



Performance Monitoring

Performance monitoring (PM) parameters are used by service providers to gather, store, set thresholds for, and report performance data for early detection of network issues. You can configure and retrieve PM counters for the various controllers in 30-second, 15-minute, or 24-hour intervals. These parameters simplify troubleshooting operations and enhance data that can be collected directly from the equipment.

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Configuring PM Parameters

You can configure and view the performance monitoring parameters for the Optics, Ethernet, and coherent DSP controllers.

To configure PM parameters, use the following commands.

configure

controller *controllertype R/S/I/P* { **pm** { **15-min** | **30-sec** | **24-hour** } { **optics** | **ether** | **pcs** | **fec** | **otn** } { **report** | **threshold** } *value* }

commit

Examples

The following is a sample in which the performance monitoring parameters of the Optics controller are configured 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
```

The following is a sample in which the performance monitoring parameters of the Ethernet controller are configured at 15-minute intervals.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller HundredGigEctrlr 0/3/0/0 pm 15-min pcs report bip
enable
RP/0/RP0/CPU0:ios(config)#commit
```

The following is a sample in which performance monitoring parameters of a Coherent DSP controller are configured 30-second intervals.

```
RP/0/RP0/CPU0:ios#configure
RP/0/RP0/CPU0:ios(config)#controller coherentDSP 0/0/1/1 pm 30-sec fec threshold post-fec-ber
max OE-15
RP/0/RP0/CPU0:ios(config)#commit
```

Viewing PM Parameters

To view the performance monitoring parameters for Optics, Ethernet, and Coherent DSP controllers, use this command:

show controllers *controllertype R/S/L/P* { **pm** { **current** | **history** } { **30 sec** | **15-min** | **24-hour** } { **optics** | **ether** | **fec** | **otn** | **prbs** } *linenumber* }

Example 1: Displays the current performance monitoring parameters of the Optics controller at 15-minute intervals. Client optics have four lanes.

```
RP/0/RP0/CPU0:ios#show controller optics 0/1/0/3 pm current 15-min optics 3
Sat Feb 9 19:33:42.480 UTC

Optics in the current interval [19:30:00 - 19:33:42 Sat Feb 9 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[% ]      : 0.0      0.0      0.0      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
FREQ_OFF[Mhz]: 0      0      0      0      NA      NO      0
      NA      NO
```

Example 2: Displays the current performance monitoring parameters of the Optics controller 15-minute intervals. Trunk optics have one lane.

```
RP/0/RP0/CPU0:ios#show controller optics 0/2/0/1 pm current 15-min optics 1
Sat Feb 9 11:19:15.234 UTC

Optics in the current interval [11:15:00 - 11:19:15 Sat Feb 9 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[% ]      : 0.0      0.0      0.0      0.0      NA      NO      100.0
      NA      NO
OPT[dBm]      : -1.51      -1.49      -1.48      -30.00      NA      NO      63.32
      NA      NO
OPR[dBm]      : -9.11      -9.07      -9.03      -30.00      NA      NO      63.32
      NA      NO
CD[ps/nm]     : 13      15      18      -180000      NA      NO      180000
      NA      NO
```

```

DGD[ps ]      : 2.00      2.33      3.00      0.01      NA      NO      21474836.46
  NA          NO
SOPMD[ps^2]   : 5.00      33.02     79.00     0.01      NA      NO      21474836.46
  NA          NO
OSNR[dB]      : 31.50     31.97     32.50     0.01      NA      NO      21474836.46
  NA          NO
PDL[dB]       : 0.20      0.34      0.50      0.01      NA      NO      21474836.46
  NA          NO
PCR[rad/s]    : 0.00      19.92     93.00     0.01      NA      NO      21474836.46
  NA          NO
RX_SIG[dBm]   : -9.05     -9.02     -8.99     -30.00    NA      NO      63.32
  NA          NO
FREQ_OFF[Mhz] : -302      -178      -74       -1500    NA      NO      1500
  NA          NO

```

Example 3: Displays the current performance monitoring parameters of the Ethernet controller 15-minute intervals.

```

RP/0/RP0/CPU0:ios#show controller HundredGigECtrlr 0/1/0/2 pm current 15-min ether
Fri Aug 30 00:37:53.527 UTC

```

```

ETHER in the current interval [00:30:00 - 00:37:53 Fri Aug 30 2019]

```

```

ETHER current bucket type : Valid
RX-UTIL[%]                : 100.00          Threshold : 0.00          TCA(enable) : NO
TX-UTIL[%]                : 10.00          Threshold : 0.00          TCA(enable) : NO
RX-PKT                    : 3852414442     Threshold : 0             TCA(enable) : NO
STAT-PKT                   : 0              Threshold : 0             TCA(enable) : NO
OCTET-STAT                 : 5847965122956  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                     : 7053588067     Threshold : 0             TCA(enable) : NO
OUT-OCTET                  : 451429636288   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              : 5847965122956  Threshold : 0             TCA(enable) : NO
IN_GOOD_PKTS               : 3852414442     Threshold : 0             TCA(enable) : NO
IN_DROP_OTHER              : 0              Threshold : 0             TCA(enable) : NO

```

```

OUT_GOOD_BYTES           : 451429636288      Threshold : 0          TCA(enable) : NO
OUT_GOOD_PKTS           : 7053588067        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 : 3852414442      Threshold : 0          TCA(enable) : NO
OUT_PKT_64_OCTET        : 7053588067        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

```



Note Performance monitoring statistics are not supported for IN-UCAST and OUT-UCAST counters for Ethernet clients.

Example 4: Displays the current *FEC* performance monitoring parameters of the Coherent DSP controller at 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controller coherentDSP 0/2/0/1 pm current 15-min fec
```

```
Sat Feb 9 11:23:42.196 UTC
```

```
g709 FEC in the current interval [11:15:00 - 11:23:42 Sat Feb 9 2019]
```

```
FEC current bucket type : Valid
```

```

EC-BITS      : 291612035786      Threshold : 903330      TCA(enable) :
YES
UC-WORDS     : 0                Threshold : 5            TCA(enable) :
YES

```

	MIN	AVG	MAX	Threshold (min)	TCA (enable)	Threshold (max)	TCA (enable)
PreFEC BER :	7.1E-03	7.2E-03	8.1E-03	0E-15	NO	0E-15	NO
PostFEC BER :	0E-15	0E-15	0E-15	0E-15	NO	0E-15	NO

Example 5: Displays the current *PRBS* performance monitoring parameters of the Coherent DSP controller 15-minute intervals.

```
RP/0/RP0/CPU0:ios#show controllers coherentDSP 0/0/0/1 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 6: Displays the current *PCS* performance monitoring parameters of the Coherent DSP controller 30-second intervals.

```
RP/0/RP0/CPU0:ios#show controllers hundredGigEctr1r 0/0/0/2 pm current 30-sec pcs
Tue Nov 19 09:17:26.684 UTC
```

```
Ethernet PCS in the current interval [09:17:00 - 09:17:26 Tue Nov 19 2019]
```

```
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

```

```

Last clearing of "show controllers ETHERNET " counters never
RP/0/RP0/CPU0:BH1_P2A4#

```

Example 7: Displays the history PCS performance monitoring parameters of the 100GE controller at 30-second intervals.

```

RP/0/RP0/CPU0:ios#show controllers hundredGigECtrlr 0/0/0/2 pm history 30-sec pcs 1
Tue Nov 19 09:27:49.169 UTC

```

```

Ethernet PCS in the current interval [09:27:00 - 09:27:30 Tue Nov 19 2019]

```

```

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

```

```

Last clearing of "show controllers ETHERNET " counters never
RP/0/RP0/CPU0:BH1_P2A4#

```

Clearing PM Parameters

To clear the performance monitoring parameters for Ethernet and Coherent DSP controllers, use this command:

clear controller *controllertype R/S/I/P pm*

Example 1: Clears the PM parameters on the Coherent DSP controller.

```

RP/0/RP0/CPU0:ios#show controller CD 0/0/0/0 pm current 15-min fec
Mon Jun 10 11:43:39.981 UTC

```

```

g709 FEC in the current interval [11:30:00 - 11:43:40 Mon Jun 10 2019]

```

```

FEC current bucket type : Invalid
EC-BITS : 308360273 Threshold : 903330 TCA(enable) :
YES
UC-WORDS : 131108352 Threshold : 5 TCA(enable) :
YES

```

	MIN	AVG	MAX	Threshold (min)	TCA (enable)	Threshold (max)	TCA (enable)
PreFEC BER	3.44E-02	3.45E-02	3.45E-02	0E-15	NO	0E-15	NO
PostFEC BER	0E-15	0E-15	0E-15	0E-15	NO	0E-15	NO
Q	0.51	0.51	0.51	0.00	NO	0.00	NO
Q_Margin	0.00	0.00	0.00	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 CD 0/0/0/0 pm current 15-min fec
Mon Jun 10 11:44:38.804 UTC

```

```

g709 FEC in the current interval [11:30:00 - 11:44:38 Mon Jun 10 2019]

```

```

FEC current bucket type : Invalid

```

```

EC-BITS : 0                               Threshold : 903330           TCA(enable) :
YES
UC-WORDS : 0                               Threshold : 5             TCA(enable) :
YES

```

	MIN	AVG	MAX	Threshold (min)	TCA (enable)	Threshold (max)	TCA (enable)
PreFEC BER	3.44E-02	3.44E-02	3.45E-02	0E-15	NO	0E-15	NO
PostFEC BER	0E-15	0E-15	0E-15	0E-15	NO	0E-15	NO
Q	0.51	0.51	0.51	0.00	NO	0.00	NO
Q_Margin	0.00	0.00	0.00	0.00	NO	0.00	NO

Last clearing of "show controllers OTU" counters 00:00:07

Example 2: Clears the PM parameters on the Ethernet controller.

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

Viewing PM Statistics

To view PM statistics for the Ethernet controllers, use this command:

```
RP/0/RP0/CPU0:ios#show controllers HundredGigECtrlr 0/0/0/2 stats
Fri Aug 30 13:10:33.123 IST
Statistics for interface HundredGigECtrlr0/0/0/2 (cached values):
```

```

Ingress:
  Input total bytes           = 1702197139760640
  Input good bytes           = 1702197139760640

  Input total packets        = 13298415154380
  Input 802.1Q frames        = 0
  Input pause frames        = 0
  Input pkts 64 bytes        = 0
  Input pkts 65-127 bytes    = 0
  Input pkts 128-255 bytes   = 13298415154380
  Input pkts 256-511 bytes   = 0
  Input pkts 512-1023 bytes  = 0
  Input pkts 1024-1518 bytes = 0
  Input pkts 1519-Max bytes  = 0

  Input good pkts            = 13298415154380
  Input unicast pkts       = 0
  Input multicast pkts      = 0
  Input broadcast pkts      = 0

  Input drop overrun        = 0
  Input drop abort          = 0
  Input drop invalid VLAN   = 0
  Input drop invalid DMAC   = 0
  Input drop invalid encap  = 0
  Input drop other          = 0

  Input error giant         = 0
  Input error runt          = 0
  Input error jabbers       = 0
  Input error fragments   = 0
  Input error CRC           = 0
  Input error collisions    = 0
  Input error symbol        = 0
  Input error other         = 0

  Input MIB giant          = 0

```



```
Input MIB jabber          = 0
Input MIB CRC             = 0

Egress:
Output total bytes       = 1702197139760640
Output good bytes       = 1702197139760640

Output total packets    = 13298415154380
Output 802.1Q frames    = 0
Output pause frames     = 0
Output pkts 64 bytes    = 0
Output pkts 65-127 bytes = 0
Output pkts 128-255 bytes = 13298415154380
Output pkts 256-511 bytes = 0
Output pkts 512-1023 bytes = 0
Output pkts 1024-1518 bytes = 0
Output pkts 1519-Max bytes = 0

Output good pkts        = 13298415154380
Output unicast pkts    = 0
Output multicast pkts   = 0
Output broadcast pkts   = 0

Output drop underrun    = 0
Output drop abort      = 0
Output drop other      = 0

Output error other      = 0
```

```
RP/0/RP0/CPU0:ios#
```



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