









How to Use Cisco Cable SDN Application

These are some general instructions and information for using the Cisco Cable SDN application:

Icon	Description
	Information button. Click this button to display more information.
	Context Menu button. Move the mouse over this button to display a context menu.
 Detail	Detail button. Click this button to display detail information.
	Normal icon. Indicates there is no error.
	Error icon. Indicates there is error, move the mouse over this icon to check the error detail.
	Warning icon. Indicates there is warning, move the mouse over this icon to check the warning detail.

There are three features available in this release: **Inventory**, **Health Monitor** and **Spectrum Management**.

- [Inventory](#), on page 1
- [Health Monitor](#), on page 5
- [Spectrum Management](#), on page 49
- [QAM Video](#), on page 55

Inventory

Use this page to view the inventory information and configure the CMTS node.

Figure 1: Inventory Page

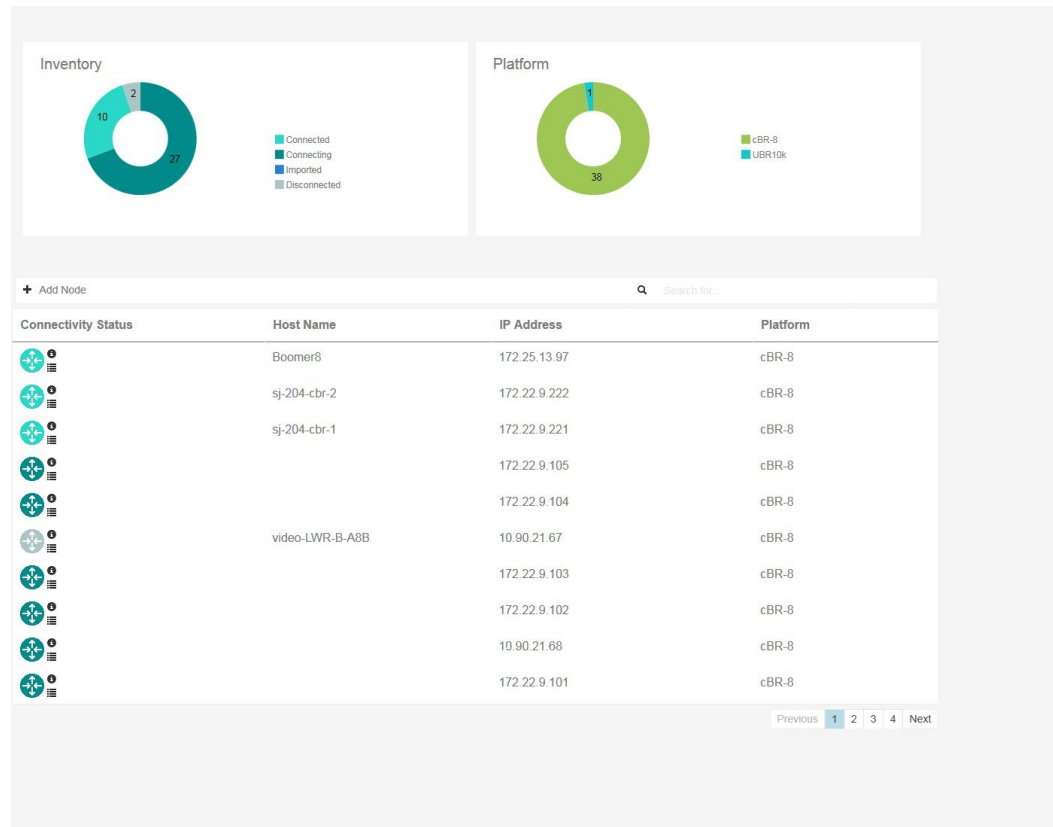


Table 1: Inventory Page Field Description

Field	Description
Connectivity Status	The working status of the CMTS node.
Host Name	The name of the CMTS node.
IP Address	The IP address of the CMTS node.
Platform	The platform of the CMTS node.

Adding CMTS Node

The Cisco Cable SDN application can only display the status and statistical data of a CMTS node that has been added in this application.

To add a CMTS node, click the **+ Add Node** button at the top left corner of the **Inventory** page. The **Add CMTS Node** window is displayed. Fill in the fields to add a new CMTS node.

Figure 2: Add CMTS Node

The screenshot shows a web form titled "Add CMTS Node". It contains five input fields, each with a label on the left and a placeholder text on the right:

- IP Address**: Device IP Address
- User Name**: Device login username
- Password**: Device login password
- Enable Password**: Device enable password
- Community String**: SNMP Community String

At the bottom right of the form, there are two buttons: "Add" and "Cancel". A vertical ID number "365192" is located on the right side of the form area.

Table 2: Add Node Field Description

Field	Description
IP Address	The IP address of the CMTS node.
User Name	The login username of the CMTS node.
Password	The login password of the CMTS node.
Enable Password	The enable password of the CMTS node.
Community String	The SNMP community string of the CMTS node.

Updating CMTS Node

To update the CMTS node, move the mouse over the **Context Menu** button to display a context menu. Choose the **Update** option to open the **Update CMTS Node** window.

Figure 3: Update CMTS Node

Update CMTS Node

IP Address 172.22.73.96

User Name admin

Password ●●●●●●

Enable Password Device enable password

Community String okcard

Update Cancel

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Update the existing field, then click **Update** to confirm.

Deleting CMTS Node

To delete the CMTS node, move the mouse over the **Context Menu** button to display a context menu. Choose the **Delete** option to delete an existing CMTS node.

Searching for a CMTS Node

To search for a specific CMTS node, type the keywords in the search box, such as host name, IP address, and platform, in partial or full, then matched CMTS node will be displayed in the **Inventory** page. For example, type **21** in the search box, the CMTS node whose host name, IP address, or platform contains **21** will be displayed in the **Inventory** page.

Figure 4: Search CMTS Node

Search for...

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Viewing CMTS Node Detail

To display the detail information of a CMTS node, click the **Information** button next to the CMTS node icon. The **Status** window is displayed.

Figure 5: CMTS Node Status

Field	Description
Hardware	CBR-8-CCAP-CHASS
Description	Buzzy
Serial Number	FXS182300DZ
Manufacturer	Cisco
Software Version	cbrsup-universalk9.2015-09-23_01.59_yucgu.SSA.bin
SNMP Status	↑

Table 3: CMTS Node Status Field Description

Field	Description
Hardware	The hardware used by the CMTS node.
Description	The name of the CMTS node.
Serial Number	The serial number of the CMTS node.
Manufacturer	The manufacturer of the CMTS node.
Software Version	The software version of the CMTS node.
SNMP Status	The status of the CMTS node.

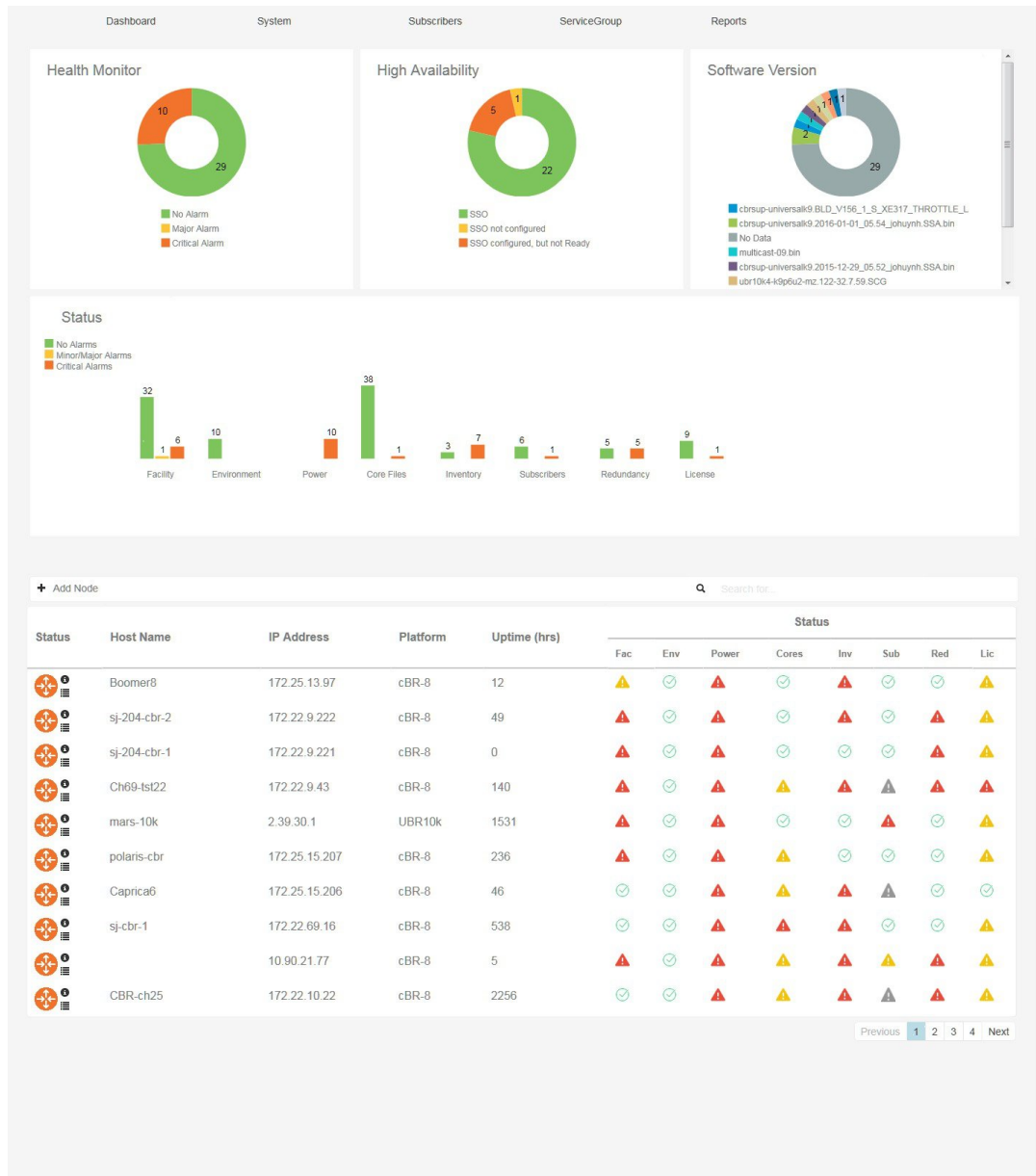
Health Monitor

There are 5 pages in this pane, each contains a different set of statistical information about the CMTS nodes.

Dashboard Page

Use this page to view detailed information of the CMTS node.

Figure 6: Dashboard Page

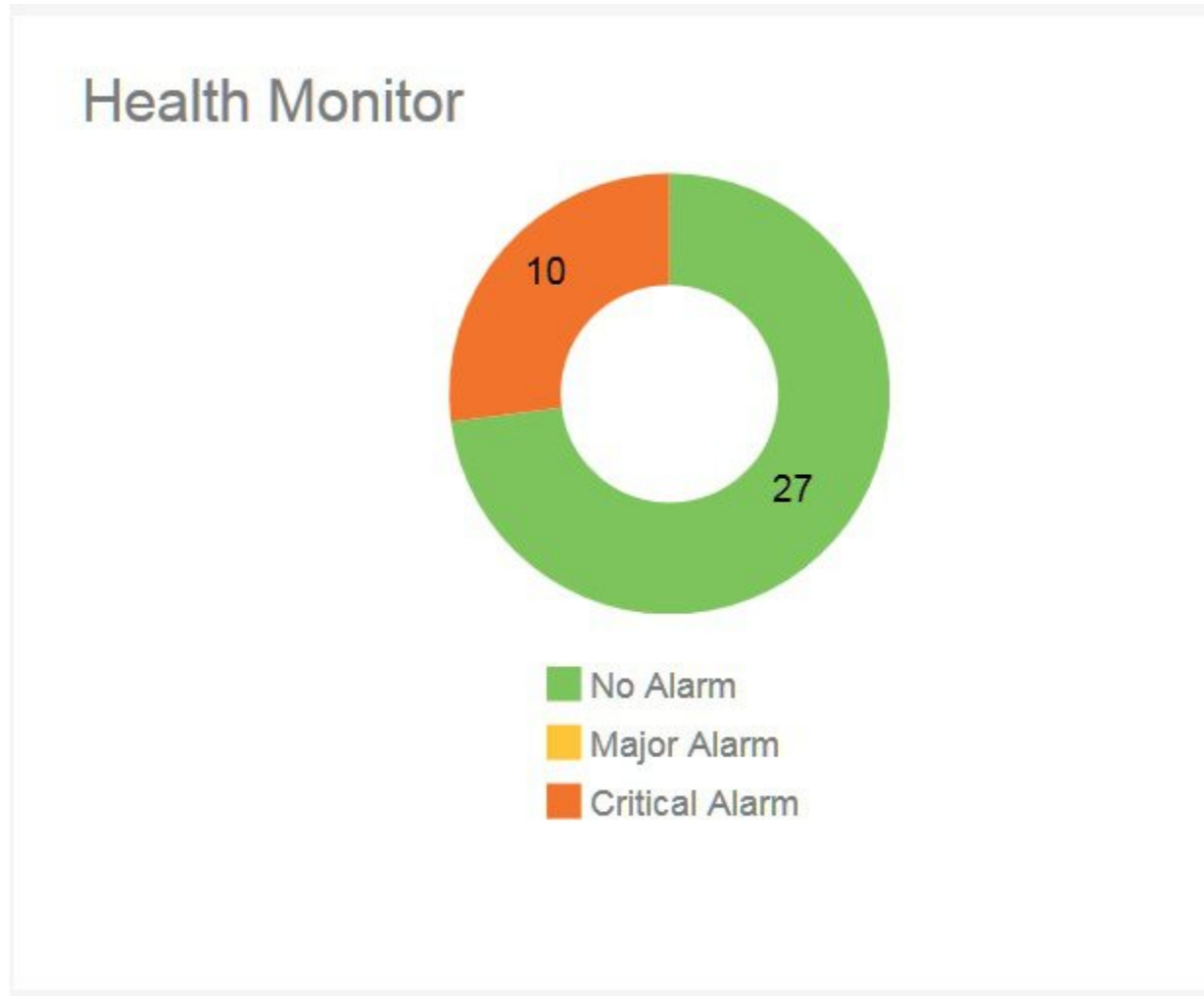


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Health Monitor

This section displays the number of CMTS nodes with different alarm status: no alarm, major/minor alarm, and critical alarm.

Figure 7: Health Monitor



High Availability

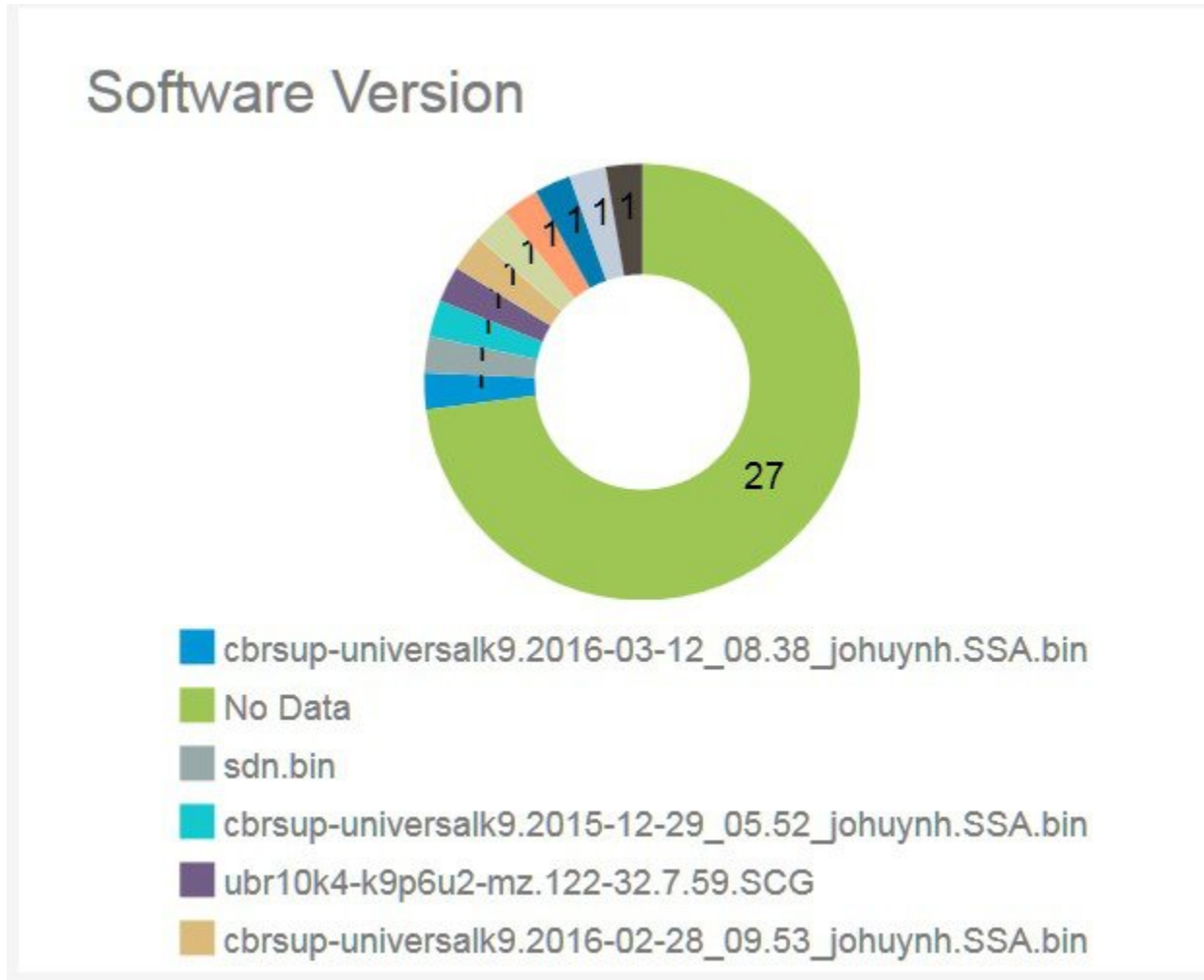
This section displays the number of CMTS nodes with different SSO status: SSO configured, SSO not configured, and SSO configured but not ready.

Figure 8: High Availability

Software Version

This section displays the number of CMTS nodes with different software versions.

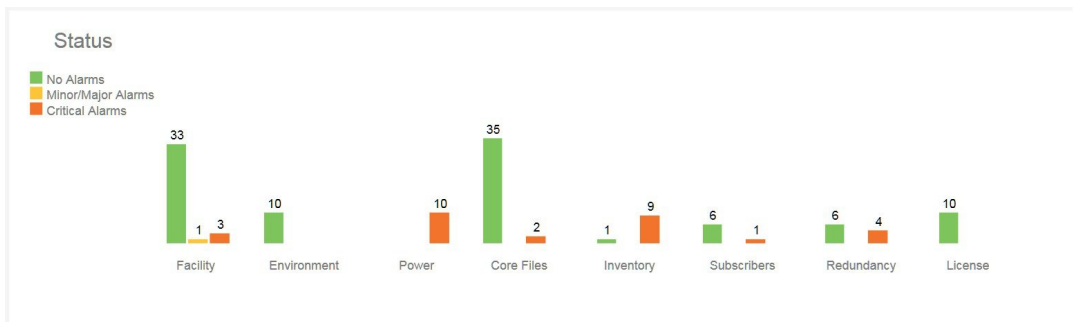
Figure 9: Software Version



Status

This section displays the number of CMTS nodes with different type of alarms: Facility, Environment, Power, Core Files, Inventory, Subscribers, Redundancy, and License.

Figure 10: Status



Alarm

In this section, there is a table listing the CMTS node basic information with their alarm details. Move the mouse over the alarm status icon to get the detailed alarm information.

The same actions can also be executed as described in the **Inventory** section.

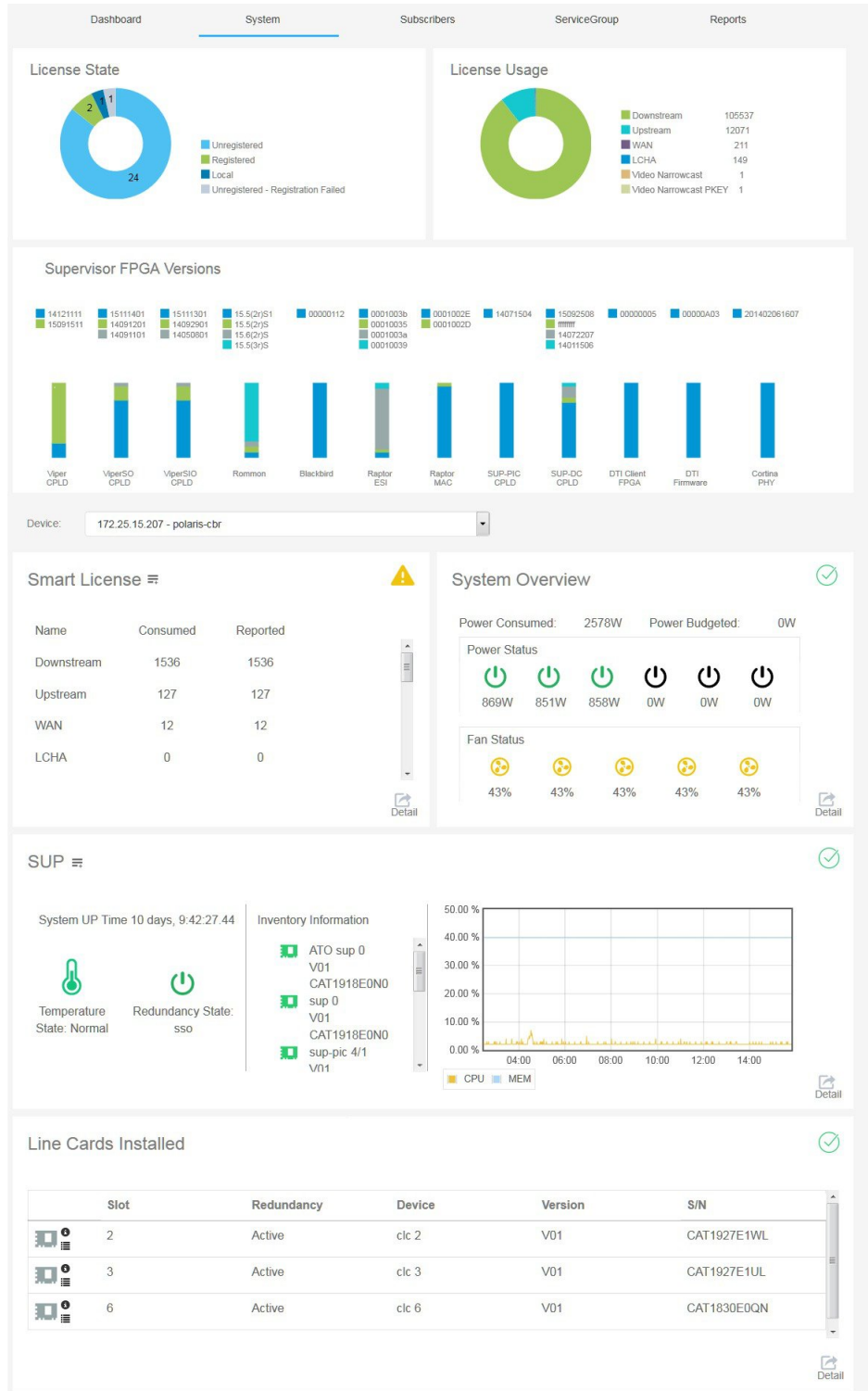
Figure 11: Alarm

Status	Host Name	IP Address	Platform	Uptime (hrs)	Status							
					Fac	Env	Power	Cores	Inv	Sub	Red	Lic
	Boomer8	172.25.13.97	cBR-8	1								
	video-LWR-B-A7T	10.90.21.64	cBR-8	48								
	Ch69-1st22	172.22.9.43	cBR-8	554								
	mars-10k	2.39.30.1	UBR10k	1854								
	video-LWR-B-A3	10.90.21.28	cBR-8	1								
	polaris-cbr	172.25.15.207	cBR-8	45								
	Caprica6	172.25.15.206	cBR-8	47								
	PSG-Golden-2	1.9.100.16	cBR-8	41								
	sj-cbr-1	172.22.69.16	cBR-8	951								
	CBR-ch25	172.22.10.22	cBR-8	2667								

System Page

Use this page to view the system related information of the CMTS nodes.

Figure 12: System Page

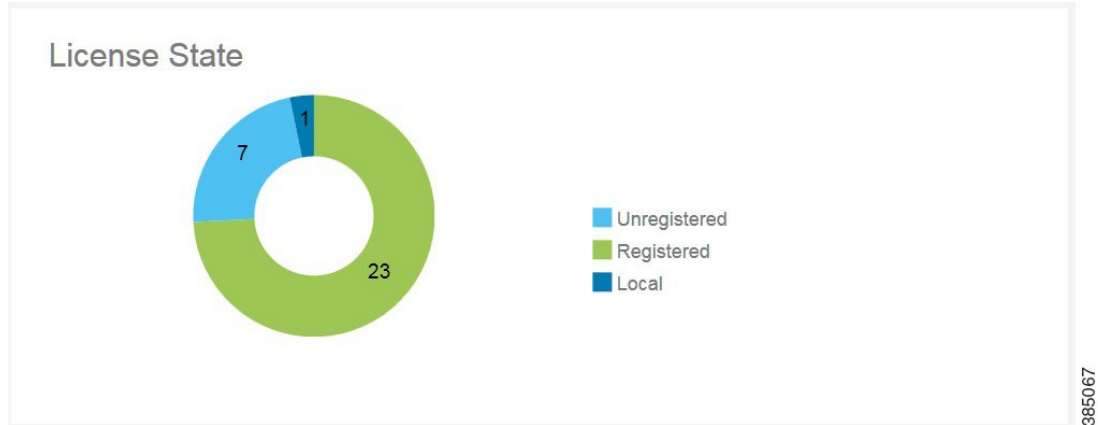


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License State

This section displays the license state for all the CMTS nodes added in the Cisco Cable SDN application.

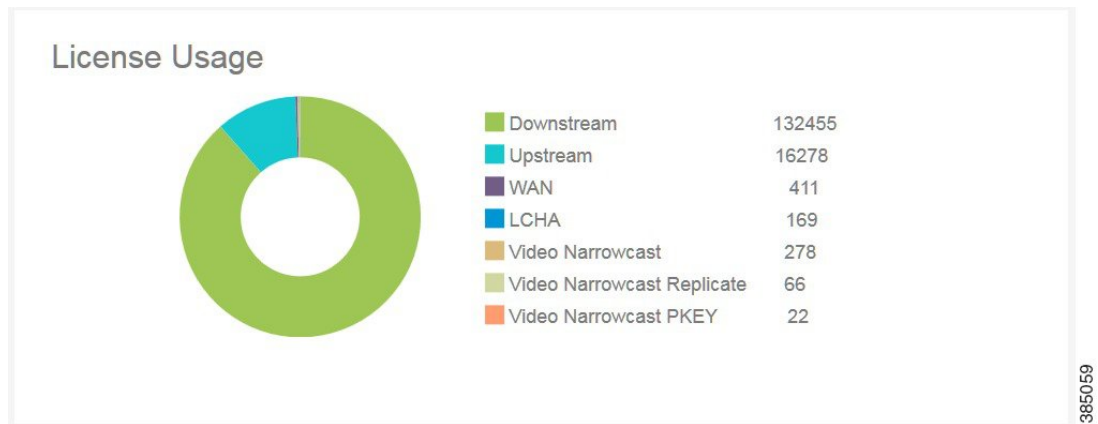
Figure 13: License State



License Usage

This section displays the license used in all the CMTS nodes added in the Cisco Cable SDN application.

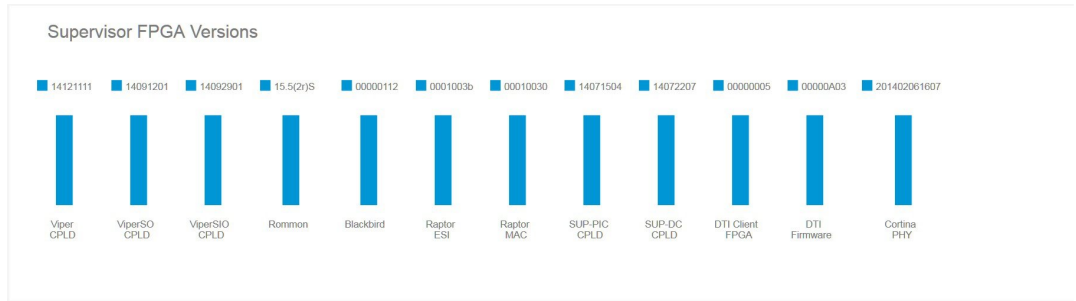
Figure 14: License Usage



Supervisor FPGA Versions

This section displays the supervisor FPGA version used in all the CMTS nodes added in the Cisco Cable SDN application.

Figure 15: Supervisor FPGA Versions



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Smart License

This section contains license related information.



Note

The information in **Smart License**, **System Overview**, **SUP**, and **Line Cards Installed** is node dependent. It means that you must choose the node in the drop down list in the middle of the **System** page to view these information of that specific node.

Figure 16: Smart License



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Table 4: Smart License Field Description

Field	Description
Name	The name of the license.
Consumed	The number of consumed license.

Field	Description
Reported	The number of consumed license that reported to SmartAgent.

Click the **Detail** button at the bottom right corner to open the **System License Detail** window.

Figure 17: System License Detail

The screenshot shows the 'System License Detail' window with a 'Back' button in the top right. The registration status is 'UNREGISTERED'. The authorization status is 'EVALUATION PERIOD EXPIRED on Mar 31 01:43:55 2012 UTC'. Below this, there are fields for 'UDI' and 'PID: Serial Number:'. A link for 'Smart License Portal' is also present. The 'License Usage Stats' table is as follows:

Licenses	Consumed	Reported	Enforcement	Restricted	Shut Channel List
Downstream	256	256	None		
Upstream	64	64	None		
WAN	4	4	None		

Below the usage stats is the 'License Server Reporting Stats' table:

Message type	Success Count	Failed Count	Inqueue count	Dropped Count	Last sent

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Table 5: System License Detail Field Description

Field	Description
Registration	The license registration status.
Authorization	The license authorization status.
PID	Product identification number.
Serial Number	Used to identify an individual, specific instance of a product.
License Usage Stats	
Licenses	The name of the license.
Consumed	The number of consumed license.
Reported	The number of consumed license that reported to SmartAgent.
Enforcement	Shows whether license enforcement exists or not.

Field	Description
Restricted	Indicates if restrictions are in effect due to out of compliance licensing.
Shut Channel List	Indicates the channels that are shut due to out of compliance licensing.
License Server Reporting Status	
Message Type	License operation type.
Success Count	Number of successful license operation.
Failed Count	Number of failed license operation.
Inqueue Count	Number of license operation to be performed.
Dropped Count	Number of license notifications that are dropped.
Last Sent	Last time the message was sent to license server.

System Overview

This section contains system overview information.

Figure 18: System Overview

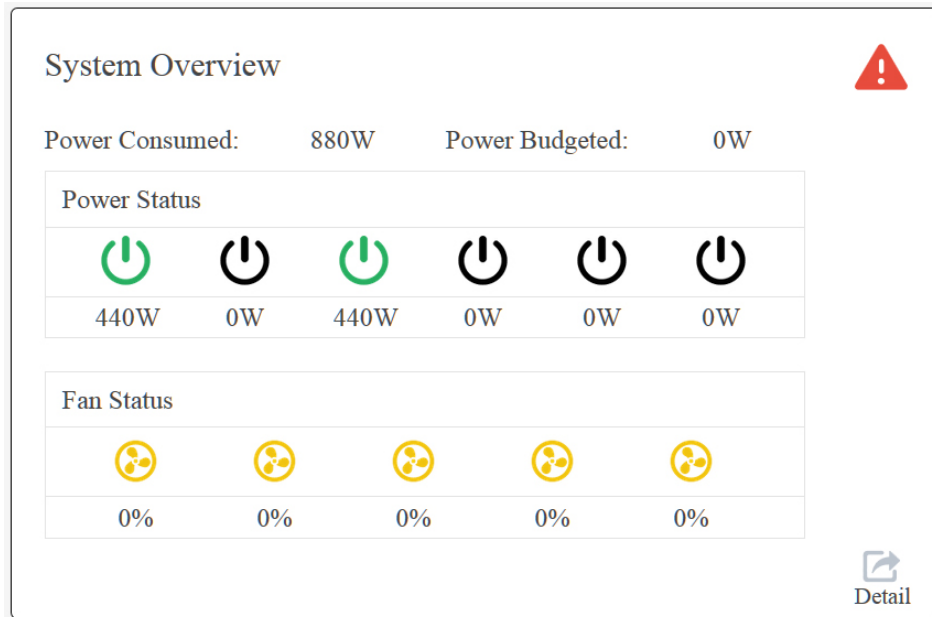


Table 6: System Overview Field Description

Field	Description
Power Consumed	Power used by the CMTS node.

Field	Description
Power Budgeted	Power allocated to the CMTS node.
Power Status	Working status of the power.
Fan Status	Fan utilization rate.

Click the **Detail** button at the bottom right corner to open the **Sensor Reading** and **Facility Alarm Details**.

Figure 19: Facility Alarm

Facility Alarm			
Time	Source	Severity	Description
Dec 31 2011 18:43:44	Power Supply Bay 1	Critical	Power Supply/FAN Module Missing [0]
Dec 31 2011 18:43:44	Power Supply Bay 3	Critical	Power Supply/FAN Module Missing [0]
Dec 31 2011 18:43:44	Power Supply Bay 4	Critical	Power Supply/FAN Module Missing [0]
Dec 31 2011 18:43:44	Power Supply Bay 5	Critical	Power Supply/FAN Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 0	Critical	Fan Tray Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 0	Critical	System shutdown will occur in few min [1]
Dec 31 2011 18:43:44	Fan Slot 1	Critical	Fan Tray Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 1	Critical	System shutdown will occur in few min [1]
Dec 31 2011 18:43:44	Fan Slot 2	Critical	Fan Tray Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 2	Critical	System shutdown will occur in few min [1]
Dec 31 2011 18:43:44	Fan Slot 3	Critical	Fan Tray Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 3	Critical	System shutdown will occur in few min [1]
Dec 31 2011 18:43:44	Fan Slot 4	Critical	Fan Tray Module Missing [0]
Dec 31 2011 18:43:44	Fan Slot 4	Critical	System shutdown will occur in few min [1]
Dec 31 2011 18:44:52	TenGigabitEthernet4/1/3	Info	Physical Port Administrative State Down [36]
Dec 31 2011 18:44:52	TenGigabitEthernet4/1/5	Info	Physical Port Administrative State Down [36]
Dec 31 2011 18:44:52	TenGigabitEthernet4/1/6	Info	Physical Port Administrative State Down [36]
Dec 31 2011 18:44:52	TenGigabitEthernet4/1/7	Info	Physical Port Administrative State Down [36]
Dec 31 2011 18:43:45	sup 1	Major	Unknown state [0]

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Table 7: Facility Alarm Field Description

Field	Description
Time	The time when alarm occurred.
Source	The equipment that triggered alarm.
Severity	The severity of the alarm.
Description	Alarm detail information.

Figure 20: Sensor Readings

Sensor Readings			
Slot	Name	State	Value
4/1	Temp: INLET	Normal	31 Celsius
4/1	Temp: OUTLET	Normal	31 Celsius
4/1	Temp: INLETPD	Normal	30 Celsius
4/1	Temp: OUTLETPD	Normal	35 Celsius
P0	Temp: INLET	Normal	24 Celsius
P0	Temp: OUTLET	Normal	46 Celsius
P2	Temp: INLET	Normal	23 Celsius
P2	Temp: OUTLET	Normal	53 Celsius
R0	Temp: Y0_DIE	Normal	38 Celsius
R0	Temp: VP_DIE	Normal	27 Celsius
R0	Temp: RT-E_DIE	Normal	39 Celsius
R0	Temp: INLET_1	Normal	25 Celsius
R0	Temp: INLET_2	Normal	24 Celsius
R0	Temp: OUTLET_1	Normal	27 Celsius
3	Temp: CAPRICA	Normal	37 Celsius
3	Temp: BASESTAR	Normal	52 Celsius
3	Temp: RAIDER	Normal	48 Celsius
3	Temp: CPU	Normal	33 Celsius
3	Temp: INLET	Normal	23 Celsius
3	Temp: OUTLET	Normal	37 Celsius
3	Temp: DIGITAL	Normal	34 Celsius
3	Temp: UPX	Normal	29 Celsius
3	Temp: LEOBEN1	Normal	33 Celsius
3	Temp: LEOBEN2	Normal	37 Celsius

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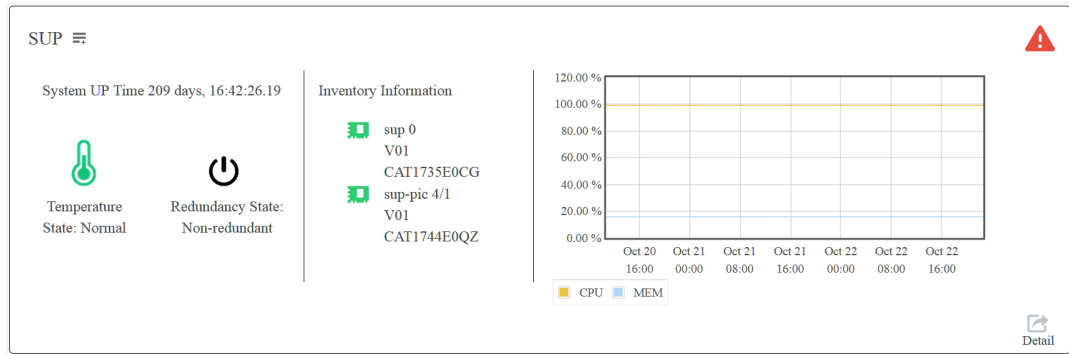
Table 8: Sensor Readings Field Description

Field	Description
Slot	Slot where the sensor resides.
Name	Sensor name.
State	Sensor status.
Value	Sensor reading.

SUP Information

This section contains supervisor related information.

Figure 21: SUP



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Click the **Detail** button at the bottom right corner to open the **Supervisor Card** window.

Figure 22: Supervisor Card Stats



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Forwarding Plane Stats

This section contains hardware packet forwarding statistics.

Figure 23: Forwarding Plane Stats



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CPP State

This section contains CPP state information.

Figure 24: CPP State

CPP State

CPP State : ENABLE

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CPP Load

This section contains CPU utilization information.

Figure 25: CPP Load

Subdev	5 Seconds	1 Minute	5 Minutes	60 Minutes
CPP 0: Subdev 0	0	0	0	0

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Table 9: CPP Load Field Description

Field	Description
Subdev	Core in the CPP.
5 Seconds	Average CPU utilization in 5 seconds.
1 Minute	Average CPU utilization in 1 minute.
5 Minutes	Average CPU utilization in 5 minute.
60 Minutes	Average CPU utilization in 60 minute.

Global Drops

This section contains dropping packets information.

Figure 26: Global Drops

Type	Drop Count	Drop Rate (p/s)
BadAdj	3	0.0000
BadUidbSubIdx	408107	0.0000
CbIBfNullRepllist	425	0.0000
CbIBfReplicationStart	67	0.0000
InjectErr	67	0.0000
InvL2Hdr	7944	0.0000
IpTtlExceeded	401729645	0.0000
Ipv4NoAdj	22980	0.0000
Ipv4NoRoute	403023069	0.0000
Ipv6Badhop	178377	0.0000
Ipv6Badsource	51	0.0000
Ipv6NoAdj	238	0.0000
Mpls	356669900	0.0000
MplsNoRoute	27	0.0000
MplsUnclassified	53	0.0000
NoDefDib	44	0.0000
PuntPerCausePolicerDrops	8422	0.0000
UnconfiguredFia	5599955	0.5968
UnconfiguredIpv4Fia	6308	0.0000

365241

Table 10: Global Drops Field Description

Field	Description
Type	The reason for dropping packets.
Drop Count	Number of packets that are dropped.
Drop Rate (p/s)	Number of packets that are dropped in one second.

Packet Buffer Usage

This section contains packet buffer memory utilization details.

Figure 27: Packet Buffer Usage

Yoda	Utilization
Yoda: 0	0 %

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Table 11: Global Drops Field Description

Field	Description
Yoda	Yoda module number.
Utilization	Packet buffer memory utilization.

Queue Usage

This section contains user queue information.

Figure 28: Queue Usage

Yoda	Active Queues	Total Queues	Percent Used
Yoda: 0	4045	128000	3.1602

Table 12: Queue Usage Field Description

Field	Description
Yoda	Yoda module number.
Active Queue	The active user queue.
Total Queue	The maximum user queue supported.
Percent Used	The percentage of the queue being used.

ESI State

This section contains ESI link statistical information.

Figure 29: ESI State

Link Name	Link Status	High (p/s)	Low (p/s)	Bad (p/s)	Dropped (p/s)	Error (p/s)
SUP0	ok, active					
Slot R1-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot R0-Link A	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot F1-Link A	RX link Init	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 3-Link A	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link A	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link B	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link C	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link D	RX link locked	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link E	RX link Init	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link F	RX link Init	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link G	RX link Init	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 4-Link H	RX link Init	0.0000	0.0000	0.0000	0.0000	0.0000
SUP1	unknown					
Slot R1-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot R0-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot F0-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 3-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link A	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link B	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link C	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link D	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link E	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link F	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link G	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000
Slot 5-Link H	RX link down	0.0000	0.0000	0.0000	0.0000	0.0000

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Table 13: ESI State Field Description

Field	Description
Link Name	ESI Link connection.
Link Status	Status of the link to the other component.
High (p/s)	Maximum packets per second to the other component.
Low (p/s)	Minimum packets per second to the other component.
Bad (p/s)	Number of uncorrectable packets per second.
Dropped (p/s)	Number of dropped packets per second.
Error (p/s)	Number of error packets per second.

TCAM Memory Stats

This section contains TCAM memory statistical information.

Figure 30: TCAM Memory Stats



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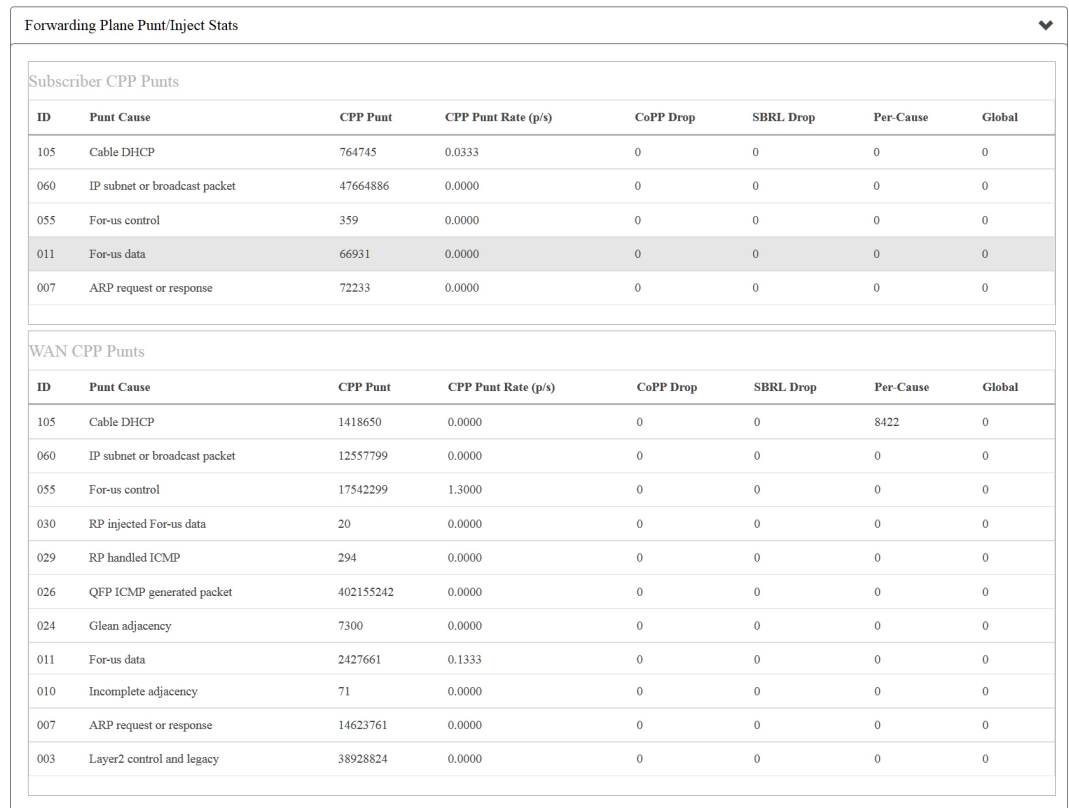
Table 14: TCAM Memory Stats Field Description

Field	Description
Memory Threshold Status	Top utilization of the TCAM.
TCAM Errors	Errors detected in TCAM memory.

Forwarding Plane Punt/Inject Stats

This section contains statistics for the packets that forwarded to/from the Supervisor card.

Figure 31: Forwarding Plane Punt/Inject Stats



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Table 15: Forwarding Plane Punt/Inject Stats Field Description

Field	Description
ID	Priority identifier.
Punt Cause	Reason for punting the packet to the local CPU.
CPP Punt	Number of packets punted for this reason.
CPP Punt Rate (p/s)	Punt rate for this reason.
CoPP Drop	Number of packets of this type dropped due to CoPP policy.
SBRL Drop	Number of packets dropped due to SBRL enforcement.
Pre-Cause	Specifies the aggregate per cause punt statistics.
Global	Specifies the aggregate drop statistics.

FPGA/CPLD Info

This section contains firmware versioning information.

Figure 32: FPGA/CPLD Info

FPGA/CPLD Info	
Slot 4	
Name	Version
CPLD version	14121111
Rommon version	15.5(2r)S
Blackbird version	00000112
Raptor ESI version	00010035
Raptor MAC version	0001002D
SUP-PIC CPLD version	14071504
SUP-DC CPLD version	ffffff
DTI Client FPGA version	00000005
DTI Firmware version	00000A03
Cortina PHY version	201402061607
Slot 5	
Name	Version
CPLD version	N/A
Rommon version	N/A
Blackbird version	N/A
Raptor ESI version	N/A
Raptor MAC version	N/A
SUP-PIC CPLD version	N/A
SUP-DC CPLD version	N/A
DTI Client FPGA version	N/A
DTI Firmware version	N/A
Cortina PHY version	N/A

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Table 16: FPGA/CPLD Info Field Description

Field	Description
Name	The firmware name.
Version	The firmware version.

Redundancy Info

This section contains the information about the redundancy configuration and statistics.

Figure 33: Redundancy Info

Name	Information
Switchovers	0
Standby Failures	0
Switchover Reason	none
Hardware Mode	Simplex
Configured Redundancy Mode	sso
Operating Redundancy Mode	Non-redundant
Maintenance Mode	Disabled
Communications	
Location	slot 4
Software State	ACTIVE
Configuration Register	0x0
Crash Directory	Directory of bootflash:/crash!* No such file 7800705024 bytes total (3098939392 bytes free)

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CPU, Mem and Processes Stats

This section contains CPU, memory and process statistics.

Figure 34: CPU, Mem and Processes Stats

Slot	CPU %	Mem-Used (Kbytes)	Mem-Free (Kbytes)
4	99%	7796032	41421300

Slot	IOS Process	CPU %
4	cmmand	0%
4	emid	7%
4	fman_rp	4%
4	hman	2%
4	imand	6%
4	linux_iosd-imag	0%
4	smand	0%
4	vman	3%
4	crman_fp	0%
4	fman_fp_image	0%
4	hman	2%
4	cmcc	7%
4	emid	3%
4	hman	2%
4	iomd	3%

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Table 17: CPU, Mem and Processes Stats Field Description

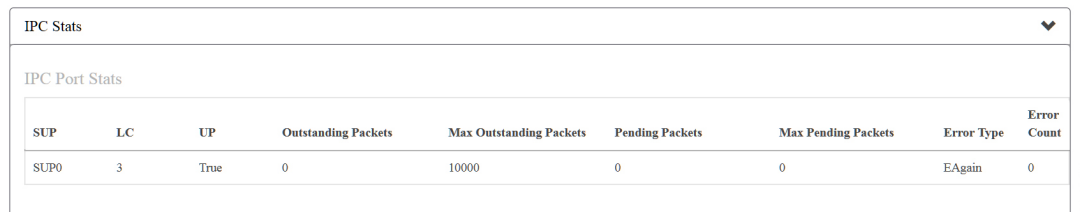
Field	Description
CPU/Mem Utilization Stats	

Field	Description
Slot	The slot where the SUP resides.
CPU %	CPU utilization.
Mem-Used (Kbytes)	The memory used by the SUP.
Mem-Free (Kbytes)	Free memory.
CPU Utilization-IOS Processes	
Slot	The slot where the SUP resides.
IOS Process	IOS process name.
CPU %	CPU utilization of the process.
CPU Utilization-BINOS Processes	
Slot	The slot where the SUP resides.
BINOS Process	BINOS process name.
CPU %	CPU utilization of the process.

IPC Stats

This section contains communication statistics between the supervisor card and cable line cards.

Figure 35: IPC Stats



The screenshot shows a web interface for 'IPC Stats'. Below the title, there is a section for 'IPC Port Stats' containing a table with the following data:

SUP	LC	UP	Outstanding Packets	Max Outstanding Packets	Pending Packets	Max Pending Packets	Error Type	Error Count
SUP0	3	True	0	10000	0	0	EAgain	0

Table 18: IPC Stats Field Description

Field	Description
SUP	The SUP that is communicating.
LC	The line card that is communicating with this SUP.
UP	Indicates if the communication is operational.
Outstanding Packets	The number of packets that is not sent.
Max Outstanding Packets	The maximum number of packets that is not sent.
Pending Packets	The number of packets that is to be sent.

Field	Description
Max Pending Packets	The maximum number of packets that is to be sent.
Error Type	Type of error.
Error Count	The number of the error packets.

Line Cards Installed

This section contains line card related information.

Figure 36: Line Cards Installed

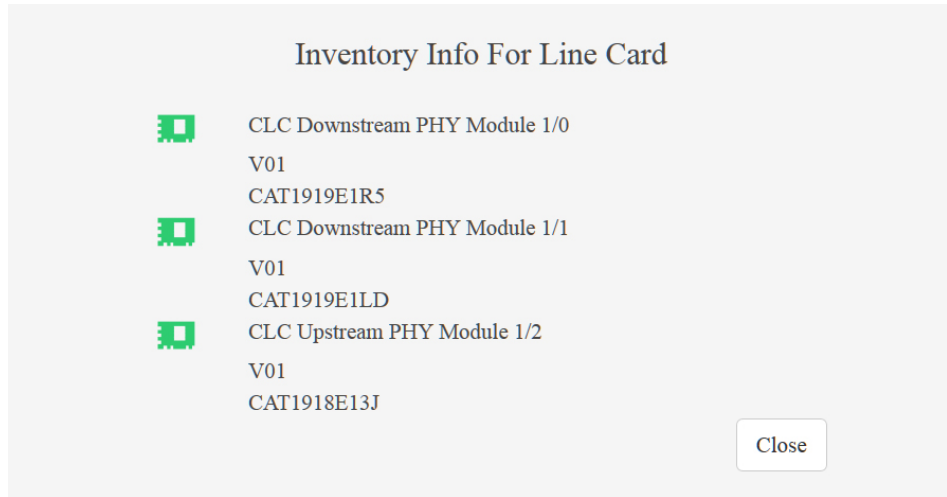
Slot	Redundancy	Device	Version	S/N
2	Active	clc 2	V01	CAT1927E1WL
3	Active	clc 3	V01	CAT1927E1UL
6	Active	clc 6	V01	CAT1830E0QN

Table 19: Line Cards Installed Field Description

Field	Description
Slot	Slot where the line card resides.
Redundancy	Line card state.
Device	Line card name.
Version	Line card version.
S/N	Line card serial number.

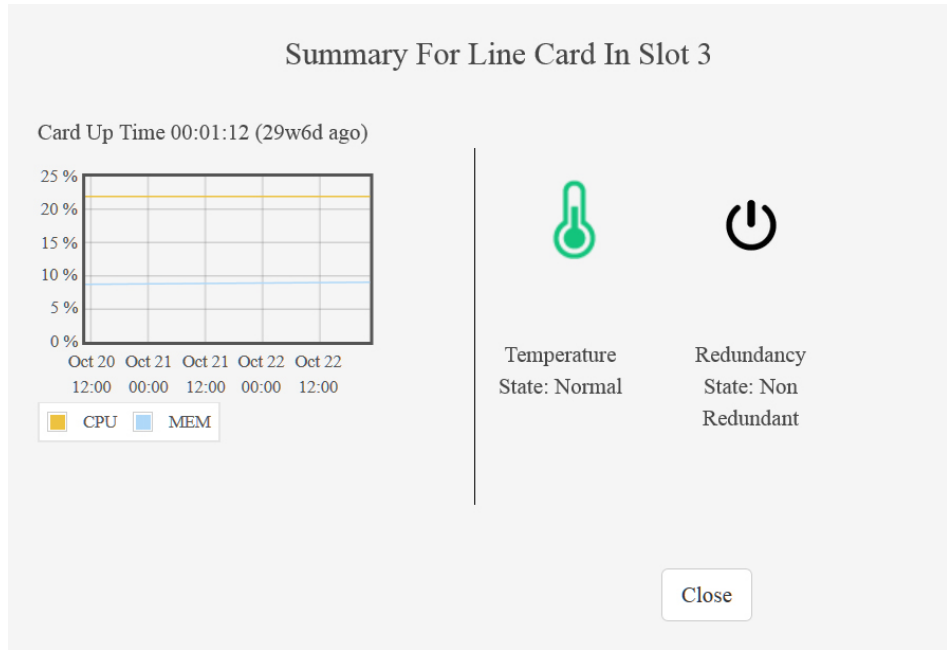
To view the Inventory Information for a line card, click the **Information** button corresponding to the specific line card, the **Inventory Info for Line Card** window is displayed, containing the line card name, version and S/N.

Figure 37: Inventory Info for Line Card



To view the summary information for a line card, move the mouse over the **Context Menu** button corresponding to the specific line card, then select **Summary** in the pop up menu, the **Summary for Line Card in Slot x** is displayed, containing the line card up time, CPU and memory utilization, temperature state and redundancy state.

Figure 38: Summary for Line Card in Slot x



Click the **Detail** button at the bottom right corner to open the **Cable Line Cards** page.

Figure 39: Cable Line Cards

365224

FPGA/CPLD Info

This section contains firmware versioning information.

Figure 40: FPGA/CPLD Info

Name	Version
CPLD version	0001011C
Rommon version	2011.03.12
Basestar version	00020035
Raider version	00010009
Caprica version	00000017

365226

Table 20: FPGA/CPLD Info Field Description

Field	Description
Name	The firmware name.
Version	The firmware version.

Redundancy Info

This section contains the information about the redundancy configuration and statistics.

Figure 41: Redundancy Info

Redundancy Info	
Name	Information
Slot	3
Role	Active
Mode	None
LC Group	
Peer Slot	
Peer State	

365228

CPU, Mem and Processes Stats

This section contains CPU, memory and process statistics.

Figure 42: CPU, Mem and Processes Stats

CPU, Mem and Processes Stats			
CPU/Mem Utilization Stats			
Slot	CPU %	Mem-Used (Kbytes)	Mem-Free (Kbytes)
3	22	2216168	22361320
CPU Utilization - IOS Processes			
Slot	IOS Process	CPU %	
3	DOCSIS Load balancing Task	4	
	UBR_INFRA_STATS	1	
CPU Utilization - BINOS Processes			
Slot	BINOS Process	CPU %	
3	edman	9	
	emcc	0	
	hman	20	
	lchaman	0	
	ubrcle-k9le-ms	2	

365225

Table 21: CPU, Mem and Processes Stats Field Description

Field	Description
CPU/Mem Utilization Stats	
Slot	The slot where the line card resides.
CPU %	CPU utilization.
Mem-Used (Kbytes)	The memory used by the line card.
Mem-Free (Kbytes)	Free memory.
CPU Utilization-IOS Processes	

Field	Description
Slot	The slot where the line card resides.
IOS Process	IOS process name.
CPU %	CPU utilization of the process.
CPU Utilization-BINOS Processes	
Slot	The slot where the line card resides.
BINOS Process	BINOS process name.
CPU %	CPU utilization of the process.

IPC Stats

This section contains communication statistics between cable line cards.

Figure 43: IPC Stats

SUP	LC	UP	Outstanding Packets	Max Outstanding Packets	Pending Packets	Max Pending Packets	Error Type	Error Count
SUP0	3	True	0	10000	0	0	EAgain	0

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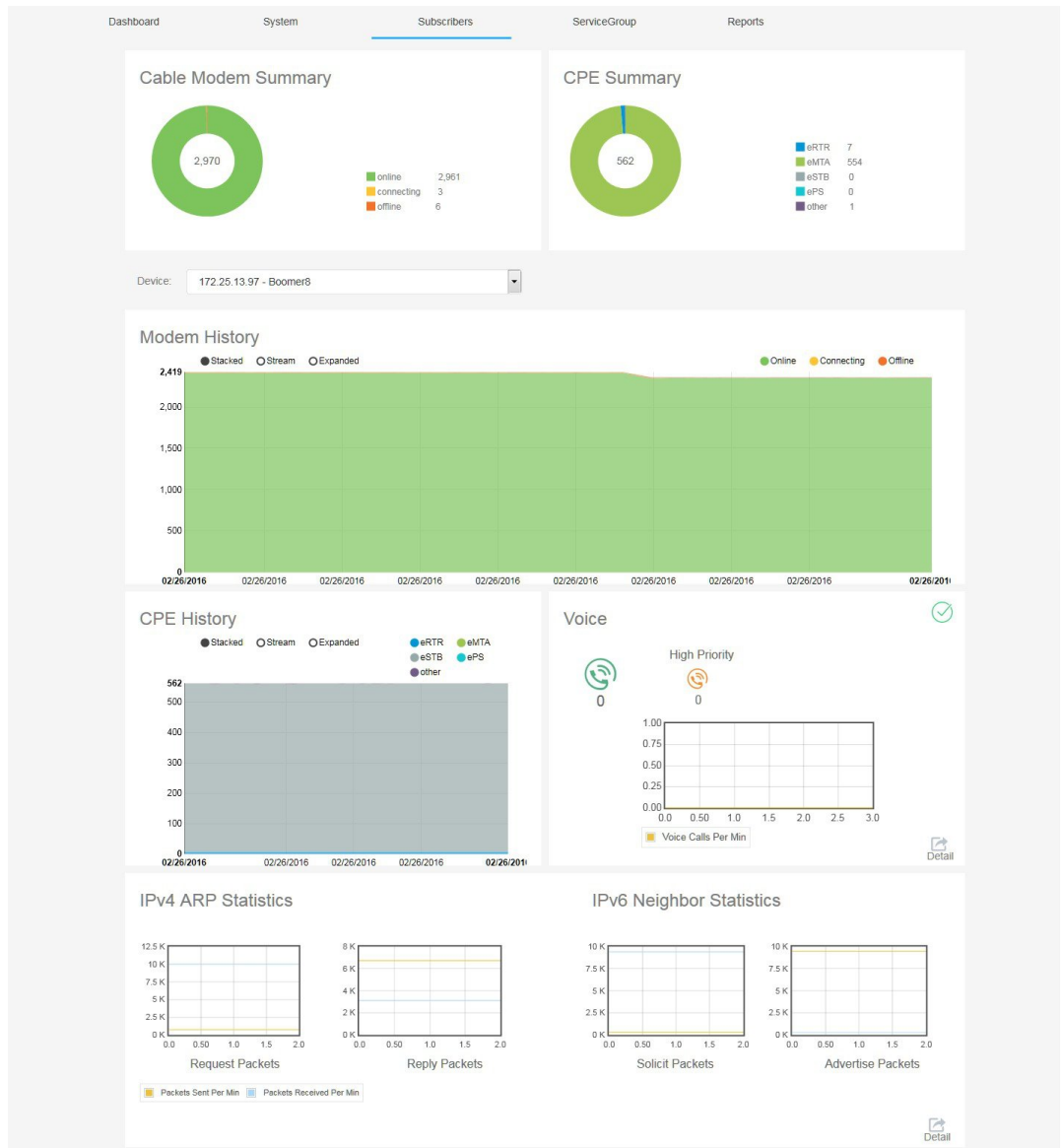
Table 22: IPC Stats Field Description

Field	Description
SUP	The SUP that is communicating.
LC	The line card that is communicating with each other.
UP	Indicates if the communication is operational.
Outstanding Packets	The number of packets that is not sent.
Max Outstanding Packets	The maximum number of packets that is not sent.
Pending Packets	The number of packets that is to be sent.
Max Pending Packets	The maximum number of packets that is to be sent.
Error Type	Type of error.
Error Count	The number of the error packets.

Subscribers Page

Use this page to view the subscribers related information of the CMTS node.

Figure 44: Subscribers Page



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Cable Modem Summary

This section displays the number of cable modem with different status for all the CMTS nodes added in the Cisco Cable SDN application.

Figure 45: Cable Modem Summary

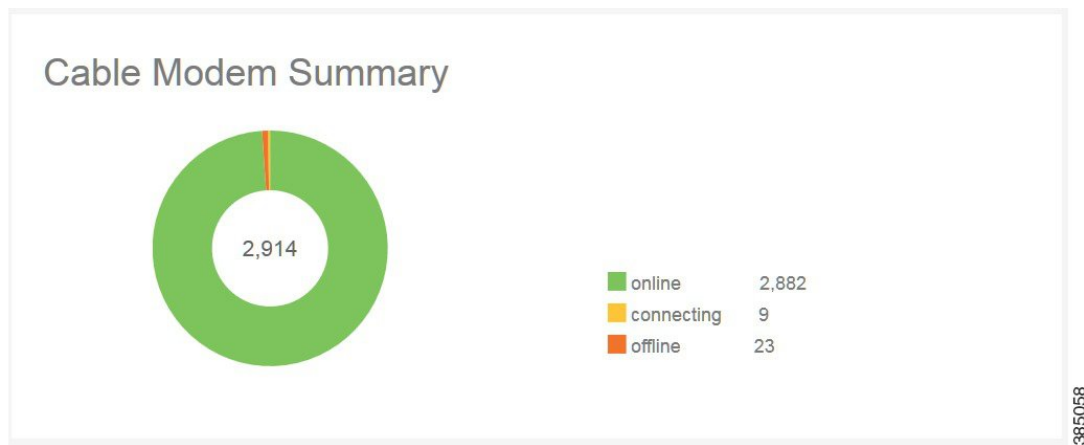


Table 23: Cable Modem Field Description

Field	Description
Online	Total number of online cable modems.
Connecting	Total number of cable modems that are connecting.
Offline	Total number of offline cable modems.

Click the **Detail** button at the bottom right corner of the IPv4 ARP Statistics and IPv6 Neighbor Statistics section to open the **Subscriber Group Detail** page.

Figure 46: Modems

Modems										
Slot	Total	Registered	Ranging	DHCP	TFTP	IPv4	IPv6	Dual Stack	Rejected	Flapcount
7	522	519	0	0	1	447	42	31	0	120
Total	522	519	0	0	1	447	42	31	0	120

Table 24: Modems Field Description

Field	Description
Slot	Slot where the line card resides.
Total	Total number of cable modems.
Registered	Total number of cable modems that have registered with the Cisco CMTS.
Ranging	Total number of cable modems that are ranging.
DHCP	Total number of cable modems that use DHCP address assignment.

Field	Description
TFTP	Total number of cable modems that download the configuration file via TFTP.
IPv4	Total number of cable modems that use IPv4 addressing.
IPv6	Total number of cable modems that use IPv6 addressing.
Dual Stack	Total number of cable modems that support both IPv4 and IPv6 addressing modes.
Rejected	Number of rejected modems.
Flapcount	Number of modems flapping on this line card.

CPE Summary

This section displays the number of CPE with different status for all the CMTS nodes added in the Cisco Cable SDN application.

Figure 47: CPE Summary

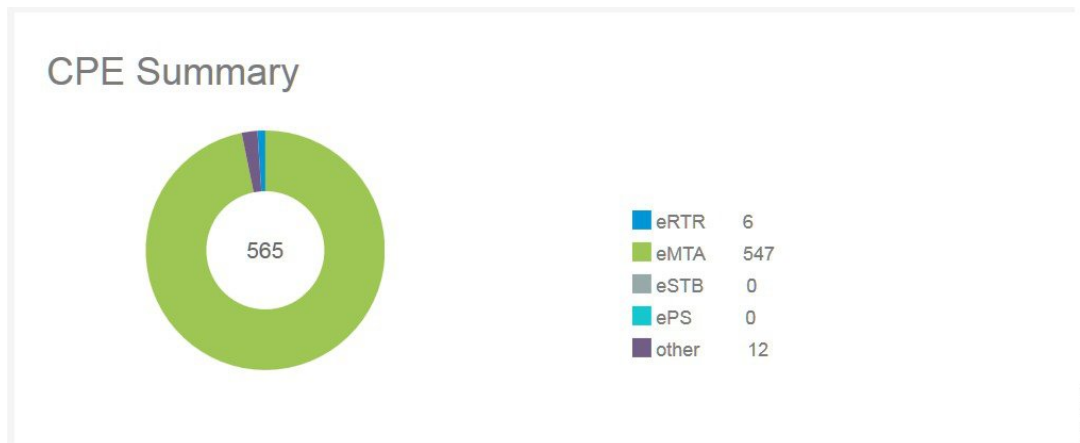


Table 25: CPE Field Description

Field	Description
eRTR	Total number of CPE on this interface that have reported the device class as an embedded router.
eMTA	Total number of CPE on this interface that have reported the device class as an embedded multimedia terminal adapter.
eSTB	Total number of CPE on this interface that have reported the device class as an embedded set-top box.

Field	Description
ePS	Embedded Portal Service Element. A CableHome-compliant eSAFE that provides management and network address translation functions between the DOCSIS network and the home network.
Other	Total number of PC or other nondescript devices.

Click the **Detail** button at the bottom right corner of the IPv4 ARP Statistics and IPv6 Neighbor Statistics section to open the **Subscriber Group Detail** page.

Figure 48: CPE Detail

CPE										
Slot	Total	Connected	eRTR	eMTA	eSTB	ePS	Other	IPv4	IPv6	Dual Stack
7	208	0	0	206	0	0	2	0	0	0
Total	208	0	0	206	0	0	2	0	0	0

365214

Table 26: CPE Detail Field Description

Field	Description
Slot	Slot where the line card resides.
Total	Total number of CPE.
Connected	Total number of CPE that are connected to cable modem.
eRTR	Total number of CPE on this interface that have reported the device class as an embedded router.
eMTA	Total number of CPE on this interface that have reported the device class as an embedded multimedia terminal adapter.
eSTB	Total number of CPE on this interface that have reported the device class as an embedded set-top box.
Other	Other device type such as Host, CPE, etc.
IPv4	Total number of CPE that use IPv4 addressing.
IPv6	Total number of CPE that use IPv6 addressing.
Dual Stack	Total number of CPE that support both IPv4 and IPv6 addressing modes.

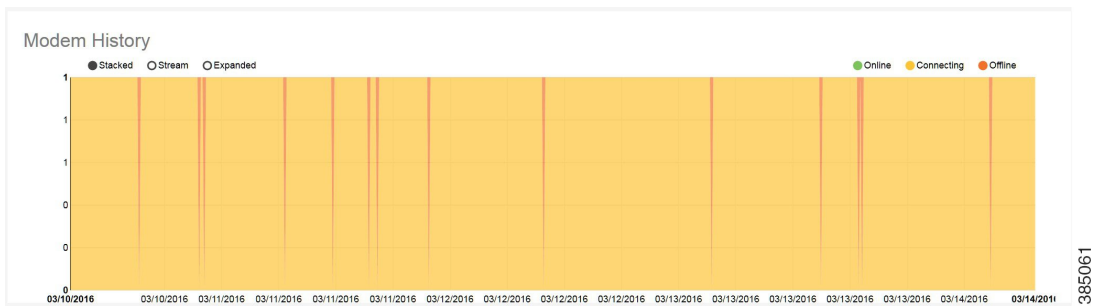
Modem History

This section contains a chart illustrating the modem number in a past few days. There are 3 types of chart to choose from: stacked chart, stream chart, and expanded chart. You can also filter the modems with different status displayed in the chart.



Note The information in **Modem History**, **CPE History**, **Voice**, **IPv4 ARP Statistics**, and **IPv6 Neighbor Statistics** is node dependent. It means that you must choose the node in the drop down list in the middle of the **Subscribers** page to view these information of that specific node.

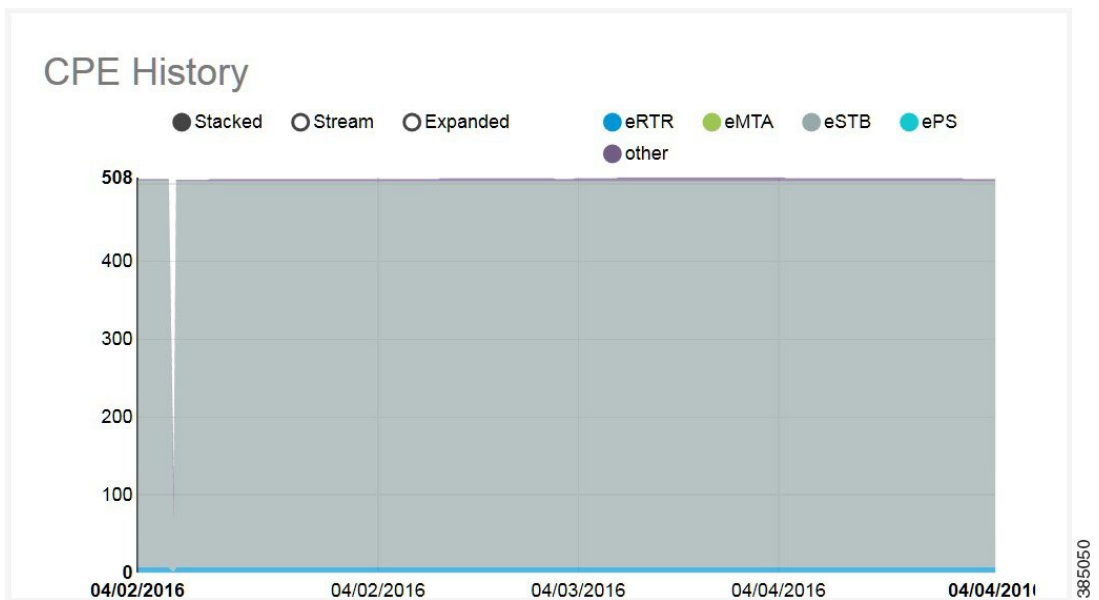
Figure 49: Modem History



CPE History

This section contains a chart illustrating the CPE number in a past few days. There are 3 types of chart to choose from: stacked chart, stream chart, and expanded chart. You can also filter the CPE with different status displayed in the chart.

Figure 50: CPE History



Voice

This section contains voice call information.

Figure 51: Voice

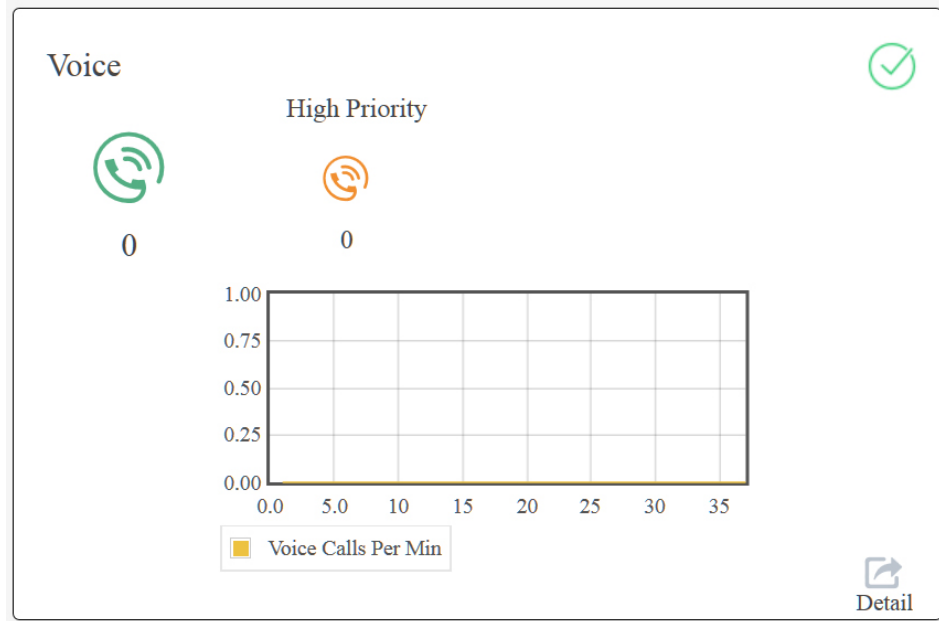


Table 27: Voice Field Description

Field	Description
Voice	Total number of voice calls.
High Priority	Total number of high priority voice calls (911 calls).

Click the **Detail** button at the bottom right corner to open the **Subscriber Group Detail - Voice** page.

Figure 52: Subscriber Group Detail - Voice

Slots	Calls	High Pri Calls	Total Gates	Committed Gates	Uncommitted Gates
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
Total	0	0	0	0	0

Address	Port	State	Keepalive Timeout
4.3.2.151	64139	Up	10
4.3.3.151	64140	Up	10
4.3.0.145	34020	Up	60
4.3.0.146	54512	Up	60

Address	Port	Client Address	Versions
4.3.2.151	64139	5.10.0.94	4
4.3.3.151	64140	5.10.0.104	4
4.3.0.145	34020	5.10.0.94	3
4.3.0.146	54512	5.10.0.94	3

Table 28: Subscriber Group Detail - Voice Field Description

Field	Description
Voice Calls	
Slot	Slot where the line card resides.
Calls	Total number of voice calls.
High Pri Calls	Total number of high priority voice calls.
Total Gates	Total number of open transactions.
Committed Gates	Total number of committed but not activated transactions.
Uncommitted Gates	Total number of transactions that have not been committed.
COPS Servers	
Address	COPS server IP address.
Port	COPS server port number.

Field	Description
State	Availability state.
Keepalive Timeout	A period of idle time after which the connection will terminate.
Call Management Servers	
Address	Call management server IP address.
Port	Call management server port number.
Client Address	Call management client IP address.
Versions	Call manager COPS version.

IPv4 ARP Statistics

This section contains IPv4 ARP statistics.

Figure 53: IPv4 ARP Statistics

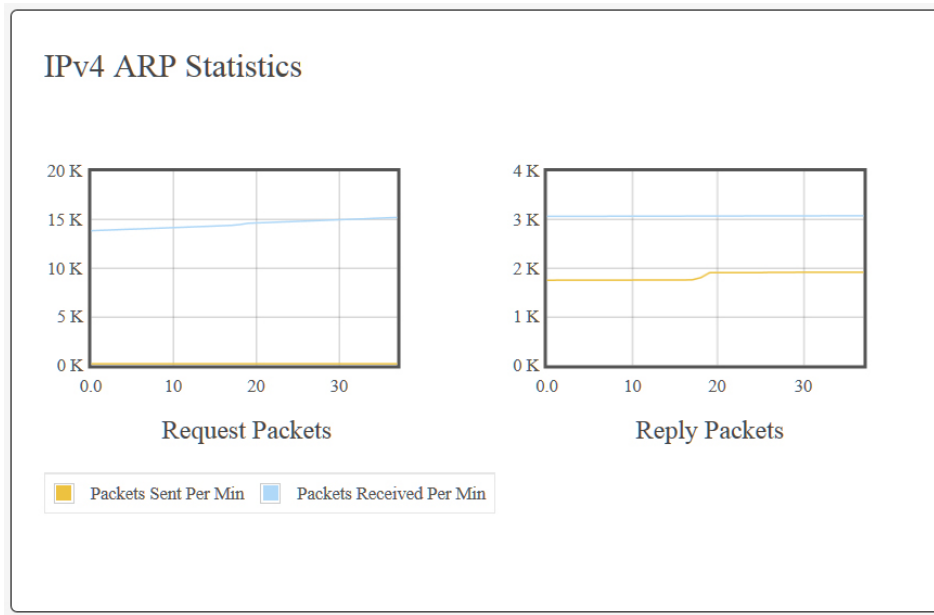


Table 29: IPv4 ARP Statistics Field Description

Field	Description
Request Packets	The number of ARP requests sent/received per second.
Reply Packets	The number of ARP reply packets send/received per second.

Click the **Detail** button at the bottom right corner of the IPv4 ARP Statistics and IPv6 Neighbor Statistics section to open the **Subscriber Group Detail** page.

Figure 54: IPv4 ARP Status



365217

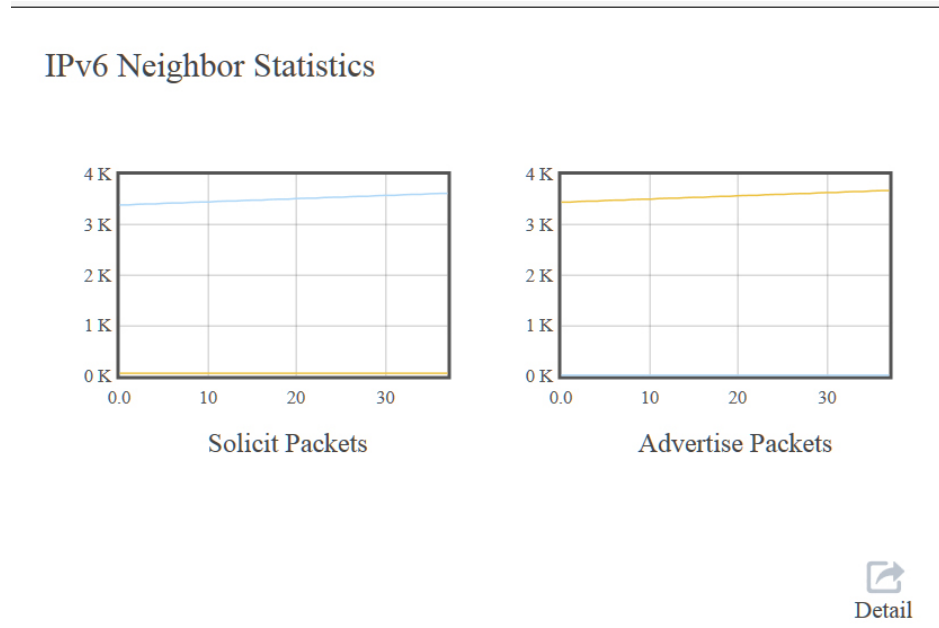
Table 30: IPv4 ARP Status Field Description

Field	Description
Total	Total number of ARP packets.
Incomplete	The number of unresolved ARP packets.
Send	The number of ARP packets sent per seconds.
Received	The number of ARP packets received per seconds.

IPv6 Neighbor Statistics

This section contains IPv6 neighbor statistics.

Figure 55: IPv6 Neighbor Statistics



365218

Table 31: IPv6 Neighbor Statistics Field Description

Field	Description
Solicit Packets	The number of ARP request per second.
Advertise Packets	The number of ARP response per second.

Click the **Detail** button at the bottom right corner of the IPv4 ARP Statistics and IPv6 Neighbor Statistics section to open the **Subscriber Group Detail** page.

Figure 56: IPv6 Neighbor Statistics Detail

Packet	Sent	Received
Solicit	0.00 pps	0.00 pps
Advertise	0.00 pps	0.00 pps

Total: 1245 Incomplete: 0

365219

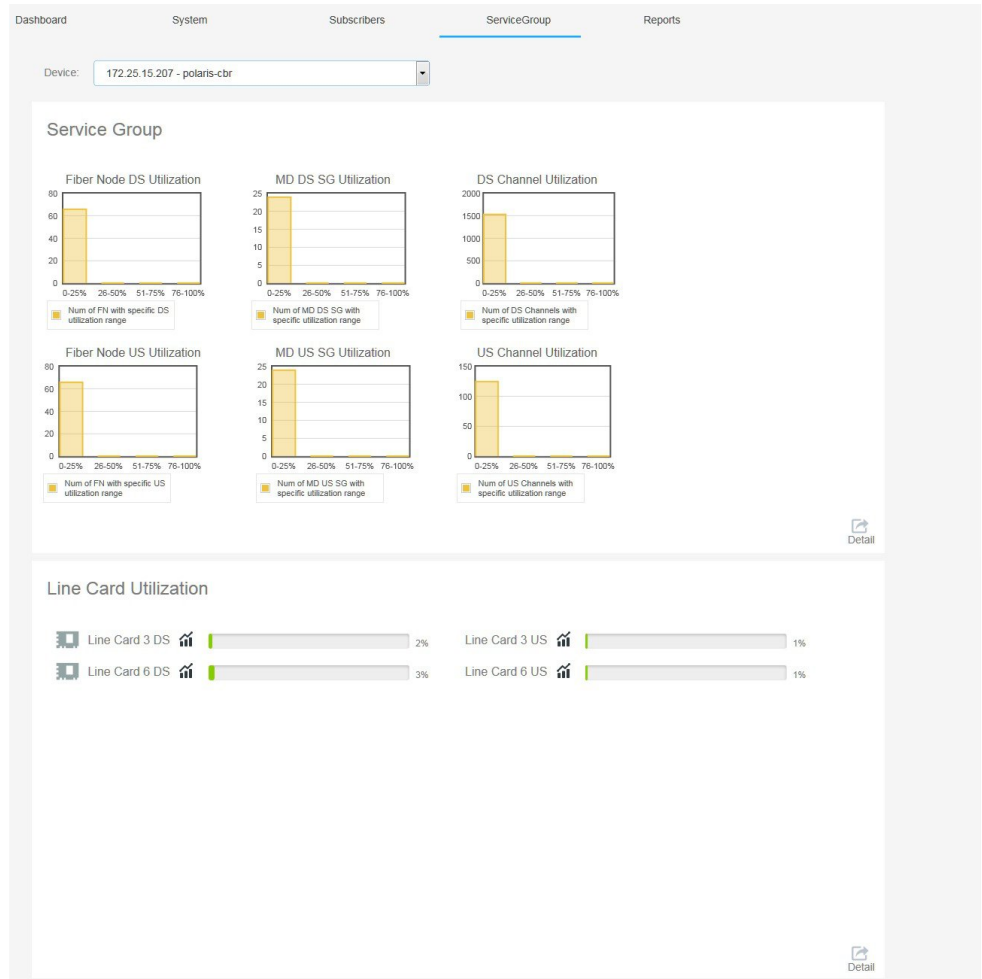
Table 32: IPv6 Neighbor Statistics Detail Field Description

Field	Description
Total	Total number of ARP packets.
Incomplete	The number of unresolved ARP packets.
Send	The number of ARP packets sent per seconds.
Received	The number of ARP packets received per seconds.

Service Group Page

Use this page to view the service group related information of a CMTS node. The information displayed in this page is node dependent. It means that you must choose the node in the drop down list to view the information of that specific node.

Figure 57: Service Group Page



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Service Group

This section contains service group related information.

Figure 58: Service Group



Table 33: Service Group Field Description

Field	Description
Fiber Node DS Utilization	Current utilization of the Fiber Node Downstream.
MD DS SG Utilization	Current utilization of the MAC Domain Downstream Service Group.
DS Channel Utilization	Downstream channel utilization.
Fiber Node US Utilization	Current utilization of the Fiber Node Upstream.
MD US SG Utilization	Current utilization of the MAC Domain Upstream Service Group.
US Channel Utilization	Upstream channel utilization.

Click the **Detail** button at the bottom right corner of the Service Group section to open the **Utilization** page.

Figure 59: Utilization



Fibernode Utilization

This section contains fibernode utilization information.

Figure 60: Fibernode Utilization

Fibernode	DS Throughput (Mbps)	Max DS Capacity (Mbps)	DS Utilization	US Throughput (Mbps)	Max US Capacity (Mbps)	US Utilization
Fibernode 1	1397	3600	39%	44	122	36%
Fibernode 10	1398	3600	39%	44	122	37%
Fibernode 11	1397	3600	39%	44	122	36%
Fibernode 12	1398	3600	39%	44	122	36%
Fibernode 13	1398	3600	39%	44	122	36%
Fibernode 14	1398	3600	39%	44	122	37%
Fibernode 15	1398	3600	39%	44	122	36%
Fibernode 16	1398	3600	39%	44	122	37%
Fibernode 2	1398	3600	39%	44	122	36%
Fibernode 21	30	3600	1%	0	122	0%

365646

Table 34: Fibernode Utilization Field Description

Field	Description
Fibernode	Fibernode serving the area.
DS Throughput (Mbps)	Downstream Throughput in Mbps.
Max DS Capacity (Mbps)	Downstream Capacity in Mbps.
DS Utilization	Downstream utilization in %.
US Throughput (Mbps)	Upstream Throughput in Mbps.
Max US Capacity (Mbps)	Upstream Capacity in Mbps.
US Utilization	Upstream utilization in %.

MD DS SG Utilization

This section contains MD DS SG utilization information.

Figure 61: MD DS SG Utilization

MD DS SG	Throughput(Mbps)	Max Capacity	Utilization
C1/0/0#11	1397	3600	39%
C1/0/1#9	1398	3600	39%
C1/0/10#8	1397	3600	39%
C1/0/11#7	1398	3600	39%
C1/0/12#7	1398	3600	39%
C1/0/13#8	1398	3600	39%
C1/0/14#7	1398	3600	39%
C1/0/15#15	1398	3600	39%
C1/0/2#10	1397	3600	39%
C1/0/3#8	1398	3600	39%

MD DS SG Utilization

Search for...

Show 10 entries

Previous 1 2 3 4 Next

365648

Table 35: MD DS SG Utilization Field Description

Field	Description
MD DS SG	MAC Domain Downstream service group number.
Throughput (Mbps)	MAC domain downstream service group throughput in Mbps.
DS Capacity (Mbps)	Maximum MAC domain downstream service group bandwidth in Mbps.
Utilization	Maximum MAC domain downstream service group bandwidth utilization.

MD US SG Utilization

This section contains MD US SG utilization information.

Figure 62: MD US SG Utilization

MD US SG	Throughput(Mbps)	Max Capacity (Mbps)	Utilization
C1/0/0#1	44	122	36%
C1/0/1#1	44	122	36%
C1/0/10#1	44	122	36%
C1/0/11#1	44	122	37%
C1/0/12#1	44	122	37%
C1/0/13#1	44	122	36%
C1/0/14#1	44	122	36%
C1/0/15#1	44	122	36%
C1/0/2#1	44	122	36%
C1/0/3#1	44	122	37%

365649

Table 36: MD US SG Utilization Field Description

Field	Description
MD US SG	MAC domain upstream service group number.
Throughput (Mbps)	MAC domain upstream service group throughput in Mbps.
Max Capacity (Mbps)	Maximum MAC domain upstream service group bandwidth in Mbps.
Utilization	Maximum MAC domain upstream service group bandwidth utilization.

Controller Utilization

This section contains controller utilization information.

Figure 63: Integrated Cable

Channel	Throughput(Mbps)	Max Capacity (Mbps)	Utilization
---------	------------------	---------------------	-------------

385053

Table 37: Integrated Cable Field Description

Field	Description
Channel	Downstream channel number referencing a frequency.
Throughput (Mbps)	Downstream channel throughput in Mbps.

Field	Description
Max Capacity (Mbps)	Maximum downstream channel bandwidth in Mbps.
Utilization	Downstream channel bandwidth utilization.

Figure 64: Upstream Cable

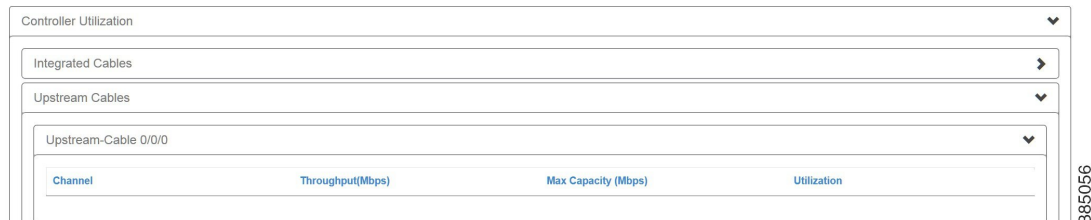


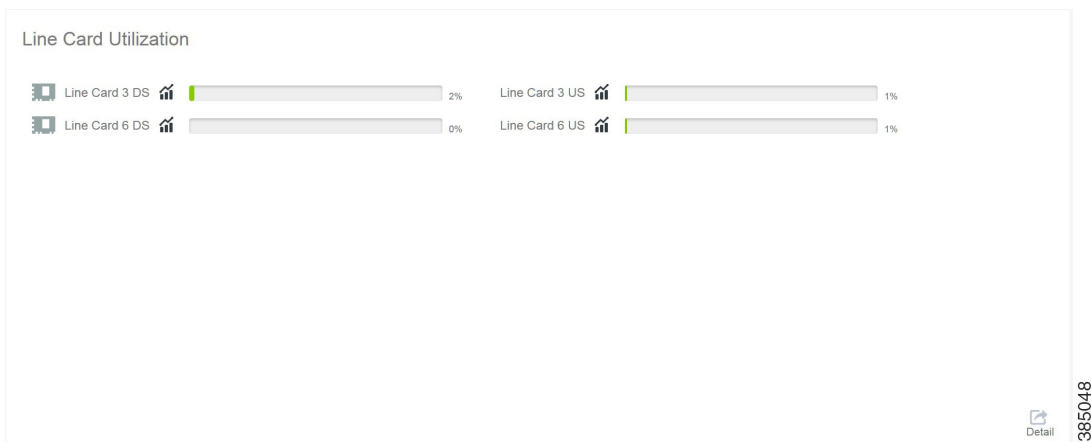
Table 38: Upstream Cable Field Description

Field	Description
Channel	Upstream channel number referencing a frequency.
Throughput (Mbps)	Upstream channel throughput in Mbps.
Max Capacity (Mbps)	Maximum upstream channel bandwidth in Mbps.
Utilization	Upstream channel bandwidth utilization.

Line Card Utilization

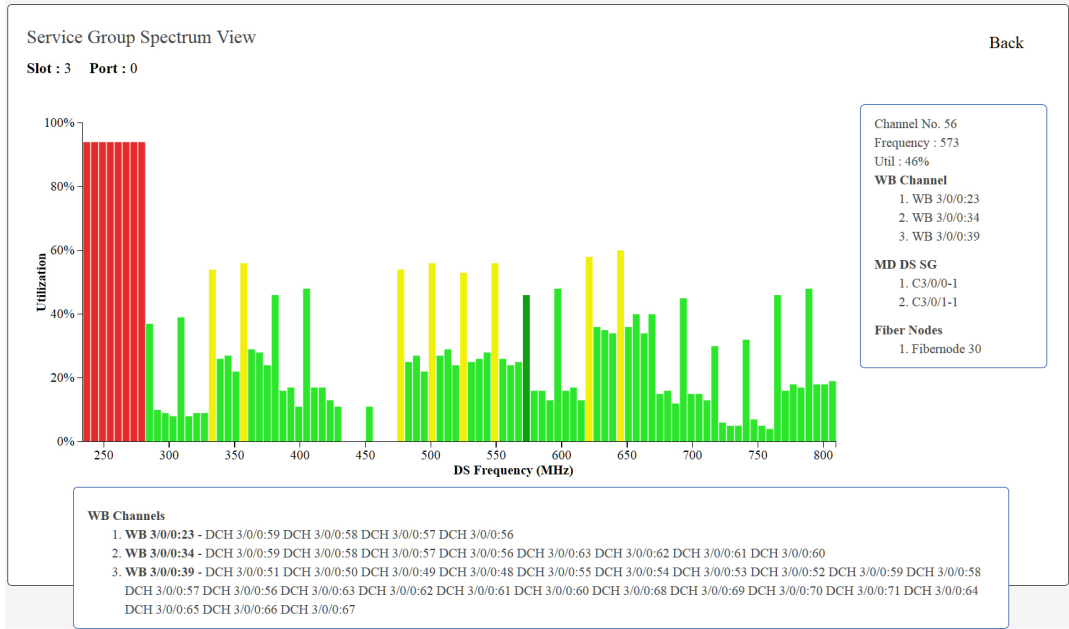
This section contains line card utilization related information.

Figure 65: Line Card Utilization



Move the mouse over the icon next to the line card name, a port list will be displayed, listing each port utilization. Then move the mouse over one of the ports and click, you can see the spectrum view of the line card utilization. Red means high unitization, yellow means medium utilization, and green means low utilization.

Figure 66: Spectrum View



365204



Spectrum Management

Use this page to generate spectrum chart, spectrogram, and signal SNR, CNR, data SNR chart of a cable modem.

General Instructions

These are some general instructions and information used in this feature:

Icon	Description
	Start generating the chart according to the defined parameters.
	Pause generating the chart.
	Stop generating the chart.
	Add Single Channel or Modem.
	Save the data for a specific period.
	Take snapshot of the screen.
	Playback the data saved using Timing Video button.

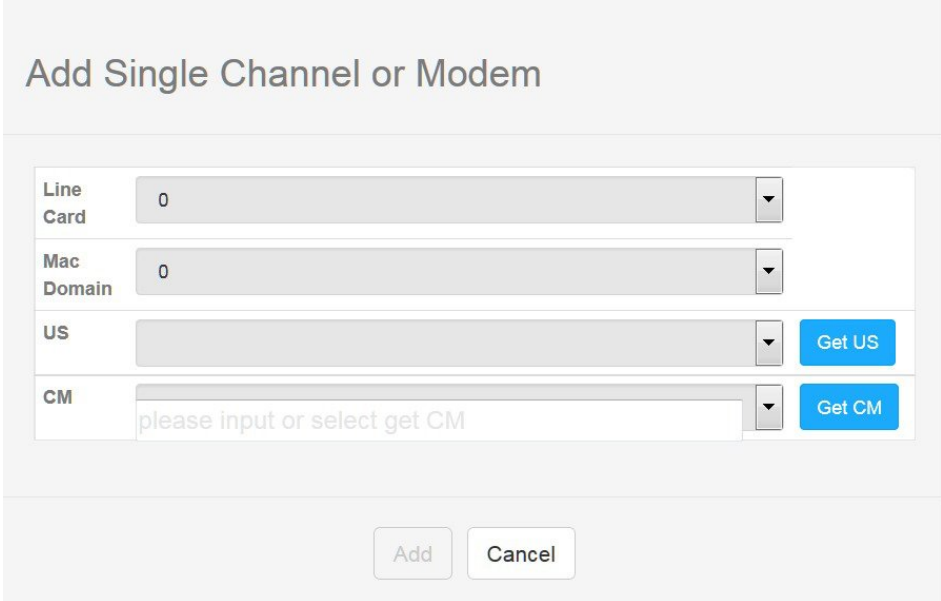
Icon	Description
	Save the data to your local computer.
	Delete the data.

Adding Single Channel or Modem

In order to generate chart in the Spectrum Management feature, you must add single channel or modem first. To add single channel or modem, follow the steps below:

1. Click the **Add Modem** button, **Add Single Channel or Modem** window is displayed.

Figure 67: Add Single Channel or Modem



2. Choose the line card and MAC domain from the drop down list.
3. Click the **Get US** button to get the upstream channel.
4. Click the **Get CM** button to get the cable modem belongs to the upstream channel.
5. Select a cable modem from the cable modem list.
6. Click the **Add** button to add the cable modem. Then the cable modem will be displayed on the page.

Spectrum US

Use this page to monitor power and noise levels for a selected modem.

Figure 68: Spectrum US



In this page, you can set the following parameters:

- **Interval** - The interval to gather the data.
- **Step** - It is related to the resolution of the chart. The bigger this value is, the more accurate the chart will be.
- **Max** - Displays the chart that shows the maximum power level.
- **Min** - Displays the chart that shows the minimum power level.
- **Average** - Displays the chart that shows the average power level.
- **Smooth** - Displays the chart that shows the power on a frequency based on its own value and neighboring power values.

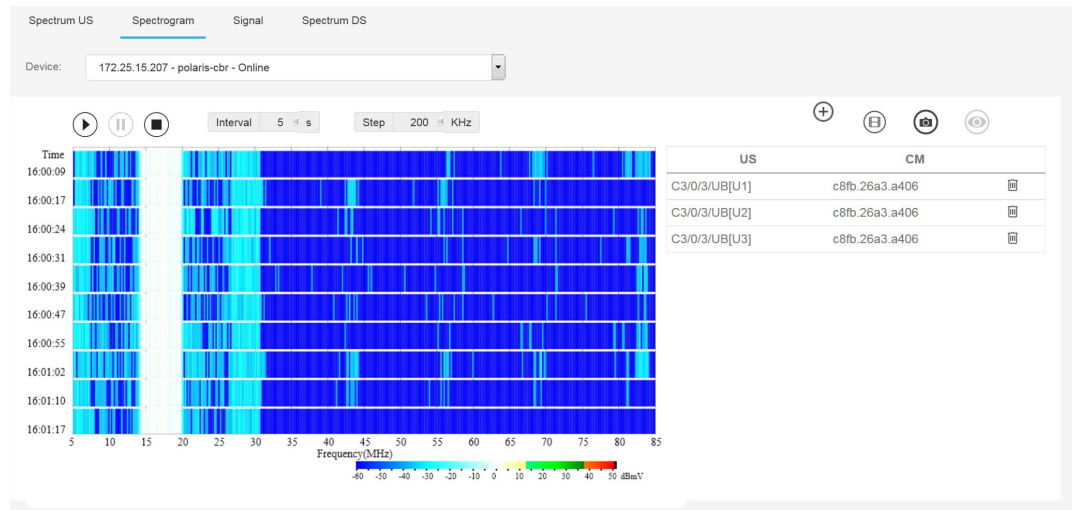
To generate the spectrum chart for a specific cable modem, follow the steps below:

1. Add a cable modem following the instructions in the [Adding Single Channel or Modem](#).
2. Set the interval and step for the data collection.
3. Check the Max, Min, Average, and Smooth check box as needed.
4. Click the **Start** button to start generating the chart.

Spectrogram

Use this page to monitor power and noise levels, while viewing the added dimension of time for a selected modem.

Figure 69: Spectrogram



In this page, you can set the following parameters:

- **Interval** - The interval to gather the data.
- **Step** - It is related to the resolution of the chart. The bigger this value is, the more accurate the chart will be.

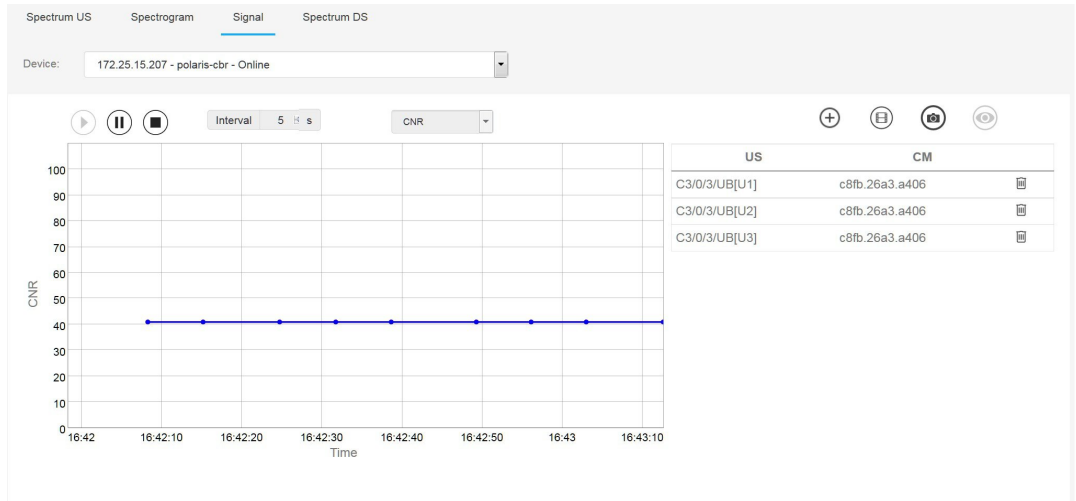
To generate the spectrogram for a specific cable modem, follow the steps below:

1. Add a cable modem following the instructions in the [Adding Single Channel or Modem](#).
2. Set the interval and step for the data collection.
3. Click the **Start** button to start generating the spectrogram.

Signal

Use this page to monitor the Carrier-to-Noise Ratio (CNR), Signal-to-Noise Ratio (SNR), and data SNR for a specific cable modem.

Figure 70: Signal



385083

In this page, you can set the following parameter:

- **Interval** - The interval to gather the data.

To generate the CNR, SNR, or data SNR chart for a specific cable modem, follow the steps below:

1. Add a cable modem following the instructions in the [Adding Single Channel or Modem](#).
2. Set the interval.
3. Select the CNR, SNR or data SNR in the drop down list.
4. Click the **Start** button to start generating the chart.

Spectrum DS

Use this page to view the detailed information for a specific cable modem. But first, you must add a cable modem following the instructions in the [Adding Single Channel or Modem](#) section.

Figure 71: Address

Item	Value
Ethernet IPV4 Address	5.135.1.116
Ethernet IPV6 Address	0587:0174
HFC MAC Address	c8fb.26a3.8d4c
Interface Name	C3/0/3
Modem Index	835597

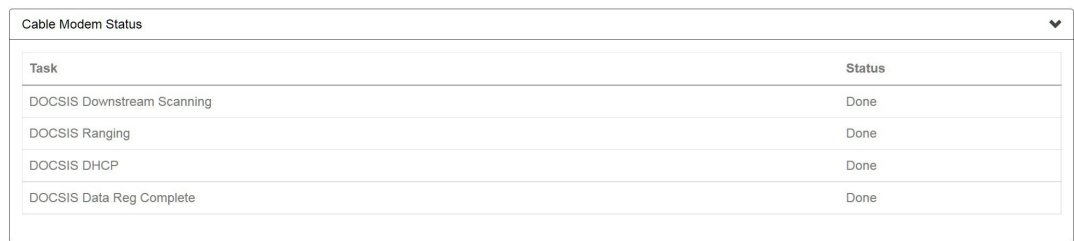
385077

Table 39: Address Field Description

Field	Description
Ethernet IPv4 Address	IPv4 address of the cable modem.

Field	Description
Ethernet IPv6 Address	IPv6 address of the cable modem.
HFC MAC Address	MAC address of the cable modem.
Interface Name	Interface of the cable modem.
Modem Index	Index of the cable modem.

Figure 72: Cable Modem Status



Task	Status
DOCSIS Downstream Scanning	Done
DOCSIS Ranging	Done
DOCSIS DHCP	Done
DOCSIS Data Reg Complete	Done

385087

Table 40: Cable Modem Status Field Description

Field	Description
DOCSIS Downstream Scanning	Modem is scanning for usable DOCSIS downstream channel.
DOCSIS Ranging	Modem is ranging on the DOCSIS channel.
DOCSIS DHCP	Modem is using DHCP to get an IP address assigned.
DOCSIS Data Reg Complete	Modem completed ranging and is online.

Figure 73: Downstream Channels



Channel ID	Power Level(dBmV)	SNR(dB)
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385088

Table 41: Downstream Channels Field Description

Field	Description
Channel ID	Downstream channel ID.
Power Level (dBmV)	Downstream power level in dBmV.
SNR (dB)	Signal to noise ratio.

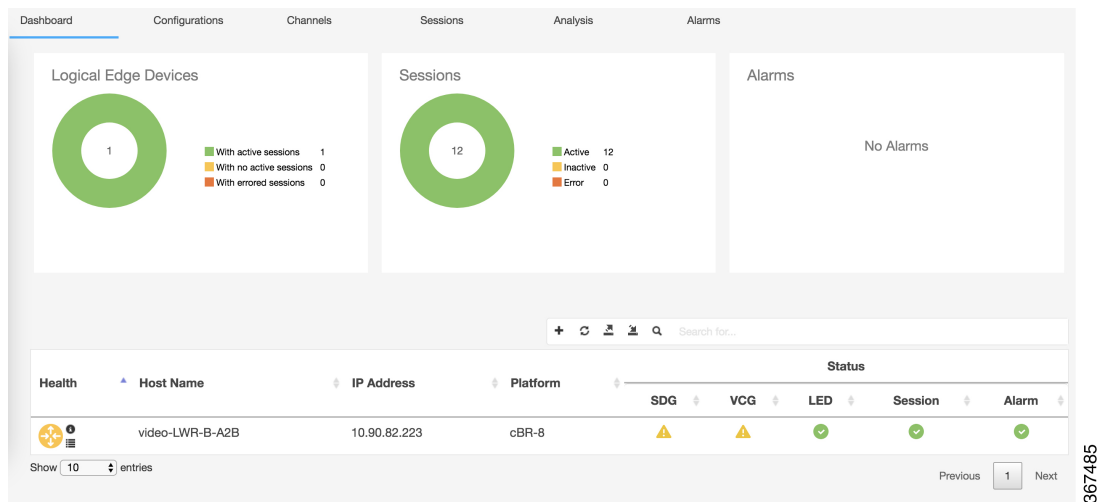
QAM Video

There are 6 pages in this pane, each contains a different set of video related statistical information about the CMTS nodes.

Dashboard Page

Use this page to view overall video information of the CMTS node. The pie chart represents the statistics for all the CMTS node in the inventory. And the status of the individual CMTS node is listed in the table below.

Figure 74: Dashboard Page



367485

Logical Edge Devices

This section displays the number of logical edge device with different session status: with active sessions, no active sessions, and with errored sessions.

Figure 75: Logical Edge Devices

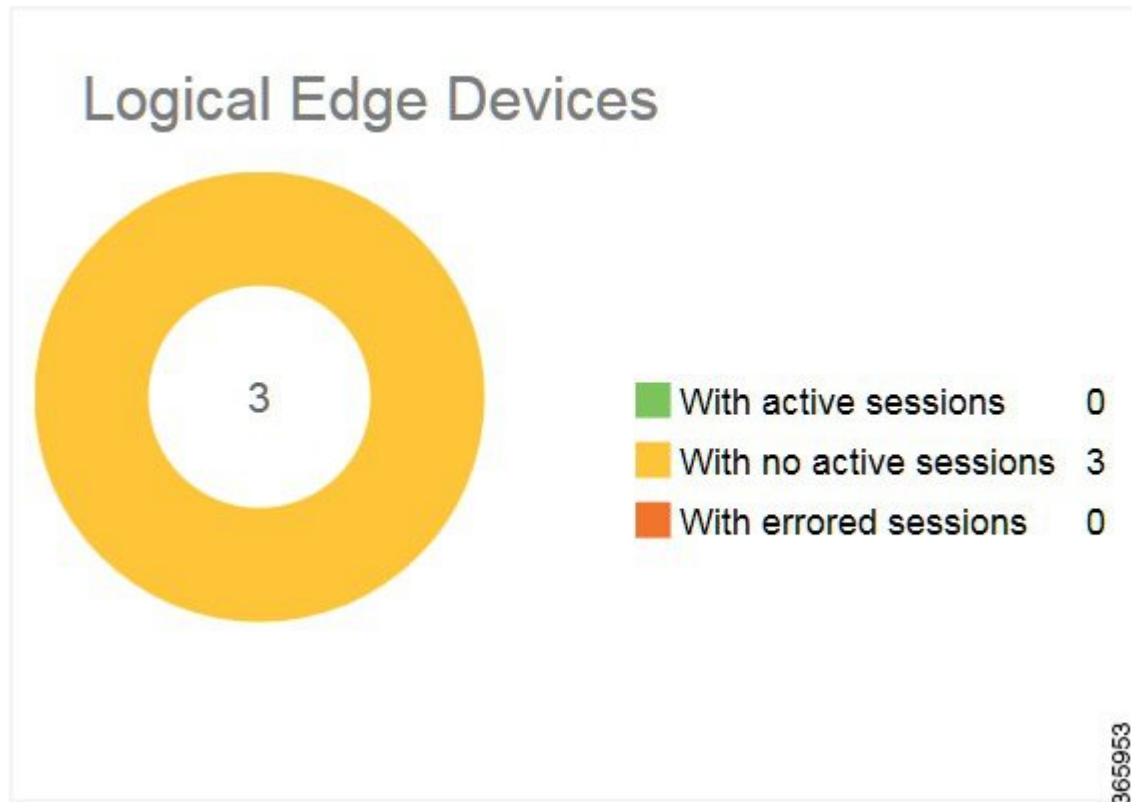


Table 42: Logical Edge Devices Field Description

Field	Description
With active sessions	The number of logical edge devices with active sessions.
With no active sessions	The number of logical edge devices with inactive sessions.
With errored sessions	The number of logical edge devices with sessions in errored state.

Sessions

This section displays the number of session with different status: active, inactive, blocked, and so on.

Figure 76: Sessions

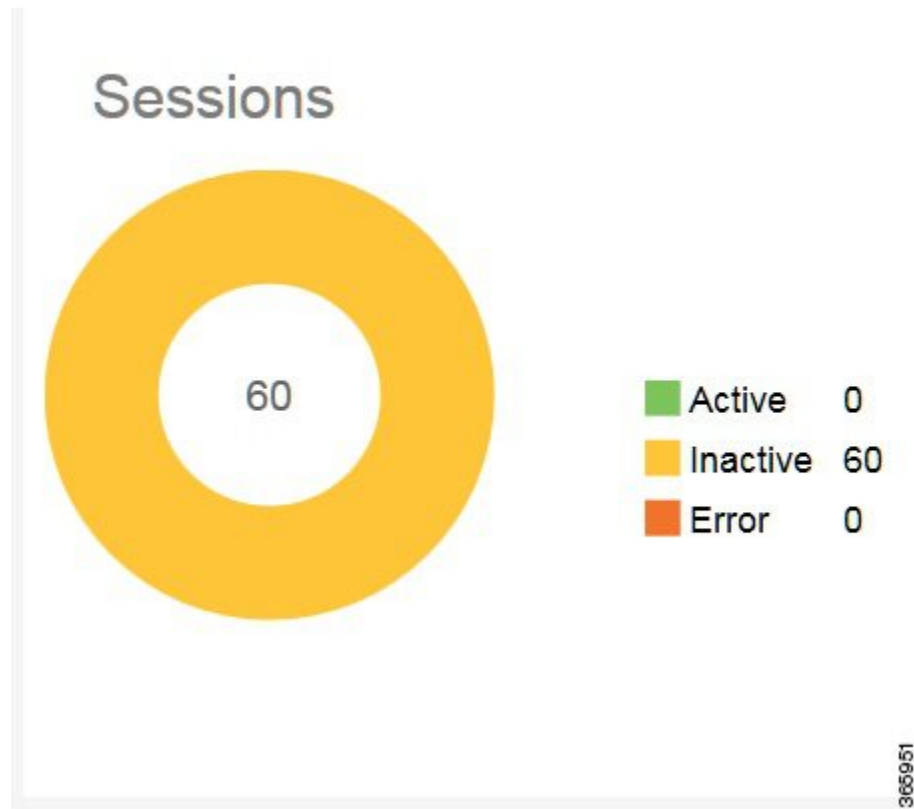


Table 43: Sessions Field Description

Field	Description
Active	The number of active sessions across the controller. The input to these sessions are valid and there is no issue in the output side. These sessions have valid input and output bitrate.
Inactive	The number of inactive sessions across the controller. Inactive sessions are sessions for which there is problem with the input or output QAM Channel.
Error	The number of pending sessions across the controller. This scenario occurs when there is issue in the encryption.

Alarms

This section displays the number of CMTS with critical, warning, and no alarms.

Figure 77: Alarms

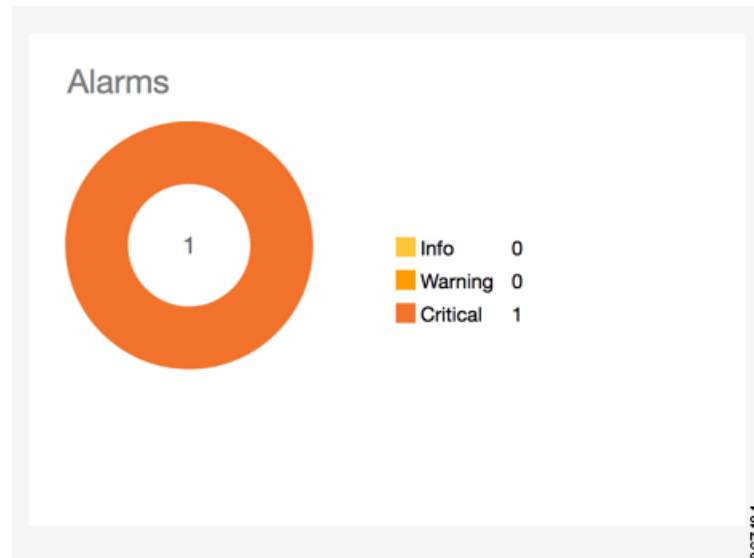


Table 44: Alarms Field Description

Field	Description
Info	Number of info alarms across all the cBR-8 routers managed by the controller.
Warning	Number of warning alarms across all the cBR-8 routers managed by the controller.
Critical	Number of critical alarms across all the cBR-8 routers managed by the controller.

Overall Statistics

In this section, there is a table listing the CMTS node basic information with their video details. Move the mouse over the status icon to get the detailed information.

Figure 78: Overall Statistics

Health	Host Name	IP Address	Platform	Status				
				SDG	VCG	LED	Session	Alarm
Warning	video-LWR-B-A2B	10.90.82.223	cBR-8	Warning	Warning	Success	Success	Success

Table 45: Overall Statistics Field Description

Field	Description
Health	Indicates the status of the CMTS node.

Field	Description
Host Name	The name of the CMTS node.
IP Address	The IP address of the CMTS node.
Platform	The platform of the CMTS node.
Status	
SDG	The status of service distribution groups in the CMTS node.
VCG	The status of virtual carrier groups in the CMTS node.
LED	The status of logical edge devices in the CMTS node.
Session	The status of session in the CMTS node.
Alarm	The status of alarm in the CMTS node.

Export and Import Inventory

User can export inventory before doing upgrade or other operations that may clear the node information in the Dashboard page. Then import inventory that exported before the operation to recover the node information in the Dashboard page.


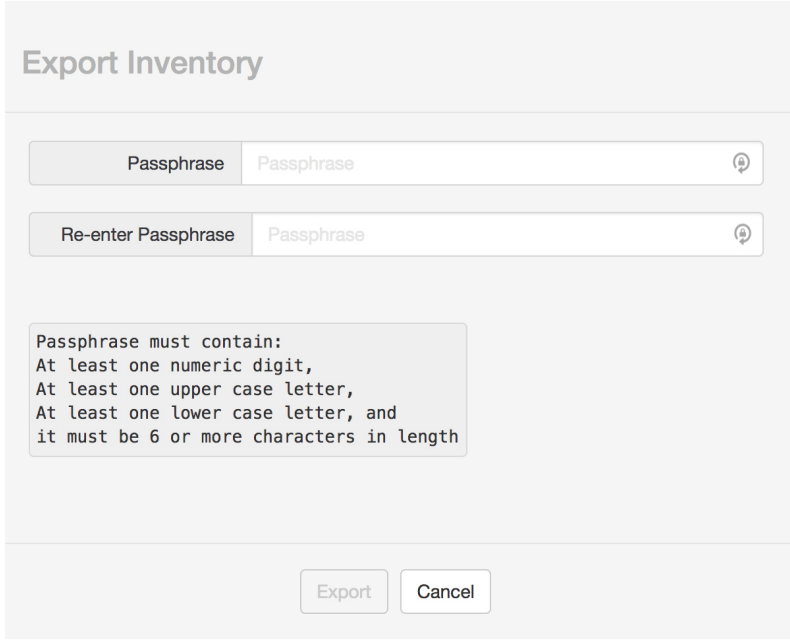
Click the  button to open Export Inventory window.

Figure 79: Export Inventory



Export Inventory

Passphrase

Re-enter Passphrase

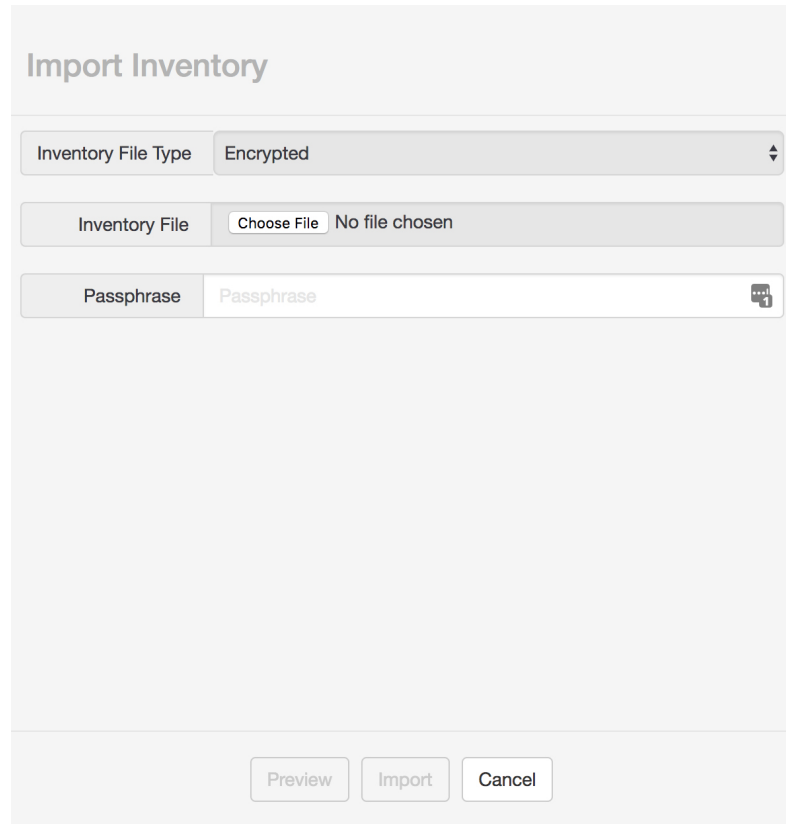
Passphrase must contain:
 At least one numeric digit,
 At least one upper case letter,
 At least one lower case letter, and
 it must be 6 or more characters in length

User has to fill in passphrase to export the inventory. The passphrase must comply with the rules listed.

Then click **Export**, the exported inventory will be saved as a file with “inventory” as the suffix.

If the user wants to import the inventory, click the  button to open the Import Inventory window.

Figure 80: Import Inventory



There are two Inventory File Types: Encrypted, which is the file type exported using Export Inventory button, and Clear (CSV).

- For the Encrypted file type, choose the exported inventory file from local computer, and fill in the correct passphrase used to export the inventory.

Click **Preview** button to display the information of the node to be imported in the Import Inventory window.

- For the Clear (CSV) file type, choose the CSV file which is made by the user from local computer. The file must follow the format listed in the Import Inventory window as shown in the following picture.

Figure 81: Import Inventory CSV File

Import Inventory

Inventory File Type: Clear (CSV)

Inventory File: Choose File No file chosen

Inventory CSV File Format:

```
#Lines starting with # would be considered as comments.
#cmts-ip-address,cmts-type,username,password,enable-password,community-string
#204-cbr-1
172.22.9.221,CBR8,lab,lab,lab,public
#204-cbr-2
172.22.9.222,CBR8,lab,lab,lab,public
```

Import Cancel

367492

Click **Import** button to import the inventory. A note saying **Nodes are being imported into Inventory. Please refresh the Inventory Table after a few minutes.** appears. Click **OK** to return to the Dashboard page.

Export CVEx

User can use this feature to export the XML file and then import this file into the headend, in order to get the LED information imported into the headend.

To export CVEx, move the mouse over the **Context Menu** button to display a context menu. Choose the **Export CVEx** option to export XML file containing LED configuration.

Figure 82: Export CVEx Topology

Export CVEx Topology

Select the Logical Edge Devices for which XML file has to be generated:

Search:

<input type="checkbox"/>	LED Name	Id	Management IP Address	Status
No LEDs configured				

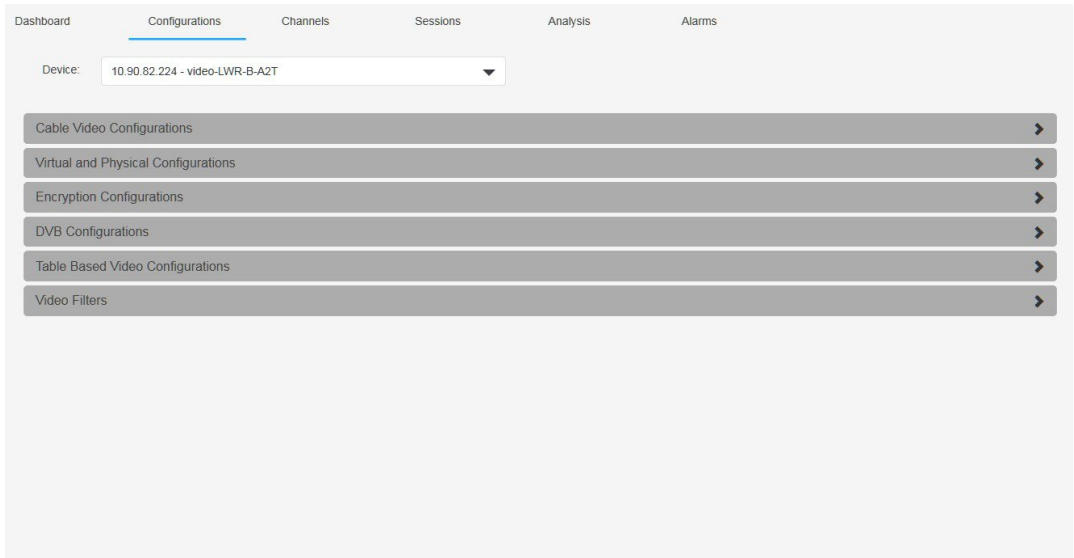
367487

User can select or search for which LED to export. Then click **Submit** to export.

Configurations Page

Use this page to view detailed video configurations of the CMTS node.

Figure 83: Configurations Page

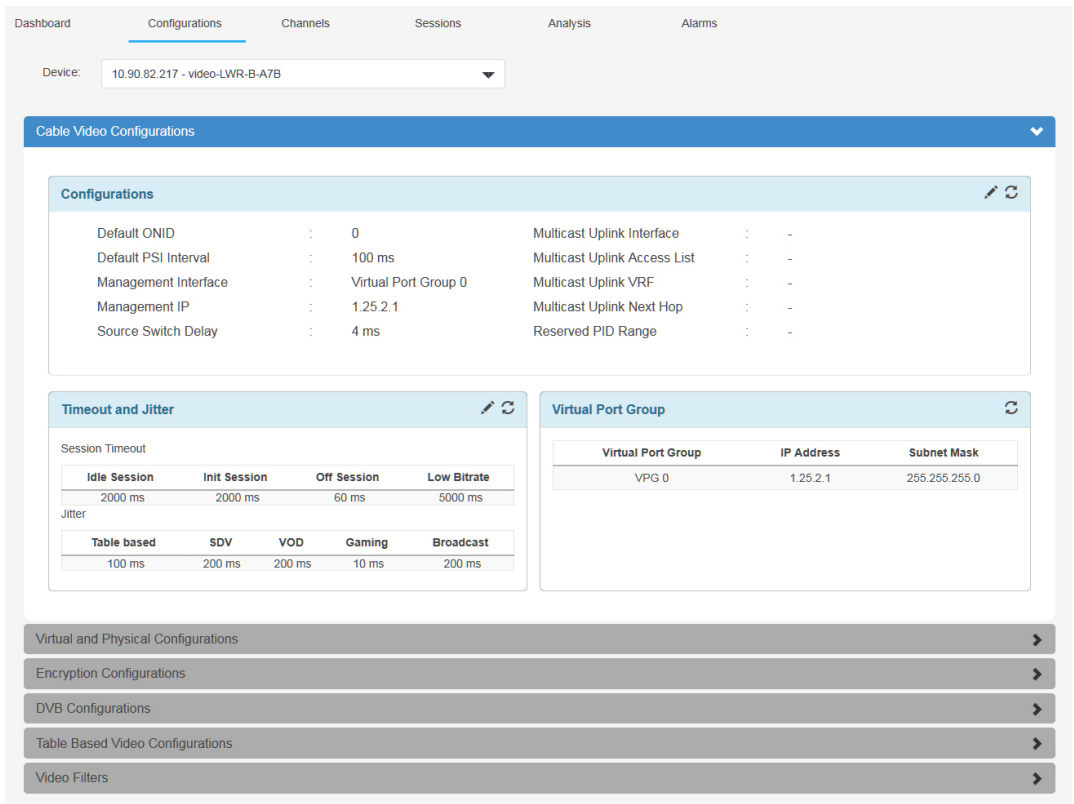


366037

Cable Video Configurations

This section displays the basic video configuration information and virtual port groups.

Figure 84: Cable Video Configurations



366413

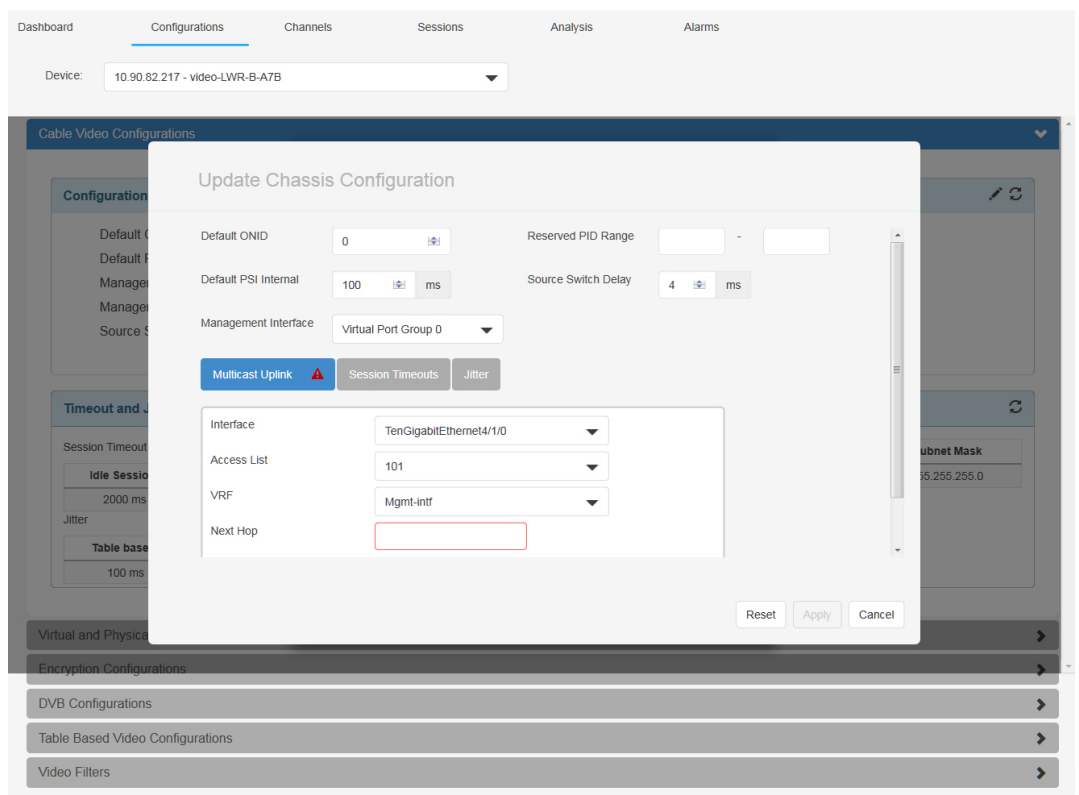
Table 46: Cable Video Configuration Field Description

Field	Description
Configurations	
Default ONID	The Default ONID used for output programs.
Default PSI Interval	The Default MPEG PSI interval used on output programs.
Management Interface	The interface between the Logical Edge Devices (LED) and the connection to external servers.
Management IP	The IP Address of the Management Interface.
Source Switch Delay	The delay that is used for performance management of Multicast Source-Switching (default = 4 msec).
Multicast Uplink Interface	The hardware interface of the multicast uplink.
Multicast Uplink Access List	Indicates the additional multicast addresses for use with SSM.
Multicast Uplink VRF	Video Multicast Uplink VRF.
Multicast Uplink Next Hop	Head end router next hop IP address associated with VRF.
Reserved PID Range	Specifies a range of PIDs that will not be used as output for remapped sessions. A range of up to 4000 PIDs from 1-8190 can be reserved.
Timeout and Jitter	
Idle Session	Indicates a period of time after which a previously active session with no data will be declared Idle.
Init Session	Indicates a period of time after which a new session will go Active before being declared Off.
Off Session	Indicates a period of time after which an Idle session with no data will be declared Off.
Low Bitrate	A longer timeout for low-bitrate and intermittent data streams.
Table Based	Indicates the jitter allowed in table based session.
SDV	Indicates the jitter allowed in SDV session.
VOD	Indicates the jitter allowed in VOD session.
Gaming	Indicates the jitter allowed in gaming session.
Broadcast	Indicates the jitter allowed in broadcast session.

Field	Description
Virtual Port Group	
Virtual Port Group	Interface that is used for communication with the external servers.
IP Address	IP address of the interface.
Subnet Mask	Subnet mask of the interface.

Click the **Pencil** button to open the Update Chassis Configuration window.

Figure 85: Update Chassis Configuration

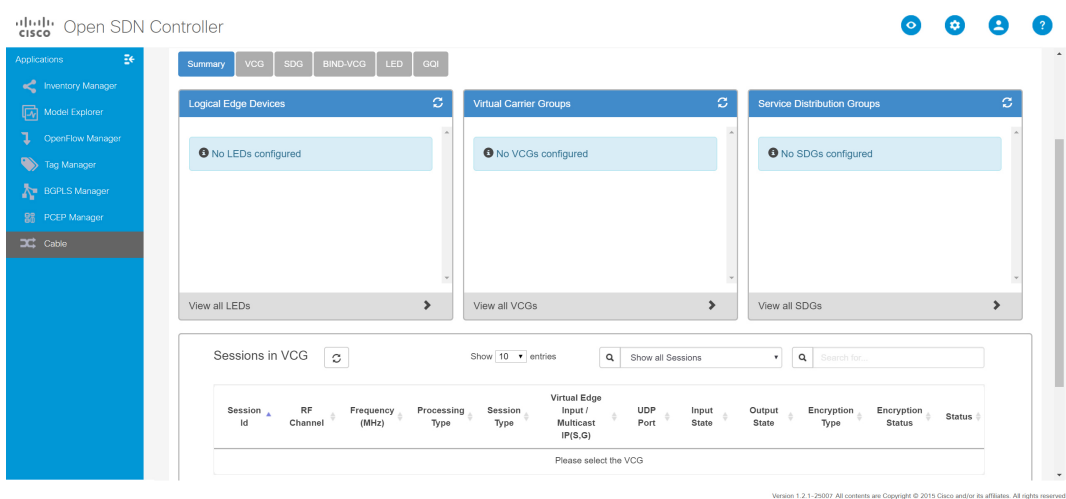


Make the necessary update in this window, then click **Apply** to commit the update. To restore to the existing configuration, click the **Reset** button.

Virtual and Physical Configurations

This section displays the virtual and physical configurations.

Figure 86: Virtual and Physical Configurations



366705

Summary

This tab displays the summary information of logical edge device, virtual carrier groups, and service distribution groups.

Click the **Information** button beside the logical edge device, virtual carrier groups, or service distribution groups, the details will display. See the description of other tabs for more information.

Click **View all LEDs**, **View all VCGs**, or **View all SDGs**, the LED, VCG, or SDG tab will display.

Select one virtual carrier group under Virtual Carrier Groups in this tab, all the sessions in this virtual carrier group will display in a list.

Table 47: Summary Tab Field Description

Field	Description
Session ID	The video session ID.
RF Channel	The RF channel that the video session belongs to.
Frequency (MHz)	The video session frequency.
Processing Type	Processing type of the session (Remap/Passthru/Data).
Session Type	Indicates the session type.
Virtual Edge Input/Multicast IP (S, G)	IP address of the input to the CMTS node.
UDP Port	UDP port number of the input to the CMTS node.
Input State	Indicates the programmed state of the input and if data is flowing into it.
Output State	Indicates if the output is ON, OFF or in an error state.
Encryption Type	Indicates the encryption type of the video session.

Field	Description
Encryption Status	Indicates the encryption status.
Status	Session status based on input and output states.

Click the session ID, the Session Details window will display. There are three parts in this window: Basic Session Information, Input Details, and Output Details.

Figure 87: Basic Session Information

Session Details

Basic Session Information

Session Name	: vcg1_20-35.1.0.1.20.49152	Output Port Number	: 1
Session Id	: 1048576	Output Program Number	: 1
Creation Time	: Sat Dec 31 20:08:14 2011	Idle Timeout	: 2000 ms
Configured Bitrate	: Not Configured	Init Timeout	: 2000 ms
Jitter	: 120 ms	Off Timeout	: 60 s
Processing Type	: Remap	Number of Sources	: 1
Stream Rate	: VBR	Destination IP	: 174.101.1.1
Encryption Type	: PME	UDP Port	: 49152
Encryption Status	: Encrypted		
TSID	: 1		
ONID	: 0		
Low Latency	: Disabled		

Table 48: Basic Session Information Field Description

Field	Description
Session Name	The video session name.
Session Id	The video session ID.
Creation Time	The time when the video session is created.
Configured Bitrate	Predicted max bitrate. Used to calculate remaining bandwidth on a QAM.
Jitter	Dejitter buffer depth for the session.
Processing Type	Processing Type of the session (Remap/Data/Passthru)
Stream Rate	Rate of input stream. Constant Bitrate (CBR) or Variable Bitrate (VBR).
Encryption Type	Indicates the encryption type of the video session.
Encryption Status	Indicates the encryption status.

Field	Description
TSID	Transport stream ID assigned to this session.
ONID	Original network ID assigned to this session.
Low Latency	Indicates if the low latency is enabled or disabled.
Output Port Number	Output port assigned to this session.
Output Program Number	QAM output program number.
Idle Timeout	Time after which an idle input will be ignored.
Init Timeout	Time after which an input in the Init state will be ignored.
Off Timeout	Time after which an input in the off state will be ignored.
Number of Sources	Number of input streams.
Destination IP	The IP address of each input source.
UDP Port	The UDP port number of each input stream.

Figure 88: Input Details

Session Details

Basic Session Information

Input Details

Session
 Input State : ACTIVE-PSI
 Uptime : 1

Bitrate
 Measured : 1.676 Mbps
 PCR : 1.800 Mbps

Errors
 CC : 0
 PCR Jumps : 0

PAT Details
 Program 1 : PMT 8020
 Other Details : Version 0, TSID 0

PMT Details
 Program 1 : Version : 0 , PCR :8000

PID	Type	Info Length	Details
8000	Video(2)	2	2
8001	Audio(3)	3	3

Packet Information
 IP Packets : Input 1347799, RTP 0, Drop 0
 TP Packets : Input 7623124, PCR 96096, PSI 112727, Null 463670, Unreferenced 0
 Errors : Discontinuity 140, Sync Loss 0, CC Errors 0, PCR Jumps 0

Output Details

385230

Table 49: Input Details Field Description

Field	Description
Session	
Input State	Indicates the programmed state of the input and if data is flowing into it.
Uptime	Indicates the duration that the input has been in the ACTIVE-PSI state.
Bitrate	
Measured	Actual bitrate of the session.
PCR	Bitrate of PCR PID.
Errors	
CC	Continuity error counter.
PCR Jumps	Program clock reference jump counter.
PAT Details	
Program 1	Displays the PMT PID for this session.
Other Details	Displays the version and TSID for the program allocation table.
PMT Details	
PID	Stream PID.
Type	Stream type (Video, Audio, etc.).
Packet Information	
IP Packets	Number and type of IP packets received.
TP Packets	Number and type of Transport Protocol (MPEG) packets received.
Errors	Discontinuity, sync loss, CC and PCR Jump.

Figure 89: Output Details

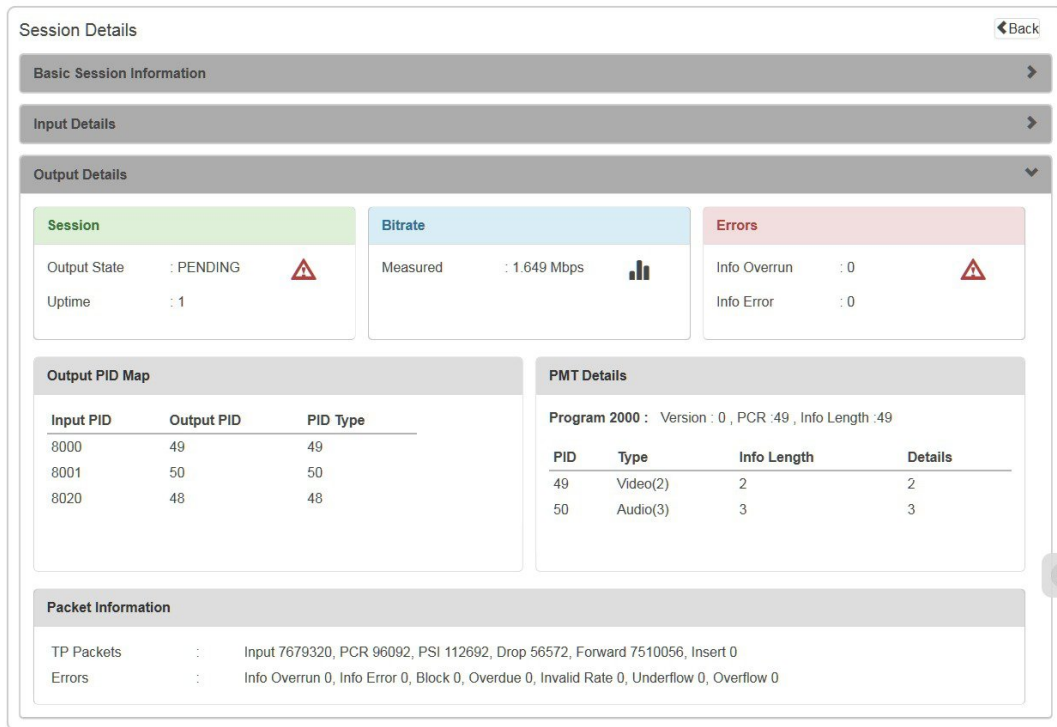


Table 50: Output Details Field Description

Field	Description
Session	
Output State	Display whether an output is on, off, waiting or has a conflict.
Uptime	Indicates the duration that an output has been in the ON state.
Bitrate	
Measured	Actual bit rate for this program.
Errors	
Info Overrun	Number of info overrun errors that have occurred in the stream.
Info Error	Number of info error packets.
Output PID Map	
Input PID	PID of this stream on input to the chassis.
Output PID	PID of stream on the output.

Field	Description
PID Type	Stream type (Video, Audio, etc.).
PMT Details	
PID	PID of this output stream.
Type	Stream type (Video, Audio, etc.).
Packet Information	
TP Packets	Number and type of MPEG packets sent.
Errors	Counters for Info overrun/error, blocked, invalid rate, underflow and overflow errors.

VCG

This tab displays the virtual carrier groups configured in the CMTS node.

Figure 90: VCG Tab

Dashboard Configurations Channels Sessions Analysis Alarms

Device: 10.90.82.214 - video-LWR-B-A7T

Cable Video Configurations

Virtual and Physical Configurations

Summary VCG SDG BIND-VCG LED GQI

Virtual Carrier Groups

Name	Id	RF Channels	Virtual Edge Inputs	Service type	Low Latency	Encrypted	Sessions	Status
vcg1	1	0 - 55	-	Narrowcast	⊘	🔒	0	No active sessions
vcg2	2	0 - 55	-	Narrowcast	⊘	🔒	0	No active sessions
vcg3	3	0 - 55	-	Narrowcast	⊘	🔒	0	No active sessions
vcg4	4	0 - 55	-	Narrowcast	⊘	🔒	0	No active sessions
vcg5	5	0 - 55	-	Narrowcast	⊘	🔒	1120	No active sessions
vcg6	6	0 - 55	-	Narrowcast	⊘	🔒	1120	No active sessions
vcg7	7	0 - 55	-	Narrowcast	⊘	🔒	1120	No active sessions
vcg8	8	0 - 55	-	Narrowcast	⊘	🔒	480	No active sessions

Previous 1 Next

Encryption Configurations

DVB Configurations

Table Based Video Configurations

Video Filters

366340

Table 51: VCG Tab Field Description

Field	Description
Name	The virtual carrier group name.
Id	The virtual carrier group ID.
RF Channels	The RF channels configured in this virtual carrier group.
Virtual Edge Inputs	The virtual edge inputs assigned to this virtual carrier group.
Service type	VCG service type (Broadcast/Narrowcast). This is used for licensing of QAMs.
Low Latency	Indicates whether the VCG is configured as low latency.
Encrypted	Indicates the encryption status. If a VCG is encrypted, all sessions created under this VCG will be encrypted.
Sessions	The number of video sessions in this virtual carrier group.
Status	Indicates if there is error on the VCG.

Click the **Add** button to open the Add VCG window.

Figure 91: Add VCG

Add VCG

Configurations

Virtual Carrier Group: ID:

Service Type:

Encryption:

Virtual Edge Inputs **RF Channels**

IP address	Input Port	VRF
No Virtual Edge Inputs configured		

366323

Fill in the information, including adding virtual edge input and RF channels when necessary. Then click **Add** to confirm.

Move the mouse over the **Context Menu** button before the virtual carrier group name to display a context menu. Choose the **Delete** option to delete the virtual carrier group. Choose the **Update** option to update the virtual carrier group.

Make the necessary updates, including adding/deleting virtual edge input and RF channels, then click **Update** to commit the update.

Click the virtual carrier group name to get the details of the virtual carrier group.

Figure 92: VCG Details

Table 52: VCG Details Field Description

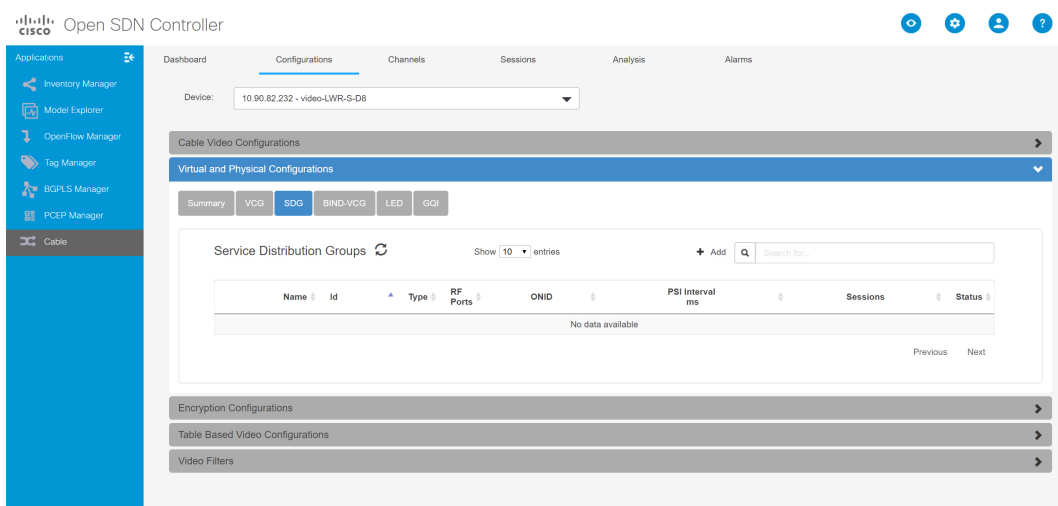
Field	Description
Virtual Carrier Group	
VCG Id	The virtual carrier group ID.
Service Type	The video service type.
Low Latency	Specifies whether the low latency is enabled on this virtual carrier group.
Bound SDG	The service distribution group that bound to this virtual carrier group.
Logical Edge Device	The logical edge device that this virtual carrier group is provisioned on.
Virtual Edge Inputs	
Virtual Edge Input IP	Destination IP address for unicast video IP packets.
Input Port Number	IP port number used for this input.
VRF	Virtual Routing and Forwarding IP address.
RF Channels	
Start Channel	First RF channel in a range. Each channel corresponds to a QAM.
End Channel	Last channel in a range. Each channel corresponds to a QAM.

Field	Description
TSID Start	First TSID. TSIDs must be unique per CMTS node.
TSID End	Last TSID.
Output Port Number Start	First output port number for this VCG. These must be unique per linecard.
Output Port Number End	Last output port number.
Sessions	
Session Id	The video session ID.
RF Channel	The RF channel that the video session belongs to.
Frequency (MHz)	The video session frequency.
Processing Type	Processing type of the session (Remap/Passthru/Data).
Session Type	Indicates the session type.
Virtual Edge Input / Multicast IP(S,G)	VEI IP address (If present).
UDP Port	Input IP port number.
Input State	Indicates the programmed state of the input and if data is flowing into it.
Output State	Displays whether an output is on, off, waiting or has a conflict.
Input Bitrate Mbps	Actual bitrate of input.
Output Bitrate Mbps	Actual bitrate of output.
Encryption	Indicates the encryption status.
Status	Indicates the session status.

SDG

This tab display the service distribution groups configured in the CMTS node.

Figure 93: SDG Tab



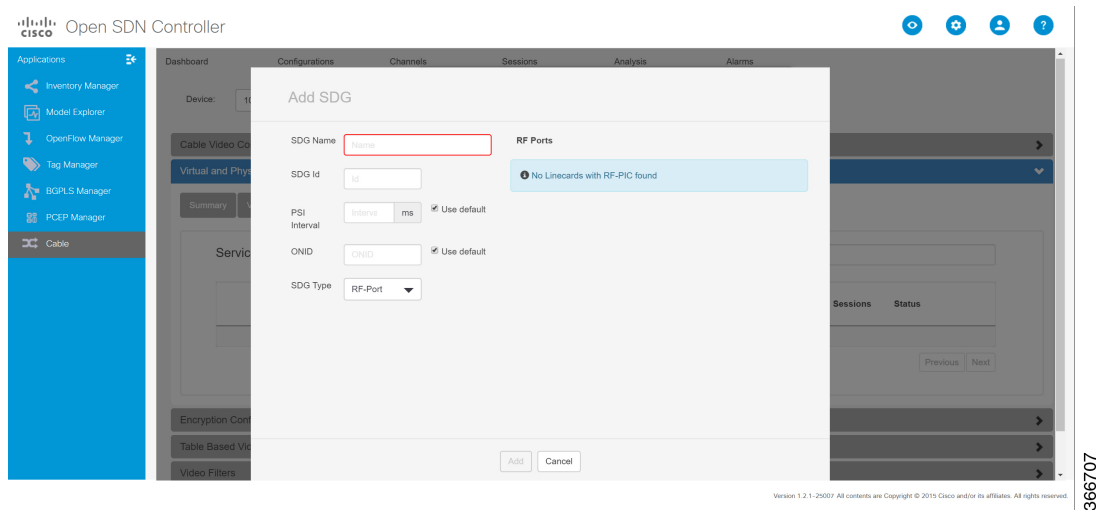
366706

Table 53: SDG Tab Field Description

Field	Description
Name	The service distribution group name.
Id	The service distribution group ID.
Type	RF port or RPD.
RF Ports	The RF ports that contained in the service distribution group.
ONID	Original network ID.
PSI Interval ms	Rate at which PSI data is sent.
Sessions	The number of sessions in this service distribution group.
Status	Indicates the status of the SDG.

Click the **Add** button to open the Add SDG window.

Figure 94: Add SDG



The RF ports of the linecards that are present in the chassis are displayed. The RF ports of the primary linecard are displayed and the RF ports of the backup linecard are not displayed.

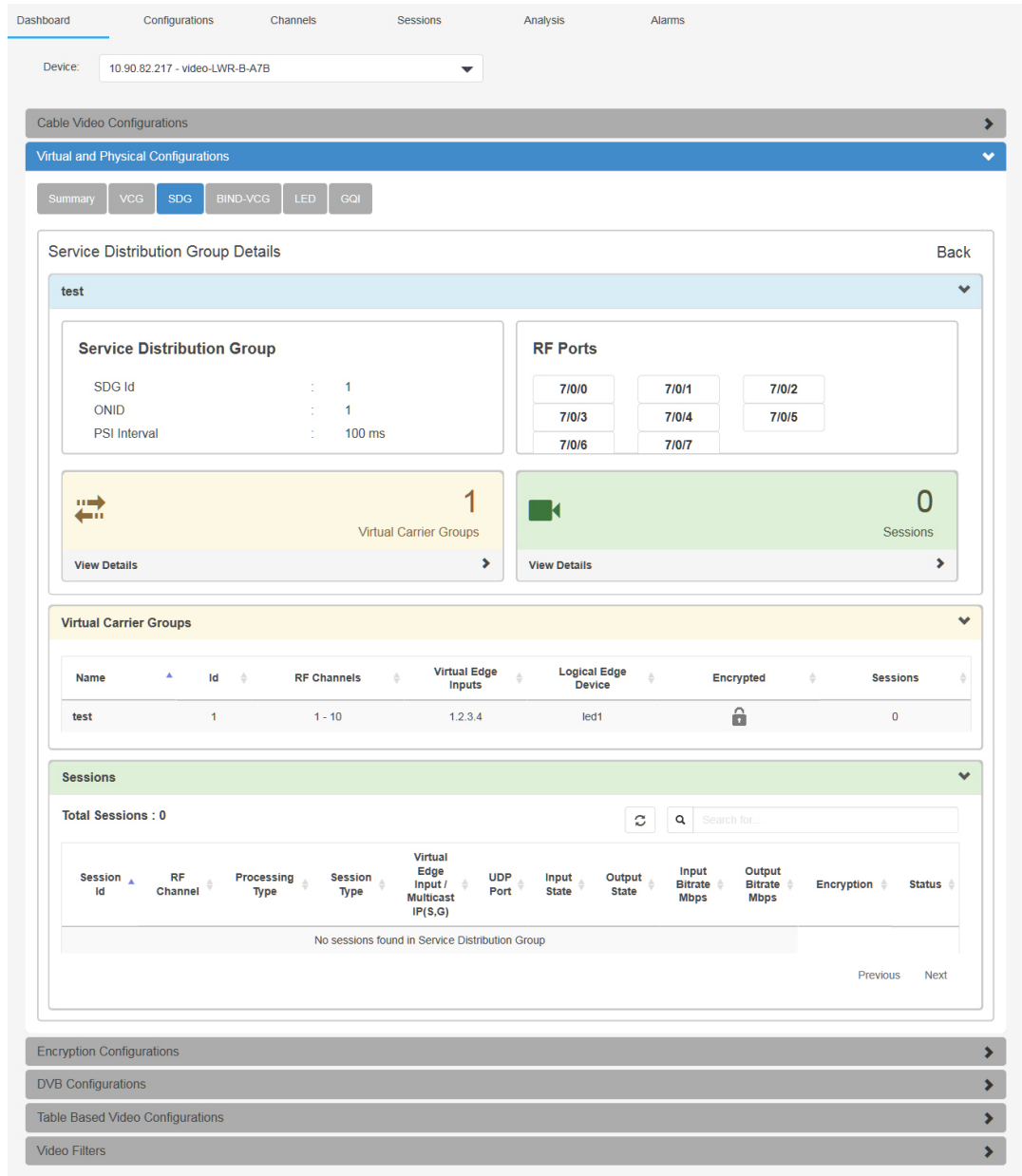
Fill in the information. Then click **Add** to confirm.

Move the mouse over the **Context Menu** button before the service distribution group name to display a context menu. Choose the **Delete** option to delete the service distribution group. Choose the **Update** option to update the service distribution group.

Make the necessary update, then click **Update** to commit the update.

Click the service distribution group name to get the details of the distribution group name.

Figure 95: SDG Details



366418

Table 54: SDG Details Field Description

Field	Description
Service Distribution Group	
SDG Id	The service distribution group ID.
ONID	Original network ID.
PSI Interval	Rate at which PSI data is sent.

Field	Description
Virtual Carrier Groups	
Name	The virtual carrier group name.
ID	The virtual carrier group ID.
RF Channels	The RF channels configured in this virtual carrier group.
Virtual Edge Inputs	The virtual edge inputs assigned to this virtual carrier group.
Logical Edge Device	The logical edge device that this virtual carrier group is provisioned on.
Encrypted	Indicates the encryption status.
Sessions	The number of video sessions in this virtual carrier group.
Sessions	
Session Id	The video session ID.
RF Channel	The RF channel that the video session belongs to.
Frequency (MHz)	The video session frequency.
Processing Type	Processing Type of the session (Remap/Data/Passthru).
Session Type	Indicates the session type.
Virtual Edge Input / Multicast IP(S,G)	VEI or Multicast IP address if present.
UDP Port	UDP Port of the Session.
Input State	Indicates the programmed state of the input and if data is flowing into it.
Output State	Displays whether an output is on, off, waiting or has a conflict.
Input Bitrate Mbps	Actual bitrate of input.
Output Bitrate Mbps	Actual bitrate of output.
Encryption	Indicates the encryption status.
Status	Indicates the session status.

BIND-VCG

This tab display the VCG to SDG bindings configured in the CMTS node.

Figure 96: BIND-VCG Tab

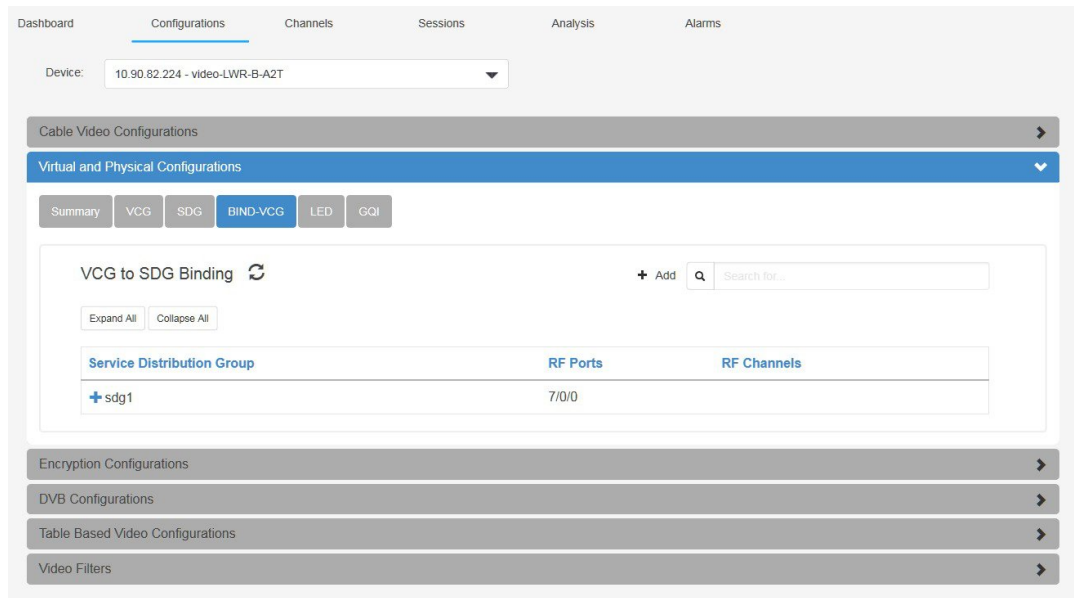
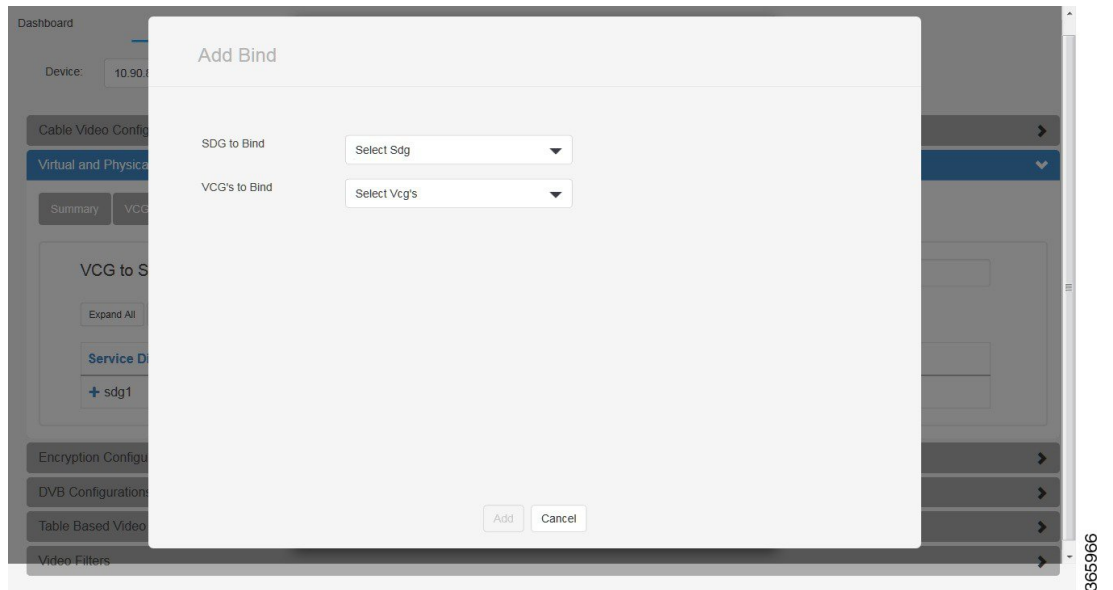


Table 55: BIND-VCG Tab Field Description

Field	Description
Service Distribution Group	The name of the service distribution group.
RF Ports	The RF ports in this service distribution group.
RF Channels	The RF channels in this virtual carrier group.

Click **Expand All** or **Collapse All** to display or hide the VCG bonded to the SDG.

Click the **Add** button to open the Add Bind window.

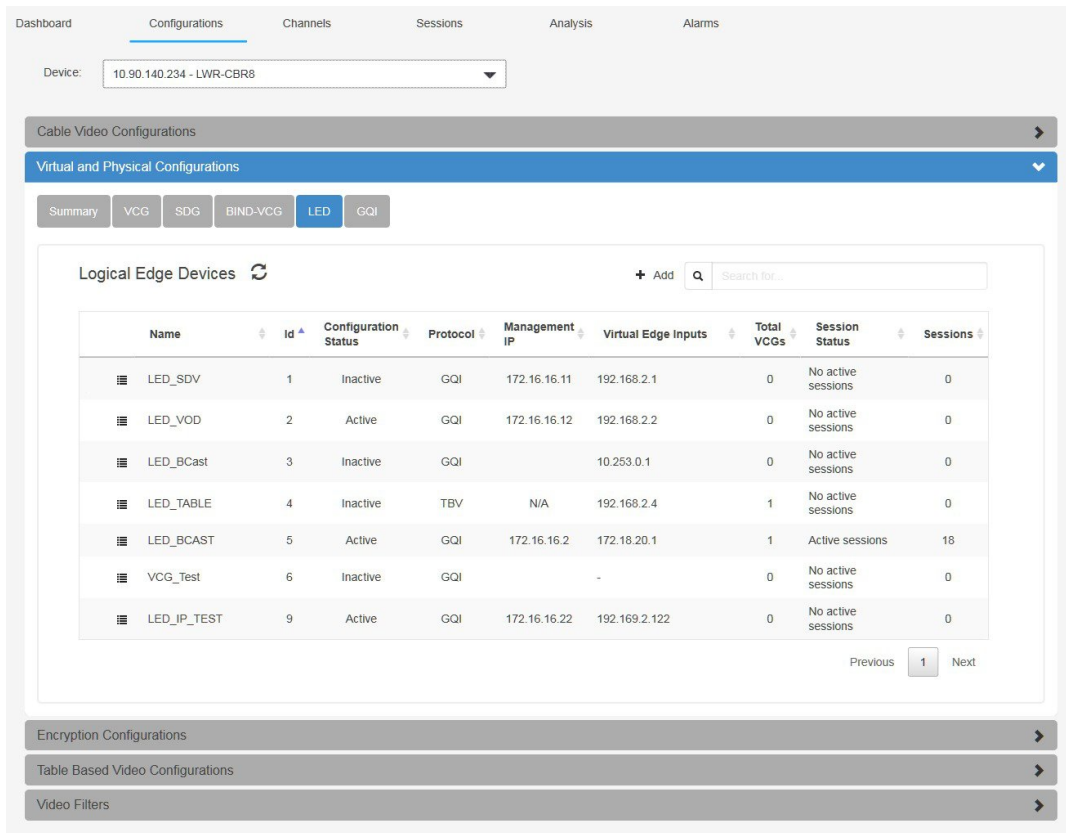
Figure 97: Add Bind

Choose the SDG and VCG to bind, then click **Add** to confirm. Multiple VCGs can be bound to a single SDG.

LED

This tab display the logical edge devices configured in the CMTS node.

Figure 98: LED Tab



366339

Table 56: LED Tab Field Description

Field	Description
Name	Name of the logical edge device.
Id	ID of the logical edge device.
Configuration Status	Activity status of the logical edge device. Active or Inactive.
Protocol	Protocol used by the logical edge device.
Management IP	IP address external programs use to manage LED.
Virtual Edge Inputs	The virtual edge inputs assigned within this logical edge device.
Total VCGs	The number of virtual carrier group that is provisioned on this logical edge device.
Session Status	Displays if LED is active based on the session status.

Field	Description
Sessions	The number of sessions in this service distribution group.

Click the **Add** button to open the Add LED window.

Figure 99: Add LED

User can add virtual edge input and virtual carrier group. Depending on the protocol assigned to the LED, user can add VEI bundle with table based protocol, and configure GQI with GQI protocol.

In GQI Config window, check the **Auto MAC Config** to automatically assign MAC address to the LED when it is active. Fill in other fields as necessary to add GQI.

Figure 100: GQI Config

Add LED

Configurations

Logical Edge Device: Name ID

Protocol: GQI

Status: Inactive

Virtual Edge Input Virtual Carrier Group **GQI Config** D6 Discovery

Features

D6 Discovery

Management IP *

GQI Servers *

Auto MAC Config

MAC Address

KeepAlive Retry / Interval: sec

Reset Indication Interval: sec

Add Cancel

* indicates parameters needed for activating LED

367489

Check the D6 Discovery checkbox to enable the D6 Discovery configuration. Fill in other fields as necessary to add D6 discovery.

Under table based protocol, check the PMV (Pid Multiplier Value) checkbox to enable the PMV feature, check 10-6 UDP Port Mapping to enable 10-6 UDP port mapping method to simplify the provisioning. Then click **Add** to confirm adding LED.

Move the mouse over the **Context Menu** button before the logical edge device name to display a context menu. Choose the **Delete** option to delete the logical edge device. Choose the **Update** option to update the logical edge device. Choose **Reload** to delete and recreate all the sessions.

Make the necessary update in this window, then click **Update** to commit the update.

Click the logical edge device name to get the details of the logical edge device.

Figure 101: LED Details

The screenshot displays the 'LED Details' page for a logical edge device named 'led1'. The interface is organized into several sections:

- Logical Edge Device Summary:** Shows 'led1' with a 'TABLE-BASED' protocol and 'D6 Discovery' status.
- Summary Cards:**
 - Virtual Carrier Groups: 1
 - RF Channels: 80
 - Sessions: 0
 - D6 Discovery: 1
 - VEI Bundles: 0
- Virtual Carrier Groups Table:**

Name	Id	RF Channels	Virtual Edge Inputs	Logical Edge Device	Encrypted	Sessions
test	1	1-10	1,2,3,4	led1	Yes	0
- RF Channels Table:**

RF Channel	Type	Physical GMID	Admin State	Operational State	TSID	ONID	Output Port Number	VCO id	SDG id	Encryption
7000.1	RF-Port	1	ON	UP	0	1	1	1	1	CLEAR
7000.2	RF-Port	2	ON	UP	1	1	2	1	1	CLEAR
7000.3	RF-Port	3	ON	UP	2	1	3	1	1	CLEAR
7000.4	RF-Port	4	ON	UP	3	1	4	1	1	CLEAR
7000.5	RF-Port	5	ON	UP	4	1	5	1	1	CLEAR
7000.6	RF-Port	6	ON	UP	5	1	6	1	1	CLEAR
7000.7	RF-Port	7	ON	UP	6	1	7	1	1	CLEAR
7000.8	RF-Port	8	ON	UP	7	1	8	1	1	CLEAR
7000.9	RF-Port	9	ON	UP	8	1	9	1	1	CLEAR
7000.10	RF-Port	10	ON	UP	9	1	10	1	1	CLEAR
- Virtual Edge Input Bundles Table:**

Bundle Id	Virtual Edge Input	Input Port Number	Slot/Bay	Gateway IP
No VEI bundles configured				
- Sessions Table:**

Session Id	RF Channel	Processing Type	Session Type	Virtual Edge Input Multicast (PISG)	UDP Port	Input State	Output State	Input Bitrate Mbps	Output Bitrate Mbps	Encryption	Status
No sessions found in Logical Edge Device											

366417

Table 57: LED Details Field Description

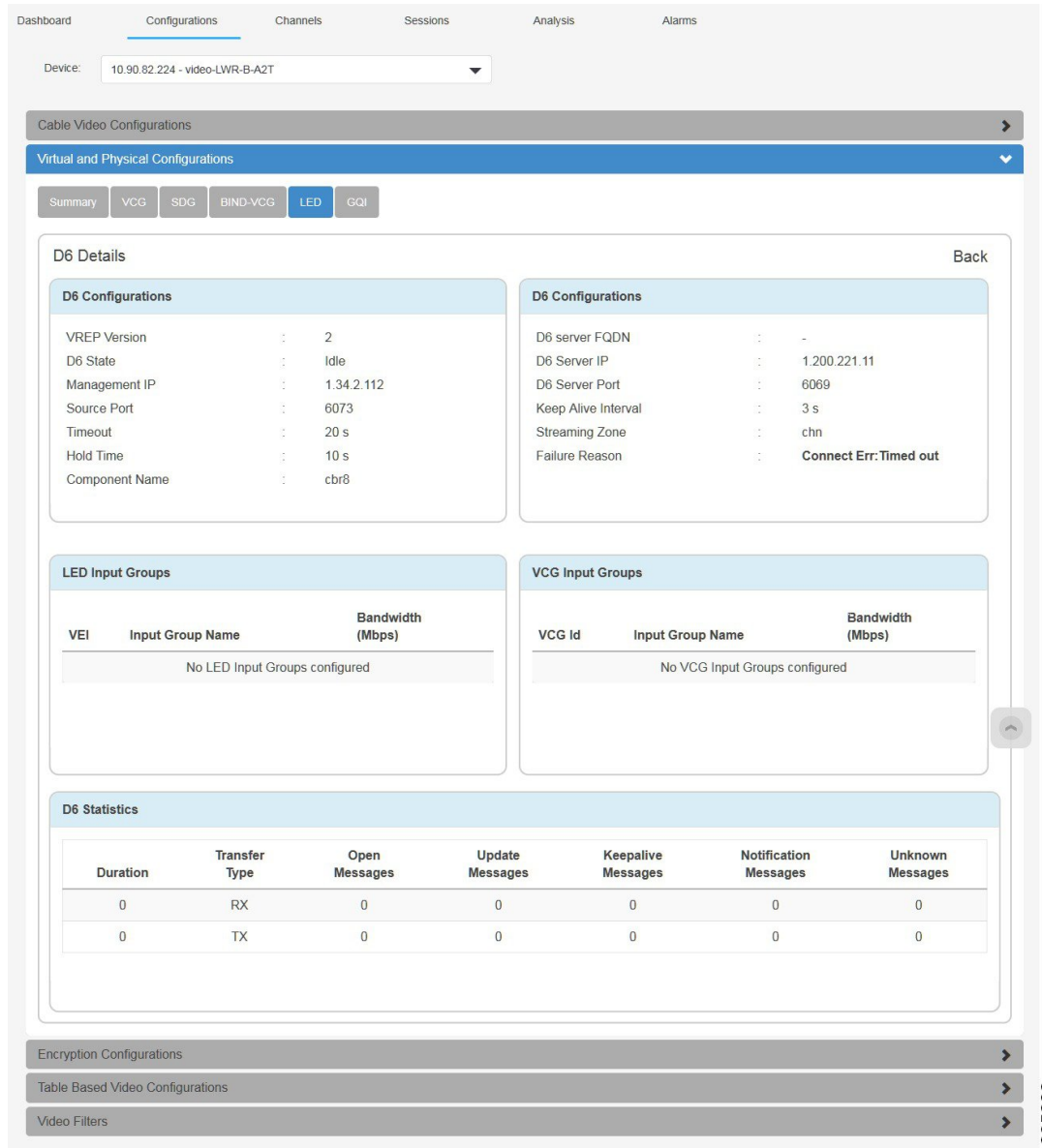
Field	Description
Logical Edge Device	
LED Id	The logical edge device ID.
Protocol	The protocol used by this logical edge device.

Field	Description
Status	The status of this logical edge device.
D6 Discovery	Status of D6 Configuration in the LED.
Virtual Edge Inputs	
Virtual Edge Input IP	Destination IP address for unicast video IP packets.
Input Port Number	IP port number used for this input.
VRF	Virtual Routing and Forwarding (VRF) name that is used for Video Traffic.
Virtual Carrier Groups	
Name	The virtual carrier group name.
Id	The virtual carrier group ID.
RF Channels	The RF channels configured in this virtual carrier group.
Virtual Edge Inputs	The virtual edge inputs assigned to this virtual carrier group.
Logical Edge Device	The logical edge device that this virtual carrier group is provisioned on.
Encrypted	Indicates the encryption status.
Sessions	The number of video sessions in this virtual carrier group.
RF Channels	
RF Channel	RF port and channel number.
Physical QAM Id	ID number of the physical QAM.
Admin State	Desired state of channel.
Operational State	Actual state of channel.
TSID	Transport stream ID assigned to this channel.
ONID	Original network ID assigned to this channel.
Output Port Number	Output port assigned to this channel.
VCG id	Virtual carrier group that contains this channel.
SDG id	Service distribution group that contains this channel.
Encryption	Indicates the encryption type of the video session.

Field	Description
Virtual Edge Input Bundles	
Bundle Id	Configured bundle ID of the VEI bundle.
Virtual Edge Input	VEI configured in the bundle.
Input Port Number	Input port number configured in the bundle.
Slot/Bay	Slot/Bay to which the VCG in the LED is bound. This is used to forward the packets to a given line card.
Gateway IP	Internal gateway IP of the VEI bundle. All the VEIs flows configured in the VEI bundle will be merged at this gateway IP address and there will be only one flow out of this gateway IP address.
Sessions	
Session Id	The video session ID.
RF Channel	The RF channel that the video session belongs to.
Processing Type	Processing Type of the session (Remap/Passthru/Data).
Session Type	Indicates the session type.
Virtual Edge Input / Multicast IP(S,G)	VEI or Multicast IP address (if present).
UDP Port	UDP port number of the session.
Input State	Indicates the programmed state of the input and if data is flowing into it.
Output State	Displays whether an output is on, off, waiting or has a conflict.
Input Bitrate Mbps	Actual bitrate of input.
Output Bitrate Mbps	Actual bitrate of output.
Encryption	Indicates the encryption type and status.
Status	Indicates the session status.

Click **View Details** in the D6 Discovery pane of the Logical Edge Device Details window, D6 Details window will display.

Figure 102: D6 Details



385222

Table 58: D6 Details Field Description

Field	Description
D6 Configurations	
VREP Version	VREP protocol version.
D6 State	D6 Connection state.
Management IP	The source IP address used to establish connection with the external D6 server (ERM).

Field	Description
Source Port	Source port from which the D6 Server is connected.
Timeout	Time to wait for the connection in socket call.
Hold Time	This value decides the interval of the keepalive message exchange between the client and the server.
Component Name	The name of the LED for the ERM to associate the subsequent update messages.
D6 Configurations	
D6 server FQDN	D6 server fully qualified domain name.
D6 Server IP	Remote D6 server (ERM) IP address.
D6 Server Port	Listening port used by the D6 client in LED to setup connection with the peer.
Keep Alive Interval	The interval at which keepalive message will be sent.
Streaming Zone	The streaming zone within which the LED operates.
Failure Reason	Connection failure reason.
LED Input Groups	
VEI	Virtual edge input IP address under the LED.
Input Group Name	The name of the input group to which the virtual edge input (VEI) IP address is assigned.
Bandwidth (Mbps)	Bandwidth allocated to the LED Input Group.
VCG Input Groups	
VCG Id	The virtual carrier group ID.
Input Group Name	The name of the input group to which the virtual carrier group (VCG) is assigned.
Bandwidth (Mbps)	Bandwidth allocated to the VCG Input Group.
D6 Statistics	
Duration	Time duration after the connection is established.
Transfer Type	Tx/Rx (Transfer/Receive).
Open Messages	Number of open Messages sent.
Update Messages	Number of update messages sent.
Keepalive Messages	Number of keepalive messages sent to D6 server.

Field	Description
Notification Messages	Number of notification messages sent to D6 server.
Unknown Messages	Number of unknown messages sent to D6 server.

GQI

This tab display the GQI connections configured in the CMTS node.

Figure 103: GQI Tab

385223

Table 59: GQI Tab Field Description

Field	Description
SRM IP	Session resource manager IP address.
Management IP	IP used by the SRM.
LED ID	The ID of the logical edge device configured with GQI protocol.
LED Name	The name of the logical edge device configured with GQI protocol.
Connection Status	The status of the connection with session resource manager.
Version	GQI version.
Event Pending	Indicates the number of the pending GQI event.
Reset Indication	Indicates whether reset indication is sent or not.

Field	Description
Encryption Discovery	Display if the encryption capabilities of this device has be sent to the SRM.

Encryption Configurations

This section displays the video encryption configurations of the CMTS node.

Figure 104: Encryption Configurations

365942

Linecard Configuration

This tab displays the summary information of the linecard encryption.

Table 60: Linecard Configuration Tab Field Description

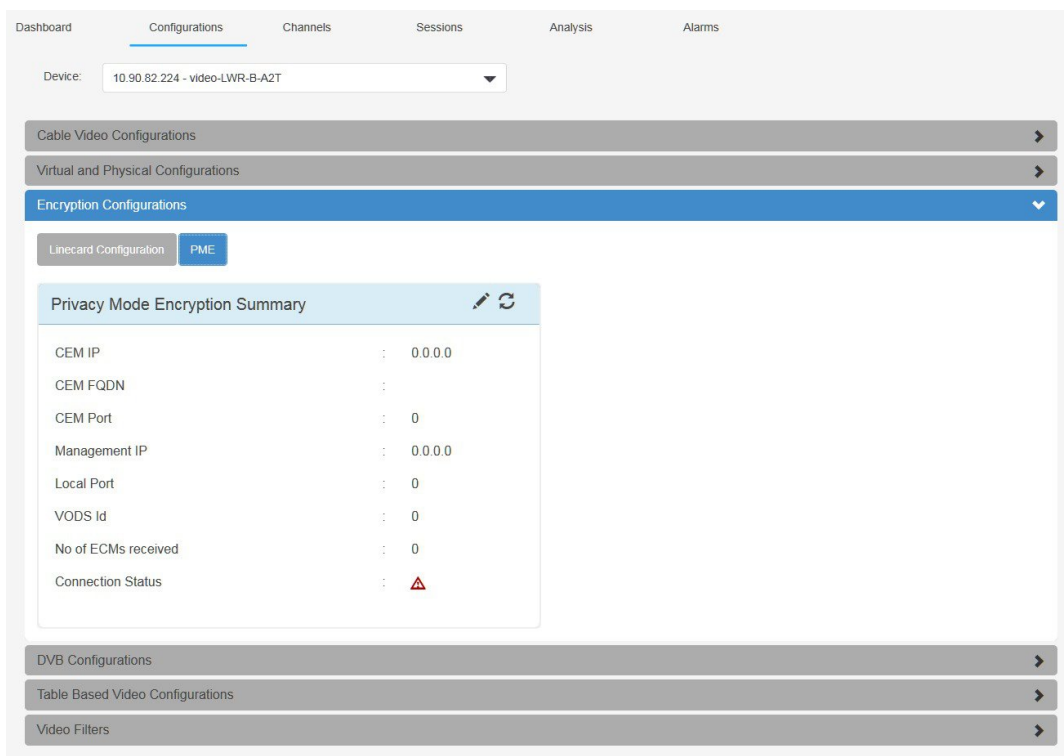
Field	Description
Slot	Linecard slot.
CA System	The conditional access system used for encryption.
Scrambling Algorithm	The scrambling algorithm used by CA system.

Check the **Show only available LineCards** box to hide unavailable linecards. Click the **Pencil** button to update the CA system and scrambling algorithm. Be aware that changing encryption will remove all the sessions and cause service interruption.

PME

This tab displays the summary information of the privacy mode encryption.

Figure 105: PME Tab



365941

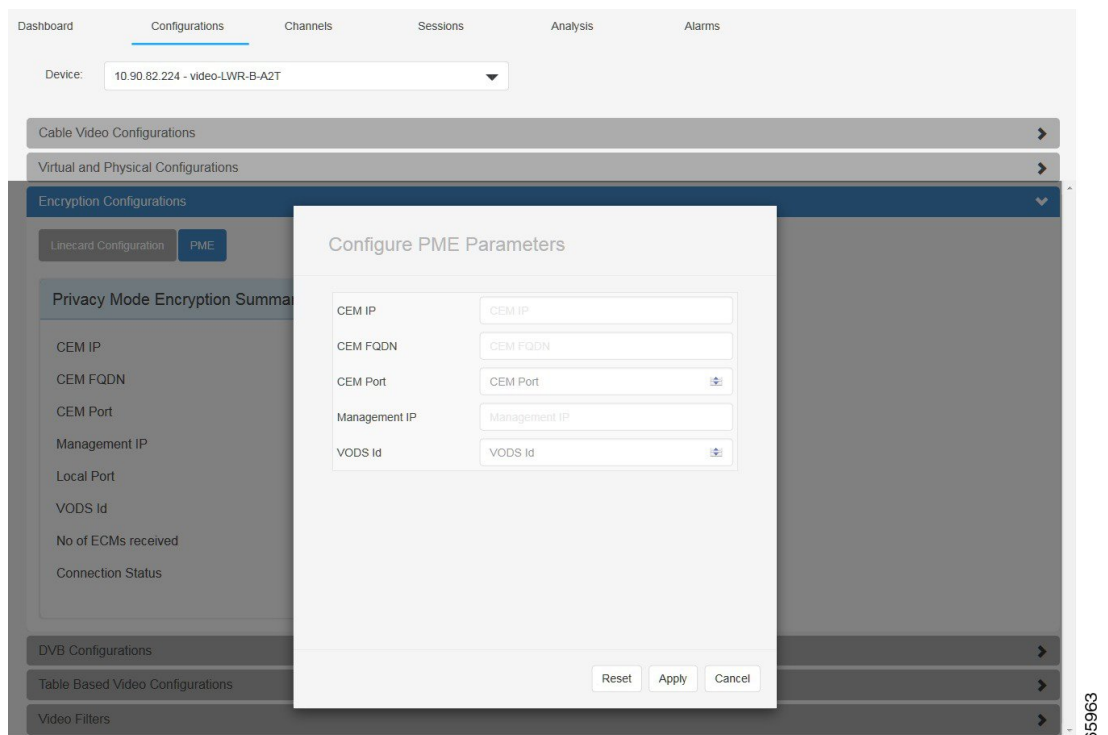
Table 61: PME Tab Field Description

Field	Description
CEM IP	IP address of the Windows/Linux system through which the CEM can be reached by Cisco cBR-8.
CEM FQDN	Fully Qualified Domain Name of the Windows/Linux system through which the CEM can be reached by Cisco cBR-8.
CEM Port	Port number on which the CEM listens for connections from the Cisco cBR-8.
Management IP	Source IP address of the cBR-8 virtual interface through which the connection must be established with the CEM server.

Field	Description
Local Port	IP port number of the CMTS used to communicate with the CEM server.
VODS Id	IDs assigned by CCAD/ARRIS to the MSO site.
No of ECMs received	Total number of PME ECMs received.
Connection Status	Indicates whether there is a connection to a CEM server.

Click the **Pencil** button to open Configure PME Parameters window.

Figure 106: Configure PME Parameters

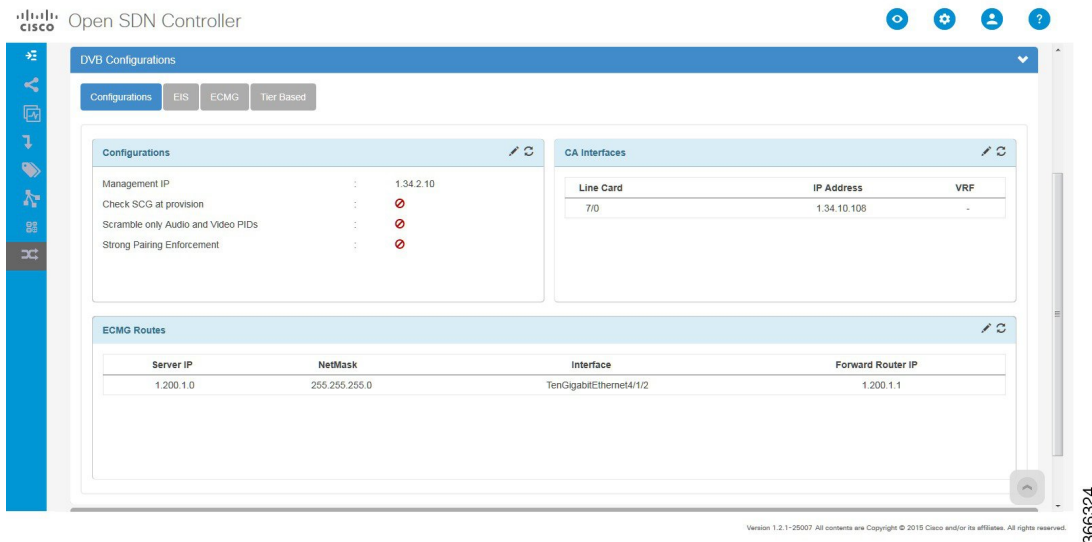


Make the necessary update in this window, then click **Apply** to commit the update.

DVB Configurations

This section displays the details of the DVB configuration.

Figure 107: DVB Configurations



Configurations

This tab displays the overview of the DVB configurations.

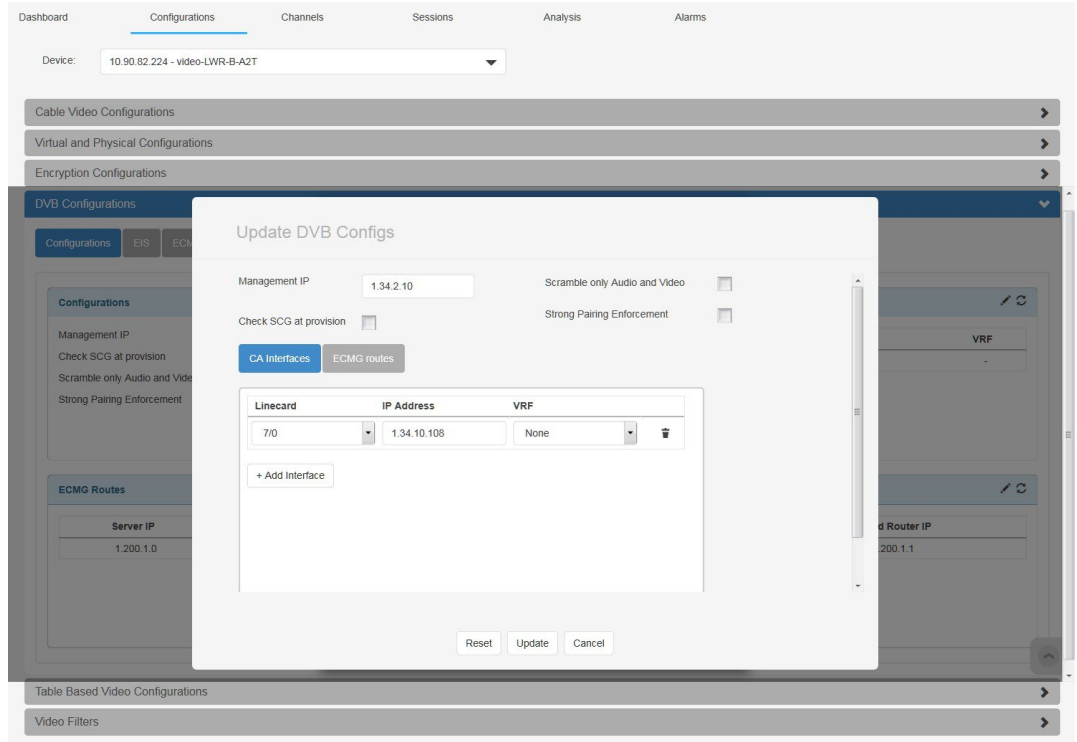
Table 62: Configurations Tab Field Description

Field	Description
Configurations	
Management IP	IP address used to manage DVB.
Check SCG at provision	Indicates whether Check SCG is enabled at provision time.
Scramble only Audio and Video PIDs	Indicates whether scrambling only video and audio pids is enabled.
Strong Pairing Enforcement	Indicates whether the NDS strong pairing enforcement is switched on.
CA Interfaces	
Line Card	Line card through which CA data is transferred.
IP Address	IP Address for the CA interface.
VRF	VRF in which the CA Interface is present.
ECMG Routes	
Server IP	IP address of the external ECMG server.
NetMask	Net mask of the external ECMG server.

Field	Description
Interface	The interface of the line card on which the connection with the external ECMG server is established.
Forward Router IP	

Click the **Pencil** button to open the Update DVB Configs window.

Figure 108: Update DVB Configs

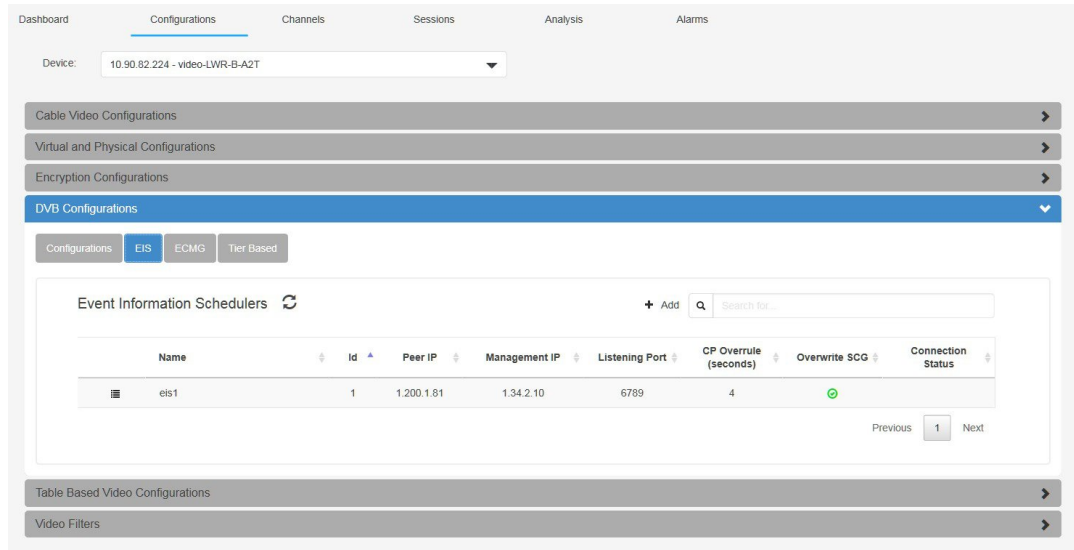


Make the necessary update in this window, then click **Apply** to commit the update.

EIS

This tab displays the EIS information.

Figure 109: EIS Tab



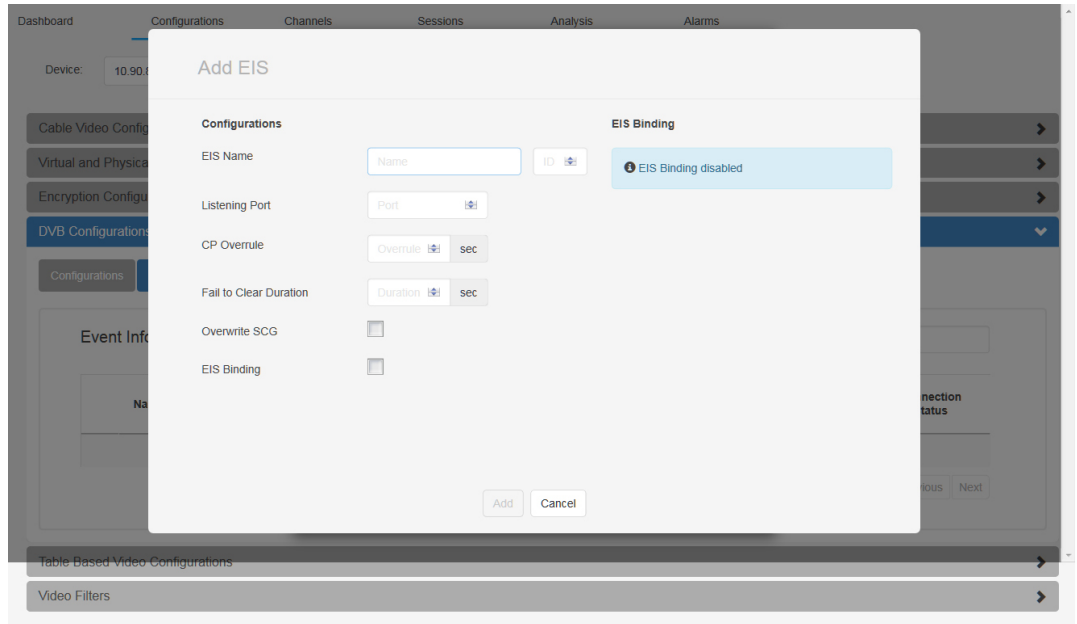
366332

Table 63: EIS Tab Field Description

Field	Description
Name	Event information scheduler name.
ID	Event information scheduler ID.
Peer IP	IP Address of the EIS server.
Management IP	IP address used to manage EIS server.
Listening Port	The listening port that is configured to establish the connection from the EIS Server.
CP Overrule (seconds)	Specifies the crypto period duration in seconds.
Overwrite SCG	Indicates whether the scrambling control group overwrite is enabled.
Connection Status	The status of the connection with the EIS.

Click the **Add** button to open the Add EIS window.

Figure 110: Add EIS



366409

Table 64: Add EIS Field Description

Field	Description
Fail to Clear Duration	Specifies a duration in second for which a configured DVB-encrypted sessions is allowed to function without encryption.
EIS Binding	Check to enable EIS binding.
Type	Specifies the EIS binding is made to an LED or a specific management IP.
LED Binding Type	LED Name or LED ID.
LED Name	The name of the LED to bind with EIS.
LED ID	The ID of the LED to bind with EIS.
IP Address	Management IP address to with the EIS is bound.

Fill in the information. Then click **Add** to confirm.

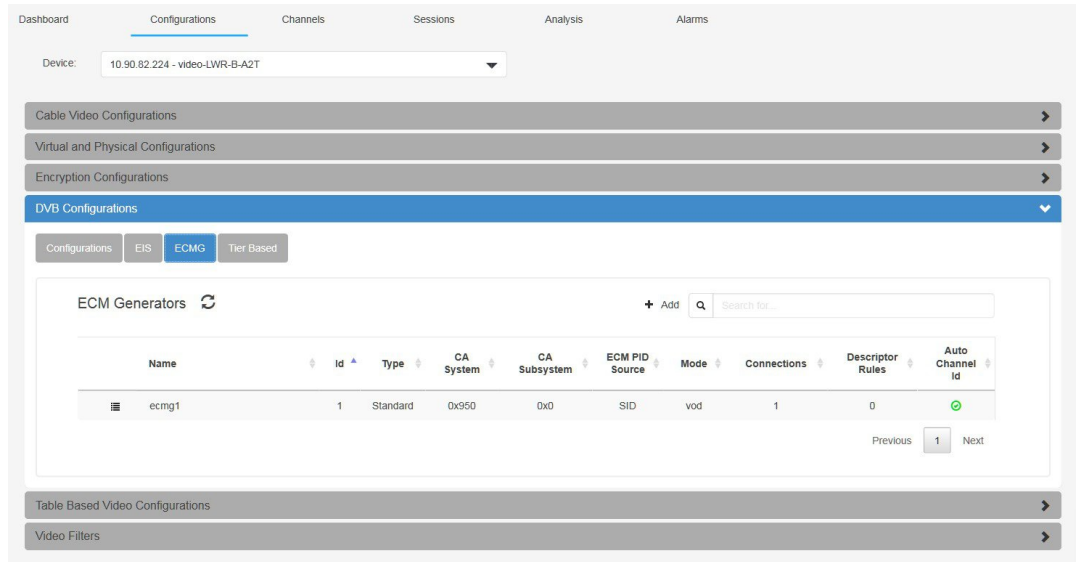
Move the mouse over the **Context Menu** button before the EIS name to display a context menu. Choose the **Delete** option to delete the EIS. Choose the **Update** option to update the EIS.

Make the necessary update in this window, then click **Update** to commit the update.

ECMG

This tab displays the ECMG information.

Figure 111: ECMG Tab



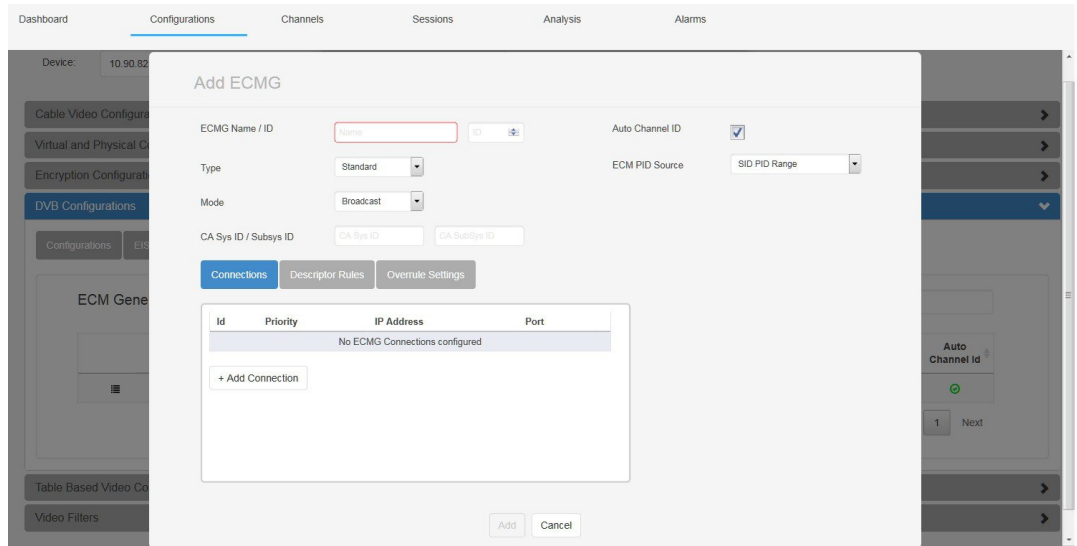
366327

Table 65: ECMG Tab Field Description

Field	Description
Name	Entitlement control message generator (ECMG) name.
ID	ECMG ID.
Type	Type of ECMG. Hitachi, Irdeto, Nagra, PowerKey, or standard.
CA System	CA system ID for the associated ECM stream in Hex.
CA Subsystem	CA subsystem ID in Hex.
ECM PID Source	Source of ECM PID.
Mode	ECMG mode. Broadcast, Tier based, or VOD.
Connections	Number of ECMG connections.
Descriptor Rules	Number of descriptor rule.
Auto Channel ID	Specifies if the automatic channel ID selection is enabled.

Click the **Add** button to open the Add ECMG window.

Figure 112: Add ECMG



There are three tabs in this window: Connections, Descriptor Rules, and Override Settings. Each has several parameters to configure.

Table 66: Add ECMG Window Tabs Field Description

Field	Description
Connections	
ID	ECMG connection ID.
Priority	Priority of the ECMG connection.
IP Address	IP address of the external ECMG.
Port	Port number.
Descriptor Rules	
Name	Descriptor rule name.
ID	Descriptor rule ID.
Rule Type	There are two descriptor rule types: <ul style="list-style-type: none"> • Add private data: Specifies that private data is inserted to the standard descriptor. • Do not insert: Specifies that no standard descriptor rules are inserted.

Field	Description
Insertion Level	There are two insertion levels: <ul style="list-style-type: none"> • As per EIS: Specifies that EIS determines the private data insertion level. • ES level: Specifies that the private data is inserted at the elementary stream level.
Rule	All ECM ID, or ECM ID List.
ECM ID List	ECM IDs to which the rules must be applied, in decimal, separated by commas.
Private Data	Private data in Hexadecimal without the 0x prefix.
Overrule Settings	
Access Criteria Start Delay	Specifies the delay between the start of first CP after a change in access criteria and ECM broadcast.
Access Criteria Stop Delay	Specifies the delay between the end of last CP preceding a change in access criteria and ECM broadcast.
Start Delay	Specifies the delay between the start of CP and ECM broadcast in milliseconds.
Stop Delay	Specifies the delay between the end of CP and ECM broadcast in milliseconds.
Transition Start Delay	Specifies the transition start delay in milliseconds.
Transition Stop Delay	Specifies the transition stop delay in milliseconds.
Repetition Period	Specifies the repetition period of ECM packets in milliseconds.
Minimum CP Duration	Specifies the minimum crypto period (CP) in milliseconds.
Maximum Computation Time	Specifies the maximum time needed by ECMG to compute an ECM in milliseconds.
Maximum Streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Fill in the information. Then click **Add** to confirm.

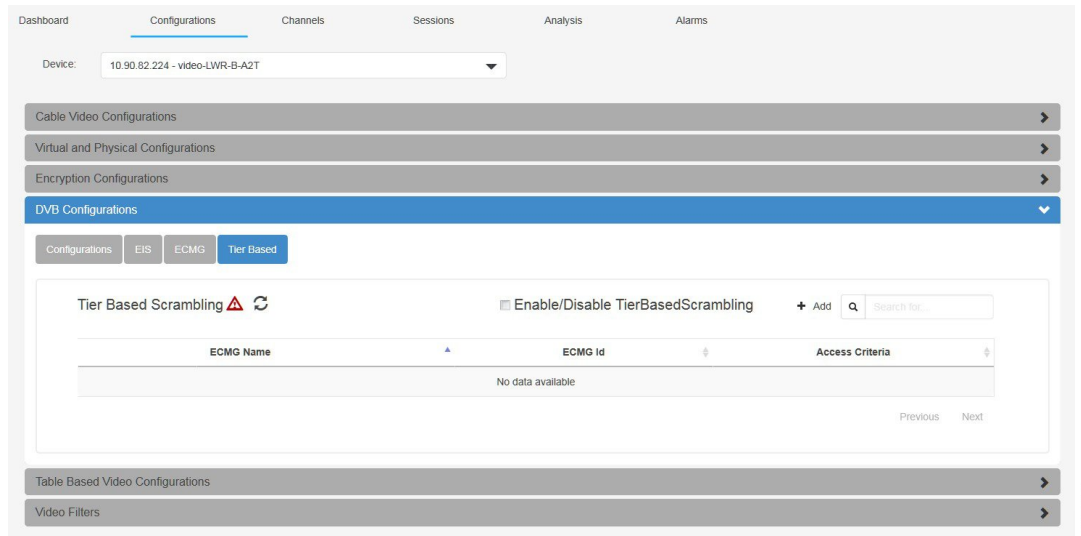
Move the mouse over the **Context Menu** button before the ECMG name to display a context menu. Choose the **Delete** option to delete the ECMG. Choose the **Update** option to update the ECMG.

Make the necessary update in this window, then click **Update** to commit the update.

Tier Based

This tab displays the Tier Based Scrambling information.

Figure 113: Tier Based Tab



366335

Table 67: Tier Based Tab Field Description

Field	Description
ECMG Name	The name of the tier based ECMG.
ECMG ID	The ID of the tier based ECMG.
Access Criteria	The access criteria per ECMG.

Check the Enable/Disable Tier Based Scrambling checkbox to enable the tier based scrambling.

Click the **Add** button to open the Add Tier Based ECMG window. To add tier based ECMG, make sure there is ECMG with tier based mode configured under ECMG tab.

Figure 114: Add Tier Based ECMG

ECMG	Access Criteria
<input type="text"/>	Access Criteria

Apply Cancel

366336

Choose the available tier based ECMG, and fill in the access criteria. Then click **Add** to confirm.

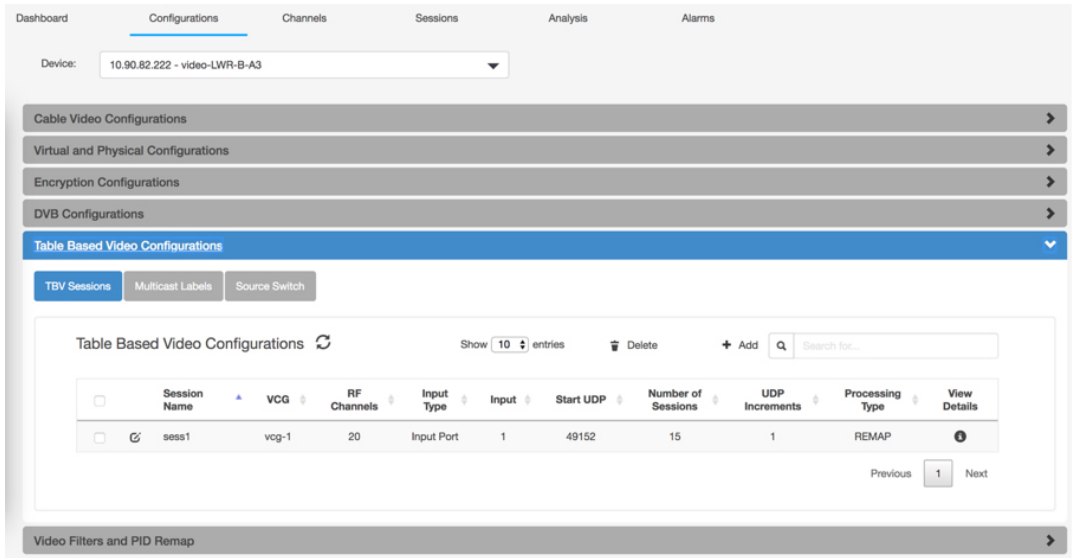
Move the mouse over the **Context Menu** button before the ECMG name to display a context menu. Choose the **Delete** option to delete the tier based ECMG. Choose the **Update** option to update the tier based ECMG.

Make the necessary update in this window, then click **Update** to commit the update.

Table Based Video Configurations

This section displays the details of the table based video configuration.

Figure 115: Table Based Video Configurations



367495

TBV Sessions

This tab displays the details of the table based video sessions.

Table 68: TBV Sessions Tab Field Description

Field	Description
Session Name	The name of the video session.
VCG	The virtual carrier group that this session belongs to.
RF Channels	The RF channel that this session belongs to.
Input Type	TBV sessions can be created using multiple inputs like Input Port/VEI Bundle ID/Multicast Label/Multicast Group and source IP. This fields describes with which input the session is created.
Input	Displays the input detail. It displays the Input Port number if the input type is Input Port or similarly it displays the VEI Bundle Id, Multicast label or group IP and source IP based on the input type.
Start UDP	UDP port number of first session.
Number of Sessions	Number of sessions per RF channel.
UDP Increments	Amount port number is increased for each session.
Processing Type	Processing type of the session (Remap/Passthru/Data).

Click the **Add** button to open the Add TBV Sessions window.

Figure 116: Add TBV Sessions

Add TBV Sessions

Configurations

Virtual Carrier Group:

RF Channels:

Session Type:

Input Type:

Session Defaults

Jitter:

Stream Rate:

Repeat:

Name	VEI/Input Port	Processing Type	Start UDP	No. of sessions	Increment by	Start Program	Start PMV	Bitrate	
<input type="text" value="sess1"/>	<input type="text" value="1.2.3.4 / 1"/>	<input type="text" value="Remap"/>	<input type="text" value="50000"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="200"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="button" value="🗑"/>
<input type="text" value="sess2"/>	<input type="text" value="1.2.3.4 / 1"/>	<input type="text" value="Remap"/>	<input type="text" value="51000"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="250"/>	<input type="text" value="2"/>	<input type="text" value="0"/>	<input type="button" value="🗑"/>

366415

VCGs that are bound to SDG with RF ports and the VCGs that have an active LED is displayed in the drop down list. A group of unicast/multicast sessions can be configured all at once. Session defaults apply to all the sessions that are created using the **Add** button.

Fill in the information. Then click **Add** to confirm.

Click the **View Details** button at the end of each session to display the details of this session.

Figure 117: Session Details

Session Details

VCG Name	: test		
RF Channel	: 1 - 4		

Session Name	: pmv1	Start UDP Port	: 51500
Input Type	: Input Port	Number of Sessions per QAM	: 1
Input Port	: 1	UDP Increments	: 1
Processing Type	: REMAP	Start Output Program Number	: 2001
Configured Bitrate	: Not configured	Repeat Output Program Numbers	: NO
Stream Rate	: VBR	Start PID Multiplier Value	: 21
Jitter	: 100 ms		

366416

Table 69: Session Details Field Description

Field	Description
VCG Name	The virtual carrier group that this session belongs to.
RF Channel	The RF channel that this session belongs to.
Session Name	The name of the video session.
Input Type	TBV sessions can be created using multiple inputs like Input Port/VEI Bundle ID/Multicast Label/Multicast Group and source IP. This fields describes with which input the session is created.
Input Port/Multicast Group/ Multicast Label	Displays the input detail. It displays the Input Port number if the input type is Input Port or similarly it displays the VEI Bundle Id, Multicast label or group IP and source IP based on the input type.
Processing Type	Processing type of the session (Remap/Passthru/Data).
Configured Bitrate	Predicted max bitrate. Used to calculate remaining bandwidth on a QAM.
Stream Rate	CBR/VBR
Jitter	Dejitter buffer depth for the session.

Field	Description
Start UDP Port	UDP port number of first session.
Number of Sessions per QAM	Number of sessions per RF channel.
UDP Increments	Amount that the port number is increased for each session.
Start Output Program Number	Output program number that the first session will be assigned.
Repeat Output Program Numbers	Display if output program numbers are reused across RF Channels when multiple sessions are created.
Start PID Multiplier Value	The value of first PID in a range that can be used for a specific UDP flow.

Click the **Edit** button at the beginning of each session to edit this session.

Select session and click the **Delete** button to delete selected session.

Multicast Labels

This tab displays the details of the multicast labels. Multicast labels are typically used for source switching and multiple sources can be configured for a multicast group.

Figure 118: Multicast Labels Tab

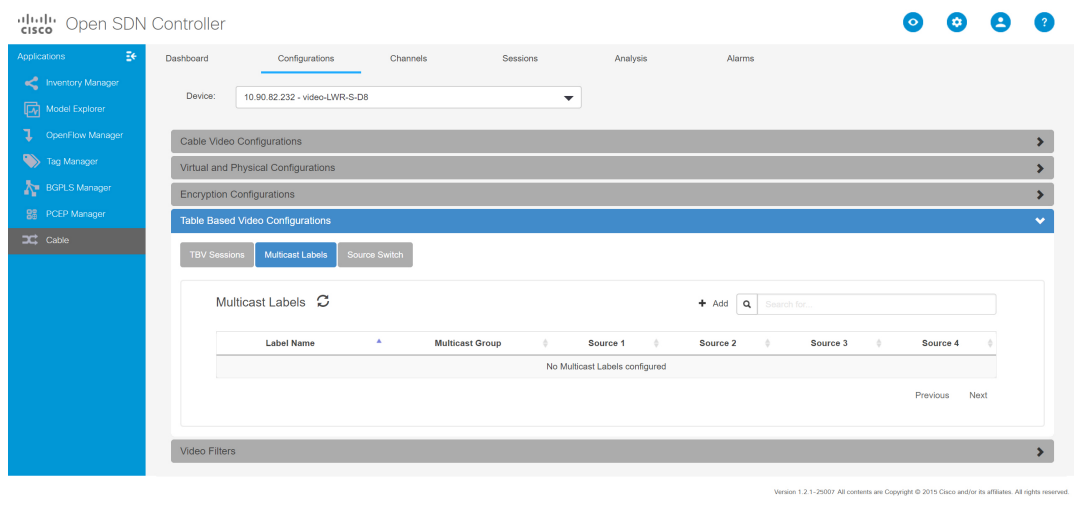


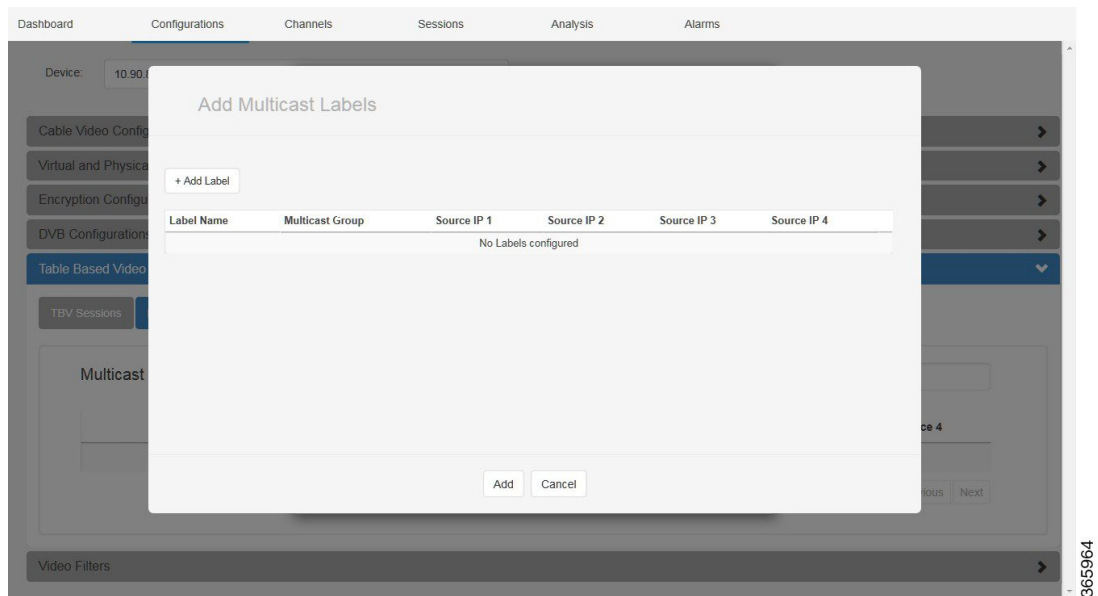
Table 70: Multicast Labels Tab Field Description

Field	Description
Label Name	Label name used to create multicast sessions.
Multicast Group	Multicast IP address that receive multicast sessions.
Source IP 1	First source IP of the multicast group.

Field	Description
Source IP 2	Second source IP of the multicast group.
Source IP 3	Third source IP of the multicast group.
Source IP 4	Fourth source IP of the multicast group.

Click the **Add** button to open the Add Multicast Label window.

Figure 119: Add Multicast Label

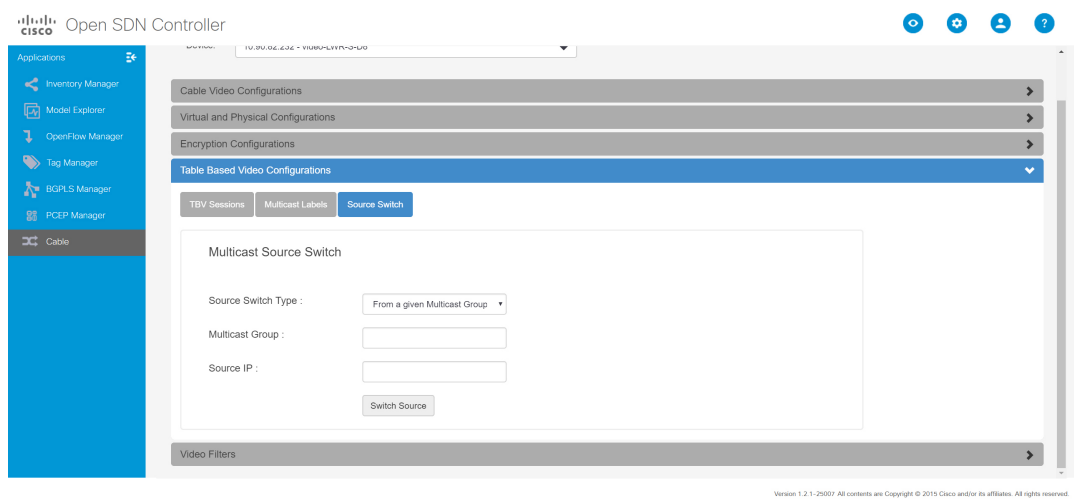


Fill in the information. Then click **Add** to confirm.

Source Switch

This tab is used to switch the source of a multicast group.

Figure 120: Source Switch Tab



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366709

Table 71: Source Switch Tab Field Description

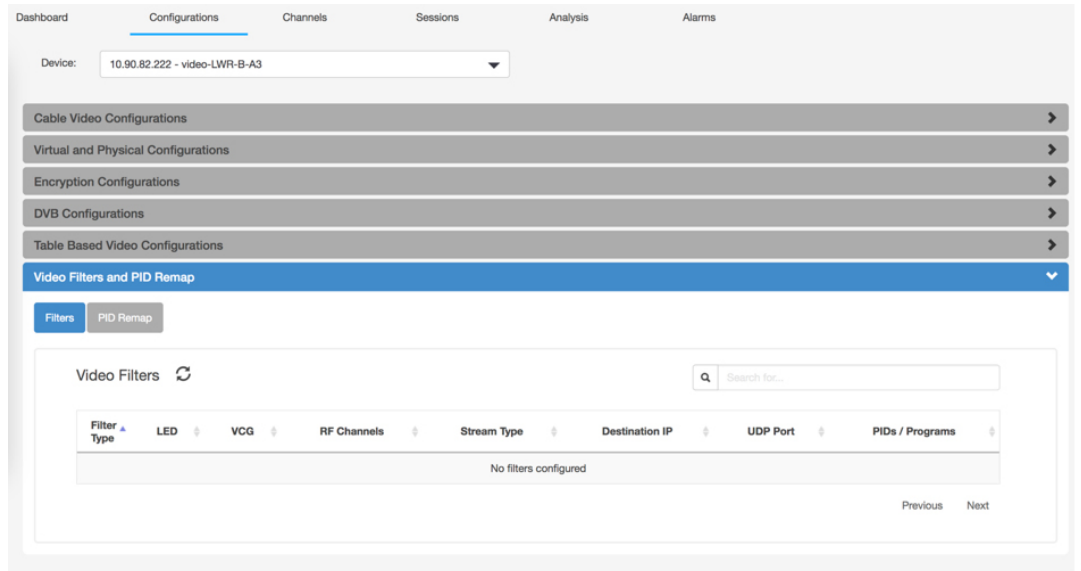
Field	Description
Source Switch Type	From a given multicast group, or to a multicast group.
Multicast Group	Multicast IP address that receive multicast sessions.
Source IP	The destination source IP to switch to.

Fill in the information. Then click **Switch Source** to switch.

Video Filters and PID Remap

This section displays the details of the video filters and PID remap.

Figure 121: Video Filters and PID Remap



367499

Filters

This tab displays the details of the video filters.

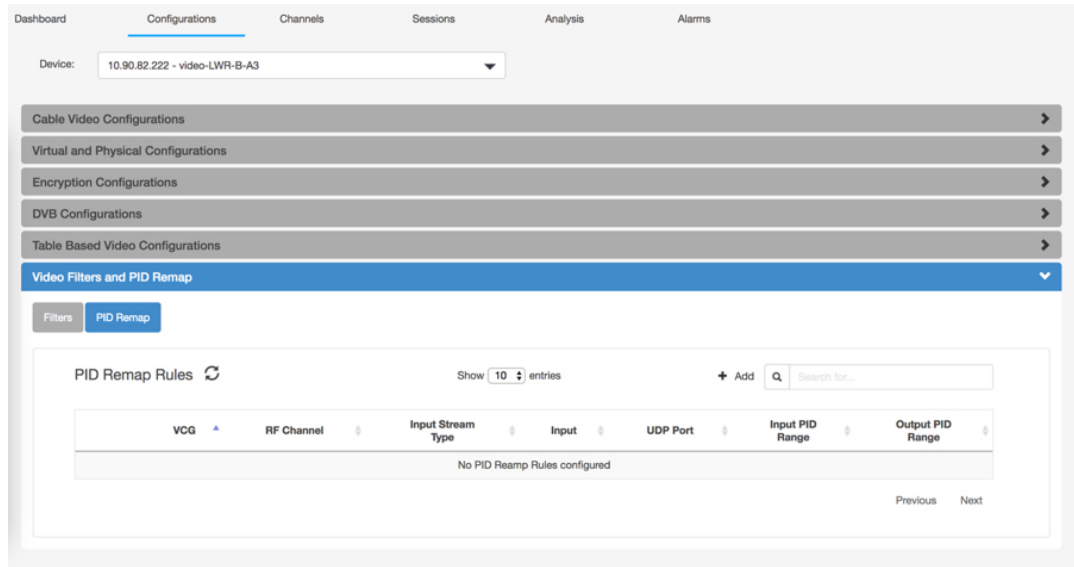
Table 72: Filters Field Description

Field	Description
Filter Type	PID filter/program filter.
LED	LED to which this filter belongs.
VCG	VCG to which this filter belongs.
RF Channels	RF Channels to which this filter applies in the VCG.
Stream Type	Unicast/Multicast.
Destination IP	Unicast destination IP address.
UDP Port	UDP port on which the filter should be applied.
PIDs/Programs	PID/Programs to be blocked.

PID Remap

This tab displays the details of the PID remap.

Figure 122: PID Remap



367509

Table 73: PID Remap Field Description

Field	Description
VCG	VCG to which this remap rule belongs.
RF Channel	RF Channels to which this remap rule applies in the VCG.
Input Stream Type	Unicast/Multicast.
Input	Destination IP to which this remap rule applies.
UDP Port	UDP port on which the remap rule applies.
Input PID Range	Original PID range.
Output PID Range	Remapped PID range.

Click the **Add** button to open the Add PID Remap Rule window.

Figure 123: Add PID Remap Rule

Fill in the information. Then click **Add** to add PID remap rule.

Channels Page

Use this page to view QAM video channels of the CMTS node.

Figure 124: Channels Page

RF-Channel	Type	TSID	ONID	Admin State	OP State	VCG	SDG	LED	Encryption Capable	Total Sessions
7/0/0.0	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.1	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.2	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.3	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.4	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.5	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.6	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.7	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.8	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0
7/0/0.9	RF-Port	-	-	ON	UP	-	-	-	CLEAR	0

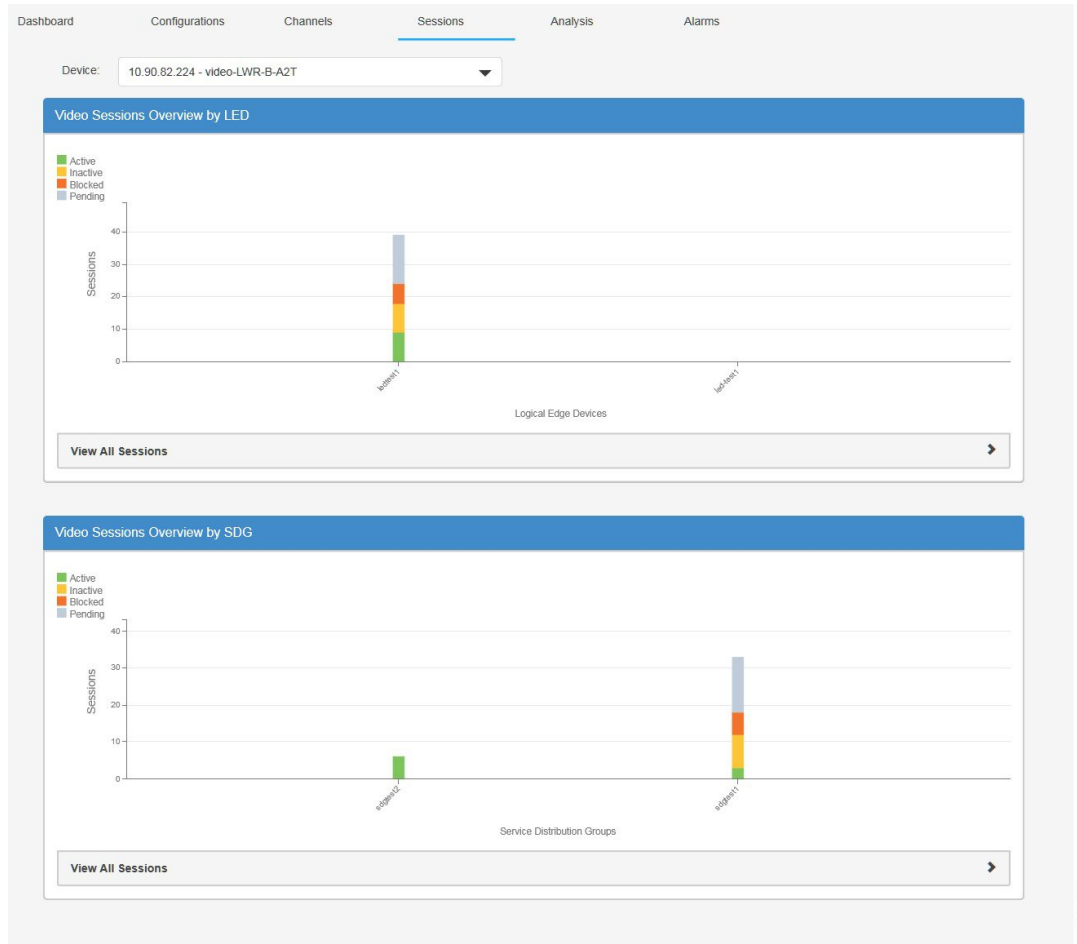
Table 74: Channels Page Field Description

Field	Description
RF-Channel	The RF channel configured on the RF port.
Type	Type of the medium on which the RF channel is created.
TSID	Transport stream ID.
ONID	Original network ID.
Admin State	Desired state.
OP State	Actual state.
VCG	The virtual carrier group that this RF channel belongs to.
SDG	The service distribution group that this RF channel belongs to.
LED	The logical edge device on which this virtual carrier group is provisioned.
Encryption Capable	Displays whether this channel is capable of encrypting the output.
Total Sessions	Total sessions in this RF channel.

Sessions Page

Use this page to get an overview of the video sessions.

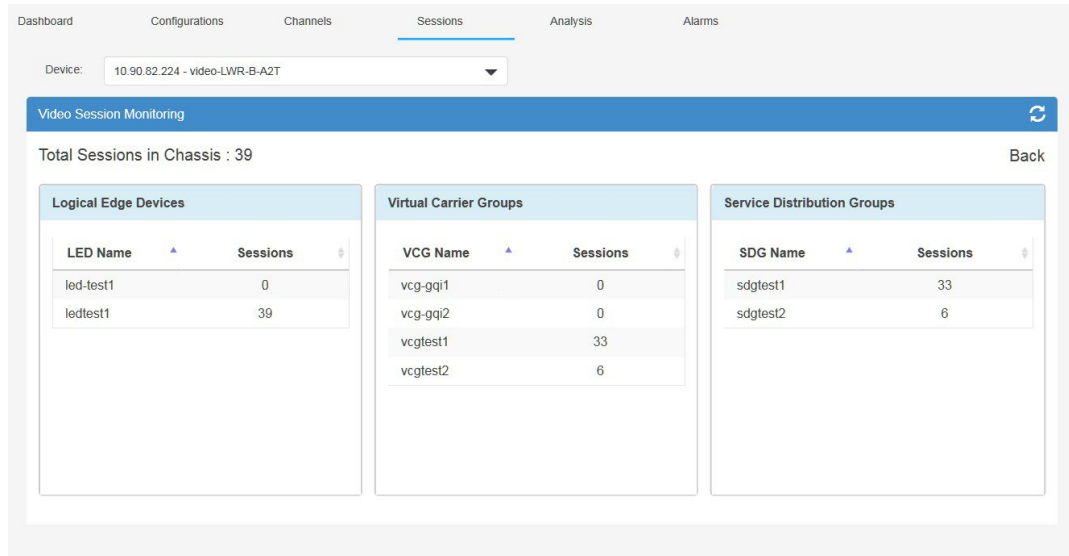
Figure 125: Sessions Page



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Click the **View All Sessions** button to view the statistical information of the video sessions.

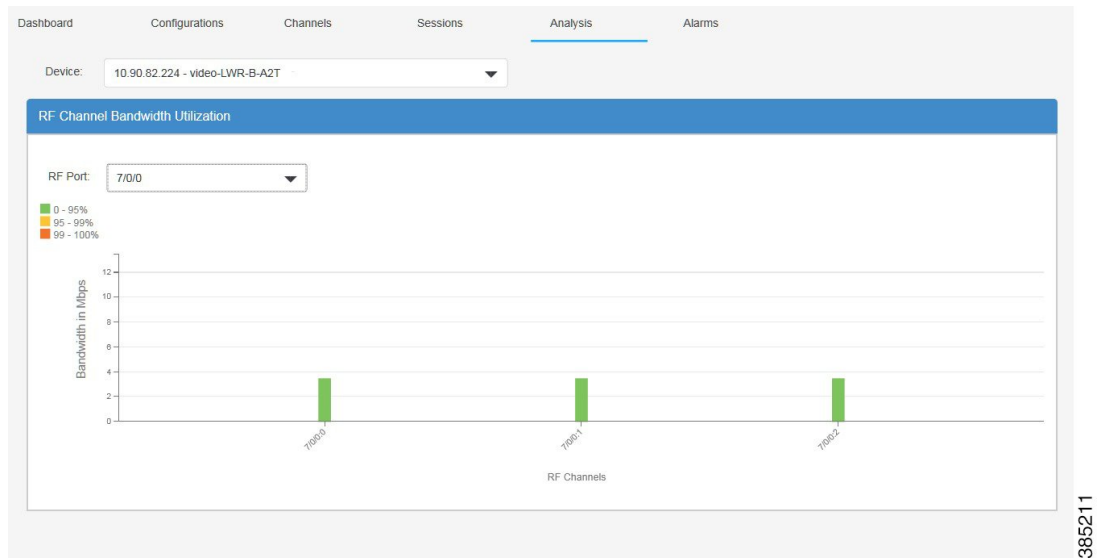
Figure 126: Video Session Monitoring



Analysis Page

Use this page to view RF channel bandwidth utilization of each RF port.

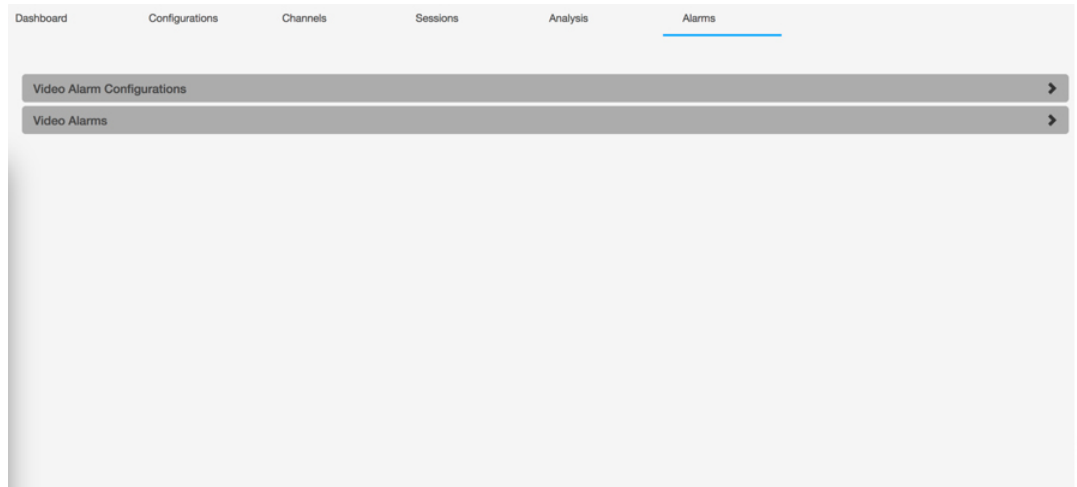
Figure 127: Analysis Page



Alarms Page

Use this page to view video related alarms of the CMTS node.

Figure 128: Alarms Page

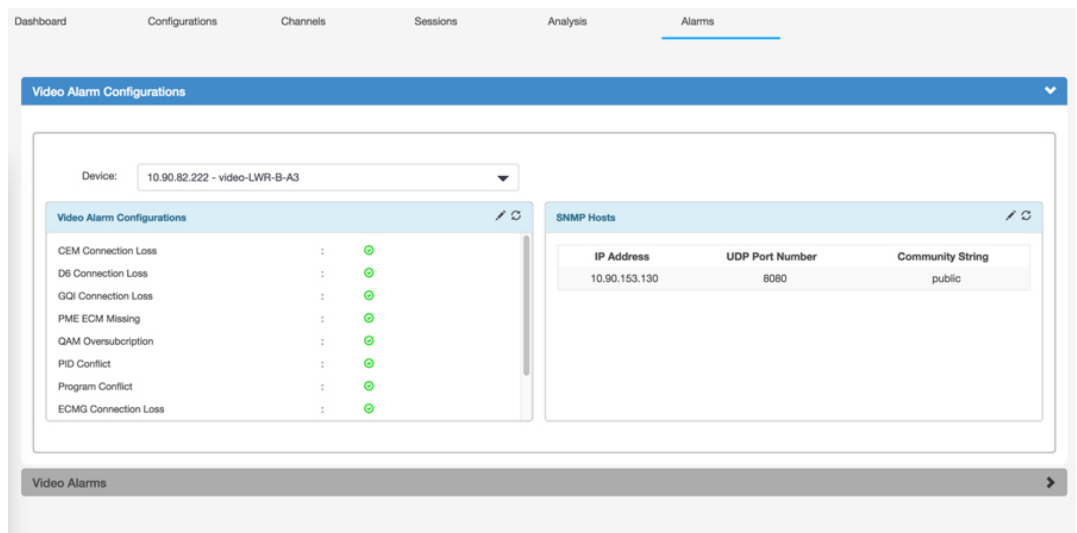


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Video Alarm Configurations

This section displays the video alarm configuration details.

Figure 129: Video Alarm Configurations



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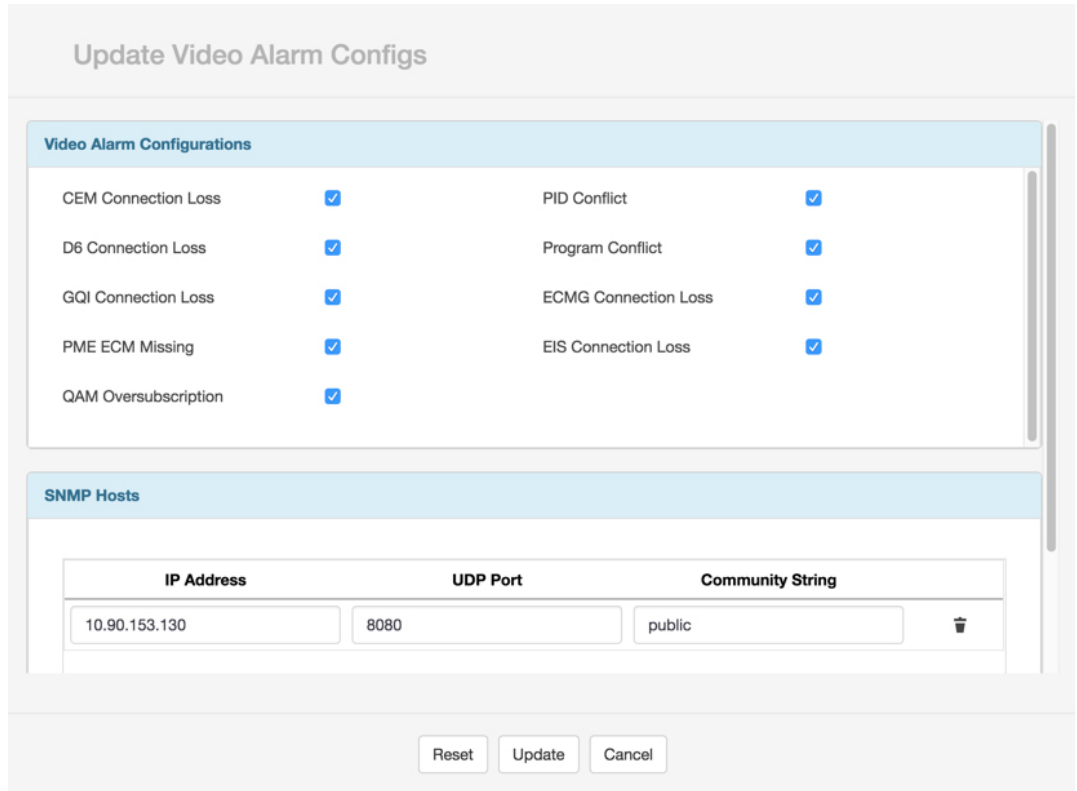
Table 75: LED Details Field Description

Field	Description
Video Alarm Configurations	
CEM Connection Loss	Display CEM connection loss configuration status (Enabled/Disabled). This alarm is triggered whenever there is a connection loss to CEM Server.

Field	Description
D6 Connection Loss	Display D6 connection loss configuration status (Enabled/Disabled). This alarm is triggered whenever there is a connection loss to D6 Server.
GQI Connection Loss	Display GQI connection loss configuration status (Enabled/Disabled). This alarm is triggered whenever there is a connection loss to GQI Server.
PME ECM Missing	Display PME ECM missing configuration status (Enabled/Disabled). This alarm is triggered when cBR-8 is connected to CEM but it hasn't received any ECM.
QAM Oversubscription	Display QAM oversubscription configuration status (Enabled/Disabled). This alarm is triggered whenever there is a QAM subscription.
PID Conflict	Display PID conflict configuration status (Enabled/Disabled). This alarm is triggered whenever there is output PID conflict in a QAM Channel.
Program Conflict	Display program conflict configuration status (Enabled/Disabled). This alarm is triggered whenever there is output program number conflict in a QAM Channel.
ECMG Connection Loss	Display ECMG connection loss configuration status (Enabled/Disabled). This alarm is triggered whenever there is a connection loss to ECMG Server.
SNMP Hosts	
IP Address	IP address of the SNMP host.
UDP Port Number	UDP port number of the SNMP host.
Community String	Community string of the SNMP host.

Click the **Pencil** button to open the Update Video Alarm Configs window.

Figure 130: Update Video Alarm Configs



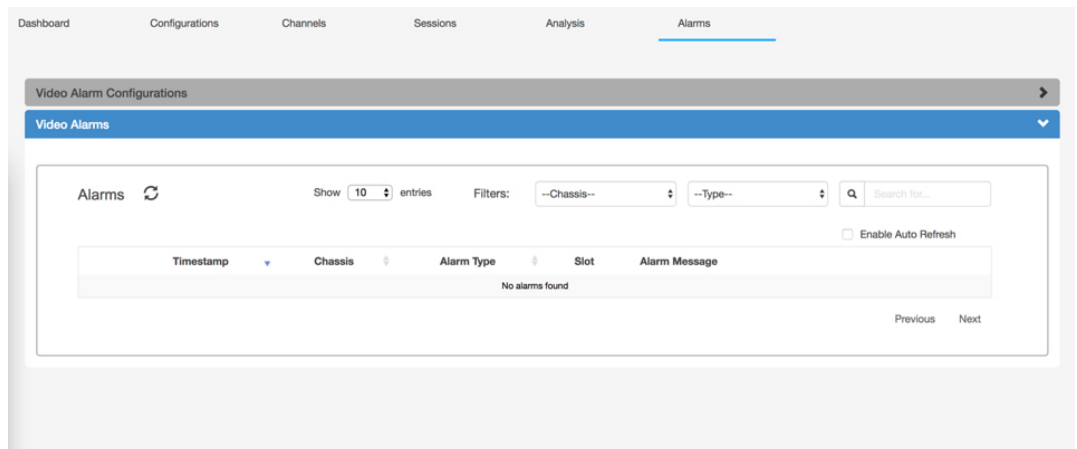
367496

Make the necessary update in this window, then click **Update** to commit the update. To restore to the existing configuration, click the **Reset** button.

Video Alarm

This section displays the video alarm details. Use the filters to filter the displayed alarms by specific criteria. Check the Enable Auto Refresh box, the alarms displayed will refresh in a specific interval.

Figure 131: Video Alarms



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