



# Transport Stack Commands on Cisco IOS-XR Software

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This chapter describes the Cisco IOS-XR software commands used to configure and monitor features related to the transport stack (TCP, User Datagram Protocol (UDP) and RAW).

# clear raw statistics pcb

To clear statistics for a single RAW connection or for all RAW connections, use the **clear raw statistics pcb** command in EXEC mode.

```
clear raw statistics pcb {all | pcb-address} [location node-id]
```

Syntax Description	all	Clears statistics for all RAW connections.
	<i>pcb-address</i>	Clears statistics for a specific RAW connection.
	<b>location</b> <i>node-id</i>	(Optional) Clears statistics for the designated node. The <i>node-id</i> argument is entered in the /rack/slot/module notation.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use the **all** keyword to clear all RAW connections. To clear a specific RAW connection, enter the protocol control block (PCB) address of the RAW connection. Use the **show raw brief** command to obtain the PCB address.

The optional **location** keyword and *node-id* argument can be used to clear RAW statistics for a designated node.

**Examples** The following example clears statistics for a RAW connection with PCB address 0x80553b0:

```
RP/0/RP0/CPU0:router# clear raw statistics pcb 0x80553b0
RP/0/RP0/CPU0:router# show raw statistics pcb 0x80553b0
```

```
Statistics for PCB 0x80553b0
Send:  0 packets received from application
       0 xipc pulse received from application
       0 packets sent to network
       0 packets failed getting queued to network
Rcvd:  0 packets received from network
       0 packets queued to application
       0 packets failed queued to application
```

This example clears statistics for all RAW connections:

```
RP/0/RP0/CPU0:router# clear raw statistics pcb all
RP/0/RP0/CPU0:router# show raw statistics pcb all
```

```
Statistics for PCB 0x805484c
Send:  0 packets received from application
```

```

    0 xipc pulse received from application
    0 packets sent to network
    0 packets failed getting queued to network
Rcvd: 0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

Statistics for PCB 0x8054f80
Send:  0 packets received from application
      0 xipc pulse received from application
      0 packets sent to network
      0 packets failed getting queued to network
Rcvd:  0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

Statistics for PCB 0x80553b0
Send:  0 packets received from application
      0 xipc pulse received from application
      0 packets sent to network
      0 packets failed getting queued to network
Rcvd:  0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

```

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## Related Commands

Command	Description
<b>show raw brief</b>	Displays information about active RAW IP sockets.
<b>show raw statistics pcb</b>	Displays statistics for either a single RAW connection or all RAW connections.

# clear tcp pcb

To clear TCP Protocol Control Block (PCB) connections, use the **clear tcp pcb** command in EXEC mode.

```
clear tcp pcb {pcb-address | all} [location node-id]
```

Syntax Description		
	<i>pcb-address</i>	Clears the TCP connection at the specified PCB address.
	<b>all</b>	Clears all open TCP connections.
	<b>location</b> <i>node-id</i>	(Optional) Clears the TCP connection for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

The **clear tcp pcb** command is useful for clearing hung TCP connections. Use the **show tcp brief** command to find the PCB address of the connection you want to clear.

The software will not clear a TCP connection that is in LISTEN state.

**Examples** In the following example, the TCP connection at PCB address 60B75E48 is cleared:

```
RP/0/RP0/CPU0:router# clear tcp pcb 60B75E48
```

Related Commands	Command	Description
	<b>show tcp brief</b>	Displays the TCP summary table.

# clear tcp statistics

To clear TCP statistics, use the **clear tcp statistics** command in EXEC mode.

```
clear tcp statistics [pcb { all | pcb-address } | location node-id]
```

Syntax	Description
<b>pcb all</b>	(Optional) Clears statistics for all TCP connections.
<b>pcb</b> <i>pcb-address</i>	(Optional) Clears statistics for a specific TCP connection.
<b>location</b> <i>node-id</i>	(Optional) Clears TCP statistics for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes
EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

Usage Guidelines
<p>To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the <i>Configuring AAA Services on Cisco IOS-XR Software</i> module of the <i>Cisco IOS-XR System Security Configuration Guide</i>.</p> <p>Use the <b>clear tcp statistics</b> command to clear TCP statistics. Use the <b>show tcp statistics</b> command to display TCP statistics. You might display TCP statistics and then clear them before you start debugging TCP.</p> <p>The optional <b>location</b> keyword and <i>node-id</i> argument can be used to clear TCP statistics for a designated node.</p>

Examples
<p>The following example clears TCP statistics:</p> <pre>RP/0/RP0/CPU0:router# <b>clear tcp statistics</b></pre>

Related Commands	Command	Description
	<b>show tcp statistics</b>	Displays TCP statistics.

# clear udp statistics

To clear User Datagram Protocol (UDP) statistics, use the **clear udp statistics** command in EXEC mode.

```
clear udp statistics { pcb { all | pcb-address } | summary } [location node-id]
```

Syntax	Description
<b>pcb all</b>	Clears statistics for all UDP connections.
<b>pcb</b> <i>pcb-address</i>	Clears statistics for a specific UDP connection.
<b>summary</b>	Clears UDP summary statistics.
<b>location</b> <i>node-id</i>	(Optional) Clears UDP statistics for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use the **clear udp statistics** command to clear UDP statistics. Use the **show udp statistics** command to display UDP statistics. You might display UDP statistics and then clear them before you start debugging UDP.

The optional **location** keyword and *node-id* argument can be used to clear UDP statistics for a designated node.

**Examples** The following example clears UDP summary statistics:

```
RP/0/RP0/CPU0:router# clear udp statistics summary
```

Related Commands	Command	Description
	<b>show udp statistics</b>	Displays UDP statistics.

# forward-protocol udp

To configure the system to forward any User Datagram Protocol (UDP) datagrams that are received as broadcast packets to a specified helper address, use the **forward-protocol udp** command in global configuration mode. To restore the system to its default condition with respect to this command, use the **no** form of this command.

**forward-protocol udp** {*port-number* | **disable** | **domain** | **nameserver** | **netbios-dgm** | **netbios-ns** | **tacacs** | **tftp**}

**no forward-protocol udp** {*port-number* | **disable** | **domain** | **nameserver** | **netbios-dgm** | **netbios-ns** | **tacacs** | **tftp**}

Syntax Description	
<i>port-number</i>	Forwards UDP broadcast packets to a specified port number. Port number range is from 1 to 65535.
<b>disable</b>	Disables IP Forward Protocol UDP.
<b>domain</b>	Forwards UDP broadcast packets to Domain Name Service (DNS, 53).
<b>nameserver</b>	Forwards UDP broadcast packets to IEN116 name service (obsolete, 42).
<b>netbios-dgm</b>	Forwards UDP broadcast packets to NetBIOS datagram service (138).
<b>netbios-ns</b>	Forwards UDP broadcast packets to Network Basic Input/Output System (NetBIOS) name service (137).
<b>tacacs</b>	Forwards UDP broadcast packets to TAC Access Control System (TACACS) (49).
<b>tftp</b>	Forwards UDP broadcast packets to TFTP (69).

**Defaults** Disabled

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use the **forward-protocol udp** command to specify that UDP broadcast packets received on the incoming interface are forwarded to a specified helper address.

When you configure the **forward-protocol udp** command, you must also configure the **helper-address** command to specify a helper address on an interface. The helper address is the IP address to which the UDP datagram is forwarded. Configure the **helper-address** command with IP addresses of hosts or networking devices that can handle the service. Because the helper address is configured per interface, you must configure a helper address for each incoming interface that will be receiving broadcasts that you want to forward.

You must configure one **forward-protocol udp** command per UDP port you want to forward. The port on the packet is either port 53 (**domain**), port 69 (**tftp**), or a port number you specify.

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### Examples

The following example specifies that all UDP broadcast packets with port 53 or port 69 received on incoming MgmtEth interface 0/0/CPU0/0 are forwarded to 172.16.0.1. MgmtEth interface 0/0/CPU0/0 receiving the UDP broadcasts is configured with a helper address of 172.16.0.1, the destination address to which the UDP datagrams are forwarded.

```
RP/0/RP0/CPU0:router(config)# forward-protocol udp domain
RP/0/RP0/CPU0:router(config)# forward-protocol udp tftp
RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# ip helper-address 172.16.0.1
```

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### Related Commands

Command	Description
<b>helper-address</b>	Configures an address to which UDP broadcasts are forwarded.

# service tcp-small-servers

To enable small TCP servers such as the Echo, use the **service tcp-small-servers** command in global configuration mode. To disable the TCP server, use the **no** form of this command.

```
service {ipv4 | ipv6} tcp-small-servers [max-servers number | no-limit] [access-list-name]
```

```
no service {ipv4 | ipv6} tcp-small-servers [max-servers number | no-limit] [access-list-name]
```

Syntax Description		
<b>ip4</b>		Specifies IPv4 small servers.
<b>ipv6</b>		Specifies IPv6 small servers.
<b>max-servers</b>	(Optional)	Sets the number of allowable TCP small servers.
<i>number</i>	(Optional)	Number value. Range is from 1 to 2147483647.
<b>no-limit</b>	(Optional)	Sets no limit to the number of allowable TCP small servers.
<i>access-list-name</i>	(Optional)	The name of an access list.

**Defaults** TCP small servers are disabled.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

The TCP small servers currently consist of three services: Discard (port 9), Echo (port 7) and Chargen (port 19). These services are used to test the TCP transport functionality. The Discard server receives data and discards it. The Echo server receives data and echoes the same data to the sending host. The Chargen server generates a sequence of data and sends it to the remote host.

**Examples** In the following example, small IPv4 TCP servers are enabled:

```
RP/0/RP0/CPU0:router(config)# service ipv4 tcp-small-servers max-servers 5 ac1100
```

Related Commands	Command	Description
	<a href="#">service udp-small-servers</a>	Enables small UDP servers such as the ECHO.
	<b>show cinetd services</b>	Displays the services whose processes are spawned by cinetd.

# service udp-small-servers

To enable small User Datagram Protocol (UDP) servers such as the ECHO, use the **service udp-small-servers** command in global configuration mode. To disable the UDP server, use the **no** form of this command.

```
service {ipv4 | ipv6} udp-small-servers [max-servers number | no-limit] [access-list-name]
```

```
no service {ipv4 | ipv6} udp-small-servers [max-servers number | no-limit] [access-list-name]
```

Syntax Description		
<b>ip4</b>		Specifies IPv4 small servers.
<b>ipv6</b>		Specifies IPv6 small servers.
<b>max-servers</b>	(Optional)	Sets the number of allowable UDP small servers.
<i>number</i>	(Optional)	Number value. Range is from 1 to 2147483647.
<b>no-limit</b>	(Optional)	Sets no limit to the number of allowable UDP small servers.
<i>access-list-name</i>	(Optional)	The name of an access list.

**Defaults** UDP small servers are disabled.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

The UDP small servers currently consist of three services: discard (port 9), echo (port 7) and chargen (port 19). These services are used to test the UDP transport functionality. The discard server receives data and discards it. The echo server receives data and echoes the same data to the sending host. The chargen server generates a sequence of data and sends it to the remote host.

**Examples** In the following example, small IPv6 UDP servers are enabled and the maximum number of allowable small servers is set to 10:

```
RP/0/RP0/CPU0:router(config)# service ipv6 udp-small-servers max-servers 10
```

## ■ service udp-small-servers

Related Commands	Command	Description
	<a href="#">service tcp-small-servers</a>	Enables small TCP servers such as the ECHO.
	<b>show cinetd services</b>	Displays the services whose processes are spawned by cinetd.

# show raw brief

To display information about active RAW IP sockets, use the **show raw brief** command in EXEC mode.

**show raw brief** [**location** *node-id*]

Syntax	Description
<b>location</b> <i>node-id</i>	(Optional) Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes
EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Protocols such as Open Shortest Path First (OSPF) and Protocol Independent Multicast (PIM) use long-lived RAW IP sockets. The **ping** and **traceroute** commands use short-lived RAW IP sockets. Use the **show raw brief** command if you suspect a problem with one of these protocols.

## Examples

The following is sample output from the **show raw brief** command:

```
RP/0/RP0/CPU0:router# show raw brief
```

PCB	Recv-Q	Send-Q	Local Address	Foreign Address	Protocol
0x805188c	0	0	0.0.0.0	0.0.0.0	2
0x8051dc8	0	0	0.0.0.0	0.0.0.0	103
0x8052250	0	0	0.0.0.0	0.0.0.0	255

# show raw pcb

To display information about active RAW IP sockets, use the **show raw pcb** command in EXEC mode.

```
show raw pcb {interface-filter location node-id | location node-id | paktype-filter location node-id}
```

Syntax Description		
	<b>interface-filter</b>	Displays the protocol control blocks (PCBs) with configured interface filters.
	<b>location</b> <i>node-id</i>	Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.
	<b>paktype-filter</b>	Displays the PCBs with configured packet type filters.

Command Modes	
	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

The **show raw pcb** command displays detailed information for all connections that use the RAW transport. Information that is displayed includes family type (for example, 2 for AF\_INET also known as IPv4), PCB address, Layer 4 (also known as transport) protocol, local address, foreign address, and any filter that is being used.

## Examples

The following is sample output from the **show raw pcb** command:

```
RP/0/RP0/CPU0:router# show raw pcb location 0/0/CPU0
```

```
Total Number of matching PCB's in database: 1
JID: 0/0
Family: 2
PCB: 0x0803dd38
L4-proto: 1
Laddr: 0.0.0.0
Faddr: 0.0.0.0
ICMP error filter mask: 0x3ff
LPTS socket options: 0x0020
Packet Type Filters:
 0
 [220 pkts in]
 3
 [0 pkts in]
 4
 [0 pkts in]
```

# show raw statistics pcb

To display statistics for a single RAW connection or for all RAW connections, use the **show raw statistics pcb** command in EXEC mode.

```
show raw statistics pcb {all | pcb-address} [location node-id]
```

Syntax Description	all	Displays statistics for all RAW connections.
	<i>pcb-address</i>	Displays statistics for a specified RAW connection.
	<b>location</b> <i>node-id</i>	(Optional) Displays RAW statistics for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes	EXEC
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Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use the **all** keyword to display all RAW connections. If a specific RAW connection is desired, then enter the protocol control block (PCB) address of that RAW connection. Use the **show raw brief** command to obtain the PCB address.

The optional **location** keyword and *node-id* argument can be used to display RAW statistics for a designated node.

**Examples**

In the following example, statistics for a RAW connection with PCB address 0x80553b0 are displayed:

```
RP/0/RP0/CPU0:router# show raw statistics pcb 0x80553b0
```

```
Statistics for PCB 0x80553b0
Send:  0 packets received from application
        0 xipc pulse received from application
        0 packets sent to network
        0 packets failed getting queued to network
Rcvd:  0 packets received from network
        0 packets queued to application
        0 packets failed queued to application
```

In this example, statistics for all RAW connections are displayed:

```
RP/0/RP0/CPU0:router# show raw statistics pcb all
```

```
Statistics for PCB 0x805484c
Send:  0 packets received from application
        0 xipc pulse received from application
        0 packets sent to network
```

## ■ show raw statistics pcb

```

    0 packets failed getting queued to network
Rcvd: 0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

```

```

Statistics for PCB 0x8054f80
Send: 0 packets received from application
      0 xipc pulse received from application
      0 packets sent to network
      0 packets failed getting queued to network
Rcvd: 0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

```

```

Statistics for PCB 0x80553b0
Send: 0 packets received from application
      0 xipc pulse received from application
      0 packets sent to network
      0 packets failed getting queued to network
Rcvd: 0 packets received from network
      0 packets queued to application
      0 packets failed queued to application

```

## Related Commands

Command	Description
<b>clear raw statistics pcb</b>	Clears statistics for either a single RAW connection or for all RAW connections.
<a href="#">show raw brief</a>	Displays information about active RAW IP sockets.

# show tcp brief

To display a summary of the TCP connection table, use the **show tcp brief** command in EXEC mode.

**show tcp brief** [**location** *node-id*]

Syntax	Description
<b>location</b> <i>node-id</i>	(Optional) Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes
EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

**Examples**

The following is sample output from the **show tcp brief** command:

```
RP/0/RP0/CPU0:router# show tcp brief
```

TCPCB	Recv-Q	Send-Q	Local Address	Foreign Address	State
0x80572a8	0	0	0.0.0.0:513	0.0.0.0:0	LISTEN
0x8056948	0	0	0.0.0.0:23	0.0.0.0:0	LISTEN
0x8057b60	0	3	10.8.8.2:23	10.8.8.1:1025	ESTAB

Related Commands	Command	Description
	<b>clear tcp pcb</b>	Clears the TCP connection.
	<b>show tcp pcb</b>	Displays details of TCP connections.

# show tcp pcb

To display the Protocol Control Block (PCB) database in the TCP stack, use the **show tcp pcb** command in EXEC mode.

```
show tcp pcb {pcb-address | spolicy | location node-id}
```

Syntax Description		
	<i>pcb-address</i>	Specifies a PCB address for which detailed information is displayed.
	<b>spolicy</b>	Displays the PCBs configured with static policies.
	<b>location</b> <i>node-id</i>	Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes	
	EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use this command to display detailed information for all connections that use the TCP transport. Some of the information that is displayed includes family type (for example, 2 for AF\_NET (also known as IPv4)), PCB address, Layer 4 (also known as transport) protocol, local port, foreign port, local address, foreign address, and any static policy configured.

If you specify the **spolicy** keyword, only the PCBs that have the Local Packet Transport System (LPTS) static policy filters configured will be displayed.

Use the [show tcp brief](#) command to find the TCP information you want to display.

## Examples

The following is sample output from the **show tcp pcb** command:

```
RP/0/RP0/CPU0:router# show tcp pcb location 0/0/CPU0
```

```
Total number of matching PCB's in database: 1
-----
JID: 0/0
Family: 2
PCB: 0x08067f10
L4-proto: 6
Lport: 513
Fport: 0
Laddr: 0.0.0.0
Faddr: 0.0.0.0
ICMP error filter mask: 0x12
LPTS socket options: 0x000
-----
```

The following is sample output from the **show tcp pcb** *pcb-address* command:

```
RP/0/RP0/CPU0:router# show tcp pcb 0x8052ae8

Connection state is LISTEN, I/O status:0, socket status:0
Local host:0.0.0.0, Local port:23
Foreign host:0.0.0.0, Foreign port:0

Current send queue size:0 (max 14600)
Current receive queue size:0 (max 14600)  mis-ordered:0 bytes

Timer           Starts      Wakeups      Next (msec)
Retrans         0           0             0
SendWnd         0           0             0
TimeWait        0           0             0
AckHold         0           0             0
KeepAlive       0           0             0
PmtuAger        0           0             0
GiveUp          0           0             0

      iss:0          snduna:0          sndnxt:0
sndmax:0          sndwnd:0          sndcwnd:65535
      irs:0          rcvnxt:0          rcvwnd:14600   rcvadv:0

SRTT:1000 ms,  RTTO:3000 ms,  RTV:0 ms,   KRTT:0 ms
minRTT:0 ms,   maxRTT:0 ms

ACK hold time:200 ms,  Keepalive time:0 sec,  SYN wait time:75 sec
Giveup time:0 ms,  Retransmission retries:0,  Retransmit forever:FALSE

State flags:none
Feature flags:Timestamp, Win Scale, Nagle
Request flags:none

Datagrams:MSS 0 bytes,  peer MSS 0 bytes
Socket states:SS_PRIV
```

#### Related Commands

Command	Description
<b>clear tcp pcb</b>	Clears the TCP connection.
<b>show lpts</b>	Displays LPTS information.
<b>show tcp brief</b>	Displays a summary of the TCP connection table.

# show tcp statistics

To display TCP statistics, use the **show tcp statistics** command in EXEC mode.

```
show tcp statistics [pcb {pcb-address | all}] [location node-id]
```

Syntax	Description
<b>pcb</b> <i>pcb-address</i>	(Optional) Displays detailed statistics for a specified connection.
<b>pcb all</b>	(Optional) Displays detailed statistics for all connections.
<b>location</b> <i>node-id</i>	(Optional) Displays statistics for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

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

Command History	Release	Modification
	Release 2.0	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the <i>Configuring AAA Services on Cisco IOS-XR Software</i> module of the <i>Cisco IOS-XR System Security Configuration Guide</i> .
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Examples	The following is sample output from the <b>show tcp statistics</b> command:
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```
RP/0/RP0/CPU0:router# show tcp statistics

TCP statistics:
Rcvd: 0 Total, 0 no port
0 checksum error, 0 too short
0 packets (0 bytes) in sequence
0 dup packets (0 bytes)
0 partially dup packets (0 bytes)
0 out-of-order packets (0 bytes)
0 packets (0 bytes) with data after window
0 packets after close
0 window probe packets, 0 window update packets
0 dup ack packets, 0 ack packets with unsend data
0 ack packets (0 bytes)
Sent: 0 Total, 0 urgent packets
0 control packets (including 0 retransmitted)
0 data packets (0 bytes)
0 data packets (0 bytes) retransmitted
0 ack only packets (0 delayed)
0 window probe packets, 0 window update packets
0 Connections initiated, 0 connections accepted, 0 connections
established
3 Connections closed (0 dropped, 0 embryonic dropped)
0 Total rxmt timeout, 0 connections dropped in rxmt timeout
0 Keepalive timeout, 0 keepalive probe, 0 Connections dropped in
keepalive
```

```

0 SYN cache entries
0 SYN cache added, 0 completed
0 SYN cache timedout, 0 reset, 0 aborted
0 SYN cache unreachable, 0 dups, 0 dropped
0 SYN cache bucket overflow, 0 cache overflow
0 Send pulse errors
3 Open sockets
0 Packets owned by the socket layer
0 Packets owned by TCP reassembly
0 Packets freed after starvation
0 Packet allocation errors
0 increase MSS, 0 decrease MSS

```

---

**Related Commands**

Command	Description
<a href="#">clear tcp statistics</a>	Clears TCP statistics.

# show udp brief

To display a summary of the User Datagram Protocol (UDP) connection table, use the **show udp brief** command in EXEC mode.

**show udp brief** [*location node-id*]

Syntax	Description
<b>location</b> <i>node-id</i>	(Optional) Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

Command Modes
EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

**Examples**

The following is sample output from the **show udp brief** command:

```
RP/0/RP0/CPU0:router# show udp brief

PCB          Recv-Q  Send-Q  Local Address          Foreign Address
0x8040c4c    0        0  0.0.0.0:7             0.0.0.0:0
0x805a120    0        0  0.0.0.0:9             0.0.0.0:0
0x805a430    0        0  0.0.0.0:19            0.0.0.0:0
0x805a740    0        0  0.0.0.0:67            0.0.0.0:0
0x804fcb0    0        0  0.0.0.0:123           0.0.0.0:0
```

Related Commands	Command	Description
	<b>show tcp brief</b>	Displays details of TCP connections.

# show udp pcb

To display the Protocol Control Block (PCB) database in the User Datagram Protocol (UDP) stack, use the **show udp pcb** command in EXEC mode.

```
show udp pcb {spolicy | location node-id}
```

Syntax Description	spolicy	Displays the PCBs configured with static policies.
	location node-id	Displays detailed information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

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

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use this command to display detailed information for all connections that use the UDP transport. Information that is displayed includes family type (for example, 2 for AF\_NET, also known as IPv4), PCB address, Layer 4 (also known as transport) protocol, local port, foreign port, local address, foreign address, and any static policy configured.

Socket client information is also displayed in the form of job ID.

If you specify the **spolicy** keyword, only the PCBs that have the Local Packet Transport System (LPTS) static policy filters configured will be displayed.

## Examples

The following example displays the output of the **show udp pcb** command:

```
RP/0/RP0/CPU0:router# show udp pcb location 0/0/CPU0
```

```
Total number of matching PCB's in database: 1
```

```
-----
JID: 0/0
Family: 2
PCB: 0x0804cdf0
L4-proto: 17
Lport: 7
Fport: 0
Laddr: 0.0.0.0
Faddr: 0.0.0.0
ICMP error filter mask: 0x0
LPTS socket options: 0x0000
-----
```

# show udp statistics

To display User Datagram Protocol (UDP) statistics, use the **show udp statistics** command in EXEC mode.

```
show udp statistics {summary | pcb {pcb-address | all}} [location node-id]
```

Syntax	Description
<b>summary</b>	Displays summary statistics.
<b>pcb</b> <i>pcb-address</i>	Displays detailed statistics for each connection.
<b>pcb all</b>	Displays detailed statistics for all connections.
<b>location</b> <i>node-id</i>	(Optional) Displays information for the designated node. The <i>node-id</i> argument is entered in the rack/slot/module notation.

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

**Examples** The following is sample output from the **show udp statistics summary** command:

```
RP/0/RP0/CPU0:router# show udp statistics summary
```

```
UDP statistics:
Rcvd:0 Total, 0 drop, 0 no port
      0 checksum error, 0 too short
Sent:0 Total, 4 error
0 Total forwarding broadcast packets
0 Cloned packets, 0 failed cloning
```

The first line shows the total number of packets received, total number of received packets dropped, and the total number of received packets that have no listening port. The second line shows the total number of received packets that have checksum error or are too short for UDP packets. The third line shows the total number of packets successfully sent and the number of packets that cannot be sent due to some error. The fourth line shows the total number of broadcast packets that are forwarded to the helper address. The last line shows the total number of packets that are cloned successfully and the number of packets that failed the cloning. UDP clones the received packets if there are multiple multicast applications that are interested in receiving those packets.

**Related Commands**

Command	Description
<a href="#">clear udp statistics</a>	Clears UDP statistics.

# tcp path-mtu-discovery

To allow TCP to automatically detect the highest common Maximum Transfer Unit (MTU) for a connection, use the **tcp path-mtu-discovery** in global configuration mode. To reset the default, use the **no** form of this command.

**tcp path-mtu-discovery** [**age-timer** *minutes* | **infinite**]

**no tcp path-mtu-discovery**

Syntax Description	age-timer <i>minutes</i>	(Optional) Specifies a value in minutes. The range is from 10 to 30. By default, a value of 10 minutes is used.
	<b>infinite</b>	(Optional) Turns off the age timer.

**Defaults** Disabled

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use this command to allow TCP to automatically detect the highest common MTU for a connection, such that when a packet traverses between the originating host and destination host the packet will not be fragmented and then reassembled.

The age timer value is in minutes, with a default value of 10 minutes. The age timer is used by TCP to automatically detect if there is an increase in MTU for a particular connection. If the **infinite** keyword is specified, the age timer is turned off.

**Examples** The following example sets the age timer to 20 minutes:

```
RP/0/RP0/CPU0:router (config) # tcp path-mtu-discovery age-timer 20
```

# tcp selective-ack

To enable TCP Selective acknowledgment (ACK) and identify which segments in a TCP packet have been received by the remote TCP, use the **tcp selective-ack** command in global configuration mode. To reset the default, use the **no** form of this command.

**tcp selective-ack**

**no tcp selective-ack**

**Syntax Description** This command has no arguments or keywords.

**Defaults** TCP Selective ACK is disabled.

**Command Modes** Global configuration

Release	Modification
Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

If TCP Selective ACK is enabled, each packet contains information about which segments have been received by the remote TCP. The sender can then resend only those segments that are lost. If Selective ACK is disabled, the sender receives no information about missing segments and will automatically send the first packet that is not acknowledged and then wait for the other TCP to respond with what is missing from the data stream. This method is inefficient because in Long Fat Network (LFN) the bandwidth delay is large and valuable bandwidth is wasted.

**Examples** In the following example, the Selective ACK is enabled:

```
RP/0/RP0/CPU0:router(config)# tcp selective-ack
```

Command	Description
<b>tcp timestamp</b>	Measures the round-trip time of a packet.

# tcp synwait-time

To set a period of time the software waits while attempting to establish a TCP connection before it times out, use the **tcp synwait-time** command in global configuration mode. To restore the default time, use the **no** form of this command.

**tcp synwait-time** *seconds*

**no tcp synwait-time** *seconds*

<b>Syntax Description</b>	<i>seconds</i>	Time in seconds the software waits while attempting to establish a TCP connection. It can be an integer from 5 to 300 seconds. The default is 75 seconds.
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<b>Defaults</b>	<i>seconds: 75 seconds</i>
-----------------	----------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 2.0	This command was introduced.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the <i>Configuring AAA Services on Cisco IOS-XR Software</i> module of the <i>Cisco IOS-XR System Security Configuration Guide</i> .
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<b>Examples</b>	The following example configures the software to continue attempting to establish a TCP connection for 180 seconds:
-----------------	---

```
RP/0/RP0/CPU0:router(config)# tcp synwait-time 180
```

# tcp timestamp

To more accurately measure the round-trip time of a packet, use the **tcp timestamp** command in global configuration mode. To reset the default, use the **no** form of this command.

**tcp timestamp**

**no tcp timestamp**

**Syntax Description** This command has no arguments or keywords.

**Defaults** TCP time stamp is not used.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.

Use the **tcp timestamp** command to more accurately measure the round-trip time of a packet. If a time stamp is not used, a TCP sender deduces the round-trip time when an acknowledgment of its packet is received, which is not a very accurate method because the acknowledgment can be delayed, duplicated, or lost. If a time stamp is used, each packet will contain a timestamp to identify packets when acknowledgments are received and the round-trip time of that packet.

This feature is most useful in Long Fat Network (LFN) where the bandwidth \* delay product is long.

**Examples** In the following example, the time stamp option is enabled:

```
RP/0/RP0/CPU0:router(config)# tcp timestamp
```

Related Commands	Command	Description
	<a href="#">tcp selective-ack</a>	Enables the TCP Selective acknowledgment feature.

# tcp window-size

To alter the TCP window size, use the **tcp window-size** command in global configuration mode. To restore the default value, use the **no** form of this command.

**tcp window-size** *bytes*

**no tcp window-size**

<b>Syntax Description</b>	<i>bytes</i> Window size in bytes. The maximum is 65535 bytes. The default value is 16384 bytes.
---------------------------	--

<b>Defaults</b>	<i>bytes</i> : 16384 bytes
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS-XR Software* module of the *Cisco IOS-XR System Security Configuration Guide*.



**Note**

Do not use this command unless you clearly understand why you want to change the default value.

**Examples** The following example sets the TCP window size to 1000 bytes:

```
RP/0/RP0/CPU0:router (config)# tcp window-size 1000
```