Performance Management Commands

This module describes the performance management and monitoring commands available on the router. These commands are used to monitor, collect, and report statistics, and to adjust statistics gathering for Border Gateway Protocol (BGP), Open Shortest Path First (OSPF) protocol, generic interfaces, and individual nodes.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

For detailed information about performance management concepts, configuration tasks, and examples, see the *Implementing Performance Management* module in the *System Monitoring Configuration Guide for Cisco ASR 9000 Series Routers*.

monitor controller fabric

To monitor controller fabric counters in real time, use the **monitor controller fabric** command in EXEC mode.

monitor controller fabric {*plane-id* | **all**}

Syntax Description

plane-id	Plane ID number of the fabric plane to be monitored. The range is 0 to 7.
all	Monitors all fabric planes.

Command Default None

Command Modes EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines Use the **monitor controller fabric** command to display controller fabric counters. The display refreshes every 2 seconds.

The interactive commands that are available during a controller fabric monitoring session are described in this table.

Table 1: Interactive Commands Available for the monitor controller fabric Command

Command	Description
c	Resets controller fabric counters to 0.
f	Freezes the display screen, thereby suspending the display of fresh counters.
t	Thaws the display screen, thereby resuming the display of fresh counters.
q	Terminates the controller fabric monitoring session.
s	Enables you to jump to a nonsequential fabric plane. You are prompted to enter the plane ID of the fabric to be monitored.

Task ID

Task ID	Operations
fabric	read
basic-services	execute
monitor	read

Examples

This is sample output from the **monitor controller fabric** command. The output in this example displays fabric controller counters from fabric plane 0.

```
RP/0/RSP0/CPU0:router# monitor controller fabric 0

rack3-3 Monitor
Time: 00:00:24 SysUptime: 03:37:57 Controller fabric for 0x0 Controller Fabric Stats:
Delta In Cells 0 ( 0 per-sec) 0 Out Cells 0 ( 0 per-sec) 0 CE Cells 0 ( 0 per-sec) 0 UCE
Cells 0 ( 0 per-sec) 0 PE Cells 0 ( 0 per-sec) 0 Quit='q', Freeze='f', Thaw='t',
Clear='c', Select controller='s'
```

monitor controller sonet

To monitor SONET controller counters, use the **monitor controller sonet** command in EXEC mode.

monitor controller sonet *interface-path-id*

Syntax Description	*interface-path-id*	Physical interface or virtual interface.

> **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
>
> For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines Use the **monitor controller sonet** command to display SONET controller counters. The display refreshes every 2 seconds.

The interactive commands that are available during a controller monitoring session are described in this table.

Table 2: Interactive Commands for the monitor controller sonet Command

Command	Description
c	Resets controller SONET counters to 0.
f	Freezes the display screen, thereby suspending the display of fresh counters.
t	Thaws the display screen, thereby resuming the display of fresh counters.
q	Terminates the controller SONET monitoring session.
s	Enables you to jump to a nonsequential SONET controller. You are prompted to enter the SONETcontroller to be monitored.

Task ID

Task ID	Operations
fabric	read
basic-services	execute
monitor	read

Examples   This is the sample output from the **monitor controller sonet** command. The output in this example displays counters from SONET controller 0/3/0/0.

```
RP/0/RSP0/CPU0:router# monitor controller sonet 0/3/0/0 rack3-3
        Monitor Time: 00:00:06 SysUptime: 01:23:56 Controller for SONET0_3_0_0 Controller
Stats:
         Delta Path LOP 0 ( 0 per-sec) 0 Path AIS 0 ( 0 per-sec) 0 Path RDI 0 ( 0 per-sec)
0 Path
          BIP 0 ( 0 per-sec) 0 Path FEBE 0 ( 0 per-sec) 0 Path NEWPTR 0 ( 0 per-sec) 0
Path PSE 0
          ( 0 per-sec) 0 Path NSE 0 ( 0 per-sec) 0 Line AIS 0 ( 0 per-sec) 0 Line RDI 0
( 0
          per-sec) 0 Line BIP 0 ( 0 per-sec) 0 Line FEBE 0 ( 0 per-sec) 0 Section LOS 1
( 0
          per-sec) 1 Section LOF 0 ( 0 per-sec) 0 Section BIP 0 ( 0 per-sec) 0 Quit='q',
          Freeze='f', Thaw='t', Clear='c', Select controller='s'
```

monitor interface

To monitor interface counters in real time, use the **monitor interface** command in EXEC mode or Admin EXEC mode.

monitor interface [*type1* *interface-path-id1* [**. . .** [*type32* *interface-path-id32*]] [*wide*] [*full-name*]]

Syntax Description		
type		Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id		Physical interface or virtual interface.
	Note	Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
wide		Display detailed statistics of the interfaces.
full-name		Display full name of the interfaces.
		For more information, use the question mark (**?**) online help function.

Command Default Use the **monitor interface** command without an argument to display statistics for all interfaces in the system.

Command Modes EXEC mode

Admin EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 7.5.4	The argument *full-name* was introduced.

Usage Guidelines The argument *full-name* is applicable only for Release 7.5.4

Use the **monitor interface** command without any keywords or arguments to display interface counters for all interfaces. The display refreshes every 2 seconds.

Use the **monitor interface** command with the *type interface-path-id* arguments to display counters for a single interface. For example: **monitor** *interface pos0/2/0/0*

To display more than one selected interface, enter the **monitor interface** command with multiple *type interface-path-id* arguments. For example: **monitor interface** *pos0/2/0/0 pos0/5/0/1 pos0/5/0/2*

To display a range of interfaces, enter the **monitor interface** command with a wildcard. For example: **monitor** *interface pos0/5/**

You can display up to 32 specific interfaces and ranges of interfaces.

The interactive commands that are available during an interface monitoring session are described in this table.

Use the **monitor interface** command with the *wide* argument to display detailed statistics of the interfaces. For example: **monitor interface** *HundredGigE0/0/0/0 HundredGigE0/0/0/1 HundredGigE0/0/0/2 wide*

Use the **monitor interface** command with the *full-name* argument to display full name of the interfaces. Full name is more useful especially for Named interfaces, which has large character lengths. For example: **monitor interface** *HundredGigE0/0/0/0 HundredGigE0/0/0/1 tunnel-te FROM-INDBGL-AAA-TO-USASJC-BBB-TO-CANAD-CCC full-name*

Use the **monitor interface** command with the *wide* and *full-name* arguments to display detailed statistics of the interfaces with its full name. For example: **monitor interface** *HundredGigE0/0/0/0 HundredGigE0/0/0/1 tunnel-te FROM-INDBGL-AAA-TO-USASJC-BBB-TO-CANAD-CCC wide full-name*

Table 3: Interactive Commands Available for the monitor interface Command (Functional Summary)

Command	Description
Use the following keys to suspend or resume the counter refresh:	
f	Freezes the display screen, thereby suspending the display of fresh counters.
t	Thaws the display screen, thereby resuming the display of fresh counters.
Use the following key to reset the counters:	
c	Resets interface counters to 0.
Use the following keys when displaying statistics for a single interface. These keys display counters in normal or detailed view.	
d	Changes the display mode for the interface monitoring session to display detailed counters. Use the **b** interactive command to return to the regular display mode.
r	Displays the protocol divided by IPv4 or IPv6, and multicast and unicast. When the statistics are displayed using the **r** option, you can also use the **k**, **y**, or **o** keys to display statistics in packets ("**k**"), bytes("**y**") or packets and ("**o**").
b	Returns the interface monitoring session to the regular display mode for counters. Statistics are not divided by protocol.
Use the following keys when displaying statistics for multiple interfaces. These keys modify the display to show **statistics in bytes, packets, or bytes and packets.**	
k	Displays statistics in packets ("**k**").
y	(Default) Displays statistics in bytes ("**y**").
o	Displays statistics in both bytes and packets ("**o**").

Use the following keys to display statistics for a different interface:	
i	Enables you to jump to a nonsequential interface. You are prompted to enter the interface type and interface path ID to be monitored.
p	Displays the previous sequential interface in the list of available interfaces.
n	Displays the next sequential interface in the list of available interfaces.
q	Terminates the interface monitoring session.

Task ID

Task ID	Operations
basic-services	execute
monitor	read

Examples

When more than one interface is specified, the statistics for each interface are displayed on a separate line. This display format appears anytime more than one interface is specified. For example:

- To display statistics for all interfaces, enter the command **monitor interface** .

- To display all the interfaces for an interface type, such as all HundredGigE interface, enter the command and wildcard **monitor interface HundredGigE *** .

- To display statistics for three specified interfaces, enter the command **monitor interface HundredGigE 0/0/0/0 HundredGigE 0/0/0/1 HundredGigE 0/0/0/0** .

This is the sample output for the **monitor interface** command entered without an argument. This command displays statistics for all interfaces in the system.

```
Router# monitor interface
Mon Jan 16 11:14:01.107 UTC

R1                      Monitor Time: 00:00:30        SysUptime: 00:48:19

Protocol:General
Interface           In(bps)      Out(bps)      InBytes/Delta  OutBytes/Delta
FH0/0/0/0               0/  0%        0/  0%        0/0             0/0
FH0/0/0/1               0/  0%        0/  0%        0/0             0/0
FH0/0/0/10              0/  0%        0/  0%        0/0             0/0
FH0/0/0/11              0/  0%        0/  0%        0/0             0/0
FH0/0/0/12              0/  0%        0/  0%        0/0             0/0
FH0/0/0/13              0/  0%        0/  0%        0/0             0/0
FH0/0/0/14              0/  0%        0/  0%        0/0             0/0
FH0/0/0/15              0/  0%        0/  0%        0/0             0/0
FH0/0/0/16              0/  0%        0/  0%        0/0             0/0
FH0/0/0/17              0/  0%        0/  0%        0/0             0/0
FH0/0/0/18              0/  0%        0/  0%        0/0             0/0
FH0/0/0/19              0/  0%        0/  0%        0/0             0/0
FH0/0/0/2               0/  0%        0/  0%        0/0             0/0
FH0/0/0/20              0/  0%        0/  0%        0/0             0/0
FH0/0/0/21              0/  0%        0/  0%        0/0             0/0
```

```
Quit='q',     Clear='c',     Freeze='f', Thaw='t',
Next set='n', Prev set='p', Bytes='y',  Packets='k'
(General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

This is the sample output for the **monitor interface** command entered with single *type interface-path-id* argument. This command displays statistics for the entered single interface.

```
Router# monitor interface fourHundredGigE 0/0/0/0
 Mon Jan 16 11:08:07.126 UTC

 R1                    Monitor Time: 00:00:18        SysUptime: 00:42:13


 FourHundredGigE0/0/0/0 is administratively down, line protocol is administratively down
 Encapsulation ARPA

 Traffic Stats:(2 second rates)                                      Delta
   Input   Packets:                        0                             0
   Input   pps:                            0
   Input   Bytes:                          0                             0
   Input   Kbps (rate):                    0                         (   0%)
   Output Packets:                         0                             0
   Output pps:                             0
   Output Bytes:                           0                             0
   Output Kbps (rate):                     0                         (   0%)

 Errors Stats:
   Input   Total:                          0                             0
   Input   CRC:                            0                             0
   Input   Frame:                          0                             0
   Input   Overrun:                        0                             0
   Output Total:                           0                             0
   Output Underrun:                        0                             0

 Quit='q', Freeze='f', Thaw='t', Clear='c', Interface='i',
 Next='n', Prev='p'

 Brief='b', Detail='d', Protocol(IPv4/IPv6)='r'
```

This is the sample output for the **monitor interface** command entered with multiple *type interface-path-id* arguments. This command displays statistics for all entered interfaces.

```
Router# monitor interface fourHundredGigE 0/0/0/0  fourHundredGigE 0/0/0/1 tunnel-te
FROM-BGL-AA-BB-TO-SJC-CC-DD-1 tunnel-te FROM-BGL-AA-BB-TO-SJC-CC-DD-2
 Mon Jan 16 11:11:03.775 UTC

 R1                    Monitor Time: 00:00:12        SysUptime: 00:45:03

 Protocol:General
 Interface           In(bps)       Out(bps)      InBytes/Delta  OutBytes/Delta
 FH0/0/0/0              0/  0%         0/  0%        0/0             0/0
 FH0/0/0/1              0/  0%         0/  0%        0/0             0/0
 FROM-BGL-AA-          0/ --%         0/ --%        0/0             0/0
 FROM-BGL-AA-          0/ --%         0/ --%        0/0             0/0

 Quit='q',     Clear='c',     Freeze='f', Thaw='t',
 Next set='n', Prev set='p', Bytes='y',  Packets='k'
 (General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

This is the sample output for the **monitor interface** command entered with *type interface-path-id* and *wide* arguments. This command displays detailed statistics of the interfaces.

```
Router# monitor interface fourHundredGigE 0/0/0/0  fourHundredGigE 0/0/0/1 tunnel-te
FROM-BGL-AA-BB-TO-SJC-CC-DD-1 tunnel-te FROM-BGL-AA-BB-TO-SJC-CC-DD-2 wide
 Mon Jan 16 11:12:48.388 UTC
```

```
R1                          Monitor Time: 00:00:04        SysUptime: 00:46:40

Protocol:General
Interface              In(bps)      Out(bps)     InBytes/Delta  OutBytes/Delta  ErrIn/Delta
  ErrCRC/Delta  ErrFr/Delta    ErrOvr/Delta   ErrOut/Delta    ErrUnd/Delta
FH0/0/0/0                     0/  0%         0/  0%        0/0              0/0            0/0
        0/0            0/0            0/0              0/0            0/0
FH0/0/0/1                     0/  0%         0/  0%        0/0              0/0            0/0
        0/0            0/0            0/0              0/0            0/0
FROM-BGL-AA-                  0/ --%         0/ --%        0/0              0/0            0/0
        0/0            0/0            0/0              0/0            0/0
FROM-BGL-AA-                  0/ --%         0/ --%        0/0              0/0            0/0
        0/0            0/0            0/0              0/0            0/0

Quit='q',    Clear='c',    Freeze='f', Thaw='t',
Next set='n', Prev set='p', Bytes='y',  Packets='k'
(General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

This is the sample output for the **monitor interface** command entered with *full-name* argument. This command displays statistics of all interfaces in the system with their full name.

```
Router# monitor interface full-name
Mon Jan 16 11:15:36.431 UTC

R1                          Monitor Time: 00:00:04        SysUptime: 00:49:28

Protocol:General
In(bps)      Out(bps)     InBytes/Delta  OutBytes/Delta        Interface
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/0
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/1
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/10
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/11
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/12
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/13
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/14
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/15
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/16
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/17
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/18
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/19
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/2
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/20
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/21

Quit='q',    Clear='c',    Freeze='f', Thaw='t',
Next set='n', Prev set='p', Bytes='y',  Packets='k'
(General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

This is the sample output for the **monitor interface** command entered with the *type interface-path-id* and *full-name* arguments. This command displays statistics of the interfaces with their full name.

```
Router# monitor interface fourHundredGigE 0/0/0/0  fourHundredGigE 0/0/0/1 tunnel-te
FROM-BGL-AA-BB-TO-SJC-CC-DD-1 tunnel-te FROM-BGL-AA-BB-TO-SJC-CC-DD-2 full-name
Mon Jan 16 11:16:30.346 UTC

R1                          Monitor Time: 00:00:04        SysUptime: 00:50:22

Protocol:General
In(bps)      Out(bps)     InBytes/Delta  OutBytes/Delta        Interface
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/0
  0/  0%       0/  0%         0/0            0/0         FourHundredGigE0/0/0/1
  0/ --%       0/ --%         0/0            0/0         FROM-BGL-AA-BB-TO-SJC-CC-DD-1
  0/ --%       0/ --%         0/0            0/0         FROM-BGL-AA-BB-TO-SJC-CC-DD-2
```

```
Quit='q',    Clear='c',    Freeze='f', Thaw='t',
Next set='n', Prev set='p', Bytes='y',  Packets='k'
(General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

This is the sample output for the **monitor interface** command entered with the *type interface-path-id wide* and *full-name* arguments. This command displays detailed statistics of the interfaces with their full name.

```
Router# monitor interface fourHundredGigE 0/0/0/0  fourHundredGigE 0/0/0/1 tunnel-te
FROM-BGL-AA-BB-TO-SJC-CC-DD-1 tunnel-te FROM-BGL-AA-BB-TO-SJC-CC-DD-2 wide full-name
Mon Jan 16 11:17:39.694 UTC

R1                       Monitor Time: 00:00:14        SysUptime: 00:51:41

Protocol:General
 In(bps)       Out(bps)       InBytes/Delta  OutBytes/Delta  ErrIn/Delta   ErrCRC/Delta
ErrFr/Delta    ErrOvr/Delta   ErrOut/Delta   ErrUnd/Delta
 Interface : FourHundredGigE0/0/0/0
   0/  0%        0/  0%         0/0              0/0            0/0           0/0
0/0            0/0            0/0            0/0
 Interface : FourHundredGigE0/0/0/1
   0/  0%        0/  0%         0/0              0/0            0/0           0/0
0/0            0/0            0/0            0/0
 Interface : FROM-BGL-AA-BB-TO-SJC-CC-DD-1
   0/ --%        0/ --%         0/0              0/0            0/0           0/0
0/0            0/0            0/0            0/0
 Interface : FROM-BGL-AA-BB-TO-SJC-CC-DD-2
   0/ --%        0/ --%         0/0              0/0            0/0           0/0
0/0            0/0            0/0            0/0

 Quit='q',    Clear='c',    Freeze='f', Thaw='t',
 Next set='n', Prev set='p', Bytes='y',  Packets='k'
 (General='g', IPv4 Uni='4u', IPv4 Multi='4m', IPv6 Uni='6u', IPv6 Multi='6m')
```

performance-mgmt apply monitor

To apply a statistics template to gather a sampling-size set of samples for a particular instance, use the **performance-mgmt apply monitor** command in Global Configuration mode. To stop monitoring statistics, use the **no** form of this command.

performance-mgmt apply monitor *entity* {*ip-address type interface-path-id node-id* | *node-id process-id process-name*} {*template-name* | **default**}
no performance-mgmt apply monitor

Syntax Description	*entity*	Specifies an entity for which you want to apply the statistics template:
		• **bgp**—Applies a template for monitoring a Border Gateway Protocol (BGP) neighbor.
		• **interface basic-counters**—Applies a template for monitoring basic counters on an interface. If you enter this keyword, supply values for the *type* and *interface-path-id* arguments.
		• **interface data-rates**—Applies a template for monitoring data rates on an interface. If you enter this keyword, supply values for the *type* and *interface-path-id* arguments.
		• **interface generic-counters**—Applies a template for monitoring generic counters on an interface. If you enter this keyword, supply values for the *type* and *interface-path-id* arguments.
		• **mpls ldp**—Applies a template for monitoring an MPLS Label Distribution Protocol (LDP) neighbor.
		• **node cpu**—Applies a template for monitoring the central processing unit (CPU) on a node. Use the *node-id* argument with this entity.
		• **node memory** —Applies a template for monitoring memory utilization on a node. Use the **location** keyword and *node-id* argument with this entity.
		• **node process**—Applies a template for monitoring a process on a node. Use the *node-id* and *process-id* arguments with this entity.
		• **ospf v2protocol**—Applies a template for monitoring an Open Shortest Path First v2 (OSPFv2) process instance.
		• **ospf v3protocol**—Applies a template for monitoring an OSPFv3 process instance.
	ip-address	IP or neighbor address. Used with the **bgp** or **ldp** keyword.
	type	Interface type. For more information, use the question mark (**?**) online help function.
	interface-path-id	Physical interface or virtual interface.
		Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
	node-id	Designated node. Used with the **node cpu** or **node memory** keyword. The *node-id* argument is entered in the *rack/slot/module* notation.
	node-id process-id	Designated node and process ID. Used with the **node process** keyword. The *node-id* argument is entered in the *rack/slot/module* notation.

process-name	Process name of the OSPF instance. Used with the **ospfv2protocol** and **ospfv3protocol** keywords.	
template-name	Name of a predefined template used for statistics collection. A template name can be any combination of alphanumeric characters, and may include the underscore character (_). Use the **show running performance-mgmt** command to display a list of available templates.	
default	Applies the default template.	

Command Default

Monitoring is disabled.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.0.1	The **interface basic-counters** keyword was added to support the monitoring of basic counters on the interface.

Usage Guidelines

Use the **performance-mgmt apply monitor** command to apply a statistics template and enable monitoring. This command captures one cycle of a sample to analyze an instance of an entity. Rather than collect statistics for all instances, which is the purpose of the **performance-mgmt apply statistics** command, the **performance-mgmt apply monitor** command captures statistics for a specific entity instance for one sampling period.

The *type* and *interface-path-id* arguments are only to be used with the **interface data-rates** or **interface generic-counter** keyword.

For information about creating templates, see the performance-mgmt apply statistics, on page 15 command.

Task ID

Task ID	Operations
monitor	read, write, execute

Examples

This example shows how to enable the BGP protocol monitoring using the criterion set in the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply monitor bgp 10.0.0.0 default
```

This example shows how to enable monitoring for data rates according to the criterion set in the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply monitor interface data-rates pos 0/2/0/0
 default
```

This example shows how to enable memory monitoring based on the criterion set in the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply monitor node memory location 0/1/cpu0
 default
```

This example shows how to enable monitoring for counters according to the criterion set in the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply monitor interface basic-counters
hundredGigE 0/2/0/0 default
```

	Command	Description
Related Commands	performance-mgmt apply statistics, on page 15	Applies a statistics template and enables statistics collection.
	performance-mgmt statistics, on page 25	Creates a template to use for collecting performance management statistics.
	show running performance-mgmt, on page 48	Displays a list of templates and the template being applied.

performance-mgmt apply statistics

To apply a statistics template and enable statistics collection, use the **performance-mgmt apply statistics** command in Global Configuration mode. To stop statistics collection, use the **no** form of this command.

performance-mgmt apply statistics *entity* **location** {**all** *node-id*} {*template-name* | **default**}
no performance-mgmt apply statistics

Syntax Description		
	entity	Specifies an entity for which you want to apply a statistics template: • **bgp**—Applies a statistics collection template for Border Gateway Protocol (BGP). • **interface basic-counters**—Applies a statistics collection template for basic counters. • **interface data-rates**—Applies a statistics collection template for data rates. • **interface generic-counters**—Applies a statistics collection template for generic counters. • **mpls ldp**—Applies a template for monitoring an MPLS Label Distribution Protocol (LDP) neighbor. • **node cpu**—Applies a statistics collection template for the central processing unit (CPU). Use the **location** keyword with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **node memory**—Applies a statistics collection template for memory utilization. Use the **location** keyword with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **node process**—Applies a statistics collection template for processes. Use the **location** keyword with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **ospf v2protocol**—Applies a statistics collection template for Open Shortest Path First v2 (OSPFv2) process instances. • **ospf v3protocol**—Applies a statistics collection template for OSPFv3 process instances.
	location {**all** | *node-id*}	Specifies all nodes or a particular node. Specify the **location all** keywords for all nodes, or the *node-id* argument to specify a particular node. The *node-id* argument is entered in the *rack*/*slot*/*module* notation. You must specify either the **location all** keywords or the **location** keyword and *node-id* argument with the **node cpu**, **node memory**, or **node process** entity.
	template-name	Name of a predefined template used for statistics collection. A template name can be any combination of alphanumeric characters, and may include the underscore character (_). Use the show running performance-mgmt, on page 48 command to display a list of available templates.
	default	Applies the default template.

Command Default   Statistics collection is disabled.

Command Modes   Global Configuration mode

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 4.0.1	The **interface basic-counters** keyword was added to support the enabling of statistics collection template for the basic counters.

Usage Guidelines

Use the **performance-mgmt apply statistics** command to apply a statistics template and enable statistics collection. Only one template for each entity can be enabled at a time. After samples are taken, the data is sent to a directory on an external TFTP server, and a new collection cycle starts. The directory where data is copied to is configured using the performance-mgmt resources tftp-server, on page 23 command. The statistics data in the directory contains the type of entity, parameters, instances, and samples. They are in binary format and must be viewed using a customer-supplied tool, or they can be queried as they are being collected using XML.

Use the **performance-mgmt apply statistics** command to collect data for all the instances on a continuous basis. To analyze a particular instance for a limited period of time, use the performance-mgmt apply monitor, on page 12 command.

Use the **no** form of the command to disable statistics collection. Because only one performance management statistics collection can be enabled for any given entity at any given time, you are not required to specify the template name with the **default** keyword or **template** keyword and *template-name* argument when disabling a performance management statistics collection.

For information about creating templates, see the performance-mgmt statistics, on page 25 command.

⚠️

Caution Each particular collection enabled requires a certain amount of resources. These resources are allocated for as long as the collection is enabled.

Task ID

Task ID	Operations
monitor	read, write, execute

Examples

This example shows how to start statistics collection for BGP using the template named bgp1:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply statistics bgp template bgp1
```

This example shows how to enable statistics collection for generic counters using the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply statistics interface generic-counters
 default
```

This example shows how to enable CPU statistics collection based on the settings set in the default template:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply statistics node cpu location all default
```

This example shows how to enable statistics collection for basic counters using the default template:

Related Commands

Command	Description
performance-mgmt apply monitor, on page 12	Applies a statistics template to gather one sampling-size set of samples for a particular instance.
performance-mgmt apply thresholds, on page 18	Applies a threshold template and enables threshold monitoring.
performance-mgmt resources tftp-server, on page 23	Configures a destination TFTP server for statistics collections.
performance-mgmt statistics, on page 25	Creates a template to use for collecting performance management statistics.
show running performance-mgmt, on page 48	Displays a list of templates and the template being applied.

performance-mgmt apply thresholds

To apply a thresholds template and enable threshold collection, use the **performance-mgmt apply thresholds** command in Global Configuration mode. To stop threshold collection, use the **no** form of this command.

performance-mgmt apply thresholds *entity* **location** {**all** *node-id*} {*template-name* | **default**}
no performance-mgmt apply thresholds

Syntax Description	*entity*	Specifies an entity for which you want to apply a threshold template:
		• **bgp**—Applies a threshold monitoring template for Border Gateway Protocol (BGP). • **interface basic-counters**—Applies a threshold monitoring template for basic counters. • **interface data-rates**—Applies a threshold monitoring template for data rates. • **interface generic-counters**—Applies a threshold monitoring template for generic counters. • **mpls ldp**—Applies a template for monitoring an MPLS Label Distribution Protocol (LDP) neighbor. • **node cpu**—Applies a threshold monitoring template for central processing unit (CPU) utilization. Use the **location** keyword in conjugation with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **node memory**—Applies a threshold monitoring template for memory utilization. Use the **location** keyword in conjugation with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **node process**—Applies a threshold monitoring template for processes. Use the **location** keyword in conjugation with the **all** keyword or *node-id* argument when enabling a statistics collection template for this entity. • **ospf v2protocol**—Applies a threshold monitoring template for OSPFv2. • **ospf v3protocol**—Applies a threshold monitoring template for OSPFv3.
	location {**all** | *node-id*}	Specifies all nodes or a particular node. Specify the **location all** keywords for all nodes, or the *node-id* argument to specify a particular node. The *node-id* argument is entered in the *rack/slot/module* notation. You must specify either the **location all** keywords or the **location** keyword and *node-id* argument with the **node cpu**, **node memory**, or **node process** entity.
	template-name	Name of a predefined template used for threshold collection. A template name can be any combination of alphanumeric characters, and may include the underscore character (_). Use the show running performance-mgmt, on page 48 command to display a list of available templates.
	default	Applies the default template.

Command Default	Threshold collection is disabled.
Command Modes	Global Configuration mode

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 4.0.1	The **interface basic-counters** keyword was added to support the enabling of threshold monitoring template for the basic counter.

Usage Guidelines

Use the **performance-mgmt apply thresholds** command to apply a threshold template and enable threshold collection. Several templates can be configured, but only one template for each entity can be enabled at a time.

Use the **no** form of the command to disable threshold collection. Because only one performance management threshold monitoring template can be enabled for any given entity at any given time, you are not required to specify the template name with the **default** keyword or **template** keyword and *template-name* argument when disabling a performance management statistics collection.

For information about creating threshold templates, see the performance-mgmt thresholds, on page 28 command.

Task ID

Task ID	Operations
monitor	read, write, execute

Examples

This example shows how to start threshold collection for BGP using a template named stats1:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply thresholds bgp stats1
```

This example shows how to enable threshold collection for generic counters using a template named stats2:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply thresholds interface generic-counters
 stats2
```

This example shows how to enable CPU threshold collection using the template named cpu12:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply thresholds node cpu global cpu12
```

This example shows how to enable threshold checking for basic counters using a template named stats3:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt apply thresholds interface basic-counters
stats3
```

Related Commands

Command	Description
performance-mgmt thresholds, on page 28	Creates a template to use for threshold collection.
show running performance-mgmt, on page 48	Displays a list of templates and the template being applied.

performance-mgmt regular-expression

To apply a defined regular expression group to one or more statistics or threshold template, use the **performance-mgmt regular-expression** *regular-expression-name* command in Global Configuration mode. To stop the usage of regular expression, use the **no** form of this command.

performance-mgmt regular-expression *regular-expression-name* **index** *number regular-expression-string*
no performance-mgmt regular-expression *regular-expression-name*

Syntax Description

regular-expression-string	Specifies a defined regular expression group to one or more statistics or threshold template.
index	Specifies a regular expression index. Range is 1 to 100.

Command Default No regular expression is configured by default.

Command Modes Global Configuration mode

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
monitor	read, write

This is the sample output from the **performance-mgmt regular-expression** command:

```
RP/0/RSP0/CPU0:router# performance-mgmt regular-expression reg1 index 10
```

performance-mgmt resources dump local

To configure the local filesystem on which the statistics data is dumped, use the **performance-mgmt resources dumplocal** command in Global Configuration mode. To stop dumping of statistics data on the local filesystem, use the **no** form of this command.

performance-mgmt resources dump local
no performance-mgmt resources dump local

Syntax Description		
	dump	Configures data dump parameters.
	local	Sets the local filesystem on which statistics data is dumped.
	Note	You can also dump the statistics data on the TFTP server location. But the configuration is rejected if you configure both local dump and TFTP server at the same time.

Command Default Local filesystem is disabled.

Command Modes Global Configuration mode

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
monitor	read, write

This is the sample output for the **performance-mgmt resources dumplocal** command:

```
RP/0/RSP0/CPU0:router# performance-mgmt resources dump local
```

performance-mgmt resources memory

To configure memory consumption limits for performance management (PM), use the **performance-mgmt resources memory** command in Global Configuration mode. To restore the default memory consumption limits, use the **no** form of this command.

performance-mgmt resources memory max-limit *kilobytes* **min-reserved** *kilobytes*
no performance-mgmt resources memory

Syntax Description		
max-limit *kilobytes*	Specifies the maximum amount of memory (specified with the *kilobytes* argument) that the PM statistics collector can use for serving data collection requests. Range is 0 to 4294967295 kilobytes.The default is 50000 kilobytes.
min-reserved *kilobytes*	Specifies a minimum amount of memory (specified with the *kilobytes* argument) that must remain available in the system after allowing a new PM data collection request. Range is 0 to 4294967295 kilobytes. The default is 10000 kilobytes.

Command Default

max-limit—50000 *kilobytes*

min-reserved—10000 kilobytes

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

Use the **performance-mgmt resource memory** command to ensure that the total memory consumed by data buffers in PM does not exceed a maximum limit and that any new PM data request does not cause available memory in the system to fall below a certain threshold.

Task ID

Task ID	Operations
monitor	read, write

Examples

This example shows how to ensure that the total memory consumed by PM data buffers does not exceed 30,000 kilobytes and that any new PM data request does not cause available memory in the system to fall below 5000 kilobytes:

```
RP/0/RSP0/CPU0:router(config)# performance-mgmt resources memory max-limit 30000 min-reserved
 5000
```

performance-mgmt resources tftp-server

To configure a destination TFTP server for PM statistics collections, use the **performance-mgmt resources tftp-server** command in Global Configuration mode. To disable the resource, use the **no** form of this command.

performance-mgmt resources tftp-server *ip-address*   {**directory***dir-name*} {**vrf** | {*vrf_name* | **default**} | {**directory***dir-name*}}
no performance-mgmt resources tftp-server

Syntax Description

tftp-server *ip-address*	Specifies the IP address of the TFTP server.
directory *dir-name*	Specifies the directory where performance management statistics will be copied.
vrf *vrf_name*	Specifies the name of the VRF instance.
default	Specifies the default VRF.

Command Default

A destination TFTP server is not configured and data is not copied out of the system after a collection cycle (sampling-size) ends.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

Use the **performance-mgmt resources tftp-server** command to configure a TFTP resource for performance management. By creating a directory name on the TFTP server, you create a place where statistics can be collected when statistics collection is enabled.

Use the **no** form of this command to disable the TFTP resource.

Note   Files copied to the TFTP server contain a timestamp in their name, which makes them unique. For that reason the TFTP server used should support creation of files as data is transferred, without requiring users to manually create them at the TFTP server host in advance.

Task ID

Task ID	Operations
monitor	read, write

Examples

This example shows how to specify a TFTP server with the IP address 192.168.134.254 as the performance management resource and a directory named /user/perfmgmt/tftpdump as the destination for PM statistic collections:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt resources tftp-server 192.168.134.254 directory
 /user/perfmgmt/tftpdump
```

Related Commands	Command	Description
	performance-mgmt apply statistics, on page 15	Applies a statistics template and enables statistics collection.
	performance-mgmt apply thresholds, on page 18	Applies a threshold template and enables threshold monitoring.

performance-mgmt statistics

To create a template to use for collecting performance management statistics, use the **performance-mgmt statistics** command in Global Configuration mode. To remove a template, use the **no** form of this command.

performance-mgmt statistics *entity* {**template** *template-name* | **default**} [**sample-size** *size*] [**sample-interval** *minutes*]**history-persistent regular-expression**
no performance-mgmt statistics

Syntax Description	*entity*	Specify an entity for which you want to create a statistics template:
		• **bgp**—Creates a statistics collection template for Border Gateway Protocol (BGP).
		• **interface basic-counters**—Creates a statistics collection template for basic counters.
		• **interface data-rates**—Creates a statistics collection template for data rates.
		• **interface generic-counters**—Creates a statistics collection template for generic counters.
		• **mpls ldp**—Applies a template for monitoring an MPLS Label Distribution Protocol (LDP) neighbor.
		• **node cpu**—Creates a statistics collection template for the central processing unit (CPU).
		• **node memory**—Creates a statistics collection template for memory utilization.
		• **node process**—Creates a statistics collection template for processes.
		• **ospf v2protocol**—Creates a statistics template for Open Shortest Path First v2 (OSPFv2) protocol instances.
		• **ospf v3protocol**—Creates a statistics template for OSPFv3 protocol instances.
	template	Specifies that a template will be used for collection.
	template-name	A template name can be any combination of alphanumeric characters, and may include the underscore character (_).
		Use the show running performance-mgmt, on page 48 to display information about templates, and to display the templates that are being used.

default	Applies the settings of the default template. The default template contains the following statistics and values. Values are in minutes.
	Each entity has a default template. In each default template, the sample interval is 10 minutes, and the default sample count is 5.
sample-size *size*	(Optional) Sets the number of samples to be taken.
sample-interval *minutes*	(Optional) Sets the frequency of each sample, in minutes.
history-persistent	(Optional) Maintains the history of statistics collections persistently.
regular-expression*regular-expression-group-name*	(Optional) Sets instance filtering by regular expression.

Command Default

Statistics collections for all entities is disabled.

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.0.1	The **interface basic-counters** keyword was added to support the creation of statistics collection templates for the basic counters. The **history-persistent** and **regular-expression** keywords were added.

Usage Guidelines

If you have not yet created a directory for the statistics, use the performance-mgmt resources tftp-server, on page 23 command to create a directory on an external TFTP server. When you apply the template and enable statistics collection with the performance-mgmt apply statistics, on page 15 command, the samples are collected and sent to that directory for later retrieval.

The statistics collected contain type of entity, parameters, instances, and samples. The collection files on the TFTP server are in binary format and must be viewed using a customer-supplied tool or they can be queried as they are being collected using XML.

Task ID

Task ID	Operations
monitor	read, write

Examples

This example shows how to create a template named int_data_rates for data rate statistics collection, how to set the sample size to 25, and how to set the sample interval to 5 minutes:

```
RP/0/RSP0/CPU0:router(config)#performance-mgmt statistics interface data-rates int_data_rates
RP/0/RSP0/CPU0:router(config_stats-if-rate)# sample-size 25
```

```
RP/0/RSP0/CPU0:router(config_stats-if-rate)# sample-interval 5
```

Related Commands

Command	Description
performance-mgmt apply statistics, on page 15	Applies a statistics template and enables statistics collection.
performance-mgmt resources tftp-server, on page 23	Configures resources for the performance management system that are independent of any particular entity.
performance-mgmt thresholds, on page 28	Configures a template for collecting threshold statistics.
show running performance-mgmt, on page 48	Displays a list of templates and the template being applied.

performance-mgmt thresholds

To configure a template for threshold checking, use the **performance-mgmt thresholds** command in Global Configuration mode. To remove a threshold template, use the **no** form of this command.

performance-mgmt thresholds *entity* { **template** *template-name* | **default** } *attribute operation value* [*value2*] [*percent*] [*delta*] [**rearm** { **toggle** | **window** *window-size* }] [*delta*]
no performance-mgmt thresholds

Syntax Description	*entity*	Specify an entity for which you want to create a template:
		• **bgp** —Creates a template for threshold collection for Border Gateway Protocol (BGP).
		• **interface basic-counters** —Creates a threshold monitoring template for basic counters.
		• **interface data-rates** —Creates a threshold monitoring template for data rates.
		• **interface generic-counters** —Creates a threshold monitoring template for generic counters.
		• **mpls ldp** —Applies a template for monitoring an MPLS Label Distribution Protocol (LDP) neighbor.
		• **node cpu** —Creates a threshold monitoring template for the central processing unit (CPU).
		• **node memory** —Creates a threshold monitoring template for memory utilization.
		• **node process** —Creates a threshold monitoring template for processes.
		• **ospf v2protocol** —Creates a threshold monitoring template for Open Shortest Path First v2 (OSPFv2) process instances.
		• **ospf v3protocol** —Creates a threshold monitoring template for OSPFv3 process instances.
	template	Specifies that a template will be used for collection.
	template-name	Name of a predefined template used for threshold collection. A template name can be any combination of alphanumeric characters, and may include the underscore character (_). Use the show running performance-mgmt, on page 48 to display information about templates, and to display the templates that are being used.
	default	Applies the settings of the default template.
	attribute	The attributes for the entity. See Table 5: Attribute Values, on page 30 for a list of attributes.

operation	A limiting operation for thresholding that includes: • **EQ** —Equal to. • **GE** —Greater than or equal to. • **GT** —Greater than. • **LE** —Less than or equal to. • **LT** —Less than. • **NE** —Not equal to. • **RG** —Not in range.
value	The base value against which you want to sample.
value2	(Optional) This value can only be used with the operator **RG** . For example, if you use **RG** for the operation argument value, you create a range between *value* and *value2* .
percent	(Optional) Specifies a value relative to the previous sample interval value. See the "Usage Guidelines" section for more information.
delta	(Optional) The feature invokes an alarm when the difference between the current and the previous counter value satisfies the threshold condition.
rearm {**toggle** | **window**}	(Optional) It can be used to reduce the number of events by suppressing redundant events from being reported. Normally, every time a condition is met in a sample interval, a syslog error is generated. Using the **toggle** keyword works in this manner: If a condition is true, a syslog error message is generated, but it is not generated again until the condition becomes false, and then true again. In this way, only "fresh" events are seen when the threshold is crossed. Use the **window** keyword to specify that an event be sent only once for each window. If a condition is true, a syslog error message is generated. You set your window size by using the **window** keyword and specify the number of intervals. With a window size, you specify that you want event notification at that number of intervals. For example, if you window size is 2 and your sample interval is 10, you would want notification of the event (for each instance in an entity) only every 20 minutes when the condition has been met.
window-size	The number of intervals to use with the **rearm** keyword.

Command Default

None

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 7.7.1	The argument **delta** was introduced.
Release 3.7.2	This command was introduced.
Release 4.0.1	The **interface basic-counters** keyword was added to support the creation of threshold monitoring template for the basic counter.

Usage Guidelines

Use the *percent* argument to specify a value that is relative to the previous sample's interval value. When you use the *percent* argument with a *value* of 50, the calculation is performed in this manner, assuming that your current sampled value is sample1 (S1) and the value sampled in the previous sampling period is sample 0 (S0):

```
(S1 - S0) GT 50% of S0
```

For example, if you wanted to check for an increase of 50 percent in the counter BGPInputErrors, you could use the following *attribute* and *operation* with the *percent* argument:

```
BGPInputErrors GT 50
```

This table shows threshold behavior, assuming the values for BGPInputErrors are at consecutive samplings.

Table 4: Threshold Behavior

Value	Calculation	Event
10	—	—
16	16 - 10 = 6, which is > than 50 percent of 10	Generate event
20	20 - 16 = 4, which is not > than 50 percent of 16	No event generated
35	35 - 20 = 15, which is > than 50 percent of 20	Generate event

This table shows the attribute values supported by the entities.

Table 5: Attribute Values

Entity	Attributes	Description
bgp	ConnDropped	Number of times the connection was dropped.
	ConnEstablished	Number of times the connection was established.
	ErrorsReceived	Number of error notifications received on the connection.
	ErrorsSent	Number of error notifications sent on the connection.
	InputMessages	Number of messages received.
	InputUpdateMessages	Number of update messages received.
	OutputMessages	Number of messages sent.
	OutputUpdateMessages	Number of update messages sent.
interface basic-counters	InOctets	Bytes received (64-bit).
	InPackets	Packets received (64-bit).

Entity	Attributes	Description
	InputQueueDrops	Input queue drops (64-bit).
	InputTotalDrops	Inbound correct packets discarded (64-bit).
	InputTotalErrors	Inbound incorrect packets discarded (64-bit).
	OutOctets	Bytes sent (64-bit).
	OutPackets	Packets sent (64-bit).
	OutputQueueDrops	Output queue drops (64-bit).
	OutputTotalDrops	Outbound correct packets discarded (64-bit).
	OutputTotalErrors	Outbound incorrect packets discarded (64-bit).
interface data-rates	Bandwidth	Bandwidth, in kbps.
	InputDataRate	Input data rate in kbps.
	InputPacketRate	Input packets per second.
	InputPeakRate	Peak input data rate.
	InputPeakPkts	Peak input packet rate.
	OutputDataRate	Output data rate in kbps.
	OutputPacketRate	Output packets per second.
	OutputPeakPkts	Peak output packet rate.
	OutputPeakRate	Peak output data rate.

Entity	Attributes	Description
interface generic-counters	InBroadcastPkts	Broadcast packets received.
	InMulticastPkts	Multicast packets received.
	InOctets	Bytes received.
	InPackets	Packets received.
	InputCRC	Inbound packets discarded with incorrect CRC.
	InputFrame	Inbound framing errors.
	InputOverrun	Input overruns.
	InputQueueDrops	Input queue drops.
	InputTotalDrops	Inbound correct packets discarded.
	InputTotalErrors	Inbound incorrect packets discarded.
	InUcastPkts	Unicast packets received.
	InputUnknownProto	Inbound packets discarded with unknown proto.
	OutBroadcastPkts	Broadcast packets sent.
	OutMulticastPkts	Multicast packets sent.
	OutOctets	Bytes sent.
	OutPackets	Packets sent.
	OutputTotalDrops	Outbound correct packets discarded.
	OutputTotalErrors	Outbound incorrect packets discarded.
	OutUcastPkts	Unicast packets sent.
	OutputUnderrun	Output underruns.

Entity	Attributes	Description
mpls ldp	AddressMsgsRcvd	Address messages received.
	AddressMsgsSent	Address messages sent.
	AddressWithdrawMsgsRcvd	Address withdraw messages received.
	AddressWithdrawMsgsSent	Address withdraw messages sent.
	InitMsgsSent	Initial messages sent.
	InitMsgsRcvd	Initial messages received.
	KeepaliveMsgsRcvd	Keepalive messages received.
	KeepaliveMsgsSent	Keepalive messages sent.
	LabelMappingMsgsRcvd	Label mapping messages received.
	LabelMappingMsgsSent	Label mapping messages sent.
	LabelReleaseMsgsRcvd	Label release messages received.
	LabelReleaseMsgsSent	Label release messages sent.
	LabelWithdrawMsgsRcvd	Label withdraw messages received.
	LabelWithdrawMsgsSent	Label withdraw messages sent.
	NotificationMsgsRcvd	Notification messages received.
	NotificationMsgsSent	Notification messages sent.
	TotalMsgsRcvd	Total messages received.
	TotalMsgsSent	Total messages sent.
node cpu	AverageCPUUsed	Average system percent CPU utilization.
	NoProcesses	Number of processes.
node memory	CurrMemory	Current application memory (in bytes) in use.
	PeakMemory	Maximum system memory (in MB) used since bootup.
node process	AverageCPUUsed	Average percent CPU utilization.
	NumThreads	Number of threads.
	PeakMemory	Maximum dynamic memory (in KB) used since startup time.

Entity	Attributes	Description
ospf v2protocol	InputPackets	Total number of packets received
	OutputPackets	Total number of packets sent
	InputHelloPackets	Number of Hello packets received
	OutputHelloPackets	Number of Hello packets sent
	InputDBDs	Number of DBD packets received
	InputDBDsLSA	Number of LSA received in DBD packets
	OutputDBDs	Number of DBD packets sent.
	OutputDBDsLSA	Number of LSA sent in DBD packets
	InputLSRequests	Number of LS requests received.
	InputLSRequestsLSA	Number of LSA received in LS requests.
	OutputLSRequests	Number of LS requests sent.
	OutputLSRequestsLSA	Number of LSA sent in LS requests.
	InputLSAUpdates	Number of LSA updates received.
	InputLSAUpdatesLSA	Number of LSA received in LSA updates.
	OutputLSAUpdates	Number of LSA updates sent.
	OutputLSAUpdatesLSA	Number of LSA sent in LSA updates.
	InputLSAAcks	Number of LSA acknowledgements received.
	InputLSAAcksLSA	Number of LSA received in LSA acknowledgements.
	OutputLSAAcks	Number of LSA acknowledgements sent.
	OutputLSAAcksLSA	Number of LSA sent in LSA acknowledgements.
	ChecksumErrors	Number of packets received with checksum errors.

Entity	Attributes	Description
ospf v3protocol	InputPackets	Total number of packets received.
	OutputPackets	Total number of packets sent.
	InputHelloPackets	Number of Hello packets received.
	OutputHelloPackets	Number of Hello packets sent.
	InputDBDs	Number of DBD packets received.
	InputDBDsLSA	Number of LSA received in DBD packets.
	OutputDBDs	Number of DBD packets sent.
	OutputDBDsLSA	Number of LSA sent in DBD packets.
	InputLSRequests	Number of LS requests received.
	InputLSRequestsLSA	Number of LSA received in LS requests.
	OutputLSRequests	Number of LS requests sent.
	OutputLSRequestsLSA	Number of LSA sent in LS requests.
	InputLSAUpdates	Number of LSA updates received.
	InputLSRequestsLSA	Number of LSA received in LS requests.
	OutputLSAUpdates	Number of LSA updates sent.
	OutputLSAUpdatesLSA	Number of LSA sent in LSA updates.
	InputLSAAcks	Number of LSA acknowledgements received.
	InputLSAAcksLSA	Number of LSA received in LSA acknowledgements.
	OutputLSAAcks	Number of LSA acknowledgements sent
	OutputLSAAcksLSA	Number of LSA sent in LSA acknowledgements.

Task ID

Task ID	Operations
monitor	read, write

Examples

This example shows how to create a template for monitoring BGP thresholds, which checks if the number of connections dropped exceeds 50 for any BGP peers. The **toggle rearm** keywords are included so that once the threshold is passed, the event will not be reported unless the value of ConnDropped is reset:

```
RP/0/RSP0/CPU0:router(config)# performance-mgmt thresholds bgp template bgp_thresh1
RP/0/RSP0/CPU0:router(config-threshold-bgp)# ConnDropped GT 50 rearm toggle
```

This example shows how to create a template for monitoring node CPU utilization that checks if there is a 25 percent increase at any given interval:

```
RP/0/RSP0/CPU0:router(config)# performance-mgmt thresholds node cpu template cpu_thresh1
RP/0/RSP0/CPU0:router(config-threshold-bgp)# AverageCPUUsed GT 25
```

This example shows how to create a template for monitoring the input CRC errors for interfaces. The rule checks whether the number of errors reach or exceed 1000 for any given interface:

```
RP/0/RSP0/CPU0:router(config)# performance-mgmt thresholds interface generic_ctr template
intf_crc_thresh1
RP/0/RSP0/CPU0:router(config-threshold-bgp)# InputCRC GE 1000
```

This example shows how to create a template for monitoring interface generic counters. The template named **ge_delta** is configured to check if the value of InPackets counter exceeds 10.

```
RP/0/0/CPU0:ios(config)#performance-mgmt thresholds interface generic-counters template
ge_delta InPackets ge 10 delta
RP/0/0/CPU0:ios(config)#commit
```

Related Commands

Command	Description
performance-mgmt apply thresholds, on page 18	Enables threshold monitoring for BGP.
performance-mgmt resources tftp-server, on page 23	Configures a TFTP resource for performance management.
show running performance-mgmt, on page 48	Displays a list of templates and the template being applied.

show performance-mgmt bgp

To display performance management (PM) data from Border Gateway Protocol (BGP) entity instance monitoring or statistics collections, use the **show performance-mgmt bgp** command in EXEC mode.

show performance-mgmt {**monitor** | **statistics**} **bgp** {*ip-address* | **all**} {*sample-id* | **all-samples** | **last-sample**}

Syntax Description		
monitor	Displays the data collected for an entity instance monitoring collection. The data gathered is from one sample cycle of a BGP statistics collection template. The data is available only as the monitor data is enabled.	
statistics	Displays the data collected from statistics collection samples.	
ip-address	IP address of a BGP peer.	
all	Displays all BGP peer instances.	
	Note	This option is available only with the **statistics** keyword. It is not available with the **monitor** keyword because an entity instance monitoring collection captures data from an entity instance for one sampling cycle.
sample-id	Sample ID of the monitoring or statistics collection to be displayed.	
all-samples	Displays all collected samples.	
last-sample	Displays the last collected samples.	

Command Default None

Command Modes EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read

Examples This is the sample output from the **show performance-mgmt bgp** command:

```
RP/0/RSP0/CPU0:router# show performance-mgmt monitor bgp 10.0.0.0 all-samples

BGP Neighbor: 10.0.0.0 Sample no: 1
---------------------------------------------
InputMessages: 0 OutputMessages: 0
```

```
InputUpdateMessages: 0 OutputUpdateMessages: 0 ConnEstablished: 0 ConnDropped: 0
ErrorsReceived: 0 ErrorsSent: 0 BGP Neighbor: 10.0.0.0 Sample no: 2
------------------------------------------ InputMessages: 0 OutputMessages: 0
InputUpdateMessages: 0 OutputUpdateMessages: 0 ConnEstablished: 0 ConnDropped: 0
ErrorsReceived: 0 ErrorsSent: 0 BGP Neighbor: 10.0.0.0 Sample no: 3
------------------------------------------ InputMessages: 0 OutputMessages: 0
InputUpdateMessages: 0 OutputUpdateMessages: 0 ConnEstablished: 0 ConnDropped: 0
ErrorsReceived: 0 ErrorsSent: 0
```

This table describes the significant fields in the display.

Table 6: show performance-mgmt bgp Field Descriptions

Field	Description
ConnDropped	Number of times the connection was dropped.
ConnEstablished	Number of times the connection was established.
ErrorsReceived	Number of error notifications received on the connection.
ErrorsSent	Number of error notifications sent on the connection.
InputMessages	Number of messages received.
InputUpdateMessages	Number of update messages received.
OutputMessages	Number of messages sent.
OutputUpdateMessages	Number of update messages sent.

show performance-mgmt interface

To display performance management (PM) data from interface entity instance monitoring or statistics collections, use the **show performance-mgmt interface** command in EXEC mode.

show performance-mgmt {**monitor** | **statistics**} **interface** {**basic-counters** | **data-rates** | **generic-counters**} {*type interface-path-id* | **all**} {*sample-id* | **all-samples** | **last-sample**}

Syntax Description		
monitor	Displays the data collected for an entity instance monitoring collection. The data gathered is from one sample cycle from one instance of an interface data entity collection template.	
	Note The data is available to be display only as the monitor data is collected.	
statistics	Displays the data collected from statistics collection samples.	
basic-counters	Displays data from interface basic counters entity collections.	
data-rates	Displays data from interface data rates entity collections.	
generic-counters	Displays data from interface generic counters entity collections.	
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.	
interface-path-id	(Optional) Physical interface or virtual interface.	
	Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.	
	For more information about the syntax for the router, use the question mark (**?**) online help function.	
all	Displays all interface instances.	
	Note This option is available only with the **statistics** keyword. It is not available with the **monitor** keyword because a entity instance monitoring collection captures data from an entity instance for one sampling cycle.	
sample-id	Sample ID of the monitoring collection or statistics collection to be displayed.	
all-samples	Displays all collected samples.	
last-sample	Displays the last collected samples.	

Command Default None

Command Modes EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Release	Modification
Release 4.0.1	The basic-counters keyword was added to support basic counters entity collections.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read

Examples

This is sample output from the **show performance-mgmt interface** command:

```
RP/0/RSP0/CPU0:router# show performance-mgmt monitor interface generic-counters pos 0/3/0/0
 all-samples

Interface: POS0_3_0_0 Sample no: 1

-------------------------------------------------
InPackets: 0 OutPackets: 0 InOctets: 0
OutOctets: 0 InUcastPkts: 0 OutUcastPkts: 0 InMulticastPkts: 0 OutMulticastPkts: 0
InBroadcastPkts: 0 OutBroadcastPkts: 0 InputTotalDrops: 0 OutputTotalDrops: 0
InputTotalErrors: 0 OutputTotalErrors: 0 InputOverrun: 0 OutputUnderrun: 0
InputQueueDrops: 0 InputUnknownProto: 0 InputCRC: 0 InputFrame: 0 Interface: POS0_3_0_0
Sample no: 2 --------------------------------------------- InPackets: 0 OutPackets: 0
InOctets: 0 OutOctets: 0 InUcastPkts: 0 OutUcastPkts: 0 InMulticastPkts: 0
OutMulticastPkts: 0 InBroadcastPkts: 0 OutBroadcastPkts: 0 InputTotalDrops: 0
OutputTotalDrops: 0 InputTotalErrors: 0 OutputTotalErrors: 0 InputOverrun: 0
OutputUnderrun: 0 InputQueueDrops: 0 InputUnknownProto: 0 InputCRC: 0 InputFrame: 0


RP/0/RSP0/CPU0:router# show performance-mgmt monitor interface generic-counters hundredGigE
 0/3/0/0 all-samples

Interface: HundredGigE0_3_0_0 Sample no: 1

-------------------------------------------------
InPackets: 0 OutPackets: 0 InOctets: 0
OutOctets: 0 InUcastPkts: 0 OutUcastPkts: 0 InMulticastPkts: 0 OutMulticastPkts: 0
InBroadcastPkts: 0 OutBroadcastPkts: 0 InputTotalDrops: 0 OutputTotalDrops: 0
InputTotalErrors: 0 OutputTotalErrors: 0 InputOverrun: 0 OutputUnderrun: 0
InputQueueDrops: 0 InputUnknownProto: 0 InputCRC: 0 InputFrame: 0 Interface:
HundredGigE0_3_0_0
Sample no: 2 --------------------------------------------- InPackets: 0 OutPackets: 0
InOctets: 0 OutOctets: 0 InUcastPkts: 0 OutUcastPkts: 0 InMulticastPkts: 0
OutMulticastPkts: 0 InBroadcastPkts: 0 OutBroadcastPkts: 0 InputTotalDrops: 0
OutputTotalDrops: 0 InputTotalErrors: 0 OutputTotalErrors: 0 InputOverrun: 0
OutputUnderrun: 0 InputQueueDrops: 0 InputUnknownProto: 0 InputCRC: 0 InputFrame: 0
```

This table describes the significant fields shown in the display.

Table 7: show performance-mgmt interface Field Descriptions

Field	Description
InBroadcastPkts	Broadcast packets received.
InMulticast Pkts	Multicast packets received.

Field	Description
InOctets	Bytes received.
InPackets	Packets received.
InputCRC	Inbound packets discarded with incorrect CRC.
InputFrame	Inbound framing errors.
InputOverrun	Input overruns.
InputQueueDrops	Input queue drops.
InputTotalDrops	Inbound correct packets discarded.
InputTotalErrors	Inbound incorrect packets discarded.
InUcastPkts	Unicast packets received.
InputUnknownProto	Inbound packets discarded with unknown proto.
OutBroadcastPkts	Broadcast packets sent.
OutMulticastPkts	Multicast packets sent.
OutOctets	Bytes sent.
OutPackets	Packets sent.
OutputTotalDrops	Outbound correct packets discarded.
OutputTotalErrors	Outbound incorrect packets discarded.
OutUcastPkts	Unicast packets sent.
OutputUnderrun	Output underruns.

show performance-mgmt mpls

To display performance management (PM) data for Multiprotocol Label Switching (MPLS) entity instance monitoring and statistics collections, use the **show performance-mgmt mpls** command in EXEC mode.

show performance-mgmt {**monitor** | **statistics**} **mpls ldp** {*ip-address* | **all**} {*first-sample-id* | **all-samples** | **last-sample**}

Syntax Description		
monitor	Displays the data collected for an entity instance monitoring collection. The data gathered is from one sample cycle from one instance of an MPLS entity collection template.	
	Note The data is available to be displayed only as the monitor data is collected.	
statistics	Displays the data collected from statistics collection samples.	
ldp	Displays data from MPLS Label Distribution Protocol (LDP) collections.	
ip-address	IP address of LDP session instance.	
all	Displays data from all LDP session instances.	
	Note This option is available only with the **statistics** keyword. It is not available with the **monitor** keyword because a entity instance monitoring collection captures data from an entity instance for one sampling cycle.	
first-sample-id	Sample ID of the monitoring or statistics collection to be displayed.	
all-samples	Displays all collected samples.	
last-sample	Displays the last collected samples.	

Command Default   None

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines   No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read

Examples

This is sample output from the **show performance-mgmt mpls** command:

```
 RP/0/RSP0/CPU0:router# show performance-mgmt monitor mpls ldp 192.0.2.45 last-sample
LDP Neighbor: 192.0.2.45 Sample no: 2
--------------------------------------------------------
TotalMsgsSent: 131,

TotalMsgsRcvd: 131 InitMsgsSent: 1, InitMsgsRcvd: 1 AddressMsgsSent: 1, AddressMsgsRcvd:
1 AddressWithdrawMsgsSent: 0, AddressWithdrawMsgsRcvd: 0 LabelMappingMsgsSent: 6,
LabelMappingMsgsRcvd: 7 LabelWithdrawMsgsSent: 0, LabelWithdrawMsgsRcvd: 0
LabelReleaseMsgsSent: 0, LabelReleaseMsgsRcvd: 0 NotificationMsgsSent: 0
NotificationMsgsRcvd: 0
```

This table describes the significant fields shown in the display.

Table 8: show performance-mgmt mpls Field Descriptions

Field	Description
InitMsgsSent	Initial messages sent.
InitMsgsRcvd	Initial messages received.
TotalMsgsSent	Total messages sent.
TotalMsgsRcvd	Total messages received.
AddressMsgsSent	Address messages sent.

show performance-mgmt node

To display performance management (PM) data for node entity monitoring and statistics collections, use the **show performance-mgmt node** command in EXEC mode.

show **performance-mgmt** {**monitor** | **statistics**} **node** {**cpu** | **memory** | **process**} **location** {*node-id* | **all**} {*sample-id* | **all-samples** | **last-sample**}

Syntax Description		
monitor	Displays the data collected for an entity instance monitoring collection. The data gathered is from one sample cycle from one instance of a node entity collection template.	
	Note The data is only available to be displayed as the monitor data is collected.	
statistics	Displays the data collected from statistics collection samples.	
cpu	Displays data from the central processing unit (CPU).	
memory	Displays data from memory.	
process	Displays data from processes.	
location	Specifies the location of data origination.	
node-id	Location of the node. The *node-id* argument is entered in the *rack/slot/module* notation.	
all	Displays data from all LDP session instances.	
	Note This option is available only with the **statistics** keyword. It is not available with the **monitor** keyword because a entity instance monitoring collection captures data from an entity instance for one sampling cycle.	
sample-id	Sample ID of the monitoring or statistics collection to be displayed.	
all-samples	Displays all collected samples.	
last-sample	Displays the last collected samples.	

Command Default   None

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines   No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read

Examples

This is sample output from the **show performance-mgmt node** command:

```
RP/0/RSP0/CPU0:router# show performance-mgmt monitor node process location 0/RSP1/CPU0
process
              614587 last-sample
Node ID: 0_RSP1_CPU0
Sample no: 1 ------------------------------------------- Process ID: 614587
--------------------------------------------- PeakMemory: 908 AverageCPUUsed: 0
NoThreads: 5
```

This table describes the significant fields shown in the display.

Table 9: show performance-mgmt node Field Descriptions

Field	Description
PeakMemory	Maximum system memory (in MB) used since bootup.
AverageCPUused	Average system percent CPU utilization.
NoThreads	Number of threads.

show performance-mgmt ospf

To display performance management (PM) data for Open Shortest Path First (OSPF) entity instance monitoring and statistics collections, use the **show performance-mgmt ospf** command in EXEC mode.

show performance-mgmt {**monitor** | **statistics**} **ospf** {**v2protocol** | **v3protocol**} *instance* {*sample-id* | **all-samples** | **last-sample**}

Syntax Description

monitor	Displays the data collected for an entity instance monitoring collection. The data gathered is from one sample cycle from one instance of an OSPF entity collection template.
	Note The data is available to be displayed only as the monitor data is collected.
statistics	Displays the data collected from statistics collection samples.
v2protocol	Displays counters for an OSPF v2 protocol instance.
v3protocol	Displays counters for an OSPF v3 protocol instance.
sample-id	Sample ID of the monitoring or statistics collection to be displayed.
all-samples	Displays all collected samples.
last-sample	Displays the last collected samples.

Command Default None

Command Modes EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read, write

Examples

This is sample output from the **show performance-mgmt ospf** command:

```
RP/0/RSP0/CPU0:router(config)# show performance-mgmt statistics ospf v2protocol 100
all-samples

Mon Aug 3 06:41:15.785 PST
OSPF Instance: 100 Sample no: 1
-------------------------------------------------------------------
```

```
InputPackets: 12323 OutputPackets: 12045
InputHelloPackets: 11281 OutputHelloPackets: 11276
InputDBDs: 18 OutputDBDs: 20
InputDBDsLSA: 508 OutputDBDsLSA: 530
InputLSRequests: 1 OutputLSRequests: 2
InputLSRequestsLSA: 11 OutputLSRequestsLSA: 0
InputLSAUpdates: 989 OutputLSAUpdates: 109
InputLSAUpdatesLSA: 28282 OutputLSAUpdatesLSA: 587
InputLSAAcks: 34 OutputLSAAcks: 638
InputLSAAcksLSA: 299 OutputLSAAcksLSA: 27995
ChecksumErrors: 0
```

show running performance-mgmt

To display a list of configured templates and the template being applied, use the **show running performance-mgmt** command in EXEC mode.

show running performance-mgmt [**apply** | **resources** | **statistics** | **thresholds**]

Syntax Description		
apply	(Optional) Displays the list of apply template commands in the current configuration.	
resources	(Optional) Displays the existing resource configuration commands applied.	
statistics	(Optional) Displays the list of configured statistics templates.	
thresholds	(Optional) Displays the list of configured threshold templates.	

Command Default   None

Command Modes   EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines   No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
monitor	read, write

Examples

This example shows the list of statistic and threshold templates, the configuration of each template, and at the end, which templates are enabled for collection:

```
RP/0/RSP0/CPU0:router(config)#show running performance-mgmt

performance-mgmt resources tftp-server 192.168.134.254 directory muckier/jagrelo/pmtest
performance-mgmt statistics bgp template template3
 sample-size 5
 sample-interval 60
!
performance-mgmt statistics node cpu template template4
 sample-size 30
 sample-interval 2
!
performance-mgmt statistics interface generic-counters template template2
 sample-size 3
 sample-interval 10
!
performance-mgmt statistics interface data-rates template template1
```

```
 sample-size 10
 sample-interval 5
!
performance-mgmt statistics node memory template template5
 sample-size 30
 sample-interval 2
!
performance-mgmt statistics node process template template6
 sample-size 10
 sample-interval 5
!
performance-mgmt thresholds node cpu template template20
 AverageCpuUsed GT 75
 sample-interval 5
!
performance-mgmt apply statistics interface generic-counters template2
performance-mgmt apply statistics node memory global template5
performance-mgmt apply statistics node process 0/0/CPU0 template6
performance-mgmt apply thresholds node cpu global template20
```

show health sysdb

To display the abstract view of the overall health of the system database (SysDB), use the **show health sysdb** command in EXEC mode.

XML schema is supported for the CLI commands.

- SysDB
    - ConfigurationSpace
    - IPCSpace
    - CPU
    - Memory
- SysdbConnections
    - NodeTable
    - Node

show health sysdb | **location** *<node-id>* | **memory** | **cpu** | **ipc** | **config** | **conn location** *<node-id>*

Syntax Description	**location** *node-id*	Displays the SysDB health information for a specified node. The *node-id* argument is entered in the *rack/slot/module* notation.
	memory	Displays the amount of memory consumed by the SysDB processes.
	cpu	Displays the health of CPU consumed by the SysDB processes.
	ipc	Displays an abstract view of the health of SysDB interprocess communication (IPC) operational space.
	config	Displays an abstract view of the health of SysDB configurational space.
	con location *<node-id>*	Displays an internal breakdown of Lightweight Messaging (LWM) connections for the node.

Command Default   None

Command Modes   EXEC mode

Command History

Release	Modification
Release 6.4.1	This command was introduced.

Usage Guidelines   No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
cisco-support	read
interface	read

Examples   The following is sample output from the **show health sysdb** command to display the health of the SysDB:

```
RP/0/RSP0/CPU0:router# show health sysdb location 0/2/cpu0
sysdb memory is 32MB, memory is healthy
sysdb cpu time is 0%, cpu is healthy
sysdb operational space is healthy
sysdb configuration space is healthy
```