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:

```
enable
configure terminal
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]
exit
```

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 VEI 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 VEI 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:
Input Port   VEI                  Slot/Bay     Bundle       Gateway
ID           IP                                ID           IP
-----------------------------------------------------------------
11           11.11.11.11          7/0          -            -
22           22.22.22.22          7/0          -            -
66           66.66.66.66          7/0          40000        177.0.10.3
77           77.77.77.77          7/0          40000        177.0.10.3
222          222.222.222.222      7/0          40000        177.0.10.3

Virtual Carrier Group:
ID  Name      Total    Total       Service-Distribution-Group   Service-Distribution-Group
              VEI      RF-channel  Name                         ID
-------------------------------------------------------------------------------------------
1   vcg-vei   5        5           sdg-vei                      1

Integrated   Physical  Admin  Operational  TSID  ONID   Output   VCG   SDG    Encryption
Cable        QAM ID    State  State                     Port     ID    ID     Capable
-------------------------------------------------------------------------------------------
7/0/3:0      208       ON     UP           0     0      1        1     1      clear
7/0/3:1      209       ON     UP           1     0      2        1     1      clear
7/0/3:2      210       ON     UP           2     0      3        1     1      clear
7/0/3:3      211       ON     UP           3     0      4        1     1      clear
7/0/3:4      212       ON     UP           4     0      5        1     1      clear
```

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.

```
Router# show cable video vei-bundle all
Total VEI Bundles: 1
Bundle       LED          Input Port   VEI              Slot/Bay     Gateway
ID           ID           ID           IP                            IP
-------------------------------------------------------------------------------
40000        1            33           33.33.33.33      7/0          177.0.10.3
40000        1            44           44.44.44.44      7/0          177.0.10.3
40000        1            66           66.66.66.66      7/0          177.0.10.3
40000        1            77           77.77.77.77      7/0          177.0.10.3
40000        1            222          222.222.222.222  7/0          177.0.10.3
```

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
  vcg vcg-vei sdg sdg-vei
  vcg vcg-vei1sdg 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 UPD 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:

```
cable video
logical-edge-device name[id id ]
protocol table-based
udp-port-mapping-method 10-6
```

If 10-6 mapping is used and no unicast remap session is configured for the VCG, table-based unicast remap sessions will be automatically created for each VCG with default setting and using the first input port configured on the VCG if any, otherwise it will use the input port from the LED. User doesn't need to explicitly provision the sessions.

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)# service-distribution-group sg-1 id 2
Router(config-video-sdg)# rf-port integrated-cable 9/0/0
Router(config-video)# service-distribution-group sg-2 id 3
Router(config-video-sdg)# rf-port integrated-cable 7/0/0
Router(config-video)# 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)# virtual-carrier-group VCG_CLR id 2
Router(config-video-vcg)# virtual-edge-input-ip 174.104.1.1 input-port-number 3
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 10.1.1.1 input-port 4
Router(config-video-led-protocol)# virtual-edge-input-ip 10.2.2.2 input-port 5
Router(config-video-led-protocol)# virtual-edge-input-ip 10.3.3.3 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

Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1: Feature Information for Table Based Configuration

Feature Name	Releases	Feature Information
Table based configuration	Cisco IOS XE Everest 16.6.1	This feature was integrated on the Cisco cBR Series Converged Broadband Routers.