



List of Commands

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aaa authentication dot1x

To configure IEEE 802.1X authentication method using RADIUS as the protocol, use the **aaa authentication dot1x** command in global configuration mode.

aaa authentication dot1x default group radius

Syntax Description	default	Uses the listed authentication methods that follow this keyword as the default list of methods for authentication. Only group radius is supported in NCS 1002.
	group radius	Specifies a method list that uses the list of all configured RADIUS servers for authentication.
Command Default	No authentication is performed.	
Command Modes	Global configuration	
Command History	Release	Modification
	R6.3.2	This command was introduced.

Example

The following is a sample of configuring the 802.1X authentication method.

```
configure
aaa authentication dot1x default group radius
exit
commit
```

aaa authentication login

To configure authentication, authorization, and accounting (AAA) authentication at login, use the **aaa authentication login** command in global configuration mode.

aaa authentication login { **default** | *list-name* } *method-list*

Syntax Description	
login	Sets authentication for login.
default	Uses the listed authentication methods that follow this keyword as the default list of methods for authentication.
<i>list-name</i>	Character string used to name the authentication method list.
<i>method-list</i>	Method used to enable AAA system accounting. Method list types are entered in the preferred sequence. The value is one of the following options: <ul style="list-style-type: none"> • group tacacs+ — Specifies a method list that uses the list of all configured TACACS+ servers for authentication. • group radius — Specifies a method list that uses the list of all configured RADIUS servers for authentication. • group named-group — Specifies a named subset of TACACS+ or RADIUS servers for authentication. • local — Specifies a local username or password database for authentication. • line — Specifies a line password or user group for authentication.
Command Default	No authentication is performed.
Command Modes	Global configuration

Example

The following example shows how to specify the default method list for authentication, and also enable authentication.

```
configure
aaa authentication login default group tacacs+
```

```
exit
commit
```

aaa authorization (System Admin-VM)

To create command rules and data rules on for user authorization, use the **aaa authorization** command in System Admin Config mode. To delete the command rules and data rules, use the **no** form of this command.

```
aaa authorization { cmdrules cmdrule { integer | range integer } [{ action action-type |
command cmd-name | context context-name | group group-name | ops ops-type }] | commands
group { none | tacacs } | datarules datarule { integer | range integer } [{ action action-type
| context context-name | group group-name | keypath keypath-name | namespace namespace-string
| ops ops-type }]} }
```

Syntax Description		
cmdrules		Configures command rules.
cmdrule <i>integer</i>		Specifies the command rule number.
range <i>integer</i>		Specifies the range of the command rules or data rules to be configured.
action		Specifies whether users are permitted or not allowed to perform the operation specified for the ops keyword.
<i>action-type</i>		Specifies the action type for the command rule or data rule. Available options are: accept , accept_log and reject .
command <i>cmd-name</i>		Specifies the command to which the command rule applies. The command must be entered within double-quotes. Example, get .
context <i>context-name</i>		Specifies to which type of connection the command rule or data rule applies. The connection type can be netconf, cli, or xml.
group <i>group-name</i>		Specifies the group to which the command rule or data rule applies. Example, admin-r .
ops <i>ops-type</i>		Specifies whether the user has read, execute, or read and execute permissions for the command. Available options for command rules are: r , rx , and x . To know the available options for data rules, use a ? after the ops keyword.
commands group		Sets the command authorization lists for server groups. Available options are none that specifies no authorization and tacacs that specifies use of the list of all tacacs+ hosts.
Command Default		None

Command Modes	System Admin Config mode
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Command History	Release	Modification
	Release 6.3.2	This command was introduced.

This example shows how to create a command rule:

```
Router#admin
sysadmin-vm:0_RP0#configure
sysadmin-vm:0_RP0(config)#aaa authorization cmdrules cmdrule 6
sysadmin-vm:0_RP0(config-cmdrule-6)#context netconf
sysadmin-vm:0_RP0(config-cmdrule-6)#command get
sysadmin-vm:0_RP0(config-cmdrule-6)#group admin-r
sysadmin-vm:0_RP0(config-cmdrule-6)#ops rx
sysadmin-vm:0_RP0(config-cmdrule-6)#action accept
sysadmin-vm:0_RP0(config)#commit
```

authentication timer reauthenticate

To specify the period of time between which reauthentication of authorized ports happens, use the **authentication timer reauthenticate** command in global configuration mode.

authentication timer reauthenticate { *seconds* | **server** }

Syntax Description	<i>seconds</i> The number of seconds between reauthentication attempts. The range is from 60 to 5184000 (in seconds).
	server Specifies that the interval between reauthentication attempts is defined by the Session-Timeout value (RADIUS Attribute 27) on the AAA server.

Command Default	None
------------------------	------

Command Modes	Global configuration
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Command History	Release	Modification
	R6.3.2	This command was introduced.

Example

The following is a sample of configuring the 802.1X profile.

```
configure
dot1x profile reauth
pae both
authentication timer reauthenticate 3600
supplicant eap profile ncs1k
exit
commit
```

aaa authorization

To create a method list for authorization, use the **aaa authorization** command in global configuration mode.

```
aaa authorization {exec | nacm} { default | list-name } {none | local | group tacacs+ | group radius |
group group-name }
```

Syntax Description		
exec		Configures authorization for an interactive (EXEC) session.
nacm		Enables the NACM (NETCONF Access Control Model) functionality.
default		Uses the listed authorization methods that follow this keyword as the default list of methods for authorization.
<i>list-name</i>		Character string used to name the list of authorization methods.
none		Uses no authorization. If you specify none , no subsequent authorization method is attempted.
local		Uses local authorization. This method of authorization is not available for command authorization.
group tacacs+		Uses the list of all configured TACACS+ servers for authorization.
group radius		Uses the list of all configured RADIUS servers for authorization. This method of authorization is not available for command authorization.
group <i>group-name</i>		Specifies a named subset of TACACS+ or RADIUS servers for authorization.

Command Default Authorization is disabled for all actions (equivalent to the method none keyword).

Command Modes Global configuration

Example

The following example shows how to define the network authorization method list named listname1, which specifies that TACACS+ authorization is used.

```
configure
aaa authorization exec listname1 group tacacs+
exit
commit
```

cipher-suite

To configure the cipher suite for encrypting traffic with MACsec, use the **cipher-suite** command in MACsec policy configuration mode.

The first portion indicates the encryption method, the second portion indicates the hash or integrity algorithm, and the third portion indicates the length of the cipher.

cipher-suite *encryption_suite*

Syntax Description	GCM-AES-XPN-256 GCM encryption method; AES encryption algorithm that uses Extended Packet Numbering (XPN) of 64 bits; 256 bit encryption.				
Command Default	The default cipher suite chosen for encryption is GCM-AES-XPN-256.				
Command Modes	MACsec policy configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.1.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.1.1	This command was introduced.
Release	Modification				
Release 6.1.1	This command was introduced.				

Example

The following example shows how to use the **cipher-suite** command.

```
configure
macsec-policy mac_policy
cipher-suite GCM-AES-XPN-256
```

clear counters controller

To clear the alarm counters of coherent DSP or optics controller, use the **clear counters controller** command in XR EXEC mode.

clear counters controller {coherentDSP|optics} R/S/I/P

Syntax Description	<i>R/S/I/P</i> Rack/Slot/Instance/Port of the coherent DSP or optics controller.				
Command Default	None				
Command Modes	XR EXEC				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.5.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.5.1	This command was introduced.
Release	Modification				
Release 6.5.1	This command was introduced.				

Example

The following example shows how to clear the alarm counters of coherent DSP or optics controller

```
RP/0/RP0/CPU0:ios#clear counters controller coherentDSP 0/0/0/6
Fri Jun 29 17:52:25.035 IST
All counters are cleared
RP/0/RP0/CPU0:ios#
RP/0/RP0/CPU0:ios#clear counters controller optics 0/0/0/5
Sat Jun 23 13:39:21.616 IST
All counters are cleared
```

The following example shows the output of show controllers coherentDSP command before the alarm counters of LOS,LOF,LOM, OOF,OOM and AIS are reset

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/0/0/5
Sat Jun 23 13:36:15.493 IST

Port                               : CoherentDSP 0/0/0/5
Controller State                   : Up
Inherited Secondary State         : Normal
Configured Secondary State       : Normal
Derived State                      : In Service
Loopback mode                     : None
BER Thresholds                    : SF = 1.0E-5  SD = 1.0E-7
Performance Monitoring            : Enable

Alarm Information:
LOS = 65          LOF = 60          LOM = 0
OOF = 60          OOM = 60          AIS = 0
IAE = 0 BIAE = 0          SF_BER = 0
SD_BER = 0        BDI = 1 TIM = 0
FECMISMATCH = 0 FEC-UNC = 0
Detected Alarms                   : None

Bit Error Rate Information
PREFEC BER                       : 1.9E-04
POSTFEC BER                      : 0.0E+00

TTI :
  Remote hostname                 : rosco-fbcvt-002
  Remote interface                : CoherentDSP 0/0/0/5
  Remote IP addr                  : 0.0.0.0

FEC mode                          : Soft-Decision 7

AINS Soak                        : None
AINS Timer                       : 0h, 0m
AINS remaining time              : 0 seconds
```

The following example shows the output of show controllers coherentDSP or optics command after the alarm counters of LOS,LOF,LOM,OOF,OOM,AIS,IAE,BIAE,SF_BER,SD_BER,BDI and TIM are reset.

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/0/0/6
Fri Jun 29 17:52:36.871 IST

Port                               : CoherentDSP 0/0/0/6
Controller State                   : Up
Inherited Secondary State         : Normal
Configured Secondary State       : Normal
Derived State                      : In Service
Loopback mode                     : None
BER Thresholds                    : SF = 1.0E-5  SD = 1.0E-7
Performance Monitoring            : Enable
```



```

Alarm Information:
LOS = 0 LOF = 0 LOM = 0
OOF = 0 OOM = 0 AIS = 0
IAE = 0 BIAE = 0          SF_BER = 0
SD_BER = 0          BDI = 0 TIM = 0
FECMISMATCH = 0 FEC-UNC = 0
Detected Alarms                          : BDI

Bit Error Rate Information
PREFEC BER                               : 4.2E-04
POSTFEC BER                              : 0.0E+00

TTI :
Remote hostname                           : ios
Remote interface                          : CoherentDSP 0/0/0/13
Remote IP addr                            : 0.0.0.0

FEC mode                                  : Soft-Decision 20

AINS Soak                                 : None
AINS Timer                                : 0h, 0m
AINS remaining time                       : 0 seconds

RP/0/RP0/CPU0:ios#show controllers optics 0/0/0/5
Sat Jun 23 13:38:39.262 IST

Controller State: Up

Transport Admin State: In Service

Laser State: On

LED State: Green

Optics Status

Optics Type: CFP2_ACO DWDM
DWDM carrier Info: C BAND, MSA ITU Channel=11, Frequency=195.60THz,
Wavelength=1532.681nm

Alarm Status:
-----
Detected Alarms: None

LOS/LOL/Fault Status:

Alarm Statistics:
-----
HIGH-RX-PWR = 0          LOW-RX-PWR = 60
HIGH-TX-PWR = 0          LOW-TX-PWR = 0
HIGH-LBC = 0            HIGH-DGD = 0
OOR-CD = 0              OSNR = 0
WVL-OOL = 0             MEA = 0
IMPROPER-REM = 0
TX-POWER-PROV-MISMATCH = 0
Laser Bias Current = 3.0 %
Actual TX Power = 0.09 dBm
RX Power = -7.21 dBm
RX Signal Power = -8.67 dBm
Frequency Offset = 174 MHz

Performance Monitoring: Enable

```

THRESHOLD VALUES

Parameter	High Alarm	Low Alarm	High Warning	Low Warning
Rx Power Threshold(dBm)	4.9	-14.5	0.0	0.0
Tx Power Threshold(dBm)	3.5	-10.1	0.0	0.0
LBC Threshold(mA)	N/A	N/A	0.00	0.00

LBC High Threshold = 98 %
 Configured Tx Power = -1.50 dBm
 Configured CD High Threshold = 70000 ps/nm
 Configured CD lower Threshold = -70000 ps/nm
 Configured OSNR lower Threshold = 0.00 dB
 Configured DGD Higher Threshold = 180.00 ps
 Chromatic Dispersion 17 ps/nm
 Configured CD-MIN -70000 ps/nm CD-MAX 70000 ps/nm
 Second Order Polarization Mode Dispersion = 164.00 ps^2
 Optical Signal to Noise Ratio = 29.50 dB
 Polarization Dependent Loss = 2.70 dB
 Polarization Change Rate = 2.00 rad/s
 Differential Group Delay = 9.40 ps

Transceiver Vendor Details

Form Factor : CFP2-ACO
 Name : Oclaro
 Part Number : 10-3128-05
 Rev Number : A0
 Serial Number : OVE210204HS
 PID : N/A
 VID : N/A
 Date Code(yy/mm/dd) : 20/17/01
 Fiber Connector Type: LC
 Otn Application Code: Undefined
 Sonet Application Code: Undefined
 Ethernet Compliance Code: Eth-Undefined

Transceiver Temperature : 34 Celsius

AINS Soak : None
 AINS Timer : 0h, 0m
 AINS remaining time : 0 seconds

conf-offset

To configure the confidentiality offset for MACsec encryption, use the **conf-offset** command in MACsec policy configuration mode.

conf-offset *offset_value*

Syntax Description	CONF-OFFSET-0 Does not offset the encryption.
---------------------------	--

Command Default	The default value is CONF-OFFSET-0.
------------------------	-------------------------------------

Command Modes MACsec policy configuration

Command History	Release	Modification
	Release 6.1.1	This command was introduced.

Example

The following example shows how to use the **conf-offset** command.

```
configure
macsec-policy mac_policy
conf-offset CONF-OFFSET-0
```

controller coherentDSP

To configure the coherent DSP controller, use the **controller coherentDSP** command in the Coherent DSP controller configuration mode.

```
controller coherentDSP R/S/I/P [ pm { 15-min | 30-sec | 24-hour | flex-bin } { fec | otn } { report | threshold } value ] [ perf-mon { enable | disable } ] | [ loopback { internal | line } ] | [ sec-admin-state maintenance ] | [ shutdown ] | [ tti { sent | expected } ascii string ]
```

To enable the PRBS on the trunk port, you can use the following configuration command at the CoherentDSP controller:

```
controller coherentDSP R/S/I/Pprbs mode { source | sink | source-sink } pattern { pn31 | pn23 | pn15 | pn11 }
```

Syntax Description		
<i>R/S/I/P</i>		Rack/Slot/Instance/Port of the coherent DSP controller.
pm { 15-min 30-sec 24-hour flex-bin }		Configures performance monitoring parameters for specific intervals.
fec		Configures FEC PM data in 30 second, 15 minute or 24 hour intervals.
otn		Configures OTN PM data in 30 second, 15 minute or 24 hour intervals.
report		Configures TCA reporting status.
threshold		Configures threshold on coherent DSP parameters.
perf-mon { enable disable }		Enables or disables performance monitoring.
loopback [internal line]		Configures the internal or line loopback mode on the controller.
sec-admin-state <i>maintenance</i>		Configures the administrative state of the controller indicating that the controller is under maintenance.

shutdown	Disables the configuration of the controller.
tti sent ascii <i>string</i>	Configures the Trail Trace Identifier (TTI) ASCII string to be sent. SAPI, DAPI, and operator inputs are not supported.
tti expected ascii <i>string</i>	Configures the expected TTI ASCII string. The TIM alarm is raised if the received TTI string does not match the expected TTI string. SAPI, DAPI, and operator inputs are not supported.
prbs mode	Pseudo Random Binary Sequence (PRBS) mode.
PRBS31	Sequence length is from 231 to 1 bits.
PRBS23	Sequence length is from 223 to 1 bits.
PRBS15	Sequence length is from 215 to 1 bits.
PRBS11	Sequence length is from 211 to 1 bits.
source sink source-sink	

Command Default None

Command Modes Coherent DSP controller configuration

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.3.1	The command was modified to enable PRBS mode.
	Release 7.3.1	flex-bin keyword was added.

Example

The following example shows how to configure the performance monitoring parameters of the Coherent DSP controller in 15 minute intervals.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller coherentDSP 0/0/0/12 pm 15-min otn threshold es-ne
```

The following example shows how to configure the TTI string.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller coherentDSP 0/0/0/12 tti sent ascii joy
```

controller GigECtrlr

To configure the Ethernet controller, use the **controller GigECtrlr** command in the Ethernet controller configuration mode.

```
controller { TenGigECtrlr | HundredGigECtrlr } R/S/I/P [ pm { 15-min | 30-sec | 24-hour | flex-bin } { ether } { report | threshold } value ] | [ perf-mon { enable | disable } ] | [ loopback { internal | line } ] | [ sec-admin-state maintenance ] | [ shutdown ] | [ laser-squelch ] | [ fec { none | standard } ] | [ holdoff-time trunk-fault timevalue ]
```

Syntax Description	
<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the Ethernet controller.
pm { 15-min 30-sec 24-hour flex-bin }	Configures performance monitoring parameters for specific intervals.
ether	Configures Ethernet PM data in 30 second, 15 minute or 24 hour intervals.
report	Configures TCA reporting status.
threshold	Configures threshold on Ethernet controller parameters.
perf-mon { enable disable }	Enables or disables performance monitoring.
loopback [internal line]	Configures the internal or line loopback mode on the controller.
sec-admin-state <i>maintenance</i>	Configures the administrative state of the controller indicating that the controller is under maintenance.
shutdown	Disables the configuration of the controller.
laser-squelch	Enables laser squelching so that laser is brought down in the event of trunk faults (LOF, LOS) and a SQUELCHED alarm is raised. For 10G Ethernet controllers, laser squelching is supported only on LR4 and QSFP+ pluggables.
fec { none standard }	(Only for 100G Ethernet Controllers) Disables FEC or enables standard (Reed-Solomon) FEC.
holdoff-time trunk-fault <i>timevalue</i>	(Only for 100G Ethernet Controllers) When a fault occurs on the trunk port, the user can hold the propagation of Local Fault using this parameter. The range of <i>timevalue</i> is 10 ms to 3 sec.

Command Default None

Command Modes Ethernet controller configuration

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.5.1	This command was updated to include the holdoff-time parameter.
	Release 7.3.1	flex-bin keyword was added.

Example

The following example shows how to configure the performance monitoring parameters of the Ethernet controller in 15 minute intervals.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller TenGigECtrlr 0/0/0/0/1 pm 15-min ether report
1024-1518-octets enable
```

The following example shows how to configure the internal loopback.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller TenGigECtrlr 0/0/0/0/1 loopback internal
```

The following example enables IDLE hold off timer in 100G controllers.

```
RP/0/RP0/CPU0:ios(config)#controller hundredGigECtrlr 0/0/0/4
RP/0/RP0/CPU0:ios (config-eth-ctrlr)# holdoff-time trunk-fault timevalue 3000
```

controller mACSecCtrlr

To configure the MACSec controller, use the **controller mACSecCtrlr** command in the MACSec controller configuration mode.

To create a MACsec Threshold Crossing Alerts at mac-sec ether, secy-rx, secy-if (interace), and secy-tx use the following command:

```
controller mACSecCtrlr R/S/I/P { pm { 30-sec | 15-min | 24-hour } { macsec-ether | macsec-secy-if | macsec-secy-tx | macsec-secy-rx } { report | threshold { in-out-decryptd | out-oct-decryptd } value } enable
```

Syntax Description		
	<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the MACSec controller.
	pm { 30-sec 15-min 24-hour }	Configures performance monitoring parameters for 30 second, 15 minute or 24 hour intervals.
	macsec-ether macsec-secy-if macsec-secy-tx macsec-secy-rx	MACSEC Ether layer counters, MACSEC secy Interface level counters, MACSEC secy Tx layer counters, and MACSEC secy Rx layer counters.

in-out-decryptd | out-oct-decryptd The number of octets of plaintext recovered from received packets that were integrity protected and encrypted

Command Default

None

Command Modes

MACSec controller configuration

Command History

Release	Modification
Release 6.1.1	This command was introduced.
Release 6.3.1	This command was modified with the parameters to enable MACsec Threshold Crossing Alerts at mac-sec ether, secy-rx, secy-if (interace), and secy-tx

Example

The following example shows how to configure the MACSec controller.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller mACSecCtrlr 0/0/0/4
```

The following is a sample to configure the MACsec TCA parameters for rx-pkt at macsec-ether level for MACsec controller in 15 min intervals:

```
controllers macSecCtrlr 0/0/0/11/1
  pm 15-min macsec-ether report rx-pkt enable
pm 15-min macsec-ether threshold rx-pkt 1000000
```

The following is a sample to configure the MACsec TCA parameters for rx-util at macsec-ether level for MACsec controller in 15 min intervals:

```
controllers macSecCtrlr 0/0/0/11/1
  pm 15-min macsec-ether report rx-util enable
pm 15-min macsec-ether threshold rx-util 10
```

The following is a sample to configure the MACsec TCA parameters for out-octets at macsec-ether level for MACsec controller in 15 min intervals:

```
controllers macSecCtrlr 0/0/0/11/1
  pm 15-min macsec-ether report out-octets enable
pm 15-min macsec-ether threshold out-octets 100000
```

The following is a sample to configure the MACsec TCA parameters for rx-pkt at MAC-SECy-If controller in 30 sec interval:

```
controller MACSecCtrlr0/0/0/4
  pm 15-min macsec-ether report rx-pkt enable
pm 15-min macsec-ether threshold rx-pkt 1000
```

controller optics

To configure the optics controller, use the **controller optics** command in the optics controller configuration mode.

```
controller optics R/S/I/P [ cd-max cd-max | cd-min cd-min | cd-low-threshold cd-low
| cd-high-threshold cd-high | dgd-high-threshold dgd-value | lbc-high-threshold lbc-value
| osnr-low-threshold osnr-value description description | rx-high-threshold rx-high |
rx-low-threshold rx-low | tx-high-threshold tx-high | tx-low-threshold tx-low |
sec-admin-state maintenance | shutdown | transmit-power transmit-power | perf-mon
{ enable | disable } | pm [ 15-min | 30-sec | 24-hour | flex-bin ] optics [ report |
threshold ]
```

```
controller optics R/S/I/P pm [ 15-min | 30-sec | 24-hour | flex-bin ] optics [ report | threshold
{ cd | dgd | lbc | lbc-pc | opr | opt | osnr | pcr | pdl | pn | sopmd ]
```

Syntax	Description
<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the optics controller.
cd-max <i>cd-max</i>	(Only for trunk optics controllers) Maximum chromatic dispersion. The range is -70000 to +70000 ps/nm when the trunk bit rate is 100G. The range is -20000 to +20000 ps/nm when the trunk bit rate is 200G or 250G.
cd-min <i>cd-min</i>	(Only for trunk optics controllers) Minimum chromatic dispersion. The range is -70000 to +70000 ps/nm when the trunk bit rate is 100G. The range is -20000 to +20000 ps/nm when the trunk bit rate is 200G or 250G.
cd-low-threshold <i>cd-low</i>	(Only for trunk optics controllers) Minimum acceptable chromatic dispersion. The CD-OOR alarm is raised if the chromatic dispersion goes below this value. The range is -70000 to +70000 ps/nm when the trunk bit rate is 100G. The range is -20000 to +20000 ps/nm when the trunk bit rate is 200G or 250G.
cd-high-threshold <i>cd-high</i>	(Only for trunk optics controllers) Maximum acceptable chromatic dispersion. The CD-OOR alarm is raised if the chromatic dispersion exceeds this value. The range is -70000 to +70000 ps/nm when the trunk bit rate is 100G. The range is -20000 to +20000 ps/nm when the trunk bit rate is 200G or 250G.
dgd-high-threshold <i>dgd-value</i>	(Only for trunk optics controllers) Configures the maximum acceptable Differential Group Delay (DGD) value. The HIGH_DGD alarm is raised if DGD exceeds this value. The range is 0 to 18000 (in the units of 0.01 ps).
lbc-high-threshold <i>lbc-value</i>	Configures the high laser bias current threshold. The range is 0 to 100%

osnr-low-threshold <i>osnr-value</i>	(Only for trunk optics controllers) Configures the minimum acceptable Optical Signal to Noise ratio (OSNR) value. The LOW_OSNR alarm is raised if OSNR goes below this value. The range is 0 to 4000 (in the units of 0.01 dB).
description <i>description</i>	Description of the optics controller.
rx-high-threshold <i>rx-high</i>	Configures high receive power threshold. The range is -400 to 300 (in the units of 0.1 dBm).
rx-low-threshold <i>rx-low</i>	Configures low receive power threshold. The range is -400 to 300 (in the units of 0.1 dBm).
tx-high-threshold <i>tx-high</i>	Configures high transmit power threshold. The range is -400 to 300 dBm (in the units of 0.1 dBm).
tx-low-threshold <i>tx-low</i>	Configures low transmit power threshold. The range is -400 to 300 dBm (in the units of 0.1 dBm).
sec-admin-state <i>maintenance</i>	Configures the administrative state of the controller indicating that the controller is under maintenance.
shutdown	Disables the configuration of the controller.
pm	Configures performance monitoring parameters for 30 second, 15 minute and 24 hour intervals.
transmit-power <i>transmit-power</i>	(Only for trunk optics controllers) Configures the transmit power. The range is -190 to 15 dBm (in the units of 0.1 dBm). The CLI allows to configure the range between -190 to 15 dBm (in the units of 0.1 dBm). See the appropriate CFP pluggable data sheet for the supported range. The default transmit-power is changed from -0.5 dbm to -1.5 dBm in R6.1.2. Hence, if the user upgrades the software from a release prior to R6.1.2 to R6.1.2 or later, the transmit-power is automatically adjusted to -1.5 dbm. Hence, traffic hit is observed for one or two seconds during the upgrade. This issue happens only if the user did not configure the transmit power.
perf-mon { enable disable }	Enables or disables performance monitoring.
cd	Configures the chromatic dispersion threshold.
dgd	Configures the DGD threshold.
lbc	Configures the laser bias current threshold.
lbc-pc	Configures the laser bias current threshold in percentage.
opr	Configures the optical Rx power threshold in uW.
opt	Configures the optical Tx power threshold in uW.

osnr	Configures the OSNR threshold.
pcr	Configures the Polarization Change Rate (PCR) threshold.
pdl	Configures the Polarization Dependent Loss (PDL) threshold.
pn	Configures the Phase Noise (PN) threshold.
sopmd	Configures the Second Order Polarization Mode Dispersion (SOPMD) threshold.

Command Default None

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.1.1	The opr-dbm and opt-dbm were added.
	Release 7.3.1	flex-bin keyword was added.

Command Modes Optics controller configuration

Usage Guidelines The configurations for chromatic dispersion (cd-max, cd-min, cd-low-threshold, and cd-high-threshold) must be performed only after the **hw-module** configuration. These configurations must be removed before the **no hw-module** configuration.

Example

The following example shows how to configure the optics controller and set the high power threshold at the transmit and receive side.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/RP0/CPU0:ios(config-optics)# rx-high-threshold 200
RP/0/RP0/CPU0:ios(config-optics)# tx-high-threshold 300
```

The following example shows how to configure the optics controller and set the ranges for chromatic dispersion when the trunk rate is 200G.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/RP0/CPU0:ios(config-optics)# cd-max 10000
RP/0/RP0/CPU0:ios(config-optics)# cd-min 2000
```

The following example shows how to configure the optics performance monitoring for 15 minute intervals.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/RP0/CPU0:ios(config-optics)# pm 15-min optics report cd max-tca enable
```

crypto ca authenticate

To authenticate the certification authority (CA) by getting the certificate for the CA server, use the **crypto ca authenticate** command in global configuration mode.

crypto ca authenticate*ca-name*

Syntax Description	<i>ca-name</i> Specifies the name of the CA server.
Command Default	None
Command Modes	Global configuration
Command History	Release Modification
	R6.3.2 This command was introduced.

Example

The following is a sample of authenticating the certificate authority and requesting certificates.

```
crypto ca authenticate ncs1k
crypto ca enroll ncs1k
exit
commit
```

crypto ca enroll

To obtain a router certificate from the certification authority (CA) server, use the **crypto ca enroll** command in global configuration mode.

crypto ca enroll*ca-name*

Syntax Description	<i>ca-name</i> Specifies the name of the CA server.
Command Default	None
Command Modes	Global configuration
Command History	Release Modification
	R6.3.2 This command was introduced.

Example

The following is a sample of authenticating the certificate authority and requesting certificates.

```
crypto ca authenticate ncs1k
crypto ca enroll ncs1k
exit
commit
```

crypto ca trustpoint

To enter the trustpoint configuration mode for the specified trustpoint, use the **crypto ca trustpoint** command in global configuration mode.

crypto ca trustpoint*trustpoint-name*

Syntax Description	<i>trustpoint-name</i> Creates a name for the certification authority (CA). (If you previously declared the CA and want to update its characteristics, specify the name you previously created.)				
Command Default	None				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of configuring the trust point.

```
configure
crypto ca trustpoint ncs1k
enrollment url http://209.165.200.226
subject-name CN=ncs1k,OU=BU,O=Govt,L=Newyork,ST=NY,C=US
rsakeypair ncs1k
crl optional
exit
commit
```

crypto key generate rsa

To generate Rivest,Shamir, and Adelman (RSA) key pairs,use the **crypto key generate rsa** command in global configuration mode.

crypto key generate rsa [**usage-keys** | **general-keys**] [*keypair-label*]

Syntax Description	usage-keys Specifies that two RSA special-usage key pairs, one encryption pair and one signature pair, will be generated.
	general-keys Specifies that a general-purpose key pair will be generated, which is the default.
	keypair-label Specifies the name that is used for an RSA key pair when they are being exported.
Command Default	RSA key pairs do not exist.
Command Modes	Global configuration
Command History	Release Modification
	R6.3.2 This command was introduced.

Example

The following is a sample of generating the RSA key pair.

```
configure
crypto key generate rsa ncslk
exit
commit
```

cryptographic-algorithm

To configure the cryptographic algorithm used for authenticating a peer for MACsec encryption, use the **cryptographic-algorithm** command in keychain configuration mode.

cryptographic-algorithm *authentication algorithm*

Syntax Description	AES-128-CMAC	Configures the 128-bit AES encryption algorithm.
	AES-256-CMAC	Configures the 256-bit AES encryption algorithm.
Command Default	No default behavior or values.	
Command Modes	Keystring configuration	
Command History	Release Modification	
	Release 6.1.1	This command was introduced.

dot1x profile*profile-name*

Syntax Description	<i>profile-name</i> Specifies the name of the 802.1X profile.				
Command Default	None				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of configuring the 802.1X profile.

```
configure
dot1x profile reauth
pae both
authenticator timer reauth-time 3600
supplicant eap profile ncs1k
exit
commit
```

dot1x supplicant eap profile

To assign the EAP-TLS profile to the 802.1X interface, use the **dot1x supplicant eap profile** command in interface configuration mode.

dot1x supplicant eap profile*profile-name*

Syntax Description	<i>profile-name</i> Specifies the name of the supplicant EAP profile.				
Command Default	None				
Command Modes	Interface configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of configuring the 802.1X profile.

```
configure
dot1x pae both
authenticator timer reauth-time 3600
```

```

supplicant eap profile ncs1k
exit
commit

```

dwdm-carrier

To configure the wavelength on the trunk port, use the **dwdm-carrier** command in optics controller configuration mode. To return the wavelength to its default value, use the **no** form of this command.

dwdm-carrier { **100MHz-grid** **frequency** *frequency* }

dwdm-carrier { **50Ghz-grid** [**frequency** *frequency* | **wavelength** *wavelength* | **itu-ch** *channel-number*] }

Syntax Description		
50Ghz-grid 100MHz-grid		Configures the wavelength in 50GHz grid and 100MHz (0.1GHz) grid spacing respectively in accordance with ITU definition.
frequency <i>frequency</i>		Specifies the frequency for the optics controller. In 50GHz grid spacing, enter the 5-digit frequency value in the range of 19115 to 19610 GHz. For example, enter 19580 to specify 195.8 THz. In 100MHz grid spacing, enter the 7-digit frequency value in the range of 1911500 to 1961000 THz. For example, enter 1913501 to specify 191.3501 THz.
wavelength <i>wavelength</i>		Specifies the wavelength for the optics controller. In 50GHz grid spacing, enter the 7-digit wavelength value in the range of 1528773 to 1568362 nm. For example, enter 1532290 to specify 1532.29 nm.
itu-ch <i>channel-number</i>		ITU channel number. The range is 1 to 100 for conventional band (C-band).

Command Default No wavelength is configured.

Command Modes Optics controller configuration

Command History	Release	Modification
	Release 6.0.0	This command was introduced.

Usage Guidelines The controller must be in the shutdown state before you can use the **wavelength** command.

Use the **show controllers optics Rack/Slot/Instance/Port dwdm-carrier-map** command to display the wavelength and channel mapping for trunk optics controllers. See the [show controllers, on page 48](#) command to view the DWDM carrier map table.

Example

The following example shows how to configure the channel number.

```

RP/0/RP0/CPU0:ios# config
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/0/CPU0:ios(config-optics)# dwdm-carrier 50Ghz-grid itu-ch 25

```


The following example shows how to configure the frequency in 50GHz grid spacing.

```
RP/0/RP0/CPU0:ios# config
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/0/CPU0:ios(config-optics)# dwdm-carrier 50GHz-grid frequency 19265
```

The following example shows how to configure the frequency in 100MHz grid spacing.

```
RP/0/RP0/CPU0:ios# config
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/0/CPU0:ios(config-optics)# dwdm-carrier 100MHz-grid frequency 1911501
```

The following example shows how to configure the wavelength in 50GHz grid spacing.

```
RP/0/RP0/CPU0:ios# config
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0
RP/0/0/CPU0:ios(config-optics)# dwdm-carrier 50GHz-grid wavelength 1560200
```

eap profile

To configure the EAP profile, use the **eap profile** command in global configuration mode.

eap profile*profile-name*

Syntax Description	<i>profile-name</i> Specifies the name of the EAP profile.
Command Default	None
Command Modes	Global configuration
Command History	Release Modification
	R6.3.2 This command was introduced.

Example

The following is a sample of configuring the EAP profile.

```
configure
eap profile ncs1k
identity PRO67
method tls pki-trustpoint ncs1k
exit
commit
```

enrollment url

To specify the certification authority location by naming the CA's URL, use the **enrollment url** command in ca-identity configuration mode.

enrollment url*ca-url*

Syntax Description	<i>ca-url</i> Specifies the URL of the CA where your router must send certificate requests, for example, <code>https://ca_server</code> where <i>ca_server</i> is the CA's host DNS name or IP address.				
Command Default	None				
Command Modes	Ca-identity configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of specifying the URL of the CA.

```
configure
crypto ca trustpoint ncs1k
enrollment url http://209.165.200.226
subject-name CN=ncs1k,OU=BU,O=Govt,L=Newyork,ST=NY,C=US
rsa-keypair ncs1k
crl optional
exit
commit
```

fault-profile

Use the **fault-profile** command in the global configuration mode, to create a new fault profile with one or more alarms and user-defined severity.

fault-profile *name* **fault-identifier subsystem XR fault-type** { **ethernet** | **sdh_controller** | **sonet** | **OPTICS** | **G709** } **fault-tag** *name sas severity nsas severity*

Syntax Description	fault-profile <i>name</i>	Name of the fault profile.
	fault-identifier subsystem XR	Supports the XR sub-system.
	fault-type	The component the fault profile is applicable to. The available options are: <ul style="list-style-type: none"> • ethernet • sdh_controller • sonet • OPTICS • G709

fault-tag <i>name</i>	The faults that are included as part of the newly created fault profile.
sas severity nsas severity	Sets the severity level for: <ul style="list-style-type: none"> • sas (service affecting; impacts traffic) • nsas (non-service affecting; does not impact traffic) <p>The available options are:</p> <ul style="list-style-type: none"> • Critical • Major • Minor • Non-faulted • Non-reported

Command Default No default behavior or values.

Command Modes Global Configuration

Command History	Release	Modification
	Release 7.2.1	This command was introduced.

Example

The following example shows how to use the **fault profile** command.

```
RP/0/RP0/CPU0: router (config) # fault profile f1 fault-identifier subsystem XR fault-type
HW_OPTICS fault-tag OPTICAL_LO_RXPOWER sas CRITICAL nsas CRITICAL
```

fault-profile apply

Use the **fault-profile apply** command in the global configuration mode, to apply a fault profile at the port level or node level.

fault-profile *name* **apply** **rack0 slot** *location*

Syntax Description	fault-profile <i>name</i>	Name of the fault profile.
	rack 0 slot <i>location</i>	Sets the profile at the port level or node level.

Command Default No default behavior or values.

Command Modes Global Configuration

Command History	Release	Modification
	Release 7.2.1	This command was introduced.

Example

The following example shows how to use the **fault profile apply** command at the port level.

```
RP/0/RP0/CPU0:ios(config)# fault profile f1 apply rack 0 slot LC0 port 1
```

The following example shows how to use the **fault profile apply** command at the node level.

```
RP/0/RP0/CPU0:ios(config)# fault profile f1 apply rack 0 slot ALL
```

hw-module

To provision the slice with traffic on the client and trunk ports, use the **hw-module** command in IOS XR configuration mode.

The slice can be provisioned to send encrypted traffic with client bitrate as 100G and trunk bitrate as 200G.

```
hw-module location location slice [slice_number | all{drop-lldp | client bitrate [10G | 40G | 100G | 10G-100G] trunk bitrate [100G | 200G | 250G] fec [softdecision7 | softdecision20] [client-port-ains-soak hours hours minutes minutes] [encrypted] ]}] }
```

Syntax Description		
location <i>location</i>		Specifies the location of the optics controller. The location is 0/RP0/CPU0.
slice [<i>slice_number</i> all]		Specifies the slice number that is provisioned or all the slices. The range of slice number is 0 to 3. Each slice is a group of five client ports and two trunk ports.
drop-lldp		Enables LLDP drop on the specified slice.
client bitrate [10G 40G 100G 10G-100G]		Specifies the traffic rate on the client ports. 10G-100G client bitrate is called mixed mode configuration.
trunk bitrate [100G 200G 250G]		Specifies the traffic rate on the trunk ports.
fec [softdecision7 softdecision20]		Specifies the FEC to configure on the trunk ports.
client-port-ains-soak hours <i>hours</i> minutes <i>minutes</i>		Specifies the AINS configuration in hours and minutes.

encrypted	Provisions the slice to send encrypted traffic.
------------------	---

Command Default No slice is configured.
You must configure the slice before enabling LLDP drop.

Command Modes Cisco IOS XR Configuration

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.0.1	40G client bit rate was introduced.
	Release 6.1.1	encrypted keyword was added.
	Release 6.1.2	drop-lldp keyword was added.
	Release 6.3.1	10G-100G is supported as one of the client bitrates.
	Release 6.5.1	AINS configuration is added.

Usage Guidelines When each slice is configured with a specific client bitrate and trunk bitrate, the **no hw-module location location slice all** command cannot be used to remove all the slice configurations. Use the **no hw-module location location slice slice_number** command for each slice to remove the slice configuration. Use the **no hw-module location location {slice slice_number | all} drop-lldp** command to disable LLDP drop the on the configured slice.

Example

The following example shows how to configure slice 0 with client rate as 100G and trunk rate as 200G.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slice 0 client bitrate 100G trunk
  bitrate 200G softdecision7
```

The following example shows how to configure slice 1 with client rate as 100G and trunk rate as 250G.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slice 1 client bitrate 100G trunk
  bitrate 250G softdecision20
```

The following example shows how to configure slice 0 to send encrypted traffic with client rate as 100G and trunk rate as 200G.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slice 0 client bitrate 100G trunk
  bitrate 200G softdecision7 encrypted
```

The following is a sample in which slice 0 is configured in mixed mode, and FEC on the trunk ports is set to softdecision20.

```
configure
hw-module location 0/RP0/CPU0 slice 0 client bitrate 10G-100G trunk bitrate 200G fec
SoftDecision20
commit
```

The following example shows how to enable LLDP drop at slice 0.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slice 0 client bitrate 40G trunk
  bitrate 200G fec softDecision7
RP/0/RP0/CPU0:ios(config)# hw-module location 0/RP0/CPU0 slice 0 drop-lldp
```

The following is a sample in which slice 0 is configured with AINS with soak time as 30 minutes.

```
configure
hw-module location 0/RP0/CPU0 slice 0 client bitrate 100G trunk bitrate 250G fec
SoftDecision20
hw-module location 0/RP0/CPU0 slice 0 client-port-ains-soak hours 0 minutes 30
commit
```

ipv4 access-group

To configure the Access List (ACL), use the following command at the IPv4 interface in the configuration mode:

Syntax Description	<i>access-list-name</i> Access list name. Names cannot contain a space or quotation marks.
ingress	Specifies an inbound interface.
egress	Specifies an outbound interface.

Command Default No IPv4 access list is defined.

Command Modes Interface Configuration

Command History	Release	Modification
	Release 6.3.2	This command is introduced.

Usage Guidelines Use the ipv4 access-list command to configure an IPv4 access list. This command places the system in access list configuration mode, in which the denied or permitted access conditions must be defined with the deny or permit command.

Example

The following examples shows how to configure the Access List at the IPv4 interface in the configuration mode:

```
interface MgmtEth0/RP0/CPU0/0
ipv4 address 10.1.1.1 255.255.255.0
ipv4 access-group IPV4_ICMP_DENY ingress
ipv4 access-group IPV4_ROUTER_FWD_TELNET_TRAFFIC_DENY egress
```

Sample Configuration for IPv4 Access Lists

```
ipv4 access-list IPV4_ICMP_DENY
10 deny icmp any any
20 permit ipv4 any any
!
ipv4 access-list IPV4_ROUTER_FWD_TELNET_TRAFFIC_DENY
10 deny tcp any any eq telnet
20 permit ipv4 any any
```

ipv6 access-group

To configure the Access List (ACL), use the following command at the IPv6 interface in the configuration mode:

Syntax Description	<i>access-list-name</i> Access list name. Names cannot contain a space or quotation marks.				
ingress	Specifies an inbound interface.				
egress	Specifies an outbound interface.				
Command Default	No IPv6 access list is defined.				
Command Modes	Interface Configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.3.2</td> <td>This command is introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.3.2	This command is introduced.
Release	Modification				
Release 6.3.2	This command is introduced.				
Usage Guidelines	Use the <code>ipv6 access-list</code> command to configure an IPv6 access list. This command places the system in access list configuration mode, in which the denied or permitted access conditions must be defined with the <code>deny</code> or <code>permit</code> command.				

Example

The following examples shows how to configure the Access List at the IPv6 interface in the configuration mode

```
interface MgmtEth0/RP0/CPU0/0
ipv6 address 1000::1/64
```

```
ipv6 access-group IPV6_SSH_DENY ingress
ipv6 access-group IPV6_ROUTER_FWD_TELNET_TRAFFIC_DENY egress
```

Sample Configuration for IPv6 Access Lists

```
ipv6 access-list IPV6_SSH_DENY
10 deny tcp any any eq ssh
20 permit ipv6 any any
!
ipv6 access-list IPV6_ROUTER_FWD_TELNET_TRAFFIC_DENY
10 deny tcp any any eq telnet
20 permit ipv6 any any
!
```

key

To create or modify a keychain key, use the **key** command in keychain configuration mode.

key *key-id*

Syntax Description *key-id* 64-character hexadecimal string.

Command Default No default behavior or values.

Command Modes Key chain configuration

Command History	Release	Modification
	Release 6.1.1	This command was introduced.

Usage Guidelines The key name must be of even number of characters and must match on both the sides.

Example

The following example shows how to use the **key** command.

```
configure
key chain mac_chain macsec
key 1234abcd5678
```

key chain

To create or modify a keychain, use the **key chain** command in global configuration mode.

key chain *key-chain-name*

Syntax Description *key-chain-name* Specifies the name of the keychain that can be up to 32 characters.

Command Default	No default behavior or values.
------------------------	--------------------------------

Command Modes	Global configuration
----------------------	----------------------

Command History	Release	Modification
	R6.1.1	This command was introduced.

Example

The following example shows how you can configure a key chain for MACsec encryption.

```
configure
key chain mac_chain macsec
```

key-server-priority

To configure the preference for a device to serve as the key server for MACsec encryption, use the **key-server-priority** command in MACsec policy configuration mode.

key-server-priority *value*

Syntax Description	<i>value</i> Indicates the priority for a device to become the key server. Lower the value, higher the preference. The range is 0 to 255.
---------------------------	---

Command Default	The default value is 16.
------------------------	--------------------------

Command Modes	MACsec policy configuration
----------------------	-----------------------------

Command History	Release	Modification
	Release 6.1.1	This command was introduced.

Example

The following example shows how to use the **key-server-priority** command.

```
configure
macsec-policy mac_policy
key-server-priority 0
```

key-string

To specify the text string for the key, use the **key-string** command in keychain configuration mode.

key-string [**clear** | **password**] *key-string-text*

Syntax Description

clear Specifies the key string in clear-text form.

password Specifies the key in encrypted form.

key-string-text Text string for the key, which is encrypted before being saved to the configuration. The text string has the following character limitations.

- Plain-text key strings—Minimum of 1 character and a maximum of 64 hexadecimal characters for 256-bit encryption. Minimum of 1 character and a maximum of 32 hexadecimal characters for 128-bit encryption.
- Encrypted key strings—Minimum of 4 characters and no maximum.

Command Default

The default value is clear.

Command Modes

Key chain configuration

Command History

Release	Modification
Release 6.1.1	This command was introduced.

Example

The following example shows how to use the **keystring** command.

```
configure
key chain mac_chain macsec
key 1234abcd5678
key-string 12345678123456781234567 cryptographic-algorithm aes-128-cmac
```

lifetime

Configures the validity period for the MACsec key.

The lifetime period (validity period of the key) can be configured, with a duration in seconds, as a validity period between two dates (for example, Jan 01 2016 to Dec 31 2016), or with infinite validity.

The key is valid from the time you configure (in HH:MM:SS format). The duration is configured in seconds.

lifetime *start_time start_date* { *end_time end_date* | **duration** *validity* | **infinite** }

Syntax Description

start_time Start time in hh:mm:ss from which the key becomes valid. The range is from 0:0:0 to 23:59:59.

start_date The date in DD month YYYY format that the key becomes valid.

<i>end_time</i>	End time in hh:mm:ss at which point the key becomes invalid. The range is from 0:0:0 to 23:59:59.
<i>end_date</i>	The date in DD month YYYY format that the key becomes invalid.
duration <i>validity</i>	The key chain is valid for the duration you configure. You can configure duration in seconds.
infinite	The key chain is valid indefinitely.

Command Default No default behavior or values

Command Modes Keychain configuration

Command History **Release Modification**

R6.1.1 This command was introduced.

Example

The following example shows how to use the **lifetime** command.

```
configure
key chain mac_chain macsec
key 1234abcd5678
key-string 123456781234567812345678 cryptographic-algorithm aes-128-cmac
lifetime 05:00:00 20 july 2016 12:00:00 30 september 2016
```

macsec

To apply the MACsec key chain and policy configuration on the MACsec controller, use the **macsec** command in controller configuration mode.

macsec psk-keychain *key-chain-name* [**policy** *policy-name*]

Syntax Description	<i>key-chain-name</i>	Specifies the name of the keychain that can be up to 32 characters.
	<i>policy_name</i>	Name of the MACsec policy for encryption.

Command Default No default behavior or values.

Command Modes Controller configuration

Command History **Release Modification**

R6.1.1 This command was introduced.

Example

The following example shows how to use the **macsec psk-keychain** command.

```
configure
controller MACSecCtrl 0/0/0/3
macsec psk-keychain mac_chain policy mac_policy
exit
commit
```

macsec eap

To configure EAP on MACsec Controller, use the **macsec eap** command in global configuration mode.

macsec eap [**policy** *macsec-policy-name*]

Syntax Description	<i>macsec-policy-name</i> Specifies the name of the MACsec policy for encryption.
---------------------------	---

Command Default	None
------------------------	------

Command Modes	Global configuration
----------------------	----------------------

Command History	Release Modification
	R6.3.2 This command was introduced.

Example

The following is a sample of configuring MACsec EAP and 802.1X profile on the MACsec controller.

```
configure
controller MACSecCtrl 0/0/0/24
dot1x profile reauth
macsec eap
exit
commit
```

macsec-policy

To create a MACsec policy for MACsec encryption, use the **macsec-policy** command in global configuration mode.

macsec-policy *policy_name*

Syntax Description	<i>policy_name</i> Name of the MACsec policy for encryption.
---------------------------	--

Command Default No default behavior or values.

Command Modes Global configuration

Command History	Release	Modification
	R6.1.1	This command was introduced.

Example

The following example shows how to use the **macsec-policy** command.

```
configure
macsec-policy mac_policy
```

macsec-tca

To create a MACsec Threshold Crossing Alerts at mac-sec ether, secy-rx, secy-if (interace), and secy-tx.

```
controllers macsecCtrlr R/S/P { pm {30-sec |15-min | 24-hour } { macsec-ether | macsec-secy-if |
macsec-secy-tx | macsec-secy-rx } { report | threshold {in-out-decryptd | out-oct-decryptd } value }
enable
```

Syntax Description	<i>R/S/I/P</i>	Rack/Slot/Instance/Port of the coherent DSP controller.
	pm {30-sec 15-min 24-hour }	Configures performance monitoring parameters for 30 second,15 minute or 24 hour intervals.
	macsec-ether macsec-secy-if macsec-secy-tx macsec-secy-rx	MACSEC Ether layer counters, MACSEC secy Interface level counters, MACSEC secy Tx layer counters, and MACSEC secy Rx layer counters.
	in-out-decryptd out-oct-decryptd	The number of octets of plaintext recovered from received packets that were integrity protected and encrypted

Command Default No default behavior or values.

Command Modes Global configuration

Command History	Release	Modification
	R6.3.1	This command was introduced.

Example

The following example shows to configure the MACsec TCA parameters for rx-util at macsec-ether level for MACsec controller in 15 min intervals:.

```
controllers macSecCtrlr 0/0/0/11/1
```

```
pm 15-min macsec-ether report rx-util enable
pm 15-min macsec-ether threshold rx-util 10
```

pki-trustpoint

To specify the configured pki trustpoint name, use the **pki-trustpoint** command in global configuration mode.

pki-trustpoint*trustpoint-name*

Syntax Description	<i>trustpoint-name</i> Specifies the configured pki trustpoint name.				
Command Default	None				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of configuring the EAP profile.

```
configure
eap profile ncs1k
identity PRO67
method tls pki-trustpoint ncs1k
exit
commit
```

pm

To configure the performance monitoring parameters of the optics, Ethernet, and coherent DSP controllers, use the **pm** command in the controller configuration mode.

pm [**15-min** | **30-sec** | **24-hour** | **flex-bin**] [**optics** | **ether** | **fec** | **otn**] [**report** | **threshold**] *value*

Syntax Description	15-min 30-sec 24-hour flex-bin Configures performance monitoring parameters for specific intervals.
	optics ether fec otn Specifies whether to configure performance monitoring parameters for the optics, Ethernet, or coherent DSP controllers.
	report Configures optics TCA reporting status.
	threshold Configures threshold on optics parameters.

value Value of the reporting or threshold parameters.

Command Default None

Command Modes Optics controller configuration

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 7.3.1	flex-bin keyword was added.

Usage Guidelines The following table describes the optics PM parameters.

Parameter	Description
cd	Chromatic dispersion TCA reporting status or threshold
dgd	Differential group delay TCA reporting status or threshold
lbc	lbc TCA reporting status or threshold
lbc-pc	lbc percentage TCA reporting status or threshold
opr	opr TCA reporting status or threshold
opt	opt TCA reporting status or threshold
osnr	Optical Signal to Noise Ratio TCA reporting status or threshold
pcr	Polarization Change Rate TCA reporting status or threshold
pdl	Polarization Dependent Loss TCA reporting status or threshold
pn	Phase Noise TCA reporting status or threshold
sopmd	Second Order Polarization Mode Dispersion TCA reporting status or threshold

The following table describes the OTN PM parameters.

Parameter	Description
ES-NE	Error seconds in the near end
ESR-NE	Error seconds ratio in the near end
SES-NE	Severely error seconds in the near end
SESR-NE	Severely error seconds ratio in the near end
UAS-NE	Unavailable seconds in the near end
BBE-NE	Background block errors in the near end

Parameter	Description
BBER-NE	Background block errors ratio in the near end
FC-NE	Failure counts in the near end
ES-FE	Error seconds in the far end
ESR-FE	Error seconds ratio in the far end
SES-FE	Severely error seconds in the far end
SESR-FE	Severely error seconds ratio in the far end
UAS-FE	Unavailable seconds in the far end
BBE-FE	Background block errors in the far end
BBER-FE	Background block errors ratio in the far end
FC-FE	Failure counts in the far end

The following table describes the Ethernet PM parameters.

Parameter	Description
RX-UTIL	Bandwidth utilization of port at the ingress side in percentage.
TX-UTIL	Bandwidth utilization of port at egress side in percentage.
RX-PKT	Number of received packets
STAT-PKT	Status of received packets
OCTET-STAT	Total number of octets of data received in the network
OVERSIZE-PKT	Total number of packets received that were longer than 1518 octets and were otherwise well formed
JABBER-STATS	Total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error)
IN_PKT_64_OCTET	Total number of packets received that were 64 octets in length
IN_PKT_65_127_OCTET	Total number of packets received that were between 65 and 127 octets in length
IN_PKT_128_255_OCTET	Total number of packets received that were between 128 and 255 octets in length
IN_PKT_256_511_OCTET	Total number of packets received that were between 256 and 511 octets in length
IN_PKT_512_1023_OCTET	Total number of packets received that were between 512 and 1023 octets in length

Parameter	Description
IN_PKT_1024_1518_OCTET	Total number of packets received that were between 1024 and 1518 octets in length
IN-UCAST	Total number of unicast frames received error-free
IN-MCAST	Total number of multicast frames received error-free
IN-BCAST	Total number of broadcast frames received error-free
OUT-UCAST	Total number of unicast frames transmitted error-free
OUT-BCAST	Total number of broadcast frames transmitted error-free
OUT-MCAST	Total number of multicast frames transmitted error-free
TX-PKT	Number of transmitted packets
OUT-OCTET	Total number of octets transmitted out of the interface, including framing characters
STAT-MULTICAST-PKT	Status of multicast packets
STAT-BROADCAST-PKT	Status of broadcast packets
STAT-UNDERSIZED-PKT	Number of good packets received that are shorter than 64 bytes.
IN_DROP_OTHER	Total number of packets dropped. In the 100 G mode, undersized and fragmented packets are dropped
OUT-OCTET	Total number of bytes transmitted
TX_UNDERSIZED_PKT	Total number of packets transmitted that are shorter than 64 bytes.
TX_OVERSIZED_PKT	Total number of oversized packets transmitted.
TX_FRAGMENTS	Total number of fragmented packets transmitted.
TX_JABBER	Total number of Jabber packets transmitted.
TX_BAD_FCS	Total number of bad FCS packets transmitted.

The following table describes the FEC PM parameters.

Parameter	Description
ec-bits	Number of bit errors that are corrected by the system
uc-words	Number of words that are not corrected by the system

Example

The following example shows how to set the maximum TCA reporting status for the chromatic dispersion.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0 pm 15-min optics report cd max-tca
enable
```

The following example shows how to set the maximum threshold for the chromatic dispersion.

```
RP/0/RP0/CPU0:ios# configure
RP/0/RP0/CPU0:ios(config)# controller optics 0/0/0/0 pm 15-min optics threshold cd max
```

radius-server host

To specify a RADIUS server host, use the **radius-server** host command in global configuration mode.

```
radius-server host {IPv4 address of RADIUS server} [auth-port port-number] [acct-port port-number]
[key string]
```

Syntax Description

auth-port <i>port-number</i>	Specifies the User Datagram Protocol (UDP) destination port for authentication requests. The port-number argument specifies the port number for authentication requests. The host is not used for authentication if this value is set to 0. The default value is 1645.
acct-port <i>port-number</i>	Specifies the UDP destination port for accounting requests. The port-number argument specifies the port number for accounting requests. The host is not used for accounting services if this value is set to 0. The default value is 1646.
key <i>string</i>	Specifies the authentication and encryption key that is used between the router and the RADIUS daemon running on the RADIUS server. This key overrides the global setting of the radius-server key command. If no key string is specified, the global value is used.

Command Default

None

Command Modes

Global configuration

Command History

Release Modification

R6.3.2 This command was introduced.

Example

The following is a sample of configuring the RADIUS server.

```
configure
radius-server host 209.165.200.225 auth-port 1645 acct-port 1646 key cisco
radius-server vsa attribute ignore unknown
exit
commit
```

radius-server

To specify the unknown vsa ignore configuration for RADIUS server, use the **radius-server vsa attribute ignore unknown** command in the global configuration mode.

radius-server*vsa attribute ignore unknown*

Syntax Description	vsa attribute ignore unknown Specifies the unknown vsa (vendor specific attributes) ignore configuration for RADIUS server. Otherwise, authentication failure may occur.				
Command Default	None				
Command Modes	Global configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of configuring the RADIUS server.

```
configure
radius-server host 209.165.200.225 auth-port 1645 acct-port 1646 key cisco
radius-server vsa attribute ignore unknown
exit
commit
```

rsakeypair

To specify a named Rivest, Shamir, and Adelman (RSA) key pair for this trustpoint, use the **rsakeypair** command in trustpoint configuration mode.

rsakeypair*keypair-label*

Syntax Description	<i>keypair-label</i> RSA key pair label that names the RSA key pairs.				
Command Default	If the RSA key pair is not specified, the default RSA key is used for this trustpoint.				
Command Modes	Trustpoint configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.2	This command was introduced.
Release	Modification				
R6.3.2	This command was introduced.				

Example

The following is a sample of specifying a RSA key pair for the trustpoint.

```
configure
crypto ca trustpoint ncslk
enrollment url http://209.165.200.226
subject-name CN=ncslk,OU=BU,O=Govt,L=Newyork,ST=NY,C=US
rsa-keypair ncslk
crl optional
exit
commit
```

security-policy

To configure the type of data (encrypted data or all data) that is allowed through the controller configured with MACsec, use the **security-policy** command in MACsec policy configuration mode.

security-policy { **should-secure** | **must-secure** }

Syntax Description

should-secure	Configures the controller on which the MACsec policy is applied, to permit all data.
must-secure	Configures the controller on which the MACsec policy is applied, to permit only MACsec encrypted data.

Command Default

The default value is **must-secure** that indicates unencrypted packets cannot be transmitted or received except MKA control protocol packets.

Command Modes

MACsec policy configuration

Command History**Release Modification**

R6.1.1 This command was introduced.

Example

The following example shows how to use the **security-policy** command.

```
configure
macsec-policy mac_policy
security-policy must-secure
```

show alarms

To display alarms in brief or detail, use the **show alarms** command in XR EXEC mode or Administration EXEC mode.

show alarms brief [**card** [**location** *location*] | **rack** | **system**] [**active** | **history**]]

show alarms detail [**card** [**location** *location*] | **rack** | **system**] [**active** | **clients** | **history** | **stats**]]

Syntax Description		
brief		Displays alarms in brief.
card		Displays card scope alarms related data.
rack		Displays rack scope alarms related data.
system		Displays system scope alarms related data.
location	<i>location</i>	Specifies the target location in the <i>rack/slot</i> notation.
active		Displays active alarms.
history		Displays alarm history.
detail		Displays alarms in detail.
clients		Displays clients associated with the service.
stats		Displays service statistics.

Command Default None

Command Modes XR EXEC
Administration EXEC

Command History	Release	Modification
	Release 6.0 .0	This command was introduced.

Usage Guidelines This command displays the alarms in brief or detail. The command displays only the administration alarms in admin EXEC mode and all the alarms in XR EXEC mode.

Task ID	Task	Operation
	fault	read

Example

The following example shows the output of the **show alarms** command.

```
sysadmin-vm:0_RP0# show alarms
```

```
Thu Dec 17 02:15:12.873 UTC
```

```
-----  
Active Alarms  
-----
```

show configuration commit changes

Location	Severity	Group	Set time	Description
0/PM0	major	environ	12/16/15 21:43:19	Power Module Output Disabled (PM_OUTPUT_EN_PIN_HI)
0	major	environ	12/16/15 21:43:19	Power Shelf redundancy lost

Thu Dec 17 02:20:34.592 UTC

Active Alarms (Brief) for 0/RP0

Location	Severity	Group	Set Time	Description
0/0 /2 - Optics Low Receive Power	Minor	Controller	12/16/2015 21:45:42	Optics0/0/0

History Alarms (Brief) for 0/RP0

Location	Severity	Group	Set Time	Description	Clear Time
0/0 /12 - Optics High Differential Group Delay	Minor	Controller	12/16/2015 21:45:42	Optics0/0/0	
0/0 /12 - Optics Out of Range Chromatic Dispersion	Minor	Controller	12/16/2015 21:45:53	Optics0/0/0	12/16/2015 21:45:42

show configuration commit changes

To display the changes made to the running configuration by previous configuration commits, a configuration commit, or for a range of configuration commits, use the **show configuration commit changes** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

```
show configuration commit changes { commit-id | since commit-id | last number-of-commits } [diff]
```

Syntax	Description
since	Displays all changes committed to the running configuration since (and including) a specific configuration commit.
<i>commit-id</i>	Displays configuration changes for a specific configuration commit.

last <i>number-of-commits</i>	Displays the changes made to the running configuration during the last number of configuration commits specified for the <i>number-of-commits</i> argument.
diff	(Optional) Displays added lines, changed lines, and deleted lines.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Each time a configuration is committed with the **commit** command, the configuration commit operation is assigned a commit ID. The **show configuration commit changes** command displays the configuration changes made since the specified commit.

To display a list of the available commit IDs, enter the **show configuration commit list** command. You can also display the commit IDs by entering the **show configuration commit changes** command with the online help function (?).

You cannot view commit IDs from a different release if the syntax or semantics of the configuration changed in the current release.



Note Syntax of a configuration refers to its structure and format, while the semantics of a configuration refers to its backend interpretation.

The following example shows sample output from the **show configuration commit changes** command with the *commit-id* argument. In this example, the output displays the changes made in the configuration commit assigned commit ID 1000035693.

```
RP/0/RP0/CPU0:ios#show configuration commit changes 1000035693
Tue Feb 28 14:28:03.404 UTC
!! Building configuration...
interface GCC20/1/0/12
  ipv4 address 10.1.1.2 255.255.255.0
!
end
```

The following example shows sample output from the **show configuration commit changes** command with the **since** *commit-id* keyword and argument. In this example, the output displays the

configuration changes made since the configuration commit assigned commit ID 1000035693 was committed.

```
RP/0/RP0/CPU0:ios#show configuration commit changes since 1000035693
Tue Feb 28 14:29:42.858 UTC
!! Building configuration...
controller ODU40/1/0/12
  no gcc2
  !
no interface preconfigure GCC20/1/0/12
no keyring keyring_all_in_one
no ikev2 profile profile_all_in_one
end
```

The following example shows sample output from the **show configuration commit changes** command with the **diff** keyword. In the display, the following symbols signify changes:

+ indicates an added line.

– indicates a deleted line.

indicates a modified line.

```
RP/0/RP0/CPU0:ios#show configuration commit changes since 1000035681 diff
Tue Feb 28 14:32:24.349 UTC
!! Building configuration...
- logging console disable
# line default
# exec-timeout 0 0
# !
- controller ODU40/1/0/12
- gcc2
- !
- interface preconfigure GCC20/1/0/12
- ipv4 address 10.1.1.2 255.255.255.0
- !
- keyring keyring_all_in_one
- peer link_1
- pre-shared-key password 11021C1C46
- address 10.1.1.2 255.255.255.0
- !
- !
end
```

show controllers

To display status and configuration information about the interfaces on a specific node, use the **show controllers** command in XR EXEC mode.

```
show controllers [ description ] controllertype R/S/I/P [ description ] [ headless-stats ] |
[ dwdm-carrier-map flexi-grid ] | [ pm { current | history } { 30-sec | 15-min |
24-hour | flex-bin } { optics | ether } linenumber { otn | fec } ] | [ lldp-snoop ]
summary ]
```

To monitor the performance of Pseudo Random Binary Sequence (PRBS) on the CoherentDSP controller, use the **show controllers** command in XR EXEC mode.

show controllers [**description**] **coherentDSP***R/S/I/P***pm** {**current** | **history**} [**description**] {**15-min** | **24-hour**} **prbs**

Use the following command to view the MACsec performance monitoring at MACsec ether layer, MACsec-secy-if, MACsec-secy-Tx, and /or MACsec-secy-Rx:

show controllers macSecCtrlr *R/S/I/P* {**pm** {**current** | **history**} {**30 sec**|**15-min** | **24-hour**} {**macsec-ether** | **macsec-secy-if****macsec-secy-rx**}

Syntax	Description
description	Displays the name, status, and port description of all the configured controllers or of the specified controller.
<i>controllertype</i>	Type of the controller. The possible values are HundredGigECtrlr, TenGigECtrlr, maCSecCtrlr, CoherentDSP, and Optics.
<i>R/S/I/P/L</i>	Rack/Slot/Instance/Port/Lane number of the controller. If the controller type is TenGigECtrlr, include the lane number after the port number.
headless-stats	Displays the statistics collected during the last headless operation. The collected statistics is preserved for a slice until the hw-module configuration is removed or changed on that slice or until the next headless operation. The statistics is also preserved across process restarts.
dwdm-carrier-map	(only for trunk optics controllers) Displays the wavelength and channel mapping.
flexi-grid	(only for trunk optics controllers) Enables GMPLS UNI flexible grid channel spacing.
pm	Displays performance monitoring parameters for the controller.
current	Displays the current performance monitoring data in 15 minute and 24 hour intervals.
history	Displays the historical performance monitoring data in 15 minute and 24 hour intervals.
optics ether	optics to display the PM data for Optics controller and ether to display the PM data for Ethernet controller.
<i>linenumber</i>	Line number to display performance monitoring data. The range is 1 to 12.
otn fec	Displays OTN PM data or FEC PM data for CoherentDSP controller.
lldp-snoop	Displays the MAC address . Verify that the MAC address displayed is same as the MAC address of the traffic generating port.
prbs mode	Pseudo Random Binary Sequence (PRBS) mode.



Note For 10G/40G/100G Ethernet Controller, the stats option displays the cumulative statistics of the Ethernet Controller port. However, the Egress accounting does not support packet size based classification (All output packets * bytes counter).

Command Default The status and configuration information of all the interfaces is displayed.

Command Modes XR EXEC

Command History	Release	Modification
	6.0.0	This command was introduced.
	6.3.2	The flex-grid and description keywords are introduced. The PRBS mode is introduced. The MACSec performance monitoring is introduced.
	6.5.1	The output was updated to include QSA vendor details.
	7.3.1	flex-bin keyword was added.

Usage Guidelines

- For QSFP-40G-SR-BD and QSFP-100G-AOC pluggables, the output of **show controllers optics** command does not display the transmit and receive optics parameters such as transmit and receive power. These pluggables do not support Digital Optical Monitoring.
- When breakout patch panel is used, the output of **show controllers TenGigE Ctrlr** command displays the LED status of the patch panel instead of LED status of the physical port. When breakout patch panel is not used, the output displays the alarm status of the Ethernet layer or controller.

Examples

RP/0/RP0/CPU0:ios# **show controllers coherentDSP 0/0/0/13**

Tue Feb 13 15:42:38.708 UTC

```

Port                               : CoherentDSP 0/0/0/13
Controller State                   : Up
Secondary State                    : Normal
Derived State                      : In Service
Loopback mode                      : None
BER Thresholds                    : SF = 1.0E-5  SD = 1.0E-7
Performance Monitoring             : Enable

```

```

Alarm Information:
LOS = 1 LOF = 0 LOM = 1
OOF = 0 OOM = 0 AIS = 0
IAE = 0 BIAE = 0          SF_BER = 0
SD_BER = 0          BDI = 0 TIM = 0
FECMISMATCH = 0 FEC-UNC = 0
Detected Alarms                : None

```

```

OTU TTI Sent
  OPERATOR SPECIFIC  ASCII      :
                               :
  OPERATOR SPECIFIC  HEX        : 00000000000000000000000000000000
                               : 00000000000000000000000000000000

```

```

OTU TTI Received
  OPERATOR SPECIFIC  ASCII      :
                               :

```

```

OPERATOR SPECIFIC HEX                : 20202020202020202020202020202020
                                        : 00000000000000000000000000000000
OTU TTI Expected
OPERATOR SPECIFIC ASCII              :
                                        :
OPERATOR SPECIFIC HEX                : 00000000000000000000000000000000
                                        : 00000000000000000000000000000000
FEC mode                             : Soft-Decision 7
Network SRLG values                  : Not Configured

```

The table below describes the significant fields shown in the above example.

Field	Description
Port	Rack/Slot/Instance/Port of the coherent DSP controller.
Controller State	State of the controller that can be one of the following: <ul style="list-style-type: none"> • Admin Down • Down • Up
Secondary State	Secondary state of the controller that can be one of the following: <ul style="list-style-type: none"> • Normal • Maintenance
Derived State	Derived state of the controller that can be one of the following: <ul style="list-style-type: none"> • Out Of Service • In Service • Maintenance
Loopback mode	Loopback mode of the controller that can be one of the following: <ul style="list-style-type: none"> • None • Line • Internal
BER Thresholds	Bit Error Rate (BER) that can be one of the following: <ul style="list-style-type: none"> • SD_BER—Signal Degrade Bit Error Rate (SD-BER) threshold • SF_BER—Signal Fail-Bit Error Rate threshold
Performance Monitoring	Specifies if performance monitoring is enabled or not: <ul style="list-style-type: none"> • Disable • Enable

Field	Description
Alarm Information	Summarizes the alarm details: <ul style="list-style-type: none"> • LOS—Loss of Signal • LOF—Loss of Frame • LOM—Loss of MultiFrame • BDI—Backward Defect Indication • TIM—Trace Identifier Mismatch • SF_BER—SF BER alarm • SD_BER—SD BER alarm • FECUNC—FEC Uncorrected Word
Detected Alarms	Summarizes the detected alarms: <ul style="list-style-type: none"> • None • LOS—Loss of Signal • LOF—Loss of Frame • LOM—Loss of MultiFrame • BDI—Backward Defect Indication • TIM—Trace Identifier Mismatch • SF_BER—SF BER alarm • SD_BER—SD BER alarm • FECUNC—FEC Uncorrected Word
OTU TTI Sent	Specifies the sent OTU Trail Trace Identifier (TTI)
OTU TTI Received	Specifies the received OTU TTI.
OTU TTI Expected	Specifies the expected OTU TTI.
FEC mode	Specifies the FEC mode: <ul style="list-style-type: none"> • Soft-Decision 7 • Soft-Decision 20
Network SRLG	Shared Risk Link Groups (SRLGs). Not supported on NCS 1002

RP/0/RP0/CPU0:ios# **show controllers optics 0/0/0/8**

Tue Jun 26 17:36:09.270 IST

Controller State: Up

Transport Admin State: In Service

Laser State: On

LED State: Green

Optics Status

Optics Type: 10G SFP+ LR

Alarm Status:

Detected Alarms: None

LOS/LOL/Fault Status:

Alarm Statistics:

HIGH-RX-PWR = 0 LOW-RX-PWR = 0

HIGH-TX-PWR = 0 LOW-TX-PWR = 0

HIGH-LBC = 0 HIGH-DGD = 0

OOR-CD = 0 OSNR = 0

WVL-OOL = 0 MEA = 0

IMPROPER-REM = 0

TX-POWER-PROV-MISMATCH = 0

Performance Monitoring: Enable

THRESHOLD VALUES

Parameter	High Alarm	Low Alarm	High Warning	Low Warning
-----	-----	-----	-----	-----
Rx Power Threshold(dBm)	4.9	-12.0	0.0	0.0
Tx Power Threshold(dBm)	3.5	-10.1	0.0	0.0
LBC Threshold(mA)	N/A	N/A	0.00	0.00

LBC High Threshold = 98 %

Polarization parameters not supported by optics

Total TX Power = -1.14 dBm

Total RX Power = -5.36 dBm

Lane	Laser Bias	TX Power	RX Power	Output Frequency
-----	-----	-----	-----	-----
1	24.5 %	-1.14 dBm	-5.36 dBm	228.84 THz
2	0.0 %	-40.00 dBm	-40.00 dBm	0.00 THz
3	0.0 %	-40.00 dBm	-40.00 dBm	0.00 THz
4	0.0 %	-40.00 dBm	-40.00 dBm	0.00 THz

Transceiver Vendor Details

Form Factor : SFP+

Name : CISCO-SUMITOMO

Part Number : 10-2618-01

Rev Number : C

Serial Number : SPC1907074R

PID : SFP-10G-LR

VID : V01

Date Code (yy/mm/dd) : 15/02/11

```

Fiber Connector Type: SC
Otn Application Code: Undefined
Sonet Application Code: Undefined
Ethernet Compliance Code: 10GBASE-LR

```

Transceiver Temperature : 28 Celsius

QSA Vendor Details

```

-----
Adapter type       : CAZADERO_QSFP_SFP_Adapter
Name               : CISCO-DNI
Part Number        : 74-9474-01
Rev Number         : 03
Serial Number      : DTY2142058L
PID                : CVR-QSFP-SFP10G
VID                : V01

```

```

AINS Soak          : None
AINS Timer         : 0h, 0m
AINS remaining time : 0 seconds

```

RP/0/RP0/CPU0:ios# show controllers hundredGigECtrlr 0/0/0/11 headless-stats

This command displays the Ethernet controller statistics in headless mode. The headless start time, headless end time, and packet statistics in Tx, Rx are displayed.

Thu May 4 08:58:23.491 UTC

```

Started in Stateful mode: Yes
Headless Start Time: Thu May 4 08:43:54 2017

```

```

Headless End Time: Thu May 4 08:45:15 2017

```

Ethernet Headless Statistics

```

RxPktsOverSized      : 37633208
RxPktsBadFcS         : 0
RxErrorJabbers       : 0
RxPktsMulticast      : 0
RxPktsBroadcast      : 37633208
RxPktsUnicast        : 0
RxPktsUnderSized     : 0
RxPkts               : 37633208
RxBytesGood          : 361278796800
RxPktsGood           : 37633208
Rx8021QPkts         : 0
RxLldpkts           : 10
RxRecvFragments     : 0
RxPkts64Bytes        : 0
RxPkts65To127Bytes  : 0
RxPkts128to255Bytes : 0
RxPkts256To511Bytes : 0
RxPkts512To1023Bytes : 0
RxPkts1024To1518Bytes : 0
RxTotalBytes         : 361278791752
RxPktsDrop           : 0
RxPause              : 0
TxPkts               : 37633202
TxTotalBytes         : 361278732768
TxGoodPkts           : 0
TxGoodBytes          : 0

```

```

TxPktsUndersized      : 0
TxPktsOversized      : 37633202
TxPktsFragments      : 0
TxPktsJabber         : 0
TxPktsBadFcs         : 0
TxPause              : 0

```

RP/0/RP0/CPU0:ios# show controllers optics 0/0/0/13 dwdm-carrier-map flexi-grid

This command provides mapping of DWDM wavelength and frequency in 6.25 Ghz spacing. The output of this command has G.694.1 channel number, frequency, and wavelength and has 776 entries in this channel spacing.

```

DWDM Carrier Band:: OPTICS_C_BAND
Frequency range supported: 196.10000 THz ~ 191.25630 THz

```

DWDM Carrier Map table

Channel index	G.694.1 Ch Num	Frequency (THz)	Wavelength (nm)
1	480	196.10000	1528.773
2	479	196.09380	1528.822
3	478	196.08750	1528.871
4	477	196.08130	1528.919
5	476	196.07500	1528.968
6	475	196.06880	1529.017
7	474	196.06250	1529.066
8	473	196.05630	1529.114
9	472	196.05000	1529.163
10	471	196.04380	1529.212
11	470	196.03750	1529.261
12	469	196.03130	1529.309
13	468	196.02500	1529.358
14	467	196.01880	1529.407
15	466	196.01250	1529.456
16	465	196.00630	1529.504
17	464	196.00000	1529.553
18	463	195.99380	1529.602
19	462	195.98750	1529.651
20	461	195.98130	1529.699
21	460	195.97500	1529.748

show controllers

22	459	195.96880	1529.797
23	458	195.96250	1529.846
24	457	195.95630	1529.894
25	456	195.95000	1529.944
26	455	195.94380	1529.992
27	454	195.93750	1530.041
28	453	195.93130	1530.090
29	452	195.92500	1530.139
30	451	195.91880	1530.187
31	450	195.91250	1530.236
32	449	195.90630	1530.285
33	448	195.90000	1530.334
34	447	195.89380	1530.383
35	446	195.88750	1530.432
36	445	195.88130	1530.480
37	444	195.87500	1530.529
38	443	195.86880	1530.578
39	442	195.86250	1530.627
40	441	195.85630	1530.676
41	440	195.85000	1530.725
42	439	195.84380	1530.773
43	438	195.83750	1530.823
44	437	195.83130	1530.871
45	436	195.82500	1530.920
46	435	195.81880	1530.969
47	434	195.81250	1531.018
48	433	195.80630	1531.066
49	432	195.80000	1531.116
50	431	195.79380	1531.164
51	430	195.78750	1531.213
52	429	195.78130	1531.262
53	428	195.77500	1531.311

54	427	195.76880	1531.360
55	426	195.76250	1531.409
56	425	195.75630	1531.458
57	424	195.75000	1531.507
58	423	195.74380	1531.555
59	422	195.73750	1531.605
60	421	195.73130	1531.653
61	420	195.72500	1531.702
62	419	195.71880	1531.751
63	418	195.71250	1531.800
64	417	195.70630	1531.849
65	416	195.70000	1531.898
66	415	195.69380	1531.947
67	414	195.68750	1531.996
68	413	195.68130	1532.044
69	412	195.67500	1532.094
70	411	195.66880	1532.142
71	410	195.66250	1532.192
72	409	195.65630	1532.240
73	408	195.65000	1532.290
74	407	195.64380	1532.338
75	406	195.63750	1532.387
76	405	195.63130	1532.436
77	404	195.62500	1532.485
78	403	195.61880	1532.534
79	402	195.61250	1532.583
80	401	195.60630	1532.632
81	400	195.60000	1532.681
82	399	195.59380	1532.730
83	398	195.58750	1532.779
84	397	195.58130	1532.828
85	396	195.57500	1532.877

86	395	195.56880	1532.926
87	394	195.56250	1532.975
88	393	195.55630	1533.024
89	392	195.55000	1533.073
90	391	195.54380	1533.122
91	390	195.53750	1533.171
92	389	195.53130	1533.220
93	388	195.52500	1533.269
94	387	195.51880	1533.318
95	386	195.51250	1533.367
96	385	195.50630	1533.416
97	384	195.50000	1533.465
98	383	195.49380	1533.514
99	382	195.48750	1533.563
100	381	195.48130	1533.612
775	-294	191.26250	1567.440
776	-295	191.25630	1567.491

RP/0/RP0/CPU0:ios# **show controllers hundredGigEctr1r 0/0/0/14**

Tue Feb 13 15:40:30.389 UTC
Operational data for interface HundredGigEctr1r0/0/0/14:

State:
Administrative state: enabled
Operational state: Up
LED state: Red On
Maintenance: Disabled
AINS Soak: None

Phy:
Alarms:
Current:
Loss of Signal

Autonegotiation disabled.

Operational values:
Speed: 100Gbps
Duplex: Full Duplex
Flowcontrol: None

RP/0/RP0/CPU0:ios# **show controllers TenGigEctr1r0/0/0/1/* | inc LED**

```
Tue Oct 25:40:30.389 UTC
LED state: Red On
LED state: Green On
LED state: Green On
LED state: Green On
```

LED is Red when one or more 10G lanes in the 4x10G QSFP is administratively enabled and down even when certain lanes are administratively enabled and up. LED is Green when one or more 10G lanes in the 4x10G QSFP is administratively disabled and down while the remaining lanes are administratively enabled and up.

RP/0/RP0/CPU0:ios# show controllers optics 0/0/1 pm current 15-min optics 1

```
Mon Jan 28 07:15:43.828 IST
```

```
Optics in the current interval [07:15:00 - 07:15:44 Mon Jan 28 2019]
```

```
Optics current bucket type : Valid
      MIN      AVG      MAX      Operational      Configured      TCA      Operational
      Configured      TCA
      Threshold(max) (max)      Threshold(min)      Threshold(min) (min)      Threshold(max)
LBC[% ]      : 17.6      17.6      17.6      0.0      NA      NO      100.0
      NA      NO
OPT[dBm]      : -0.86      -0.85      -0.85      -30.00      NA      NO      63.32
      NA      NO
OPR[dBm]      : 0.53      0.53      0.54      -30.00      NA      NO      63.32
      NA      NO
```

```
Last clearing of "show controllers OPTICS" counters never
```

RP/0/RP0/CPU0:ios# show controllers coherentDSP 0/0/0/13 pm current 15-min otn

```
Tue Feb 13 15:43:00.173 UTC
```

```
g709 OTN in the current interval [15:30:00 - 15:43:00 Tue Feb 13 2001]
```

```
OTN current bucket type : Valid
ES-NE : 0      Threshold : 500      TCA(enable) : YES
ESR-NE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
SES-NE : 0      Threshold : 500      TCA(enable) : YES
SESR-NE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
UAS-NE : 0      Threshold : 500      TCA(enable) : YES
BBE-NE : 0      Threshold : 10000      TCA(enable) : YES
BBER-NE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
FC-NE : 0      Threshold : 10      TCA(enable) : YES

ES-FE : 0      Threshold : 500      TCA(enable) : YES
ESR-FE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
SES-FE : 0      Threshold : 500      TCA(enable) : YES
SESR-FE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
UAS-FE : 0      Threshold : 500      TCA(enable) : YES
BBE-FE : 0      Threshold : 10000      TCA(enable) : YES
BBER-FE : 0.00000      Threshold : 0.00000      TCA(enable) : NO
FC-FE : 0      Threshold : 10      TCA(enable) : YES
```

```
Last clearing of "show controllers OTU" counters never
```

RP/0/RP0/CPU0:ios# show controllers coherentDSP 0/0/0/13 pm current 15-min fec

```

Tue Feb 13 15:43:05.054 UTC

g709 FEC in the current interval [15:30:00 - 15:43:05 Tue Feb 13 2001]

FEC current bucket type : Valid
  EC-BITS   : 407265375460   Threshold : 903330   TCA(enable) : YES
  UC-WORDS  : 0               Threshold : 5         TCA(enable) : YES

Last clearing of "show controllers OTU" counters never

```



Note The EC-BITS counter value increases continuously although the client traffic is not present.

RP/0/RP0/CPU0:ios# **show controllers hundredGigECtrlr 0/0/0/3 pm current 15-min ether**

RP/0/RP0/CPU0:ios# **show controllers hundredGigECtrlr 0/0/0/24 stats**

The following example shows the output for the MACsec controller.

RP/0/RP0/CPU0:ios# **show controllers maCSecCtrlr 0/0/0/4**

```

Mon Nov 14 12:08:24.391 IST

Port:    MACSecCtrlr0/0/0/4

-----

Interface Status

-----

Controller state      : Up
ReplayWindowSize     : 64
MustSecure           : TRUE

-----

Encrypted Secure Channel Status

-----

ProtectionEnabled    : TRUE
SecureChannelID      : 0x4000000c8e22a04
ConfidentialityOffset : 0
CipherSuite          : GCM-AES-XPB-256
MaxPacketNumber      : 18446744073709551615
RecentPacketNumber   : 0

-----

Encrypted Active Associations

-----

AssociationNumber     : 0
ShortSecureChannelID : 2

-----

Decrypted Secure Channel Status

-----

```

```

ProtectionEnabled      : TRUE
SecureChannelID       : 0xb000000c8e22a04
ConfidentialityOffset : 0
CipherSuite           : GCM-AES-XPN-256
MaxPacketNumber       : 18446744073709551615
RecentPacketNumber    : 0

```

Decrypted Active Associations

```

AssociationNumber      : 0
ShortSecureChannelID  : 1

```

RP/0/RP0/CPU0:ios# **show controllers maCSecCtrlr 0/0/0/11/1 summary**

Tue Jan 1 06:55:31.606 UTC

```

|<----- Secure Channel Status ----->||<--Active
|
|          Replay
|Associations->|
MACSecCtrlr Ctrlr Window Must          Secure          Recent
              State Size  Secure Channel Channel ID (SCI)  Packet number      AN  Short
SCI
-----
0/0/0/11/1  Up    64    TRUE   Encrypt 0xb01901452ed9c6c  441617595          2  2
              Decrypt 0x1901901452ed9c6c  441617450          2  1

```

The following examples show the wildcard character support for **show controllers** command.

RP/0/RP0/CPU0:ios# **show controllers macSecCtrlr 0/0/0/* summary**

Sun Dec 18 14:28:10.826 IST

```

|<----- Secure Channel Status ----->||<--Active
|
|          Replay
|Associations->|
MACSecCtrlr Ctrlr Window Must          Secure          Recent
              State Size  Secure Channel Channel ID (SCI)  Packet number      AN  Short
SCI
-----
0/0/0/3     Up    128   TRUE   2      Encrypt 0x300ccea3b562038  0                    3
2
              Decrypt 0x1100ccea3b562038  0                    3
1
0/0/0/4     Up    128   TRUE   2      Encrypt 0x400ccea3b562038  410472853057         3
2
              Decrypt 0x1200ccea3b562038  410472758788         3
1
0/0/0/17    Up    128   TRUE   2      Encrypt 0x1100ccea3b562038  0                    3
1
              Decrypt 0x300ccea3b562038  0                    3
2
0/0/0/18    Up    128   TRUE   2      Encrypt 0x1200ccea3b562038  410472653944         3
1

```

```

Decrypt 0x400ccea3b562038 410472728753 3
2

```

RP/0/RP0/CPU0:ios# show controllers macSecCtrlr 0/0/0/11/* summary

This command displays the details of all the four sub-controllers of 0/0/0/11 port.

```
Sun Dec 18 10:10:03.929 IST
```

```

|<----- Secure Channel Status ----->||<--Active
|
|          Replay
|Associations->|
MACSecCtrlr Ctrlr Window Must          Secure          Recent
              State Size  Secure Channel Channel ID (SCI)  Packet number      AN  Short
-----
-----
0/0/0/11/1  Up    64    TRUE   2    Encrypt 0xb01901452ed9c6c  10776298219        0
2
1          Decrypt 0x1901901452ed9c6c  10776374039        0
0/0/0/11/2  Up    64    TRUE   2    Encrypt 0xb02901452ed9c6c  10776295022        0
2
1          Decrypt 0x1902901452ed9c6c  10776370709        0
0/0/0/11/3  Up    64    TRUE   2    Encrypt 0xb03901452ed9c6c  578387113115       0
2
1          Decrypt 0x1903901452ed9c6c  10776367512        0
0/0/0/11/4  Up    64    TRUE   2    Encrypt 0xb04901452ed9c6c  10776302725        0
2
1          Decrypt 0x1904901452ed9c6c  10776364171        0

```

The wildcard character support is provided for **clear controller** command as well. For example, **clear controller macSecCtrlr 0/0/0/* stats**.

```
ios#show controllers macSecCtrlr 0/0/0/16/2 pm current 30-sec macsec-secy-if
```

Displays the current performance monitoring parameters of the controller in macsec-secy-if mode in 30 sec intervals.

```

Macsec-Secy-If in the current interval [10:18:30 - 10:18:57 Sat Apr 22 2017]
Macsec-Secy-If current bucket type : Valid
InPktsUntagged      : 0          Threshold : 0          TCA(enable) : NO
InPktsNoTag         : 0          Threshold : 0          TCA(enable) : NO
InPktsBadTag        : 0          Threshold : 0          TCA(enable) : NO
InPktsUnknownSCI   : 0          Threshold : 0          TCA(enable) : NO
InPktsNoSCI         : 0          Threshold : 0          TCA(enable) : NO
InPktsOverrun       : 0          Threshold : 0          TCA(enable) : NO
InOctetsValidated   : 0          Threshold : 0          TCA(enable) : NO
InOctetsDecrypted   : 321909392  Threshold : 0          TCA(enable) : NO
OutPktsUntagged     : 0          Threshold : 0          TCA(enable) : NO
OutPktsTooLong      : 0          Threshold : 0          TCA(enable) : NO
OutOctetsProtected  : 0          Threshold : 0          TCA(enable) : NO
OutOctetsEncrypted  : 415501264  Threshold : 0          TCA(enable) : NO

```

```
ios#show controllers macSecCtrlr 0/0/0/16/2 pm current 15-min macsec-secy-if
```

Displays the current performance monitoring parameters of the controller in macsec-secy-if mode in 15 minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers macSecCtrlr 0/0/0/16/2 pm current 15-min macsec-secy-if
Sat Apr 22 10:18:40.743 UTC
Macsec-Secy-If in the current interval [10:15:00 - 10:18:40 Sat Apr 22 2017]
Macsec-Secy-If current bucket type : Valid
  InPktsUntagged      : 0                Threshold : 0                TCA(enable) : NO
  InPktsNoTag        : 0                Threshold : 0                TCA(enable) : NO
  InPktsBadTag       : 0                Threshold : 0                TCA(enable) : NO
  InPktsUnknownSCI   : 0                Threshold : 0                TCA(enable) : NO
  InPktsNoSCI        : 0                Threshold : 0                TCA(enable) : NO
  InPktsOverrun      : 0                Threshold : 0                TCA(enable) : NO
  InOctetsValidated  : 0                Threshold : 0                TCA(enable) : NO
  InOctetsDecrypted  : 2541082096        Threshold : 0                TCA(enable) : NO
  OutPktsUntagged    : 0                Threshold : 0                TCA(enable) : NO
  OutPktsTooLong     : 0                Threshold : 0                TCA(enable) : NO
  OutOctetsProtected : 0                Threshold : 0                TCA(enable) : NO
  OutOctetsEncrypted : 3279875344        Threshold : 0                TCA(enable) : NO

ios#show controllers macSecCtrlr 0/0/0/16/2 pm current 30-sec macsec-secy-tx
```

Displays the current performance monitoring parameters of the controller in macsec-secy-tx mode in 30 minute intervals.

```
Macsec-Secy-Tx in the current interval [10:18:30 - 10:18:59 Sat Apr 22 2017]
Macsec-Secy-Tx current bucket type : Valid
  OutPktsProtected   : 0                Threshold : 0                TCA(enable) : NO
  OutPktsEncrypted   : 286527           Threshold : 0                TCA(enable) : NO
  OutOctetsProtected : 0                Threshold : 0                TCA(enable) : NO
  OutOctetsEncrypted : 430363554        Threshold : 0                TCA(enable) : NO
  OutPktsTooLong     : 0                Threshold : 0                TCA(enable) : NO
```

Displays the current performance monitoring parameters of the controller in macsec-secy-tx mode in 24-hour interval.

```
RP/0/RP0/CPU0:ios#show controllers macSecCtrlr 0/0/0/24/3 pm current 24-hour macsec-secy-tx
Sat Apr 1 15:38:30.158 IST
Macsec-Secy-Tx in the current interval [00:00:00 - 15:38:30 Sat Apr 1 2017]
Macsec-Secy-Tx current bucket type : Valid
  OutPktsProtected   : 0                Threshold : 0                TCA(enable) : NO
  OutPktsEncrypted   : 3160983513        Threshold : 0                TCA(enable) : NO
  OutOctetsProtected : 0                Threshold : 0                TCA(enable) : NO
  OutOctetsEncrypted : 31559259393792        Threshold : 0                TCA(enable) : NO
  OutPktsTooLong     : 0                Threshold : 0                TCA(enable) : NO
```

Displays the current performance monitoring parameters of the controller in macsec-secy-rx mode in 24-hour interval.

```
RP/0/RP0/CPU0:ios#show controllers macSecCtrlr 0/0/0/10/3 pm current 24-hour macsec-secy-rx
Sat Apr 1 15:38:00.820 IST
Macsec-Secy-Rx in the current interval [00:00:00 - 15:38:01 Sat Apr 1 2017]
Macsec-Secy-Rx current bucket type : Valid
  InPktsUnchecked    : 0                Threshold : 0                TCA(enable) : NO
  InPktsDelayed      : 0                Threshold : 0                TCA(enable) : NO
  InPktsLate         : 0                Threshold : 0                TCA(enable) : NO
  InPktsInvalid      : 0                Threshold : 0                TCA(enable) : NO
  InPktsOK           : 3159299558        Threshold : 0                TCA(enable) : NO
  InPktsNotValid     : 0                Threshold : 0                TCA(enable) : NO
  InPktsNotUsingSA   : 0                Threshold : 0                TCA(enable) : NO
  InPktsUnusedSA     : 0                Threshold : 0                TCA(enable) : NO
  InPktsUntaggedHit  : 0                Threshold : 0                TCA(enable) : NO
  InOctetsValidated  : 0                Threshold : 0                TCA(enable) : NO
  InOctetsDecrypted  : 31542446787072        Threshold : 0                TCA(enable) : NO
```

```
RP/0/RP0/CPU0:ios# show controllers hundredGigEctrlr 0/0/0/4
```

This example displays the Ethernet controller statistics with AINS Soak in Running state.

```
Fri Apr 27 02:49:45.858 UTC
Operational data for interface HundredGigEctrlr0/0/0/4:
State:
  Administrative state: enabled
  Operational state: Up
  LED state: Green On
  Maintenance: Disabled
  AINS Soak: Running
    Total Duration: 0 hour(s) 30 minute(s)
    Remaining Duration: 0 hour(s) 29 minute(s) 50 second(s)
  Laser Squelch: Disabled
```

```
RP/0/RP0/CPU0:ios# show controllers optics 0/0/0/2
```

This example displays the Optics controller statistics with AINS Soak in Running state.

```
Fri Jun  8 18:33:46.027 IST

Controller State: Up

Transport Admin State: Automatic In Service

Laser State: On

LED State: Green

Optics Status

  Optics Type: 100G QSFP28 LR4

  Alarm Status:
  -----
  Detected Alarms: None

  LOS/LOL/Fault Status:

  Alarm Statistics:

  -----
  HIGH-RX-PWR = 0          LOW-RX-PWR = 0
  HIGH-TX-PWR = 0          LOW-TX-PWR = 0
  HIGH-LBC = 0            HIGH-DGD = 0
  OOR-CD = 0              OSNR = 0
  WVL-OOL = 0             MEA = 0
  IMPROPER-REM = 0
  TX-POWER-PROV-MISMATCH = 0

  Performance Monitoring: Enable

  THRESHOLD VALUES
  -----

  Parameter                High Alarm  Low Alarm  High Warning  Low Warning
  -----
  Rx Power Threshold(dBm)   4.9        -12.0     0.0           0.0
  Tx Power Threshold(dBm)   3.5        -10.1     0.0           0.0
  LBC Threshold(mA)         N/A        N/A       0.00          0.00

  LBC High Threshold = 98 %
```


Polarization parameters not supported by optics

Total TX Power = 7.94 dBm

Total RX Power = 7.76 dBm

Lane	Laser Bias	TX Power	RX Power	Output Frequency
1	28.3 %	1.91 dBm	1.30 dBm	231.39 THz
2	27.8 %	1.83 dBm	1.05 dBm	230.59 THz
3	28.2 %	1.93 dBm	2.14 dBm	229.79 THz
4	27.3 %	2.00 dBm	2.32 dBm	228.99 THz

Transceiver Vendor Details

```

Form Factor           : QSFP28
Name                  : CISCO-FINISAR
Part Number           : 10-3146-01
Rev Number            : B
Serial Number         : FNS20401P4J
PID                   : QSFP-100G-LR4-S
VID                   : V01
Date Code (yy/mm/dd) : 16/10/01
Fiber Connector Type  : LC
Otn Application Code  : Undefined
Sonet Application Code: Undefined
Ethernet Compliance Code: 100GBASE-LR4

```

Transceiver Temperature : 25 Celsius

```

AINS Soak             : Running
AINS Timer            : 0h, 30m
AINS remaining time   : 1791 seconds

```

RP/0/RP0/CPU0:ios#show controllers hundredGigEctrlr 0/0/0/4

This example enables to view the hold off timer configured over 100G client ports.

Mon Jun 11 21:14:37.612 IST

Operational data for interface HundredGigEctrlr0/0/0/4:

State:

```

Administrative state: enabled
Operational state: Up
LED state: Green On
Maintenance: Disabled
AINS Soak: None
  Total Duration: 0 hour(s) 0 minute(s)
  Remaining Duration: 0 hour(s) 0 minute(s) 0 second(s)
Laser Squelch: Disabled

```

Phy:

```
Media type: Not known
```

Autonegotiation disabled.

Operational values:

```

Speed: 100Gbps
Duplex: Full Duplex
Flowcontrol: None
Loopback: None (or external)
BER monitoring:

```

```
Not supported
Holdoff Time: 3000ms
```

show environment

To display environmental monitor parameters for the system, use the **show environment** command in administration EXEC mode.

```
show environment [ all | fan | power | voltages | current | trace | temperatures ] [
location | location ]
```

Syntax Description	
all	(Optional) Displays information for all the environmental monitor parameters.
fan	(Optional) Displays information about the fans.
power	(Optional) Displays power supply voltage and current information.
voltages	(Optional) Displays system voltage information.
current	(Optional) Displays current sensor information.
temperatures	(Optional) Displays system temperature information.
trace	(Optional) Displays trace data for environment monitoring.
location <i>location</i>	(Optional) Enter the location for which the environmental information needs to be displayed.

Command Default All environmental monitor parameters are displayed.

Command Modes Administration EXEC

Command History	Release	Modification
	Release 6.0.0	This command was introduced.

Usage Guidelines The **show environment** command displays information about the hardware that is installed in the system, including fans, power supply voltage, current information, and temperatures.

Task ID	Task ID	Operation
	system	read

Example

The following example shows sample output from the **show environment** command with the **fan** keyword.

sysadmin-vm:0_RP0# show environment fan

```
Thu Nov 12 02:39:46.390 UTC
=====
Fan speed (rpm)
Location      FRU Type      FAN_0
-----
0/FT0         NCS1K-FTA     4800
0/FT1         NCS1K-FTA     4800
0/FT2         NCS1K-FTA     4920

0/PM1         NCS1K-2KW-AC  9152
```

The following example shows sample output from the **show environment** command with the **temperatures** keyword.

sysadmin-vm:0_RP0# show environment temperatures location 0/RP0

```
Tue Feb 27 10:32:38.967 UTC
=====
Location      TEMPERATURE      Value  Crit Major Minor Minor Major Crit
              Sensor              (deg C)  (Lo) (Lo) (Lo) (Hi) (Hi) (Hi)
-----
0/RP0
              Thermistor 1      27    -10   0   0   55   55   85
              Thermistor 2      28    -10   0   0   55   55   85
              Hot Spot Temperature  26    -10   0   0   55   55   85
```

The following example shows sample output from the **show environment** command with the **power** keyword.

sysadmin-vm:0_RP0# show environment power

```
Thu Nov 12 02:42:40.177 UTC
=====
CHASSIS LEVEL POWER INFO: 0
=====
Total output power capacity (Group 0 + Group 1) :      2000W +      2000W
Total output power required :      975W
// Total power required by NCS 1002 for the current configuration
Total power input :      888W
// Total power currently entering both the NCS 1002 power Modules
Total power output :      818W
// Total power supplied to the NCS 1002 components by both the power modules

Power Group 1:
=====
Power      Supply      -----Input-----      -----Output---      Status
Module     Type          Volts      Amps      Volts      Amps
-----
0/PM1      2kW-AC        211.0      2.2      12.0      35.9      OK

Total of Power Group 0:      424W/ 2.0A      387W/ 32.0A
// 424W/2.0A is the power/current input to PM0 module from power supply and 387W/32.0A is
the power/current output supplied by PM0 module to NCS 1002 components

Total of Power Group 1:      464W/ 2.2A      431W/ 35.9A
// 464W/2.2A is the power/current input to PM1 module from power supply and 431W/35.9A is
the power/current output supplied by PM1 module to NCS 1002 components

// 424W(PM0 input) + 464W (PM1 input)= 888W (Total power input)
// 387W (PM0 output) + 431W (PM1 output)= 818W (Total power output)
```

```

=====
Location      Card Type          Power      Power      Status
                Allocated      Used
                Watts        Watts
=====
0/0           NCS1002           70         -          RESERVED
0/RP0        NCS1K-CNTRLR-K9  35         -          ON
0/FT0        NCS1K-FTA        40         -          ON
0/FT1        NCS1K-FTA        40         -          ON
0/FT2        NCS1K-FTA        40         -          ON
=====

```

The following example shows sample output from the **show environment** command with the **voltages** keyword.

sysadmin-vm:0_RP0# show environment voltages location 0/RP0

Thu Nov 12 02:45:49.213 UTC

```

=====
Location  VOLTAGE          Value  Crit Minor Minor  Crit
          Sensor          (mV)  (Lo) (Lo) (Hi) (Hi)
=====
0/RP0
          VP1P0_CPU          996    900  950 1050 1100
          CPU_CORE_VCC  889    400  450 1350 1400
          CPU_CORE_VNN  979    400  450 1350 1400
          VP1P1          1067   990 1050 1160 1210
          VP1P2          1194  1080 1140 1260 1320
          VP1P35_DDR     1344  1220 1280 1420 1490
          VP1P35         1338  1220 1280 1420 1490
          VP1P5          1495  1350 1430 1580 1650
          VP1P8_CPU     1793  1620 1710 1890 1980
          VP3P3_STBY    3305  2970 3140 3470 3630
          VP3P3         3334  2970 3140 3470 3630
          VP5P0         4936  4500 4750 5250 5500
          VP12P0        11897 10800 11400 12600 13200
          VREF          1216  1190 1200 1240 1250
          12V Input Voltage 11178  8000 10000 14000 16000
=====

```

show hw-module

To display the details of the slice and the Field Programmable Devices (FPDs), use the **show hw-module** in XR EXEC or administration EXEC mode.

show hw-module {**slice** [*slicenumber* | **all**] | **fpd**}

Syntax Description	
slice <i>slicenumber</i>	Displays information for a slice. The slice number is from 0 to 3.
all	Displays information for all the slices.
fpd	Displays the status of FPDs installed.

Command Default None

Command Modes XR EXEC

Administration EXEC

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.0.1	The output of show hw-module fpd and show hw-module slice were updated.
	Release 6.1.1	The output of show hw-module slice was updated.
	Release 6.1.2	The output of show hw-module slice was updated.
	Release 6.3.1	The output of show hw-module slice was updated.

Usage Guidelines

If the ISO image has new version of FPD, the Status column in **show hw-module fpd** command shows NEED UPGD. If the upgrade is required, use the **upgrade hw-module location all fpd fpd_device_name** command to start the upgrade. When the upgrade starts, the Status column in **show hw-module fpd** command sequentially shows UPGD PREP, UPGRADING, and the percentage of upgrade completion. After the upgrade is completed, the Status column shows RLOAD REQ if the ISO image requires reload; otherwise the Status column shows CURRENT.

If reload is required:

If the FPGA location is 0/RP0, use the **admin hw-module location 0/RP0 reload** command. This command reboots only the CPU. Hence, the traffic is not impacted. If the FPGA location is 0/0, use the **admin hw-module location all reload** command. This command reboots NCS 1002. Hence, the traffic is impacted. After the reload is completed, the new FPGA runs the current version.

The **show hw-module slice slicenumber** command displays the state of current slice provisioning, client and trunk bit rate, traffic split between coherent DSPs, and version of data path FPGA. If the HW status field displays NEED UPGD, use the **upgrade hw-module slice slicenumber re-provision** command. The **Encryption Supported** field indicates whether the slice is provisioned with firmware that supports encryption or not.

Task ID

Task ID	Operation
system	read

Example

You can use the **show hw-module slice slicenumber** command to check if the upgrade is required after the software is installed.

```
RP/0/RP0/CPU0:ios# show hw-module slice 0
```

```
RP/0/RP0/CPU0:ios#show hw-module slice 0
Thu Sep 22 10:55:35.985 UTC
Slice ID:                0
Status:                   Provisioned
```

show hw-module

```

Client Bitrate:          40
Trunk Bitrate:          200
DP FPGA FW Type:       XMG4
DP FPGA FW Version:    01.01
HW Status:             CURRENT
Encryption Supported:  FALSE
LLDP Drop Enable:     TRUE
Client Port - Trunk Port      CoherentDSP0/0/0/6
Traffic Split Percentage
FortyGigECtrlr0/0/0/0          100
FortyGigECtrlr0/0/0/1          100
FortyGigECtrlr0/0/0/2          100
FortyGigECtrlr0/0/0/3          100
FortyGigECtrlr0/0/0/4          100

```

RP/0/RP0/CPU0:ios# **show hw-module slice 2**

```

Slice ID:                2
Status:                  Provisioned
Client Bitrate:         10,100
Trunk Bitrate:         200
DP FPGA FW Type:       RMM
DP FPGA FW Version:    04.00
HW Status:             CURRENT

Encryption Supported:  FALSE
LLDP Drop Enabled:    FALSE
Client Port - Trunk Port      CoherentDSP0/0/0/19 CoherentDSP0/0/0/20
Traffic Split Percentage

HundredGigECtrlr0/0/0/14          100          0
HundredGigECtrlr0/0/0/15          100          0
HundredGigECtrlr0/0/0/16           0          100
TenGigECtrlr0/0/0/17/1            0          100
TenGigECtrlr0/0/0/17/2            0          100
TenGigECtrlr0/0/0/17/3            0          100
TenGigECtrlr0/0/0/17/4            0          100
TenGigECtrlr0/0/0/18/1            0          100
TenGigECtrlr0/0/0/18/2            0          100
TenGigECtrlr0/0/0/18/3            0          100
TenGigECtrlr0/0/0/18/4            0          100

```

RP/0/RP0/CPU0:ios# **show hw-module slice all**

```

Thu Aug 11 16:16:58.935 IST
Slice ID:                0
Status:                  Provisioned
Client Bitrate:         100
Trunk Bitrate:         200
DP FPGA FW Type:       M100
DP FPGA FW Version:    02.00
HW Status:             CURRENT

Encryption Supported:  TRUE
Client Port - Trunk Port      CoherentDSP0/0/0/6
Traffic Split Percentage

HundredGigECtrlr0/0/0/3          100
HundredGigECtrlr0/0/0/4          100

Slice ID:                1
Status:                  Provisioned
Client Bitrate:         100

```

```

Trunk Bitrate:          200
DP FPGA FW Type:       M100
DP FPGA FW Version:    02.00
HW Status:              CURRENT

Encryption Supported:   TRUE
Client Port - Trunk Port      CoherentDSP0/0/0/13
Traffic Split Percentage

HundredGigEctrler0/0/0/10          100
HundredGigEctrler0/0/0/11          100

Slice ID:                    2
Status:                      Provisioned
Client Bitrate:              100
Trunk Bitrate:               200
DP FPGA FW Type:             M100
DP FPGA FW Version:          02.00
HW Status:                   CURRENT

Encryption Supported:        TRUE
Client Port - Trunk Port      CoherentDSP0/0/0/20
Traffic Split Percentage

HundredGigEctrler0/0/0/17          100
HundredGigEctrler0/0/0/18          100

Slice ID:                    3
Status:                      Provisioned
Client Bitrate:              100
Trunk Bitrate:               200
DP FPGA FW Type:             M100
DP FPGA FW Version:          02.00
HW Status:                   CURRENT

Encryption Supported:        TRUE
Client Port - Trunk Port      CoherentDSP0/0/0/27
Traffic Split Percentage

HundredGigEctrler0/0/0/24          100
HundredGigEctrler0/0/0/25          100

```

RP/0/RP0/CPU0:ios# show hw-module fpd

Tue Apr 12 09:04:14.935 UTC

FPD Versions

=====

Location	Card type	HWver	FPD device	ATR	Status	Running	Programd
0/0	NCS1002	2.4	CDSP_PORT_05		CURRENT	3.56	3.56
0/0	NCS1002	2.4	CDSP_PORT_06		CURRENT	3.56	3.56
0/0	NCS1002	2.4	CDSP_PORT_12		CURRENT	3.56	3.56
0/0	NCS1002	2.3	CDSP_PORT_13		NEED UPGD	3.55	3.55
0/0	NCS1002	2.4	CDSP_PORT_19		CURRENT	3.56	3.56
0/0	NCS1002	2.4	CDSP_PORT_20		CURRENT	3.56	3.56
0/0	NCS1002	2.4	CDSP_PORT_26		CURRENT	3.56	3.56
0/0	NCS1002	2.4	CDSP_PORT_27		CURRENT	3.56	3.56
0/0	NCS1002		CFP2_PORT_05		NOT READY		
0/0	NCS1002	2.0	CFP2_PORT_06		CURRENT	4.38	4.38
0/0	NCS1002		CFP2_PORT_12		NOT READY		
0/0	NCS1002		CFP2_PORT_13		NOT READY		
0/0	NCS1002		CFP2_PORT_19		NOT READY		
0/0	NCS1002	2.1	CFP2_PORT_20		CURRENT	5.19	5.19
0/0	NCS1002		CFP2_PORT_26		NOT READY		

show inventory

```

0/0      NCS1002                CFP2_PORT_27      NOT READY
0/0      NCS1002                0.1 CTRL_BKP_LOW  B      CURRENT      1.22
0/0      NCS1002                0.1 CTRL_BKP_UP   B      CURRENT      1.22
0/0      NCS1002                0.1 CTRL_FPGA_LOW  CURRENT      1.22 1.22
0/0      NCS1002                0.1 CTRL_FPGA_UP   CURRENT      1.22 1.22
0/RP0    NCS1K-CNTLR-K9          0.1 BIOS_Backup    BS     CURRENT      13.10
0/RP0    NCS1K-CNTLR-K9          0.1 BIOS_Primary    S     CURRENT      13.10 13.10
0/RP0    NCS1K-CNTLR-K9          0.1 Daisy_Duke_BKP BS     CURRENT      0.15
0/RP0    NCS1K-CNTLR-K9          0.1 Daisy_Duke_FPGA S     CURRENT      0.15 0.15

```

```
sysadmin-vm:0_RP0# show hw-module fpd
```

```

Tue Apr 12 09:28:22.879 UTC
FPD Versions
=====
Location Card type      HWver  FPD device      ATR   Status      Run Programd
-----
0/0      NCS1002            0.1    CTRL_BKP_LOW    B     CURRENT      1.22
0/0      NCS1002            0.1    CTRL_BKP_UP     B     CURRENT      1.22
0/0      NCS1002            0.1    CTRL_FPGA_LOW   S     CURRENT      1.22 1.22
0/0      NCS1002            0.1    CTRL_FPGA_UP    S     CURRENT      1.22 1.22
0/RP0    NCS1K-CNTLR-K9    0.1    BIOS_Backup     BS    CURRENT      13.10
0/RP0    NCS1K-CNTLR-K9    0.1    BIOS_Primary    S     CURRENT      13.10 13.10
0/RP0    NCS1K-CNTLR-K9    0.1    Daisy_Duke_BKP BS    CURRENT      0.15
0/RP0    NCS1K-CNTLR-K9    0.1    Daisy_Duke_FPGA S     CURRENT      0.15 0.15
0/PM0    NCS1K-2KW-AC      0.0    PO-PrimCU       NEED UPGD 0.00 0.00
0/PM1    NCS1K-2KW-AC      0.0    PO-PrimCU       NEED UPGD 0.00 0.00

```

show inventory

To retrieve and display the physical inventory information, use the **show inventory** command in XR EXEC or administration EXEC mode.

XR EXEC Mode

```
show inventory [all | oid | raw | location location ]
```

Administration EXEC Mode

```
show inventory [all | chassis | fan | power | raw | location location ]
```

Syntax Description

all	(Optional) Displays inventory information for all the physical entities.
fan	(Optional) Displays inventory information for the fans.
power	(Optional) Displays inventory information for the power supply.
raw	(Optional) Displays raw information about the chassis for diagnostic purposes.
chassis	(Optional) Displays inventory information for the entire chassis.
location location	(Optional) Displays inventory information for a specific node, or for all nodes in the chassis.
oid	(Optional) Displays inventory information along with oid.

Command Default All hardware inventory information is displayed.

Command Modes XR EXEC

Administration EXEC

Command History	Release	Modification
	Release 6.0.0	This command was introduced.
	Release 6.0.1	The output was updated to include 40G pluggables.
	Release 6.5.1	The output was updated to include QSA vendor details.

Usage Guidelines Enter the **show inventory** command with the **raw** keyword to display every RFC 2737 entity installed in NCS 1002, including those without a PID, unique device identifier (UDI), or other physical identification. The **raw** keyword is primarily intended for troubleshooting problems with the **show inventory** command itself.

Task ID	Task ID	Operations
	system	read

Example

The following examples show sample output from the **show inventory** command in both EXEC and Administration EXEC modes.

```
sysadmin-vm:0_RP0# show inventory
```

```
Tue Feb 13 15:27:30.159 UTC
NAME: "0/0", DESCR: "Network Convergence System 1000 Controller"
PID: NCS1002          , VID: V01, SN: CHANGE-ME-

NAME: "0/0-PORT-6", DESCR: "Cisco 100GE CFP2 Pluggable Optics"
PID: ONS-CFP2-WDM    , VID: N/A, SN: OUK1936005W

NAME: "0/0-PORT-11", DESCR: "Cisco 40G QSFP+ CSR4 Pluggable Optics Module"
PID: QSFP-40G-CSR4   , VID: V02 , SN: AVP1834S18A

NAME: "0/0-PORT-14", DESCR: "Cisco 100G QSFP28 SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S , VID: ES1 , SN: AVF1933G116

NAME: "0/0-PORT-16", DESCR: "Cisco 100G QSFP28 SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S , VID: ES1 , SN: AVF1933G16A

NAME: "0/0-PORT-18", DESCR: "Cisco 100G QSFP28 SR4 Pluggable Optics Module"
PID: QSFP-100G-SR4-S , VID: ES1 , SN: AVF1934G04U

NAME: "0/0-PORT-21", DESCR: "Cisco QSFP-100G-LR4-S Pluggable Optics Module"
PID: QSFP-100G-LR4-S , VID: V01 , SN: ECL19250052

NAME: "0/RP0", DESCR: "Network Convergence System 1000 Controller"
PID: NCS1002--RP     , VID: V01, SN: CHANGE-ME-
```

show inventory

```

NAME: "0/FT0", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA          , VID: V01, SN: N/A
NAME: "0/FT1", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA          , VID: V01, SN: N/A

```

```

NAME: "0/FT2", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA          , VID: V01, SN: N/A

```

RP/0/RP0/CPU0:ios# show inventory

```

Fri May 18 10:46:51.323 UTC
NAME: "0/0", DESCR: "Network Convergence System 1002 20 QSFP28/QSFP+ slots"
PID: NCS1002-K9        , VID: V03, SN: CAT2116B170

NAME: "0/0-Optics0/0/0/1", DESCR: "Non-Cisco QSFP28 100G LR4 Pluggable Optics Module"
PID: SPQCELRCDFB       , VID: 01 , SN: G9I2011804

NAME: "0/0-Optics0/0/0/4", DESCR: "Non-Cisco QSFP28 100G LR4 Pluggable Optics Module"
PID: TR-FC13L-N00      , VID: 01 , SN: INGAJ0930306

NAME: "0/0-Optics0/0/0/6", DESCR: "Cisco CFP2 DWDM Pluggable Optics"
PID: ONS-CFP2-WDM      , VID: V01 , SN: OUK1936006S

NAME: "0/0-Optics0/0/0/7", DESCR: "Cisco 4x10GE QSFP+ LR-S Pluggable Optics Module"
PID: QSFP-4X10G-LR-S   , VID: V02 , SN: INL20410069

NAME: "0/0-Optics0/0/0/8-LANE1", DESCR: "Cisco 10G SFP LR Pluggable Optics Module"
PID: SFP-10G-LR        , VID: V01 , SN: SPC1907074N

NAME: "0/0-Optics0/0/0/9", DESCR: "Cisco 40GE QSFP+ SR4 Pluggable Optics Module"
PID: QSFP-40G-SR4      , VID: V03 , SN: JFQ20332088

NAME: "0/0-Optics0/0/0/10", DESCR: "Non-Cisco QSFP28 100G LR4 Pluggable Optics Module"
PID: SPQCELRCDFB       , VID: 01 , SN: GAV2008935

NAME: "0/0-Optics0/0/0/11-LANE1", DESCR: "Cisco 10G SFP LR Pluggable Optics Module"
PID: SFP-10G-LR        , VID: V01 , SN: SPC190707YP

NAME: "0/0-Optics0/0/0/8-LANE1", DESCR: "Cisco 10G SFP LR Pluggable Optics Module"
PID: SFP-10G-LR        , VID: V01 , SN: SPC1907074R

NAME: "0/0-Optics0/0/0/18", DESCR: "Non-Cisco QSFP28 100G LR4 Pluggable Optics Module"
PID: FTLC1151RDPL     , VID: A0 , SN: UVE1C6C

NAME: "0/0-Optics0/0/0/19", DESCR: "Cisco CFP2 DWDM Pluggable Optics"
PID: ONS-CFP2-WDM      , VID: V05 , SN: OVE204404PA

NAME: "0/0-Optics0/0/0/21", DESCR: "Cisco 4x10GE QSFP+ LR-S Pluggable Optics Module"
PID: QSFP-4x10G-LR-S   , VID: V01 , SN: INL20200012

NAME: "0/0-Optics0/0/0/22-LANE1", DESCR: "Cisco 10G SFP LR Pluggable Optics Module"
PID: SFP-10G-LR        , VID: V01 , SN: SPC190707YS

NAME: "0/0-Optics0/0/0/23", DESCR: "Cisco 40GE QSFP+ SR4 Pluggable Optics Module"
PID: QSFP-40G-SR4      , VID: V03 , SN: JFQ2033201H

NAME: "0/0-Optics0/0/0/24", DESCR: "Non-Cisco QSFP28 100G LR4 Pluggable Optics Module"
PID: FTLC1151RDPL     , VID: A0 , SN: UWD2QMM

NAME: "0/0-Optics0/0/0/25-LANE1", DESCR: "Cisco 10G SFP ER Pluggable Optics Module"
PID: SFP-10G-ER        , VID: V02 , SN: ONT213100BW

NAME: "0/RP0", DESCR: "Network Convergence System 1000 Controller"

```

```

PID: NCS1K-CNTRLR      , VID: V04, SN: CAT2052B0FZ

NAME: "Rack 0", DESCR: "Network Convergence System 1002 20 QSFP28/QSFP+ slots"
PID: NCS1002-K9      , VID: V03, SN: CAT2116B170

NAME: "0/FT0", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA      , VID: V01, SN: N/A

NAME: "0/FT1", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA      , VID: V01, SN: N/A

NAME: "0/FT2", DESCR: "Network Convergence System 1000 Fan"
PID: NCS1K-FTA      , VID: V01, SN: N/A

NAME: "0/PM0", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC   , VID: V01, SN: POG2041J0BW

NAME: "0/PM1", DESCR: "Network Convergence System 1000 2KW AC PSU"
PID: NCS1K-2KW-AC   , VID: V01, SN: POG2041J01C

```

show access-lists ipv4

To display the contents of current IPv4 access lists, use the **show access-lists ipv4** command in EXEC mode.

```

show access-lists ipv4 [interface MgmtEth R/S/I/P | maximum [detail] | summary [access-list-name
] | usage pfilter location { location node-id | all } | access-list-name [sequence-number | usage
pfilter location { location node-id | all } ] ]

```

Syntax Description

<i>R/S/I/P</i>	Rack/Slot/Instance/Port/ number of the interface.
<i>access-list-name</i>	(Optional) Name of a particular IPv4 access list. The name cannot contain a space or quotation mark; it may contain numbers.
location number	Location of a particular IPv4 access list.
locationnode-id	(Optional) Location of a particular IPv4 access list. The node-id argument is entered in the rack/slot/module notation.
usage	(Optional) Displays the usage of the access list on a given line card.
pfilter	(Optional) Displays the packet filtering usage for the specified line card.
summary	Displays a summary of all current IPv4 access lists.
<i>sequence-number</i>	(Optional) Sequence number of a particular IPv4 access list.
maximum	Displays the current maximum number of configurable IPv4 accesscontrol lists (ACLs) and access control entries (ACEs).
detail	(Optional) Displays complete out-of-resource (OOR) details.
all	(Optional) Displays the location of all the line cards.

Command Default

Displays all IPv4 access lists.

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	Release 6.3.2	This command is introduced.

Usage Guidelines Use the **show access-lists ipv4** command to display the contents of all IPv4 access lists. To display the contents of a specific IPv4 access list, use the name argument. Use the *sequence-number* argument to specify the sequence number of the access list.

Use the **show access-lists ipv4 summary** command to display a summary of all current IPv4 access lists. To display a summary of a specific IPv4 access list, use the name argument.

Use the **show access-lists ipv4 maximum detail** command to display the OOR details for IPv4 access lists. OOR limits the number of ACLs and ACEs that can be configured in the system. When the limit is reached, configuration of new ACLs or ACEs is rejected.

Example

In the following example, the contents of all IPv4 access lists are displayed:

```
RP/0/RP0/CPU0:ios# show access-lists ipv4
```

show access-lists ipv6

To display the contents of current IPv6 access lists, use the **show access-lists ipv6** command in EXEC mode.

```
show access-lists ipv6 [interface MgmtEth R/S/I/P | maximum [detail] | summary [access-list-name] | usage pfilter location { location node-id | all } | access-list-name [sequence-number | usage pfilter location { location node-id | all } ] ]
```

Syntax Description	
<i>R/S/I/P</i>	Rack/Slot/Instance/Port/ number of the interface.
<i>access-list-name</i>	(Optional) Name of a particular IPv4 access list. The name cannot contain a space or quotation mark; it may contain numbers.
location number	Location of a particular IPv4 access list.
location node-id	(Optional) Location of a particular IPv4 access list. The node-id argument is entered in the rack/slot/module notation.
usage	(Optional) Displays the usage of the access list on a given line card.
pfilter	(Optional) Displays the packet filtering usage for the specified line card.
summary	Displays a summary of all current IPv4 access lists.
<i>sequence-number</i>	(Optional) Sequence number of a particular IPv4 access list.
maximum	Displays the current maximum number of configurable IPv4 access control lists (ACLs) and access control entries (ACEs).

detail	(Optional) Displays complete out-of-resource (OOR) details.
---------------	---

all	(Optional) Displays the location of all the line cards.
------------	---

Command Default Displays all IPv6 access lists.

Command Modes EXEC

Command History	Release	Modification
	Release 6.3.2	This command is introduced.

Usage Guidelines The **show access-lists ipv6** command is similar to the **show access-lists ipv4** command, except that it is IPv6 specific.

Use the **show access-lists ipv6** command to display the contents of all IPv6 access lists. To display the contents of a specific IPv6 access list, use the name argument. Use the *sequence-number* argument to specify the sequence number of the access list.

Use the **show access-lists ipv6 summary** command to display a summary of all current IPv6 access lists. To display a summary of a specific IPv6 access list, use the name argument.

Use the **show access-lists ipv6 maximum detail** command to display the OOR details for IPv6 access lists. OOR limits the number of ACLs and ACEs that can be configured in the system. When the limit is reached, configuration of new ACLs or ACEs is rejected.

Example

In the following example, the contents of all IPv6 access lists are displayed:

```
RP/0/RP0/CPU0:ios#show access-lists ipv6
```

show led

To display the status of various LEDs present in NCS 1002, use the **show led** command in administration EXEC mode.

```
show led [ location location ]
```

Syntax Description **location location** (Optional) Displays LED information for a specific location.

Command Default The status of all the LEDs present in NCS 1002 is displayed.

Command Modes Administration EXEC

Command History	Release	Modification
	Release 6.0.0	This command was introduced.

Usage Guidelines Enter the **show LED** command in administration EXEC mode to display the status of all the LEDs present in NCS 1002.

Example

The following example shows sample output from the **show led** command.

sysadmin-vm:0_RP0# **show led**

```
Wed Dec 16 22:39:47.779 UTC
=====
Location  LED Name                               Mode      Color
=====
0/0
    0/0-Power Status LED                 WORKING   RED
    0/0-Fan Status LED                   WORKING   GREEN
0/RP0
    0/RP0-Status LED                     WORKING   AMBER
    0/RP0-Attention LED                  WORKING   OFF
0/PM0
    0/PM0-Status LED                     WORKING   AMBER
0/PM1
    0/PM1-Status LED                     WORKING   GREEN
```

show terminal-device

To display terminal-device parameters of the system, use the **show terminal-device** command in administration EXEC mode.

show terminal-device {**internal** {**adj-list** | **config-status**} | **layout** | **logical-channel** {**all** | **number channel-number**} | **ltrace** {**all** | **error** | **file** | **hexdump** | **info** | **last** | **location** | **reverse** | **stats** | **tailf** | **unique** | **usec** | **verbose** | **wide** | **wrapping**} | **operational-modes** | {**all** | **name word**}}

Syntax Description		
internal		Displays the internal structure information.
adj-list		Displays the adjacency list.
config-status		Displays the configuration status.
layout		Displays the layout of channels and connections.
logical-channel		Displays the logical channel information.
all		Displays all logical channels information.
number <i>channel-number</i>		Specifies the logical channel number. The range of logical channel is 1 to 100000.

ltrace { all error file hexdump info last location reverse stats tailf unique usec verbose wide wrapping }	Displays the ltrace data. <ul style="list-style-type: none"> • all—Displays all traces. • error—Displays error traces. • file—Displays the specified file. • hexdump—Displays traces in hexadecimal. • info—Displays informational traces. • last—Displays last <n> entries. • location—Displays card location. • reverse—Displays latest traces. • stats—Displays statistics. • tailf—Displays new traces as they are added. • unique—Displays unique entries with counts. • usec—Displays timestamp of usec. • verbose—Displays internal debugging information. • wide—Displays ltrace information without buffer name, node name and tid. • wrapping—Displays wrapping entries.
operational-modes	Displays the supported operational modes.
optical-channel	Displays the optical channel information.
all	Displays information of all optical channels.
name <i>word</i>	Displays the specified optical channel name.

Command Default None

Command Modes Administration EXEC

Command History	Release	Modification
	Release 6.2.1	This command was introduced.

Usage Guidelines The **show terminal-device** command displays information about the terminal-device parameters of the system.

Example

To view the configuration layout of channels, use the following command:

```
Router#show terminal-device layout
Tue Mar 14 15:39:08.821 IST
```

show terminal-device

```

Slice Id:                0
Status:                  Config Accepted
Client Bitrate:          100G
Line Bitrate:            200G

```

Client [Lane]	Logical Channel (Ethernet)	Logical Channel (Coherent)	Optical Channel	Line
Optics0/0/0/0 [0]	2001	2003	0_0-OpticalChannel0_0_0_5	Optics0/0/0/5
Optics0/0/0/1 [0]	2005	2003	0_0-OpticalChannel0_0_0_5	Optics0/0/0/5
Optics0/0/0/3 [0]	2006	2004	0_0-OpticalChannel0_0_0_6	Optics0/0/0/6
Optics0/0/0/4 [0]	2002	2004	0_0-OpticalChannel0_0_0_6	Optics0/0/0/6

```

Slice Id:                3
Status:                  Config Accepted
Client Bitrate:          100G
Line Bitrate:            200G

```

Client [Lane]	Logical Channel (Ethernet)	Logical Channel (Coherent)	Optical Channel	Line
Optics0/0/0/21 [0]	4001	4003	0_0-OpticalChannel0_0_0_26	Optics0/0/0/26
Optics0/0/0/22 [0]	4005	4003	0_0-OpticalChannel0_0_0_26	Optics0/0/0/26
Optics0/0/0/24 [0]	4006	4004	0_0-OpticalChannel0_0_0_27	Optics0/0/0/27
Optics0/0/0/25 [0]	4002	4004	0_0-OpticalChannel0_0_0_27	Optics0/0/0/27

To view the display graph adjacency list, use the following command:

```

Router#show terminal-device internal adj-list
Tue Mar 14 15:40:21.024 IST

```

OC-Optical Adjacency List

```

Number of Vertices = 44
Number of Logical Channel(s) [Ethernet] = 8
Number of Logical Channel(s) [OTN] = 4
Number of Optical Channel(s) = 4

```

No	VID	VName	Slice-Id	Channels
0	NA	Optics0/0/0/0	0	2001
1	NA	Optics0/0/0/1	0	2005
2	NA	Optics0/0/0/2	0	-----
3	NA	Optics0/0/0/3	0	2006
4	NA	Optics0/0/0/4	0	2002
5	NA	Optics0/0/0/5	0	0_0-OpticalChannel0_0_0_5
6	NA	Optics0/0/0/6	0	0_0-OpticalChannel0_0_0_6
7	NA	Optics0/0/0/7	1	-----
8	NA	Optics0/0/0/8	1	-----
9	NA	Optics0/0/0/9	1	-----
10	NA	Optics0/0/0/10	1	-----
11	NA	Optics0/0/0/11	1	-----
12	NA	Optics0/0/0/12	1	-----
13	NA	Optics0/0/0/13	1	-----
14	NA	Optics0/0/0/14	2	-----
15	NA	Optics0/0/0/15	2	-----
16	NA	Optics0/0/0/16	2	-----
17	NA	Optics0/0/0/17	2	-----
18	NA	Optics0/0/0/18	2	-----
19	NA	Optics0/0/0/19	2	-----
20	NA	Optics0/0/0/20	2	-----
21	NA	Optics0/0/0/21	3	4001
22	NA	Optics0/0/0/22	3	4005
23	NA	Optics0/0/0/23	3	-----
24	NA	Optics0/0/0/24	3	4006
25	NA	Optics0/0/0/25	3	4002
26	NA	Optics0/0/0/26	3	0_0-OpticalChannel0_0_0_26


```

27  NA  Optics0/0/0/27      3      0_0-OpticalChannel0_0_0_27
28 2001      NA              0      Optics0/0/0/0, 2003
29 2003      NA              0      2001, 0_0-OpticalChannel0_0_0_5, 2005
30 2002      NA              0      Optics0/0/0/4, 2004
31 2004      NA              0      2002, 0_0-OpticalChannel0_0_0_6, 2006
32  NA      0_0-OpticalChannel0_0_0_5      0      2003, Optics0/0/0/5
33  NA      0_0-OpticalChannel0_0_0_6      0      2004, Optics0/0/0/6
34 2005      NA              0      Optics0/0/0/1, 2003
35 2006      NA              0      Optics0/0/0/3, 2004
36 4001      NA              3      Optics0/0/0/21, 4003
37 4003      NA              3      4001, 0_0-OpticalChannel0_0_0_26, 4005
38 4002      NA              3      Optics0/0/0/25, 4004
39 4004      NA              3      4002, 0_0-OpticalChannel0_0_0_27, 4006
40  NA      0_0-OpticalChannel0_0_0_26      3      4003, Optics0/0/0/26
41  NA      0_0-OpticalChannel0_0_0_27      3      4004, Optics0/0/0/27
42 4005      NA              3      Optics0/0/0/22, 4003
43 4006      NA              3      Optics0/0/0/24, 4004

```

To view the logical channel information, use the following command:

```

Router#show terminal-device logical-channel number 2001
Tue Mar 14 16:13:23.397 IST
Logical Channel Index:      2001
Name:                      HundredGigEctrlr0/0/0/0
Admin-State:               Enable
Loopback-Mode:             None
Type of Logical Channel:   Logical Level 1
Trib-Rate:                 100G tributary signal rate
Trib-Protocol:             100G MLG protocol
Protocol-Type:             Ethernet protocol framing
Ingress Client Port:      Optics0/0/0/0
Ingress Physical Channel:  0
Logical Assignment Index:  1
Logical Assignment Name:   NA
Logical Channel:          2003
Optical Channel:          NA
Allocation:               100G
Assignment Type:          Logical

```

To view all the logical channels information, use the following command:

```

Router#show terminal-device logical-channel all
Tue Mar 14 15:42:29.468 IST
Logical Channel Index:      2001
Name:                      HundredGigEctrlr0/0/0/0
Admin-State:               Enable
Loopback-Mode:             None
Type of Logical Channel:   Logical Level 1
Trib-Rate:                 100G tributary signal rate
Trib-Protocol:             100G MLG protocol
Protocol-Type:             Ethernet protocol framing
Ingress Client Port:      Optics0/0/0/0
Ingress Physical Channel:  0
Logical Assignment Index:  1
Logical Assignment Name:   NA
Logical Channel:          2003
Optical Channel:          NA
Allocation:               100G
Assignment Type:          Logical

Logical Channel Index:      2002
Name:                      HundredGigEctrlr0/0/0/4
Admin-State:               Enable
Loopback-Mode:             None
Type of Logical Channel:   Logical Level 1

```

show terminal-device

```

Trib-Rate:                100G tributary signal rate
Trib-Protocol:            100G MLG protocol
Protocol-Type:            Ethernet protocol framing
Ingress Client Port:      Optics0/0/0/4
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          2004
Optical Channel:          NA
Allocation:                100G
Assignment Type:          Logical

Logical Channel Index:    2003
Name:                     CoherentDSP0/0/0/5
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 2
Trib-Rate:                Unknown tributary signal rate
Trib-Protocol:            Unknown protocol
Protocol-Type:            OTN protocol framing
Ingress Client Port:      NA
Ingress Physical Channel: 0
TTI Transmit:            NA
TTI Expected:             NA
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          0
Optical Channel:          0_0-OpticalChannel0_0_0_5
Allocation:                200G
Assignment Type:          Optical

Logical Channel Index:    2004
Name:                     CoherentDSP0/0/0/6
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 2
Trib-Rate:                Unknown tributary signal rate
Trib-Protocol:            Unknown protocol
Protocol-Type:            OTN protocol framing
Ingress Client Port:      NA
Ingress Physical Channel: 0
TTI Transmit:            NA
TTI Expected:             NA
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          0
Optical Channel:          0_0-OpticalChannel0_0_0_6
Allocation:                200G
Assignment Type:          Optical

Logical Channel Index:    2005
Name:                     HundredGigECtrlr0/0/0/1
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 1
Trib-Rate:                100G tributary signal rate
Trib-Protocol:            100G MLG protocol
Protocol-Type:            Ethernet protocol framing
Ingress Client Port:      Optics0/0/0/1
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          2003
Optical Channel:          NA

```

```

Allocation:                100G
Assignment Type:           Logical

Logical Channel Index:    2006
Name:                     HundredGigEctr1r0/0/0/3
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 1
Trib-Rate:                100G tributary signal rate
Trib-Protocol:            100G MLG protocol
Protocol-Type:            Ethernet protocol framing
Ingress Client Port:     Optics0/0/0/3
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          2004
Optical Channel:          NA
Allocation:                100G
Assignment Type:           Logical

Logical Channel Index:    4001
Name:                     HundredGigEctr1r0/0/0/21
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 1
Trib-Rate:                100G tributary signal rate
Trib-Protocol:            100G MLG protocol
Protocol-Type:            Ethernet protocol framing
Ingress Client Port:     Optics0/0/0/21
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          4003
Optical Channel:          NA
Allocation:                100G
Assignment Type:           Logical

Logical Channel Index:    4002
Name:                     HundredGigEctr1r0/0/0/25
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 1
Trib-Rate:                100G tributary signal rate
Trib-Protocol:            100G MLG protocol
Protocol-Type:            Ethernet protocol framing
Ingress Client Port:     Optics0/0/0/25
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name:  NA
Logical Channel:          4004
Optical Channel:          NA
Allocation:                100G
Assignment Type:           Logical

Logical Channel Index:    4003
Name:                     CoherentDSP0/0/0/26
Admin-State:              Enable
Loopback-Mode:            None
Type of Logical Channel:  Logical Level 2
Trib-Rate:                Unknown tributary signal rate
Trib-Protocol:            Unknown protocol
Protocol-Type:            OTN protocol framing
Ingress Client Port:     NA
Ingress Physical Channel: 0

```

```

TTI Transmit:           NA
TTI Expected:          NA
Logical Assignment Index: 1
Logical Assignment Name: NA
Logical Channel:       0
Optical Channel:       0_0-OpticalChannel0_0_0_26
Allocation:            200G
Assignment Type:       Optical

Logical Channel Index:  4004
Name:                  CoherentDSP0/0/0/27
Admin-State:           Enable
Loopback-Mode:         None
Type of Logical Channel: Logical Level 2
Trib-Rate:              Unknown tributary signal rate
Trib-Protocol:          Unknown protocol
Protocol-Type:          OTN protocol framing
Ingress Client Port:   NA
Ingress Physical Channel: 0
TTI Transmit:          NA
TTI Expected:          NA
Logical Assignment Index: 1
Logical Assignment Name: NA
Logical Channel:       0
Optical Channel:       0_0-OpticalChannel0_0_0_27
Allocation:            200G
Assignment Type:       Optical

Logical Channel Index:  4005
Name:                  HundredGigECtrlr0/0/0/22
Admin-State:           Enable
Loopback-Mode:         None
Type of Logical Channel: Logical Level 1
Trib-Rate:              100G tributary signal rate
Trib-Protocol:          100G MLG protocol
Protocol-Type:          Ethernet protocol framing
Ingress Client Port:   Optics0/0/0/22
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name: NA
Logical Channel:       4003
Optical Channel:       NA
Allocation:            100G
Assignment Type:       Logical

Logical Channel Index:  4006
Name:                  HundredGigECtrlr0/0/0/24
Admin-State:           Enable
Loopback-Mode:         None
Type of Logical Channel: Logical Level 1
Trib-Rate:              100G tributary signal rate
Trib-Protocol:          100G MLG protocol
Protocol-Type:          Ethernet protocol framing
Ingress Client Port:   Optics0/0/0/24
Ingress Physical Channel: 0
Logical Assignment Index: 1
Logical Assignment Name: NA
Logical Channel:       4004
Optical Channel:       NA
Allocation:            100G
Assignment Type:       Logical

```

To view specific optical channel details, use the following command:

```
Router#show terminal-device optical-channel name 0_0-OpticalChannel0_0_0_5
Tue Mar 14 15:44:41.576 IST
Optical Channel Name:    0_0-OpticalChannel0_0_0_5
Index:                   0
Frequency:                0
Power:                   0
Operational Mode:        7
Line Port:                Optics0/0/0/5
```

To view all the optical channels details, use the following command:

```
Router#show terminal-device optical-channel all
Tue Mar 14 15:44:41.254 IST
Optical Channel Name:    0_0-OpticalChannel0_0_0_26
Index:                   0
Frequency:                0
Power:                   0
Operational Mode:        7
Line Port:                Optics0/0/0/26

Optical Channel Name:    0_0-OpticalChannel0_0_0_27
Index:                   0
Frequency:                0
Power:                   0
Operational Mode:        7
Line Port:                Optics0/0/0/27

Optical Channel Name:    0_0-OpticalChannel0_0_0_5
Index:                   0
Frequency:                0
Power:                   0
Operational Mode:        7
Line Port:                Optics0/0/0/5

Optical Channel Name:    0_0-OpticalChannel0_0_0_6
Index:                   0
Frequency:                0
Power:                   0
Operational Mode:        7
Line Port:                Optics0/0/0/6
```

To view the supported operational modes, use the following command:

```
Router#show terminal-device operational-modes
Tue Mar 14 15:50:55.289 IST
Operational Mode:        1
Description:              FEC Mode 7
Vendor:                  Cisco Systems, Inc.

Operational Mode:        2
Description:              FEC Mode 20
Vendor:                  Cisco Systems, Inc.
```

To view the present, past, and partial configuration status and its corresponding time-stamp values, use the following command:

```
Router#show terminal-device internal config-status
Tue Mar 14 15:51:34.189 IST
Partial Config:          Disabled

Slice:                   0
Status:                  Config Accepted
Present Config:          100Gx200G
Present Config Time:     Mon Mar 13 23:41:59 2017
```

```

Past Config:           None
Past Config Time:     None
Last Config Error:    None
Error Time:           None

Slice:                 1
Status:               Un-Configured
Present Config:       None
Present Config Time:  None
Past Config:          None
Past Config Time:     None
Last Config Error:    None
Error Time:           None

Slice:                 2
Status:               Un-Configured
Present Config:       None
Present Config Time:  None
Past Config:          None
Past Config Time:     None
Last Config Error:    None
Error Time:           None

Slice:                 3
Status:               Config Accepted
Present Config:       100Gx200G
Present Config Time:  Mon Mar 13 23:41:59 2017
Past Config:          None
Past Config Time:     None
Last Config Error:    None
Error Time:           None

```

show platform

To display information and status for each node in the system, use the **show platform** command in XR EXEC or administration EXEC mode.

Administration EXEC Mode

```
show platform [{detail | location | slices} location]
```

XR EXEC Mode

```
show platform [vm | 0/RP0 ]
```

Syntax Description

detail	(Optional) Displays the details of node type and state.
location	(Optional) Displays the location of node.
slices	(Optional) Displays the summary information of each slice in the node.
<i>location</i>	(Optional) Node location such as 0/FT0, 0/RP0.
vm	(Optional) Displays the virtual machine information of node.

Command Default

The status and information are displayed for all the nodes in the system.

Command Modes

XR EXEC

Administration EXEC

Command History

Release	Modification
Release 6.0.0	This command was introduced.

Usage Guidelines

Enter the **show platform** command in administration EXEC mode to display the output for the entire system.

Task ID

Task ID	Operations
system	read

Example

The following example shows sample output from the **show platform** command.

```
sysadmin-vm:0_RP0# show platform
```

```
Wed Dec 16 22:51:27.789 UTC
Location Card Type HW State SW State Config State
-----
0/0 NCS1002 OPERATIONAL N/A NSHUT
0/RP0 NCS1K-CNTRLR-K9 OPERATIONAL OPERATIONAL NSHUT
0/FT0 NCS1K-FTA OPERATIONAL N/A NSHUT
0/FT1 NCS1K-FTA OPERATIONAL N/A NSHUT
0/FT2 NCS1K-FTA OPERATIONAL N/A NSHUT
```

The following example shows sample output from the **show platform detail** command.

```
sysadmin-vm:0_RP0# show platform detail
```

```
Wed Dec 16 22:52:25.551 UTC

Platform Information for 0/0
  PID : NCS1002
  Description : "Network Convergence System 1000 Controller"
  VID/SN : V01
  HW Oper State : OPERATIONAL
  SW Oper State : N/A
  Configuration : "NSHUT RST"
  HW Version : 0.1
  Last Event : HW_EVENT_OK
  Last Event Reason : "HW Event OK"

Platform Information for 0/RP0
  PID : NCS1K-CNTRLR-K9
  Description : "Network Convergence System 1000 Controller"
  VID/SN : V01
  HW Oper State : OPERATIONAL
  SW Oper State : OPERATIONAL
  Configuration : "NSHUT RST"
  HW Version : 0.1
  Last Event : HW_EVENT_OK
  Last Event Reason : "HW Event OK"
```

```

Platform Information for 0/FT0
PID : NCS1K-FTA
Description : "Network Convergence System 1000 Fan"
VID/SN : V01
HW Oper State : OPERATIONAL
SW Oper State : N/A
Configuration : "NSHUT RST"
HW Version : 0.1
Last Event : HW_EVENT_OK
Last Event Reason : "HW Operational"

```

```

Platform Information for 0/FT1
PID : NCS1K-FTA
Description : "Network Convergence System 1000 Fan"
VID/SN : V01
HW Oper State : OPERATIONAL
SW Oper State : N/A
Configuration : "NSHUT RST"
HW Version : 0.1
Last Event : HW_EVENT_OK
Last Event Reason : "HW Operational"

```

```

Platform Information for 0/FT2
PID : NCS1K-FTA
Description : "Network Convergence System 1000 Fan"
VID/SN : V01
HW Oper State : OPERATIONAL
SW Oper State : N/A
Configuration : "NSHUT RST"
HW Version : 0.1
Last Event : HW_EVENT_OK
Last Event Reason : "HW Operational"

```

RP/0/RP0/CPU0:ios# **show platform**

```

Wed Dec 16 22:56:35.515 UTC
Node name      Node type      Node state      Admin state      Config state
-----
0/RP0          NCS1K-CNTRLR  OPERATIONAL     UP               NSHUT

```

terminal-device transition cli-to-yang

To enable the transition from CLI configuration to terminal-device configuration, use the **terminal-device transition cli-to-yang** command in XR EXEC mode or Administration EXEC mode. The transition from CLI to terminal-device must be done via merge-config operation in gRPC.

terminal-device transition cli-to-yang {enable | disable}

Syntax Description	
enable	Enables transition from CLI configuration to terminal-device configuration.
disable	Disables transition from CLI configuration to terminal-device configuration.
Command Default	None
Command Modes	XR EXEC

Administration EXEC

Command History	Release	Modification
	Release 6.2.1	This command was introduced.

Example

The following example shows how to enable the transition from CLI configuration to terminal-device configuration.

```
RP/0/RP0/CPU0:ios#terminal-device transition cli-to-yang enable
```

transmit-shutdown

To disable the laser on the trunk port of the optics controller, use the **transmit-shutdown** command in the optics controller configuration mode.

controller optics *R/S/I/P* **transmit-shutdown**

Syntax Description	transmit-shutdown Disables the laser on the trunk port of the optics controller				
Command Default	None				
Command Modes	Optics controller configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>R6.3.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	R6.3.1	This command was introduced.
Release	Modification				
R6.3.1	This command was introduced.				

Usage Guidelines This command is similar to the **shutdown** command. Both the commands disable the Tx laser. However, the **shutdown** command changes the admin state of the controller as well. Hence, the **shutdown** command affects the tunnel state in case of GMPLS-UNI whereas the **transmit-shutdown** command does not affect the tunnel state.

Example

The following example shows how to use the **transmit-shutdown** command.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller optics 0/0/0/13
RP/0/RP0/CPU0:ios(config-optics)#transmit-shutdown
```

window-size

To configure the replay protection window size, use the **window-size** command in MACsec policy configuration mode.

The replay protection window size indicates the number of out-of-sequence frames that can be accepted at the controller configured with MACsec, without being dropped.

window-size *value*

Syntax Description	<i>value</i> Number of out-of-sequence frames that can be accepted at the controller without being dropped. The range is 0 to 1024.
---------------------------	---

Command Default	The default value is 64.
------------------------	--------------------------

Command Modes	MACsec policy configuration
----------------------	-----------------------------

Command History	Release	Modification
	R6.1.1	This command was introduced.

Example

The following example shows how to use the **window-size** command.

```
configure
macsec-policy mac_policy
window-size 64
```