



Displaying CPU Hog Information for IPC Processes

The **show ipc** command displays various interprocess communication (IPC) counters and is used for troubleshooting issues with IPC services. Some IPC messages are delivered in batches, and waiting for the callback function to process the IPC message can lead to the IPC server process hogging the CPU. This feature introduces a new keyword—**hog-info**—to the **show ipc** command to display information about IPC messages that were processed when the IPC process hogged the CPU.

Feature History for the Displaying CPU Hog Information for IPC Processes Feature

Release	Modification
12.0(26)S	This feature was introduced.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Information About Displaying CPU Hog Information for IPC Processes

To use the Displaying CPU Hog Information for IPC Processes feature, you should understand the following concept:

- [Cisco IOS IPC Services, page 2](#)

Cisco IOS IPC Services

The Cisco IOS version of IPC provides a reliable ordered delivery of messages using an underlying platform driver transport or UDP transport protocol. Cisco IOS software IPC services allow line cards (LCs) and the central route processor (RP) in a distributed system, such as a Cisco 7500 series router, to communicate with each other by exchanging messages from the RP to the LCs. Communication messages are also exchanged between active and standby RPs. The IPC messages include configuration commands, responses to the configuration commands, and other events that are reported by an LC to the RP.

How to Display CPU Hog Information for IPC Processes

This section contains the following task:

- [Displaying IPC Hog Information Statistics, page 2](#) (optional)

Displaying IPC Hog Information Statistics

Perform this task to track instances of IPC services hogging the CPU and to display information about IPC messages that were processed when the IPC process hogged the CPU.

SUMMARY STEPS

1. **enable**
2. **show ipc {hog-info | nodes | ports [open] | queue | status [cumulative]}**

DETAILED STEPS

Step 1 enable

Enters privileged EXEC mode. Enter your password if prompted.

```
Router> enable
```

Step 2 show ipc {hog-info | nodes | ports [open] | queue | status [cumulative]}

Enter the **show ipc hog-info** privileged EXEC command to determine if the IPC services have hogged the CPU. In this first example, IPC services have not hogged the CPU.

```
Router# show ipc hog-info
```

```
IPC process has not hogged CPU
```


Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents the following modified command. All other commands used with this feature are documented in the Cisco IOS Release 12.0 command reference publications.

- [show ipc](#)

show ipc

To display interprocess communication (IPC) statistics, use the **show ipc** command in privileged EXEC mode.

```
show ipc {hog-info | nodes | ports [open] | queue | status [cumulative]}
```

Syntax Description		
hog-info		Displays information about IPC messages that were processed when the IPC process hogged the CPU.
nodes		Displays participating nodes.
ports		Displays local and registered IPC ports.
open		(Optional) Displays local IPC ports that have been opened by the current seat (node).
queue		Displays information about the IPC retransmission queue and IPC message queue.
status		Displays the status of the local IPC server.
cumulative		(Optional) Displays cumulative totals for the status counters of the local IPC server since the router was rebooted.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.1(12c)EW	This command was introduced.
	12.0(26)S	The hog-info and cumulative keywords were added.

Usage Guidelines The Cisco IOS version of IPC provides a reliable ordered delivery of messages using an underlying platform driver transport or UDP transport protocol.

Hog-Info

Use the **hog-info** keyword when an error message is displayed stating that an IPC process has hogged the CPU. Information is displayed about the IPC messages that were processed when the IPC process hogged the CPU.

Nodes

A node (referred to as a seat) is an intelligent element, like a processor, that can communicate using IPC services. A seat is where entities and ports reside. A seat manager performs all the interprocessor communications by receiving messages from the network and forwarding the messages to the appropriate port.

Ports

IPC communication endpoints (ports) receive and queue received IPC messages.

Table 1 show ipc hog-info Field Descriptions (continued)

Field	Description
Message-Type	Type of message. IPC clients use different message types to differentiate between messages.
Time-taken	Time taken, in milliseconds, to process the message.

The following is sample output from the **show ipc** command with the **nodes** keyword displaying the participating nodes:

```
Router# show ipc nodes

There are 3 nodes in this IPC realm.
ID      Type      Name                Last Sent Last Heard
10000   Local     IPC Master          0          0
2010000 Local     GALIOS IPC:Card 1  0          0
2020000 Ethernet GALIOS IPC:Card 2  12         26
```

Table 2 describes the significant fields shown in the display.

Table 2 show ipc nodes Field Descriptions

Field	Description
ID	Port ID.
Type	Type of seat (node).
Name	Seat name.
Last Sent	Sequence number of the message that was last sent.
Last Heard	Sequence number of the in-sequence message that was last heard.

The following is sample output from the **show ipc** command with the **ports** keyword displaying the local and registered IPC ports:

```
Router# show ipc ports

There are 11 ports defined.

Port ID  Type      Name                (current/peak/total)
10000.1  unicast   IPC Master:Zone
10000.2  unicast   IPC Master:Echo
10000.3  unicast   IPC Master:Control
10000.4  unicast   Remote TTY Server Port
10000.5  unicast   GALIOS RF :Active
index = 0 seat_id = 0x2020000 last sent = 0 heard = 1635 0/1/1635

10000.6  unicast   GALIOS RED:Active
index = 0 seat_id = 0x2020000 last sent = 0 heard = 2 0/1/2

2020000.3 unicast   GALIOS IPC:Card 2:Control
2020000.4 unicast   GALIOS RFS :Standby
2020000.5 unicast   Slave: Remote TTY Client Port
2020000.6 unicast   GALIOS RF :Standby
2020000.7 unicast   GALIOS RED:Standby
RPC packets: current/peak/total
              0/1/17
```

Table 3 describes the significant fields shown in the display.

Table 3 show ipc ports Field Descriptions

Field	Description
Port ID	Port ID.
Type	Type of port.
Name	Port name.
current/peak/total	Displays information about the number of messages held by this IPC session.

The following is sample output from the **show ipc** command with the **queue** keyword displaying information about the IPC retransmission queue:

```
Router# show ipc queue

Message waiting for acknowledgement in Tx queue :      0
Maximum acknowledgement msg usage in Tx queue :      6

Message waiting for additional Fragments      :      0
Maximum message fragment usage                :      0

There are 0 IPC messages waiting for a response.
There are 0 IPC messages currently on the IPC inboundQ.

Messages currently in use                      :      0
Message cache size                            :      1000
Maximum message cache usage                   :      1000

0 times message cache crossed      5000 [max]

Emergency messages currently in use           :      0

Inbound message queue depth 0
Zone inbound message queue depth 0
```

The following is sample output from the **show ipc** command with the **status** keyword:

```
Router# show ipc status

IPC System Status

Time last IPC stat cleared : never

This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.

1000 IPC Message Headers Cached.

                                     Rx Side   Tx Side
Total Frames                          1861     342
Total from Local Ports                 1845     422
Total Protocol Control Frames          211     131
Total Frames Dropped                   0        0
```

```

Service Usage
Total via Unreliable Connection-Less Service      1319      0
Total via Unreliable Sequenced Connection-Less Svc  395      0
Total via Reliable Connection-Oriented Service    131      211

IPC Protocol Version 0
Total Acknowledgements                          211      131
Total Negative Acknowledgements                  0        0

Device Drivers
Total via Local Driver                           0        0
Total via Platform Driver                        1861     211
Total Frames Dropped by Platform Drivers         0        0

Reliable Tx Statistics
Re-Transmission                                 0
Re-Tx Timeout                                  0

Rx Errors                                     Tx Errors
Unsupp IPC Proto Version                       0 Tx Session Error                       0
Corrupt Frame                                  0 Tx Seat Error                           0
Duplicate Frame                                0 Destination Unreachable               0
Rel Out-of-Seq Frame                           0 Unrel Out-of-Seq Frame                 0
Dest Port does Not Exist                       0 Tx Driver Failed                       0
Rx IPC Msg Alloc Failed                        0 Ctrl Frm Alloc Failed                  0
Unable to Deliver Msg                          0 Tx Test Drop                           0

Buffer Errors                                 Misc Errors
IPC Msg Alloc                                  0 IPC Open Port                           0
Emer IPC Msg Alloc                             0 No HWQ                                   0
IPC Frame PakType Alloc                       0 Hardware Error                         0
IPC Frame MemD Alloc                           0

Tx Driver Errors
No Transport                                   0
MTU Failure                                   0
Dest does not Exist                           0

```

Table 4 describes the significant fields shown in the display.

Table 4 show ipc status Field Descriptions

Field	Description
Time last IPC stat cleared	Displays time, in dd:hh:mm, since the IPC statistics were last cleared.
This processor is	Shows whether the processor is the IPC master or an IPC slave.
IPC Message Headers Cached	Number of message headers available in IPC message cache.
Rx Side	Information about IPC messages received.
Tx Side	Information about IPC messages sent.

Table 4 *show ipc status Field Descriptions (continued)*

Field	Description
Service Usage	Number of IPC messages received or sent via connectionless or connection-oriented protocols.
IPC Protocol Version 0	Number of acknowledgements and negative acknowledgements received or sent by the system.
Device Drivers	Number of IPC messages received or sent using the underlying device drivers.
Reliable Tx Statistics	Number of IPC messages that were retransmitted or timed out on retransmission using a reliable connection-oriented protocol.
Rx Errors	Number of IPC messages received displaying various internal frame or delivery errors.
Tx Errors	Number of IPC messages sent displaying various transmission errors.
Buffer Errors	Number of message allocation failures from the IPC message cache, IPC emergency message cache, IPC frame allocation cache, and the IPC frame memory allocation cache.
Misc Errors	Various miscellaneous errors relating to the IPC open queue, to the hardware queue, or to other hardware failures.
Tx Driver Errors	Number of messages related to IPC transmission driver failures including messages to or from a destination without a valid transport entity from the seat; number of messages dropped because packet size is larger than the Maximum transmission unit (MTU); and number of messages without a valid destination address.

The following example shows how to display cumulative IPC counters for the local IPC server. Note that the recent IPC clearing has not cleared the IPC counters because the **cumulative** keyword displays the IPC statistics generated since the router was rebooted.

```
Router# show ipc status cumulative
```

```
IPC System Status
```

```
Time last IPC stat cleared : 00:00:05
```

```
This processor is the IPC master server.  
Do not drop output of IPC frames for test purposes.
```

```
1000 IPC Message Headers Cached.
```

	Rx Side	Tx Side
Total Frames	3473	184
Total from Local Ports	3473	92
Total Protocol Control Frames	92	54
Total Frames Dropped	0	0

```

Service Usage
Total via Unreliable Connection-Less Service      2449      0
Total via Unreliable Sequenced Connection-Less Svc  970      0
Total via Reliable Connection-Oriented Service    54      92

IPC Protocol Version 0

Total Acknowledgements                          0      0
Total Negative Acknowledgements                  0      0

Device Drivers

Total via Local Driver                           0      0
Total via Platform Driver                        0      92
Total Frames Dropped by Platform Drivers         0      0

Reliable Tx Statistics

Re-Transmission                                 0
Re-Tx Timeout                                  0

Rx Errors                                     Tx Errors
Unsupp IPC Proto Version                      0 Tx Session Error                      0
Corrupt Frame                                 0 Tx Seat Error                          0
Duplicate Frame                               0 Destination Unreachable              0
Out-of-Sequence Frame                        0 Tx Test Drop                           0
Dest Port does Not Exist                     0 Tx Driver Failed                       0
Rx IPC Msg Alloc Failed                      0 Ctrl Frm Alloc Failed                 0
Unable to Deliver Msg                        0

Buffer Errors                                 Misc Errors
IPC Msg Alloc                                 0 IPC Open Port                          0
Emer IPC Msg Alloc                           0 No HWQ                                  0
IPC Frame PakType Alloc                      0 Hardware Error                         0
IPC Frame MemD Alloc                          0

Tx Driver Errors

No Transport                                  0
MTU Failure                                   0
Dest does not Exist                           0
    
```

Related Commands	Command	Description
	clear ipc statistics	Clears and resets the IPC statistics.

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