mapping is enabled for the LED, then the system generates remap sessions configuration only. If table-based session is configured, user has the option to skip providing UDP port number if he/she wants the udp port number to be automatically generated by the system.

Restrictions for 10-6 UDP Port Mapping

In order to fit the output port number and program number in a 16-bit value to represent an UDP port number per VOD session, output port number must be configured in the range of 1 to 1024, and program number must be configured in the range of 1 to 63 per QAM channel. Due to this limitation, the configuration must follow this guideline, otherwise the UDP port mapping for table-based configuration will be rejected.

UDP port mapping feature supports remap sessions configuration for table-based protocol LED only.

Configuring 10-6 UDP Port Mapping

To configure the 10-6 UDP port mapping, perform the following steps:
Verifying 10-6 UDP Port Mapping Configuration

To verify if the 10-6 UDP port mapping is enabled, use `show cable video logical-edge-device` command as shown in the following example:

```
Router# show cable video logical-edge-device id 1
Logical Edge Device: LED_DVB
Id: 1
Protocol: Table-based
Service State: Active
Discovery State: Disable
10-6 UDP Port Mapping Enabled: Yes
Number of Virtual Carrier Groups: 3
Number of Share Virtual Edge Input: 3
Number of Physical Qams: 384
Number of Sessions: 0
No Reserve PID Range

Virtual Edge Input:
Input Port: VEI Slot/Bay Bundle Gateway
ID IP ID IP
-----------------------------------------------------------------
```

10-6 UDP Port Mapping Configuration Example

Below is an example of generated session CLI commands when LED detects a UDP port mapping method is 10-6 mapping, and no table-based session is configured for the VCG.

```
Router(config)# cable video
Router(config-video)# service-distribution-group SDG_DVB id 1
Router(config-video-sdg)# rf-port integrated-cable 8/0/0
Router(config-video-sdg)# service-distribution-group sg-1 id 2
Router(config-video-sdg)# rf-port integrated-cable 9/0/0
Router(config-video-sdg)# service-distribution-group sg-2 id 3
Router(config-video-sdg)# service-distribution-group sg-2 id 3
Router(config-video-sdg)# virtual-carrier-group VCG_DVB id 1
Router(config-video-vcg)# virtual-edge-input-ip 174.103.1.1 input-port-number 2
Router(config-video-vcg)# encrypt
Router(config-video-vcg)# service-type narrowcast
Router(config-video-vcg)# rf-channel 0-4 tsid 100-104 output-port-number 10-14
Router(config-video-vcg)# virtual-carrier-group VCG_CLR id 2
Router(config-video-vcg)# virtual-edge-input-ip 174.104.1.1 input-port-number 2
Router(config-video-vcg)# service-type narrowcast
Router(config-video-vcg)# rf-channel 5-9 tsid 105-109 output-port-number 15-19
Router(config-video)# virtual-carrier-group vcg-1 id 3
```
Router(config-video-vcg)# virtual-edge-input-ip 174.101.1.1 input-port-number 1
Router(config-video-vcg)# service-type narrowcast
Router(config-video-vcg)# rf-channel 0-4 tsid 1-5 output-port-number 1-5
Router(config-video)# bind-vcg
Router(config-video-bd)# vcg VCG_DVB sdg SDG_DVB
Router(config-video-bd)# vcg vcg-1 sdg sg-1
Router(config-video-bd)# vcg VCG_CLR sdg sg-2
Router(config-video)# logical-edge-device LED_DVB id 1
Router(config-video-led)# protocol table-based
Router(config-video-led-protocol)# vcg VCG_DVB
Router(config-video-led-protocol)# vcg vcg-1
Router(config-video-led-protocol)# vcg VCG_CLR
Router(config-video-led-protocol)# virtual-edge-input-ip 1.1.1.1 input-port 4
Router(config-video-led-protocol)# virtual-edge-input-ip 2.2.2.2 input-port 5
Router(config-video-led-protocol)# virtual-edge-input-ip 3.3.3.3 input-port 6
Router(config-video-led-protocol)# vei-bundle 1 input-port 4, 5
Router(config-video-led-protocol)# vei-bundle 2 input-port 1, 3
Router(config-video-led-protocol)# udp-port-mapping-method 10-6
Router(config-video-led-protocol)# active
Router(config-video)# table-based
Router(config-video-tb)# vcg VCG_DVB
Router(config-video-tb-vcg)# rf-channel 0-4
Router(config-video-tb-vcg-sess)# session VCG_DVB input-port 2 num-sessions-per-qam 63
processing-type remap start-program 21 repeat
Router(config-video-tb)# vcg vcg-1
Router(config-video-tb-vcg)# rf-channel 0-4
Router(config-video-tb-vcg-sess)# session vcg-1 input-port 1 num-sessions-per-qam 63
processing-type remap start-program 21 repeat
Router(config-video-tb)# vcg VCG_CLR
Router(config-video-tb-vcg)# rf-channel 5-9
Router(config-video-tb-vcg-sess)# session VCG_CLR input-port 3 num-sessions-per-qam 63
processing-type remap start-program 21 repeat
Router(config-video-tb-vcg-sess)# session abc input-port 4 udp-port 1000 processing-type passthru

Feature Information for Table Based Configuration

Table 1: Feature Information for Table Based Configuration

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table based configuration</td>
<td>Cisco IOS XE Everest 16.6.1</td>
<td>This feature was integrated on the Cisco cBR Series Converged Broadband Routers.</td>
</tr>
</tbody>
</table>