Performance monitoring

Performance monitoring (PM) parameters help service providers gather and store performance data, set thresholds, and report results. This process enables early detection of network issues.

You can configure and retrieve PM counters for various controllers in 30-second, 15-minute, or 24-hour flex-bin intervals.

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Configure the PM parameters

Use this task to configure the performance monitoring (PM) parameters for the optics, Ethernet, odu-flex, and coherent DSP controllers.

Follow these steps to configure PM parameters:

Procedure

Run the **show controller** *controllertype R/S/I/P* { **pm** { **current | history**} { **30-sec 15-min** | | **24-hour** } { **optics** | **ether** | **fec** | **otn | prbs| flex-bin**} **linenumber** command to configure the controllers.

Example:

This sample configures the performance monitoring parameters for the optics controller at 24-hour intervals.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller optics 0/0/1/5 pm 24-hour optics threshold osnr max
345
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:RINode1#configure
Tue Feb 25 17:52:54.320 IST
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 24-hour optics threshold opr min
-30
RP/0/RP0/CPU0:RINode1(config)#commit
```

Example:

This sample configures the performance monitoring parameters for the Ethernet controller at 15-minute intervals.

```
RP/0/RP0/CPU0:chassisA164(config)#controller fourHundredGigECtrlr 0/1/0/4 pm 15-min ether
threshold rx-pkt 1
RP/0/RP0/CPU0:RINode1#configure
Tue Feb 25 17:51:18.353 IST
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 15-min optics threshold opr min -30
RP/0/RP0/CPU0:RINode1(config)#commit
Tue Feb 25 17:52:02.504 IST
```

Example:

This sample configures the performance monitoring parameters for the Coherent DSP controller at 30-second intervals.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller coherentDSP 0/0/0/7 pm 30-sec fec threshold post-fec-ber
max OE-15
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:RINode1#configur
Tue Feb 25 17:48:00.789 IST
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 ?
apply-group Apply configuration from a group
exclude-group Exclude apply-group configuration from a group
pm Configure pm parameters
rx-low-threshold Configure transponder low receive power threshold
sec-admin-state Configure the secondary admin state of och controller
shutdown Disable och controller processing
tone-detect-oob Configure tone detect oob
tone-pattern-expected Configure Tone Pattern Expected
tone-rate Configure bit rate
tx-low-threshold Configure transponder low transmit power threshold
<cr>
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm ?
15-min Configure pm parameters of 15 minute interval
24-hour Configure pm parameters of 24 hour interval
30-sec Configure pm parameters of 30 second interval
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec ?
optics Configure och optics layer performance monitoring
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec optics ?
report set och optics layer TCA reporting status
threshold Configure threshold on och optics layer parameters
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec optics threshold ?
opr set opr threshold in dBm
opt set opt threshold in dBm
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec optics threshold opr ?
max set opr max threshold in dBm
min set opr min threshold in dBm
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec optics threshold opr min ?
<-5000,+6633> Enter 4 digit value ;Input value 3000 for 30.00dbm
```

```
RP/0/RP0/CPU0:RINode1(config)#controller och 0/5/0/8 pm 30-sec optics threshold opr min -30
RP/0/RP0/CPU0:RINode1(config)#commit
Tue Feb 25 17:50:01.632 IST
```

View the PM parameters

Use this task to view the performance monitoring parameters for Optics, Ethernet, and Coherent DSP controllers.

Follow these steps to configure the PM parameters:

Procedure

Step 1 Run the **show controllers** *controllertype R/S/I/P* **{ pm { current | history } { 30 sec | 15-min | 24-hour } { optics | ether | fec | otn | prbs}** *linenumber* } command to display the current performance monitoring parameters of the controller with 15-minute intervals.

Example:

This sample displays the current performance monitoring parameters of the Optics controller with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controller optics 0/1/0/3 pm current 15-min optics 3
Fri Sep 22 13:53:37.120 IST

Optics in the current interval [13:45:00 - 13:53:37 Fri Sep 22 2023]

Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
LBC[% ]      : 56.8      56.8      56.8     0.0               NA              NO   100.0
 NA              NO
OPT[dBm]     : -40.00    -40.00    -40.00   -30.00            NA              NO   63.32
 NA              NO
OPR[dBm]     : -40.00    -40.00    -40.00   -30.00            NA              NO   63.32
 NA              NO
```

```
RP/0/RP0/CPU0:RINode1#show controllers och 0/5/0/8 pm current 15-min optics 1
Tue Feb 25 17:55:28.915 IST

Optics in the current interval [17:45:00 - 17:55:28 Tue Feb 25 2025]

Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
OPT[dBm]     : -50.00    -50.00    -50.00   -30.00            NA              NO   15.00
 NA              NO
OPR[dBm]     : -2.59     -2.59     -2.59    -28.00            NA              NO   8.00
 NA              NO

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

Example:

This sample displays the current performance monitoring parameters of the client Optics controller with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controller optics 0/2/0/1 pm current 15-min optics 1
Fri Sep 22 13:56:52.123 IST

Optics in the current interval [13:45:00 - 13:56:52 Fri Sep 22 2023]

Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
LBC[% ]      : 24.8      25.7      26.7     0.0               NA              NO   100.0
 NA              NO
OPT[dBm]     : -0.12     -0.00     0.11     -30.00            NA              NO   63.32
 NA              NO
OPR[dBm]     : -0.67     -0.46     -0.24    -30.00            NA              NO   63.32
 NA              NO
```

Example:

This sample displays the current performance monitoring parameters of the client Ethernet controller with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers fourHundredGigEctrlr 0/0/0/4 pm current 15-min ether
ETHER in the current interval [16:15:00 - 16:18:44 Fri Nov 17 2023]
ETHER current bucket type : Valid
 RX-UTIL[%]                : 0.00               Threshold : 0.00         TCA(enable) : NO
 TX-UTIL[%]                : 0.00               Threshold : 0.00         TCA(enable) : NO
 RX-PKT                    : 0                  Threshold : 0            TCA(enable) : NO
 STAT-PKT                  : 0                  Threshold : 0            TCA(enable) : NO
 OCTET-STAT                : 0                  Threshold : 0            TCA(enable) : NO
 OVERSIZE-PKT              : 0                  Threshold : 0            TCA(enable) : NO
 FCS-ERR                   : 0                  Threshold : 0            TCA(enable) : NO
 LONG-FRAME                : 0                  Threshold : 0            TCA(enable) : NO
 JABBER-STATS              : 0                  Threshold : 0            TCA(enable) : NO
 64-OCTET                  : 0                  Threshold : 0            TCA(enable) : NO
 65-127-OCTET              : 0                  Threshold : 0            TCA(enable) : NO
 128-255-OCTET             : 0                  Threshold : 0            TCA(enable) : NO
 256-511-OCTET             : 0                  Threshold : 0            TCA(enable) : NO
 512-1023-OCTET            : 0                  Threshold : 0            TCA(enable) : NO
 1024-1518-OCTET           : 0                  Threshold : 0            TCA(enable) : NO
 IN-UCAST                  : 0                  Threshold : 0            TCA(enable) : NO
 IN-MCAST                  : 0                  Threshold : 0            TCA(enable) : NO
 IN-BCAST                  : 0                  Threshold : 0            TCA(enable) : NO
 OUT-UCAST                 : 0                  Threshold : 0            TCA(enable) : NO
 OUT-BCAST                 : 0                  Threshold : 0            TCA(enable) : NO
 OUT-MCAST                 : 0                  Threshold : 0            TCA(enable) : NO
 TX-PKT                    : 0                  Threshold : 0            TCA(enable) : NO
 OUT-OCTET                 : 0                  Threshold : 0            TCA(enable) : NO
 IFIN-ERRORS               : 0                  Threshold : 0            TCA(enable) : NO
 IFIN-OCTETS               : 0                  Threshold : 0            TCA(enable) : NO
 STAT-MULTICAST-PKT        : 0                  Threshold : 0            TCA(enable) : NO
 STAT-BROADCAST-PKT        : 0                  Threshold : 0            TCA(enable) : NO
 STAT-UNDERSIZED-PKT       : 0                  Threshold : 0            TCA(enable) : NO
 IN_GOOD_BYTES             : 0                  Threshold : 0            TCA(enable) : NO
 IN_GOOD_PKTS              : 0                  Threshold : 0            TCA(enable) : NO
 IN_DROP_OTHER             : 0                  Threshold : 0            TCA(enable) : NO
 OUT_GOOD_BYTES            : 0                  Threshold : 0            TCA(enable) : NO
 OUT_GOOD_PKTS             : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKT_64_OCTET           : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKTS_65_127_OCTETS     : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKTS_128_255_OCTETS    : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKTS_256_511_OCTETS    : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKTS_512_1023_OCTETS   : 0                  Threshold : 0            TCA(enable) : NO
 IN_PKTS_1024_1518_OCTETS  : 0                  Threshold : 0            TCA(enable) : NO
 OUT_PKT_64_OCTET          : 0                  Threshold : 0            TCA(enable) : NO
```

```
 OUT_PKTS_65_127_OCTETS    : 0                    Threshold : 0            TCA(enable) : NO
 OUT_PKTS_128_255_OCTETS   : 0                    Threshold : 0            TCA(enable) : NO
 OUT_PKTS_256_511_OCTETS   : 0                    Threshold : 0            TCA(enable) : NO
 OUT_PKTS_512_1023_OCTETS  : 0                    Threshold : 0            TCA(enable) : NO
 OUT_PKTS_1024_1518_OCTETS : 0                    Threshold : 0            TCA(enable) : NO
 TX_UNDERSIZED_PKT         : 0                    Threshold : 0            TCA(enable) : NO
 TX_OVERSIZED_PKT          : 0                    Threshold : 0            TCA(enable) : NO
 TX_JABBER                 : 0                    Threshold : 0            TCA(enable) : NO
 TX_BAD_FCS                : 0                    Threshold : 0            TCA(enable) : NO
```

Example:

This sample displays the current performance monitoring for FEC on the Coherent DSP controller 15-minute intervals:

```
RP/0/RP0/CPU0:ios#show controller coherentDSP 0/2/0/0 pm current 15-min fec
Fri Sep 22 14:02:19.236 IST

g709 FEC in the current interval [14:00:00 - 14:02:19 Fri Sep 22 2023]

FEC current bucket type : Valid
    EC-BITS   : 545156378205            Threshold : 5400000000000          TCA(enable)  : YES
    UC-WORDS  : 0                       Threshold : 5                      TCA(enable)  : YES

                                      MIN       AVG        MAX      Threshold      TCA     Threshold
     TCA
                                                                        (min)      (enable)     (max)
    (enable)
PreFEC BER                     :   5.19E-03   5.36E-03   6.09E-03      0E-15        NO        0E-15
       NO
PostFEC BER                    :     0E-15     0E-15     0E-15      0E-15        NO        0E-15
    NO
Q[dB]                          :      8.10      8.10      8.10          0.00        NO         0.00
       NO
Q_Margin[dB]                   :      2.10      2.10      2.10          0.00        NO         0.00
       NO
Instantaneous Q_Margin [dB]    :      1.70      1.77      1.80          0.00        NO         0.00
       NO
```

```
RP/0/RP0/CPU0:RINode1#show controllers oms 0/5/0/33 pm current 30-sec optics 1
Tue Feb 25 17:56:39.462 IST

Optics in the current interval [17:56:30 - 17:56:39 Tue Feb 25 2025]

Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min)  Threshold(max)
Threshold(max)  (max)
OPT[dBm]     : -7.90     -7.90     -7.90    -30.00            NA              NO   15.00
 NA              NO
OPR[dBm]     : -0.60     -0.60     -0.60    -28.00            NA              NO   8.00
 NA              NO

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

Example:

This sample displays the current performance monitoring parameters for PRBS of the Coherent DSP controller with 15-minute intervals:

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/0/0/7 pm current 15-min prbs
Mon Feb 13 00:58:48.327 UTC
PRBS in the current interval [00:45:00 - 00:58:48 Mon Feb 13 2019]
PRBS current bucket type : Valid
EBC : 40437528165
FOUND-COUNT : 1 FOUND-AT-TS : 00:51:22 Mon Feb 13 2019
```

```
LOST-COUNT : 1 LOST-AT-TS : 00:52:52 Mon Feb 13 2019
CONFIG-PTRN : PRBS_PATTERN_PN31
Last clearing of "show controllers OTU" counters never
```

Example:

This sample displays the current performance monitoring FEC parameters of the coherentDSP OTN with 15-minute intervals:

```
show controllers coherentDSP 0/0/0/7 pm current 15-min otn
Fri Nov 17 16:33:50.820 UTC
g709 OTN in the current interval [16:30:00 - 16:33:50 Fri Nov 17 2023]
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
```

Example:

This sample displays the current performance monitoring for OTN parameters of the ODU-Flex with 15-minute intervals:

```
RP/0/RP0/CPU0:ios#show controllers odu-flEX 0/0/0/7/4 pm current 15-min otn pathmonitor
Fri Nov 17 16:44:34.849 UTC
g709 OTN in the current interval [16:30:00 - 16:44:34 Fri Nov 17 2023]
OTN current bucket type : Valid
    ES-NE   : 0         Threshold : 87       TCA(enable)  : YES
    ESR-NE  : 0.00000   Threshold : 0.00000  TCA(enable)  : NO
    SES-NE  : 0         Threshold : 1        TCA(enable)  : YES
    SESR-NE : 0.00000   Threshold : 0.00000  TCA(enable)  : NO
    UAS-NE  : 0         Threshold : 3        TCA(enable)  : YES
    BBE-NE  : 0         Threshold : 85040    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 : 87       TCA(enable)  : YES
    ESR-FE  : 0.00000   Threshold : 0.00000  TCA(enable)  : NO
    SES-FE  : 0         Threshold : 1        TCA(enable)  : YES
    SESR-FE : 0.00000   Threshold : 0.00000  TCA(enable)  : NO
    UAS-FE  : 0         Threshold : 3        TCA(enable)  : YES
    BBE-FE  : 0         Threshold : 85040    TCA(enable)  : YES
    BBER-FE : 0.00000   Threshold : 0.00000  TCA(enable)  : NO
    FC-FE   : 0         Threshold : 10       TCA(enable)  : YES
```

Example:

This sample displays the current performance monitoring parameters of the coherentDSP with 15-minute intervals FEC:

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/0/0/7 pm current 15-min fec
Fri Nov 17 16:16:05.276 UTC

g709 FEC in the current interval [16:15:00 - 16:16:05 Fri Nov 17 2023]

FEC current bucket type : Valid
```

```
    EC-BITS   : 19795040790             Threshold : 5400000000000          TCA(enable)  : YES
    UC-WORDS  : 0                       Threshold : 5                      TCA(enable)  : YES

                                      MIN       AVG        MAX      Threshold      TCA     Threshold
     TCA
                                                                        (min)      (enable)    (max)
    (enable)
PreFEC BER                    :   2.70E-04   2.79E-04   2.88E-04      0E-15        NO       0E-15
       NO
PostFEC BER                   :     0E-15     0E-15     0E-15      0E-15        NO       0E-15
    NO
Q[dB]                         :     10.70     10.70     10.70          0.00        NO        0.00
       NO
Q_Margin[dB]                  :      4.40      4.45      4.50          0.00        NO        0.00
       NO
Instantaneous Q_Margin [dB]   :      4.40      4.45      4.50          0.00        NO        0.00
       NO
```

Example:

This sample displays the current performance monitoring parameters of the Ethernet controller with 15-minute intervals for FEC.

```
RP/0/RP0/CPU0:ios#show controllers fourHundredGigEctrlr 0/0/0/1 pm current 15-min fec
Ethernet FEC in the current interval [11:30:00 - 11:31:00 Mon Oct 30 2023]
FEC current bucket type : Valid
    EC-WORDS  : 8406                    Threshold : 0                      TCA(enable)  : NO
    UC-WORDS  : 0                       Threshold : 0                      TCA(enable)  : NO
```

Example:

This sample displays the current performance monitoring parameters of the trunk optics with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers optics 0/0/0/7 pm current 15-min optics 1
Optics in the current interval [16:00:00 - 16:11:43 Fri Nov 17 2023]
Optics current bucket type : Valid
            MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
LBC[% ]       : 0.0       0.0       0.0      5.0              NA              NO   85.0
 NA               NO
OPT[dBm]      : 1.96      2.01      2.04     -12.01           NA              NO   4.00
 NA               NO
OPR[dBm]      : -0.55     -0.46     -0.35    -14.09           NA              NO   11.00
 NA               NO
CD[ps/nm]     : -1        0         0        -9700            NA              NO   46560
 NA               NO
DGD[ps ]      : 0.00      1.00      1.00     0.00             NA              NO   81.00
 NA               NO
SOPMD[ps^2]   : 2.00      24.45     93.00    0.00             NA              NO   60000.00
 NA               NO
OSNR[dB]      : 37.90     39.11     40.70    21.50            NA              NO   99.00
 NA               NO
PDL[dB]       : 1.70      1.91      2.10     0.00             NA              NO   3.00
 NA               NO
PCR[rad/s]    : 0.00      0.00      0.00     0.00             NA              NO   2500000.00
 NA               NO
RX_SIG[dBm]   : -1.07     -0.78     -0.64    -15.09           NA              NO   3.00
 NA               NO
FREQ_OFF[Mhz]: -112       -51       14       -3200            NA              NO   3200
 NA               NO
SNR[dB]       : 17.20     17.48     17.70    0.00             NA              NO   100.00
 NA               NO
SNR-X[dB]    : 17.40     17.67     18.00    0.00             NA              NO   300.00
NA               NO
```

```
SNR-Y[dB]    : 17.00     17.31     17.60    0.00              NA              NO   300.00
NA              NO
SOP-S1       : 0.00      0.00      0.00     -1.00             NA              NO   1.00
 NA             NO
SOP-S2       : 0.00      0.00      0.00     -1.00             NA              NO   1.00
 NA             NO
SOP-S3       : 0.00      0.00      0.00     -1.00             NA              NO   1.00
 NA             NO
```

Example:

This sample displays the current performance monitoring parameters of the client optics with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers optics 0/0/0/4 pm current 15-min optics 1
Fri Nov 17 16:13:38.671 UTC

Optics in the current interval [16:00:00 - 16:13:38 Fri Nov 17 2023]

Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
LBC[% ]      : 83.3      83.3      83.3     0.0               NA              NO   100.0
 NA             NO
OPT[dBm]     : 1.23      1.23      1.23     -2.01             NA              NO   4.00
 NA             NO
OPR[dBm]     : 1.19      1.21      1.24     -5.00             NA              NO   4.00
 NA             NO
```

Example:

This sample displays the current performance monitoring PCS parameters of the client with 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers fourHundredGigEctrlr 0/0/0/4 pm current 15-min pcs
Ethernet PCS in the current interval [16:15:00 - 16:26:15 Fri Nov 17 2023]
Ethernet PCS current bucket type : Valid
 BIP[00]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[01]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[02]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[03]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[04]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[05]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[06]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[07]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[08]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[09]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[10]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[11]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[12]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[13]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[14]                    : 0                          Threshold : 0
```

```
TCA(enable) : NO
 BIP[15]                  : 0                         Threshold : 0
TCA(enable) : NO
 BIP[16]                  : 0                         Threshold : 0
TCA(enable) : NO
 BIP[17]                  : 0                         Threshold : 0
TCA(enable) : NO
 BIP[18]                  : 0                         Threshold : 0
TCA(enable) : NO
 BIP[19]                  : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[00]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[01]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[02]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[03]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[04]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[05]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[06]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[07]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[08]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[09]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[10]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[11]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[12]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[13]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[14]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[15]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[16]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[17]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[18]              : 0                         Threshold : 0
TCA(enable) : NO
 FRM-ERR[19]              : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[00]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[01]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[02]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[03]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[04]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[05]               : 0                         Threshold : 0
TCA(enable) : NO
 BAD-SH[06]               : 0                         Threshold : 0
```

```
TCA(enable) : NO
 BAD-SH[07]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[08]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[09]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[10]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[11]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[12]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[13]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[14]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[15]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[16]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[17]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[18]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[19]                : 0                          Threshold : 0
TCA(enable) : NO
 ES                        : 0                          Threshold : 0
TCA(enable) : NO
 SES                       : 0                          Threshold : 0
TCA(enable) : NO
 UAS                       : 0                          Threshold : 0
TCA(enable) : NO
 ES-FE                     : 0                          Threshold : 0
TCA(enable) : NO
 SES-FE                    : 0                          Threshold : 0
TCA(enable) : NO
 UAS-FE                    : 0                          Threshold : 0
TCA(enable) : NO
```

Step 2 Run the **show controllers** *controllertype R/S/I/P* **{ pm { current | history } { 30 sec | 15-min | 24-hour } { optics | ether | fec | otn | prbs}** *linenumber* } command to display the current performance monitoring parameters of the controller with 30-minute intervals.

Example:

This sample displays the current performance monitoring of PCS of the Ethernet controller with 30-second intervals:

```
RP/0/RP0/CPU0:ios#show controllers hundredGigECtrlr 0/1/0/2/1 pm current 30-sec pcs
Fri Sep 22 14:04:33.676 IST
Ethernet PCS in the current interval [14:04:30 - 14:04:33 Fri Sep 22 2023]
Ethernet PCS current bucket type : Valid
 BIP[00]                   : 0                          Threshold : 0
TCA(enable) : NO
 BIP[01]                   : 0                          Threshold : 0
TCA(enable) : NO
 BIP[02]                   : 0                          Threshold : 0
TCA(enable) : NO
 BIP[03]                   : 0                          Threshold : 0
TCA(enable) : NO
 BIP[04]                   : 0                          Threshold : 0
TCA(enable) : NO
 BIP[05]                   : 0                          Threshold : 0
TCA(enable) : NO
```

```
 BIP[06]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[07]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[08]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[09]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[10]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[11]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[12]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[13]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[14]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[15]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[16]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[17]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[18]                    : 0                          Threshold : 0
TCA(enable) : NO
 BIP[19]                    : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[00]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[01]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[02]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[03]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[04]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[05]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[06]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[07]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[08]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[09]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[10]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[11]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[12]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[13]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[14]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[15]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[16]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[17]                : 0                          Threshold : 0
TCA(enable) : NO
```

```
 FRM-ERR[18]                : 0                          Threshold : 0
TCA(enable) : NO
 FRM-ERR[19]                : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[00]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[01]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[02]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[03]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[04]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[05]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[06]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[07]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[08]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[09]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[10]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[11]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[12]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[13]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[14]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[15]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[16]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[17]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[18]                 : 0                          Threshold : 0
TCA(enable) : NO
 BAD-SH[19]                 : 0                          Threshold : 0
TCA(enable) : NO
 ES                         : 0                          Threshold : 0
TCA(enable) : NO
 SES                        : 0                          Threshold : 0
TCA(enable) : NO
 UAS                        : 0                          Threshold : 0
TCA(enable) : NO
 ES-FE                      : 0                          Threshold : 0
TCA(enable) : NO
 SES-FE                     : 0                          Threshold : 0
TCA(enable) : NO
 UAS-FE                     : 0                          Threshold : 0
TCA(enable) : NO
```

Example:

This sample displays the history performance monitoring of PCS of the Ethernet controller with 30-second intervals:

```
RP/0/RP0/CPU0:ios#show controllers hundredGigECtrlr 0/1/0/2/1 pm history 30-sec pcs 1
Fri Sep 22 14:06:14.193 IST
Ethernet PCS in the current interval [14:05:30 - 14:06:00 Fri Sep 22 2023]
Ethernet PCS current bucket type : Valid
```

```
BIP[00]                    : 0
BIP[01]                    : 0
BIP[02]                    : 0
BIP[03]                    : 0
BIP[04]                    : 0
BIP[05]                    : 0
BIP[06]                    : 0
BIP[07]                    : 0
BIP[08]                    : 0
BIP[09]                    : 0
BIP[10]                    : 0
BIP[11]                    : 0
BIP[12]                    : 0
BIP[13]                    : 0
BIP[14]                    : 0
BIP[15]                    : 0
BIP[16]                    : 0
BIP[17]                    : 0
BIP[18]                    : 0
BIP[19]                    : 0
FRM-ERR[00]                : 0
FRM-ERR[01]                : 0
FRM-ERR[02]                : 0
FRM-ERR[03]                : 0
FRM-ERR[04]                : 0
FRM-ERR[05]                : 0
FRM-ERR[06]                : 0
FRM-ERR[07]                : 0
FRM-ERR[08]                : 0
FRM-ERR[09]                : 0
FRM-ERR[10]                : 0
FRM-ERR[11]                : 0
FRM-ERR[12]                : 0
FRM-ERR[13]                : 0
FRM-ERR[14]                : 0
FRM-ERR[15]                : 0
FRM-ERR[16]                : 0
FRM-ERR[17]                : 0
FRM-ERR[18]                : 0
FRM-ERR[19]                : 0
BAD-SH[00]                 : 0
BAD-SH[01]                 : 0
BAD-SH[02]                 : 0
BAD-SH[03]                 : 0
BAD-SH[04]                 : 0
BAD-SH[05]                 : 0
BAD-SH[06]                 : 0
BAD-SH[07]                 : 0
BAD-SH[08]                 : 0
BAD-SH[09]                 : 0
BAD-SH[10]                 : 0
BAD-SH[11]                 : 0
BAD-SH[12]                 : 0
BAD-SH[13]                 : 0
BAD-SH[14]                 : 0
BAD-SH[15]                 : 0
BAD-SH[16]                 : 0
BAD-SH[17]                 : 0
BAD-SH[18]                 : 0
BAD-SH[19]                 : 0
ES                         : 0
SES                        : 0
UAS                        : 0
ES-FE                      : 0
```

```
 SES-FE                      : 0
 UAS-FE                      : 0
```

Step 3 Run the **show controllers** *controllertype R/S/I/P* **{ pm { current | history } { 30 sec | 15-min | 24-hour } { optics | ether | fec | otn | prbs}** *linenumber* } command to display the current performance monitoring parameters of the controller with 10-second intervals as flexi-bin.

Example:

This sample displays the current performance monitoring parameters of the trunk optics controller with 10-second intervals as flexi-bin:

```
RP/0/RP0/CPU0:ios#show controllers optics 0/1/0/0 pm current flex-bin optics 1
Fri Sep 22 14:08:37.001 IST
Optics in the current interval [14:08:30 - 14:08:36 Fri Sep 22 2023]
Flexible bin interval size: 10 seconds
Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max) (max)
LBC[% ]      : 0.0       0.0       0.0      0.0              NA              NO   0.0
 NA              NO
OPT[dBm]     : -1.53     -1.49     -1.45    0.00             NA              NO   0.00
 NA              NO
OPR[dBm]     : -1.62     -1.61     -1.57    0.00             NA              NO   0.00
 NA              NO
CD[ps/nm]    : 2         2         3        0                NA              NO   0
 NA              NO
DGD[ps ]     : 3.00      3.00      3.00     0.00             NA              NO   0.00
 NA              NO
SOPMD[ps^2]  : 9.00      21.57     40.00    0.00             NA              NO   0.00
 NA              NO
OSNR[dB]     : 37.90     37.90     37.90    0.00             NA              NO   0.00
 NA              NO
PDL[dB]      : 1.10      1.10      1.10     0.00             NA              NO   0.00
 NA              NO
PCR[rad/s]   : 0.00      26.29     93.00    0.00             NA              NO   0.00
 NA              NO
RX_SIG[dBm]  : -2.14     -2.09     -2.05    0.00             NA              NO   0.00
 NA              NO
FREQ_OFF[Mhz]: 873       902       938      0                NA              NO   0
 NA              NO
SNR[dB]      : 20.90     20.97     21.10    0.00             NA              NO   0.00
 NA              NO
SNR-AX[dB]   : 20.90     21.00     21.10    0.00             NA              NO   0.00
 NA              NO
SNR-AY[dB]   : 20.90     20.99     21.00    0.00             NA              NO   0.00
 NA              NO
SNR-BX[dB]   : 19.20     19.40     19.60    0.00             NA              NO   0.00
 NA              NO
SNR-BY[dB]   : 19.30     19.40     19.50    0.00             NA              NO   0.00
 NA              NO
SOP-S1       : 0.00      1.09      2.55     0.00             NA              NO   0.00
 NA              NO
SOP-S2       : 0.31      0.32      0.33     0.00             NA              NO   0.00
 NA              NO
SOP-S3       : 0.94      0.94      0.94     0.00             NA              NO   0.00
 NA              NO
```

Example:

This sample displays the history performance monitoring parameters of the trunk optics controller with 10-second intervals as flexi-bin:

```
RP/0/RP0/CPU0:ios#show controllers optics 0/1/0/0 pm history flex-bin optics 1 bucket 1
Fri Sep 22 14:09:54.425 IST
Optics in interval 1 [14:09:40 - 14:09:50 Fri Sep 22 2023]
Flexible bin interval size: 10 seconds
Optics history bucket type : Valid
              MIN       AVG       MAX
LBC[% ]     : 0.0       0.0       0.0
OPT[dBm]    : -1.52     -1.49     -1.47
OPR[dBm]    : -1.63     -1.59     -1.55
CD[ps/nm]   : 1         1         2
DGD[ps ]    : 2.00      2.70      3.00
SOPMD[ps^2]: 4.00       14.00     27.00
OSNR[dB]    : 37.90     37.90     37.90
PDL[dB]     : 1.10      1.10      1.10
PCR[rad/s]  : 0.00      16.00     96.00
RX_SIG[dBm] : -2.13      -2.08     -2.02
FREQ_OFF[Mhz]: 833        870       916
SNR[dB]    : 20.80     20.94     21.10
SNR-AX[dB]: 20.80      20.97     21.10
SNR-AY[dB]: 20.90      20.93     21.10
SNR-BX[dB]: 19.30      19.42     19.50
SNR-BY[dB]: 19.20      19.42     19.50
SOP-S1     : 0.00      1.53      2.55
SOP-S2     : 0.30      0.32      0.33
SOP-S3     : 0.94      0.94      0.95
```

Example:

This sample displays the current performance monitoring parameters of the coherentDSP controller as flexi-bin:

```
RP/0/0/CPU0:ios#show controllers coherentDSP 0/1/0/0 pm current flex-bin fec
Fri Sep 22 14:11:11.213 IST
g709 FEC in the current interval [14:11:10 - 14:11:10 Fri Sep 22 2023]
Flexible bin interval size: 10 seconds
FEC current bucket type : Valid
    EC-BITS   : 2532544513              Threshold : 0                     TCA(enable)  : NO
    UC-WORDS  : 0                       Threshold : 0                     TCA(enable)  : NO

                                      MIN       AVG        MAX      Threshold      TCA     Threshold
     TCA
                                                                        (min)      (enable)     (max)
    (enable)
PreFEC BER                     :   3.39E-03   3.44E-03   3.59E-03      0E-15        NO       0E-15
       NO
PostFEC BER                    :     0E-15     0E-15     0E-15      0E-15        NO       0E-15
    NO
Q[dB]                          :      8.60      8.60      8.60          0.00        NO        0.00
       NO
Q_Margin[dB]                   :      2.60      2.60      2.60          0.00        NO        0.00
       NO
Instantaneous Q_Margin [dB]    :      2.30      2.30      2.30          0.00        NO        0.00
       NO
```

Step 4 Run the **show controllers** *controllertype R/S/I/P* **{ pm { current | history } { 30 sec | 15-min | 24-hour } { optics | ether | fec | otn | prbs}** *linenumber* } command to display the current performance monitoring FEC parameters of the coherentDSP OTN.

Example:

This sample displays the current performance monitoring FEC parameters of the coherentDSP OTN with 15-minute intervals:

```
show controllers coherentDSP 0/0/0/7 pm current 15-min otn
Fri Nov 17 16:33:50.820 UTC
g709 OTN in the current interval [16:30:00 - 16:33:50 Fri Nov 17 2023]
```

```
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
```

Example:

This sample displays the current performance monitoring for OTN parameters of the ODU-Flex with 15-minute intervals:

```
RP/0/RP0/CPU0:ios#show controllers odu-flEX 0/0/0/7/4 pm current 15-min otn pathmonitor
Fri Nov 17 16:44:34.849 UTC
g709 OTN in the current interval [16:30:00 - 16:44:34 Fri Nov 17 2023]
OTN current bucket type : Valid
    ES-NE   : 0          Threshold : 87       TCA(enable)  : YES
    ESR-NE  : 0.00000    Threshold : 0.00000  TCA(enable)  : NO
    SES-NE  : 0          Threshold : 1        TCA(enable)  : YES
    SESR-NE : 0.00000    Threshold : 0.00000  TCA(enable)  : NO
    UAS-NE  : 0          Threshold : 3        TCA(enable)  : YES
    BBE-NE  : 0          Threshold : 85040    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 : 87       TCA(enable)  : YES
    ESR-FE  : 0.00000    Threshold : 0.00000  TCA(enable)  : NO
    SES-FE  : 0          Threshold : 1        TCA(enable)  : YES
    SESR-FE : 0.00000    Threshold : 0.00000  TCA(enable)  : NO
    UAS-FE  : 0          Threshold : 3        TCA(enable)  : YES
    BBE-FE  : 0          Threshold : 85040    TCA(enable)  : YES
    BBER-FE : 0.00000    Threshold : 0.00000  TCA(enable)  : NO
    FC-FE   : 0          Threshold : 10       TCA(enable)  : YES
```

Clear the PM parameters

Procedure

Run the **clear controller** *controllertype R/S/I/P* **pm** command to clear performance monitoring parameters for Ethernet and CoherentDSP controllers.

Example:

This sample shows how to clear the PM parameters on the CoherentDSP controller.

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

```
Fri Sep 22 14:28:12.100 IST
g709 FEC in the current interval [14:15:00 - 14:28:12 Fri Sep 22 2023]
FEC current bucket type : Valid
Configuration Guide for Cisco NCS 1014, IOS XR Releases 25.x.x
212
Configure NCS 1014 Transponder Cards
Configuring PM Parameters
EC-BITS : 1159814176244 Threshold : 5400000000000 TCA(enable) :
YES
UC-WORDS : 0 Threshold : 5 TCA(enable) :
YES
MIN AVG MAX Threshold TCA
Threshold TCA
(min) (enable)
(max) (enable)
PreFEC BER : 0E-15 2.14E-03 2.28E-02 0E-15 NO
0E-15 NO
PostFEC BER : 0E-15 1.37E-10 6.59E-08 0E-15 NO
0E-15 NO
Q[dB] : 0.00 4.14 8.60 0.00 NO
0.00 NO
Q_Margin[dB] : -6.00 -1.89 2.60 0.00 NO
0.00 NO
Instantaneous Q_Margin [dB] : -21474836.48 -28144.25 2.30 0.00
NO 0.00 NO
Last clearing of "show controllers OTU" counters never

RP/0/RP0/CPU0:ios#clear controller coherentDSP 0/0/0/0 pm
Mon Jun 10 11:44:31.650 UTC
RP/0/RP0/CPU0:ios#show controller coherentDSP 0/0/0/0 pm current 15-min fec
Fri Sep 22 14:30:06.833 IST
g709 FEC in the current interval [14:30:00 - 14:30:06 Fri Sep 22 2023]
FEC current bucket type : Valid
EC-BITS : 17889249955 Threshold : 5400000000000 TCA(enable) :
YES
UC-WORDS : 0 Threshold : 5 TCA(enable) :
YES
MIN AVG MAX Threshold TCA
Threshold TCA
(min) (enable)
(max) (enable)
PreFEC BER : 3.38E-03 3.49E-03 3.85E-03 0E-15 NO
0E-15 NO
PostFEC BER : 0E-15 0E-15 0E-15 0E-15 NO
0E-15 NO
Q[dB] : 8.60 8.60 8.60 0.00 NO
0.00 NO
Q_Margin[dB] : 2.50 2.50 2.60 0.00 NO
0.00 NO
Instantaneous Q_Margin [dB] : 2.20 2.20 2.20 0.00 NO
0.00 NO
Last clearing of "show controllers OTU" counters 00:00:07
```

Example:

This sample shows how to clear the PM parameters on the Ethernet controller.

```
RP/0/RP0/CPU0:ios#clear controller HundredGigECtrlr 0/0/0/2/1 pm
```

PM history persistence

PM history parameters for Optics, Ethernet, and coherent DSP controllers are retained even after a line card cold reload, line card warm reload, XR reload, Calvados reload, RP reload, Hw-module all reload, power cycle, or upgrade of the NCS 1014 chassis.

After a software upgrade to the latest release, you can view the history performance monitoring parameters from the previous release. The PM history persistence is supported for 30-second, 15-minute, and 24-hour bucket types.

However, this list describes the time required to fill all historical buckets for each bucket type. After the buckets are full, no errors appear when you fetch PM historical data.

- For 30-second bucket type, 15 minutes is required to fill 30 historical buckets.
- For 15-minute bucket type, 8 hours is required to fill 32 historical buckets.
- For 24-hour bucket type, 24 hours are required to fill 7 historical bucket.

PM counters are updated continuously in the current bucket for all bucket types: flex, 30-second, 15-minute, and 24-hour. When the timer expires for a bucket type, the current PM data moves to the historical PM bucket. This process is called rollover. After rollover, the current PM data becomes available as historical PM data.

If the controller is deleted or removed, PM data remains persistent for three hours. If the controller does not return within three hours, the PM data is cleared because the controller is considered no longer in use.

Limitations of PM history persistence

If the NCS 1014 reloads during the rollover period, one of these scenarios occurs:

- A complete PM bucket may be missing, and the system marks the next PM bucket as Invalid.
- PM bucket expiry message appears as follows:

```
RP/0/RP0/CPU0:ios#show controllers hundredGigECtrlr 0/3/0/2/2 pm history 30-sec ether
29
Fri Apr  1 01:32:20.646 UTC
History data is empty, Verify at least one collection period is expired
```

- PM bucket interval is marked as Invalid and counters are updated as zero.
- PM bucket interval is marked as Invalid and counters are updated as nonzero.

Instantaneous Q-Margin

Scenarios on Instantaneous Q-margin

In these scenarios, the initial few PM buckets are displayed as valid although the instantaneous Q-margin values are displayed as invalid in those buckets. The PM is performed for 30 sec, 15 mins, and 24 hours, respectively.

Scenarios where this issue occurs include:

- Shutdown or enable optics
- Trunk rate change

- Fiber cuts

To address these situations, avoid considering the initial PM bucket readings when monitoring the instantaneous Q-margin values for these scenarios.

This sample shows that, in certain scenarios, the initial PM bucket readings are invalid. Later, the PM bucket readings become valid, even when the instantaneous Q-margin value remains invalid.

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/2/0/0 pm history flex-bin fec 1
Fri Sep 22 14:17:01.008 IST
g709 FEC in interval 1 [14:16:50 - 14:17:00 Fri Sep 22 2023]
Flexible bin interval size: 10 seconds
FEC history bucket type : Valid
 EC-BITS   : 25615718133              UC-WORDS  : 0
                                MIN                          AVG                          MAX
PreFEC BER              :    3.37E-03                     3.49E-03                     3.90E-03
PostFEC BER             :    0E-15                        0E-15                        0E-15
Q                       :    8.60                         8.60                         8.60
Q_margin                :    2.50                         2.56                         2.60
Instantaneous Q_margin  :    2.20                         2.20                         2.20
```

Now, the PM buckets are valid although the instantaneous Q-margin value is invalid.

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/2/0/0 pm history 30-sec fec 1
Sep 22 08:52:03.750 UTC
g709 FEC in interval 1 [08:51:50 - 08:52:00 Fri Sep 22 2023]
FEC history bucket type : Invlid
 EC-BITS   : 35072302421                   UC-WORDS  : 0

                                MIN                          AVG                          MAX
PreFEC BER              :    5.20E-03                     5.30E-03                     5.64E-03
PostFEC BER             :    0E-15                        0E-15                        0E-15
Q                       :    8.10                         8.10                         8.10
Q_margin                :    2.10                         2.10                         2.10
Instantaneous Q_margin  :    1.80                         1.80                         1.80
```

View Ethernet statistics

You can access and view the Performance Monitoring statistics for the Ethernet controllers.

Procedure

Run the **show controller** *controllertype R/S/I/P* **pm** command to view the performance monitoring statistics for the Ethernet controllers.

Example:

```
RP/0/RP0/CPU0:ios#show controllers fourHundredGigEctrlr 0/0/0/4 stats
Fri Nov 17 16:28:34.138 UTC
Statistics for interface FourHundredGigECtrlr0/0/0/4 (cached values):
Ingress:
    Input total bytes          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input good bytes           = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input total packets        = 0                     Valid = False        Start time = 13:12:29
```

```
 Fri Nov 17 2023
    Input 802.1Q frames         = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pause frames          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 64 bytes         = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 65-127 bytes     = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 128-255 bytes    = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 256-511 bytes    = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 512-1023 bytes   = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 1024-1518 bytes  = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input pkts 1519-Max bytes   = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input good pkts             = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input unicast pkts          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input multicast pkts        = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input broadcast pkts        = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop overrun          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop abort            = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop invalid VLAN     = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop invalid DMAC     = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop invalid encap    = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input drop other            = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error giant           = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error runt            = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error jabbers         = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error fragments       = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error CRC             = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error collisions      = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error symbol          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input error other           = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input MIB giant             = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input MIB jabber            = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
    Input MIB CRC               = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
Egress:
    Output total bytes          = 0                     Valid = False        Start time = 13:12:29
 Fri Nov 17 2023
```

```
   Output good bytes           = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output total packets        = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output 802.1Q frames        = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pause frames         = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 64 bytes        = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 65-127 bytes    = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 128-255 bytes   = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 256-511 bytes   = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 512-1023 bytes  = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 1024-1518 bytes = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output pkts 1519-Max bytes  = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output good pkts            = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output unicast pkts         = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output multicast pkts       = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output broadcast pkts       = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output drop underrun        = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output drop abort           = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output drop other           = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
   Output error other          = 0                     Valid = False        Start time = 13:12:29
Fri Nov 17 2023
```

Note
Performance monitoring statistics are not supported for the input unicast packets, output unicast packets, and input error fragments counters for Ethernet clients.

Performance monitoring for NCS1K14-2.4T-X-K9 card

Service providers use performance monitoring (PM) parameters to gather performance data, store it, set thresholds, and report it. This helps with early detection of network issues.

You can configure and retrieve PM counters at intervals of 30 seconds, 15 minutes, or 24 hours. These parameters simplify troubleshooting operations and increase the amount of data that can be collected directly from the equipment.

Performance monitoring for NCS1K14-CCMD-16-C and NCS1K14-CCMD-16-L cards

Table 1: Feature History

Feature Name	Release Information	Feature Description
Supported Functionalities of CCMD-16-C and CCMD-16-L Line Cards	Cisco IOS XR Release 7.11.1	Supported Functionalities of CCMD-16-C and CCMD-16-L Line Cards: The software supports Variable Optical Attenuator (VoA), power monitoring and reporting of parameters to the controllers at the OCH and OMS level. It helps in configuring the amplifier parameters for optimizing signal transmissions. The software also supports in-band and out-of-band tone detection and monitoring and reporting of alarms.

Service providers use performance monitoring (PM) parameters to gather and store data, set thresholds, and report performance information for early detection of network issues.

You can configure and retrieve PM counters for the OCH and OMS controllers in 30-second, 15-minute, or 24-hour intervals, or in a flexible 10-second bin interval. These parameters simplify troubleshooting and enhance the value of data collected directly from the equipment.

PM parameters supported on OMS controller

These are the PM parameters supported on the OMS controller:

Table 2: PM parameters supported on OMS controller

Controller	Supported PM parameters	Description
OMS	OPT (dBm)	Transmitted power
	OPR (dBm)	Received Power
	OPBR (dBm)	Back Reflection Power
	OPBRR (dB)	Back Reflection Ratio
	EAGN (dB)	Egress Ampli Gain
	EATL (dB)	Egress Ampli Tilt
	IAGN (dB)	Ingress Ampli Gain
	IATL (dB)	Ingress Ampli Tilt

PM parameters supported on OCH controller

These are the PM parameters supported on the OCH controller:

Controller	Supported PM parameters	Description
OCH	OPT (dBm)	Transmitted Power
	OPR (dBm)	Received Power

Configure PM parameters for NCS1K14-CCMD-16-C and NCS1K14-CCMD-16-L cards

Follow these steps to configure the minimum and maximum thresholds for individual parameters.

Procedure

Step 1 Run the **controller** *controllertype R/S/I/P* **pm** {**30-sec** | **15-min** | **24-hour**} **optics threshold** { **parameter-name**} {**max**|**min**} {**value**} command to configure minimum and maximum thresholds for individual performance monitoring parameters.

Example:

This sample displays the performance monitoring parameters of the OMS controller.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:(config)#controller oms 0/1/0/0 pm 30-sec optics threshold opt min < value >
RP/0/RP0/CPU0:ios(config)#commit
```

This sample displays the performance monitoring parameters of the OCH controller.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:(config)#controller och 0/1/0/1 pm 30-sec optics threshold opt min < value >
RP/0/RP0/CPU0:ios(config)#commit
```

Step 2 Run the **controller** *controllertype R/S/I/P* **pm** {**30-sec** | **15-min** | **24-hour**} **optics report** { **parameter-name**} {**min-tca**|**max-tca**} command to enable reporting of threshold crossing alarms for individual parameters.

Step 3 Run the **commit** command to save the changes.

View PM parameters for NCS1K14-CCMD-16-C and NCS1K14-CCMD-16-L cards

Use this task to view the performance monitoring parameters for OMS and OCH controllers.

Procedure

Step 1 Run the **show controllers** *controllertype R/S/I/P* **pm { current | history } { 30 sec | 15-min | 24-hour | flex-bin } optics** { *linenumber* } command to view PM parameters for the OMS and OCH controllers.

Example:

This is a sample to view the PM parameters of the OMS controller.

```
RP/0/RP0/CPU0:ios_P2A_DT_03#show controllers oms 0/1/0/0 pm current 30-sec optics 1
Optics in the current interval [15:02:30 - 15:02:36 Mon Nov 20 2023]
Optics current bucket type : Valid
             MIN       AVG       MAX      Operational      Configured      TCA   Operational
Configured     TCA
                                          Threshold(min)   Threshold(min)  (min) Threshold(max)
Threshold(max)  (max)
OPT[dBm]      : -8.30     -8.24     -8.20    -50.00            NA              NO   30.00
 NA               NO
OPR[dBm]      : -1.80     -1.76     -1.60    -50.00            NA              NO   30.00
 NA               NO
OPBR[dBm]      : -11.61    -11.61    -11.61   -50.00            NA              NO   -10.00
  NA               NO
OPBRR[dB]      : -3.30     -3.30     -3.30    -50.00            NA              NO   0.00
  NA               NO
EAGN[dB]       : 2.00      2.00      2.00     -3.00             NA              NO   22.00
  NA               NO
EATL[dB]       : 0.00      0.00      0.00     -6.50             NA              NO   6.50
  NA               NO
IAGN[dB]       : 5.00      5.00      5.00     0.00              NA              NO   10.00
  NA               NO
IATL[dB]       : 0.00      0.00      0.00     -6.50             NA              NO   6.50
  NA               NO
Last clearing of "show controllers OPTICS" counters never
```

This is a sample to view the PM parameters of the OCH controller.

```
RP/0/RP0/CPU0:ios_P2A_DT_03#show controllers och 0/1/0/2 pm current 30-sec optics 1
Optics in the current interval [15:04:30 - 15:04:39 Mon Nov 20 2023]
Optics current bucket type : Valid
MIN AVG MAX Operational Configured TCA Operational Configured TCA
Threshold(min) Threshold(min) (min) Threshold(max) Threshold(max) (max)
OPT[dBm] : -1.40 -1.36 -1.30 -50.00 NA NO 30.00 NA NO
OPR[dBm] : -5.80 -5.71 -5.70 -50.00 NA NO 30.00 NA NO


RP/0/RP0/CPU0:ios_P2A_DT_03#show controllers och 0/1/0/2 pm current 15-min optics 1
Optics in the current interval [15:00:00 - 15:05:03 Mon Nov 20 2023]
Optics current bucket type : Valid
MIN AVG MAX Operational Configured TCA Operational Configured TCA
Threshold(min) Threshold(min) (min) Threshold(max) Threshold(max) (max)
OPT[dBm] : -1.80 -1.50 -1.30 -50.00 NA NO 30.00 NA NO
OPR[dBm] : -5.80 -5.75 -5.70 -50.00 NA NO 30.00 NA NO
Last clearing of "show controllers OPTICS" counters never
```

Step 2 Run the **show controllers** *controllertype R/S/I/P* **pm history { 30 sec | 15-min | 24-hour }**[**optics** { *lanenumber* }] to view the PM history parameters for OMS and OCH controllers.

Example:

This is a sample to view the historical PM parameters on an OMS controller for the 30-second interval.

```
RP/0/RP0/CPU0:ios_P2A_DT_02#show controllers oms 0/3/0/0 pm history 30-sec optics 1 bucket 1
Wed Dec 6 11:04:50.821 UTC
Optics in interval 1 [11:04:00 - 11:04:30 Wed Dec 6 2023]
Optics history bucket type : Valid
MIN AVG MAX
OPT[dBm]      : -8.30     -8.27     -8.20
OPR[dBm]      : -3.00     -1.62     -0.20
OPBR[dBm]      : -11.61    -11.61    -11.51
OPBRR[dB]      : -3.40     -3.31     -3.30
```

```
EAGN[dB]       : 2.00      2.00      2.00
EATL[dB]       : 0.00      0.00      0.10
IAGN[dB]       : 5.00      5.00      5.00
IATL[dB]       : 0.00      0.00      0.00
```