

Transport Stack Commands

This chapter describes the Cisco IOS XR software commands used to configure and monitor features related to the transport stack (Nonstop Routing, Stream Control Transmission Protocol (SCTP), NSR, TCP, User Datagram Protocol (UDP), and RAW. Any IP protocol other than TCP or UDP is known as a *RAW* protocol.

For detailed information about transport stack concepts, configuration tasks, and examples, refer to the *IP Addresses and Services Command Reference for Cisco 8000 Series Routers*

- clear nsr ncd client, on page 3
- clear nsr ncd queue, on page 5
- clear nsr npl, on page 7
- clear raw statistics pcb, on page 11
- clear tcp nsr client, on page 13
- clear tcp nsr pcb, on page 14
- clear tcp nsr session-set, on page 16
- clear tcp nsr statistics client, on page 17
- clear tcp nsr statistics pcb, on page 19
- clear tcp nsr statistics session-set, on page 21
- clear tcp nsr statistics summary, on page 23
- clear tcp pcb, on page 25
- clear tcp statistics, on page 28
- clear udp statistics, on page 30
- forward-protocol udp, on page 32
- nsr process-failures switchover, on page 34
- service tcp-small-servers, on page 35
- service udp-small-servers, on page 36
- show nsr ncd client, on page 37
- show nsr ncd queue, on page 39
- show raw brief, on page 41
- show raw detail pcb, on page 43
- show raw extended-filters, on page 45
- show raw statistics, on page 47
- show tcp brief, on page 49
- show tcp detail, on page 51
- show tcp dump-file, on page 52
- show tcp extended-filters, on page 53

- show tcp nsr brief, on page 55
- show tcp nsr client brief, on page 57
- show tcp nsr detail client, on page 58
- show tcp nsr detail endpoint, on page 60
- show tcp nsr detail pcb, on page 61
- show tcp nsr detail session-set, on page 64
- show tcp nsr session-set brief, on page 66
- show tcp nsr statistics client, on page 68
- show tcp nsr statistics npl, on page 70
- show tcp nsr statistics pcb, on page 72
- show tcp nsr statistics session-set, on page 74
- show tcp nsr statistics summary, on page 76
- show tcp packet-trace, on page 79
- show tcp pak-rate, on page 81
- show tcp statistics, on page 83
- show udp brief, on page 85
- show udp detail pcb, on page 87
- show udp extended-filters, on page 89
- show udp statistics, on page 90
- tcp dump-file convert, on page 92
- tcp mss, on page 94
- tcp path-mtu-discovery, on page 95
- tcp selective-ack, on page 96
- tcp synwait-time, on page 97
- tcp timestamp, on page 98
- tcp window-size, on page 99

clear nsr ncd client

To clear the counters of a specified client or all the clients of nonstop routing (NSR) Consumer Demuxer (NCD), use the **clear nsr ncd client** command in XR EXEC mode.

clear nsr ncd client {*PID value* | **all**} [**location** *node-id*]

Syntax Description

PID value	Process ID value of the client in which counters need to be cleared. The range is from 0 to 4294967295.
all	Clears the counters for all NCD clients.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

The default value for the *node-id* argument is the current node in which the command is being executed. The *PID value* argument does not have a default value.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

The active and standby instances of some NSR-capable applications communicate through two queues, and these applications are multiplexed onto these queues. NSR consumer demuxer (NCD) is a process that provides the demuxing services on the receiver side.

You can use the **clear nsr ncd client** command to troubleshoot traffic issues. If you clear the existing counters, it can help you to monitor the delta changes.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows how to clear all the counters for all NCD clients:

```
RP/0/RP0/CPU0:router# clear nsr ncd client all
RP/0/RP0/CPU0:router# show nsr ncd client all

Client PID                          : 3874979
Client Protocol                     : TCP
Client Instance                     : 1
Total packets received              : 0
Total acks received                 : 0
Total packets/acks accepted         : 0
Errors in changing packet ownership  : 0
Errors in setting application offset : 0
```

```
Errors in enqueuing to client        : 0
Time of last clear                   : Sun Jun 10 14:43:44 20

RP/0/RP0/CPU0:router# show nsr ncd client brief

                             Total    Total   Accepted
Pid   Protocol   Instance    Packets Acks    Packets/Acks
3874979   TCP          1          0   0         0
```

clear nsr ncd queue

To clear the counters for the nonstop routing (NSR) Consumer Demuxer (NCD) queue, use the **clear nsr ncd queue** command in XR EXEC mode.

clear nsr ncd queue {**all** | **high** | **low**} [**location** *node-id*]

Syntax Description

all	Clears the counters for all the NCD queues.
high	Clears the counters for the high-priority NCD queue.
low	Clears the counters the low-priority NCD queue.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows how to clear the counters for all the NCD queues:

```
RP/0/RP0/CPU0:router# clear nsr ncd queue all
RP/0/RP0/CPU0:router# show nsr ncd queue all

Queue Name                          : NSR_LOW
Total packets received              : 0
Total packets accepted              : 0
Errors in getting datagram offset   : 0
Errors in getting packet length     : 0
Errors in calculating checksum      : 0
Errors due to bad checksum          : 0
Errors in reading packet data       : 0
Errors due to bad NCD header        : 0
Drops due to a non-existent client  : 0
Errors in changing packet ownership : 0
Errors in setting application offset : 0
Errors in enqueuing to client       : 0
Time of last clear                  : Sun Jun 10 14:44:38 2007
```

```
Queue Name                          : NSR_HIGH
Total packets received              : 0
Total packets accepted              : 0
Errors in getting datagram offset   : 0
Errors in getting packet length     : 0
Errors in calculating checksum      : 0
Errors due to bad checksum          : 0
Errors in reading packet data       : 0
Errors due to bad NCD header        : 0
Drops due to a non-existent client  : 0
Errors in changing packet ownership : 0
Errors in setting application offset : 0
Errors in enqueuing to client       : 0
Time of last clear                  : Sun Jun 10 14:44:38 2007

RP/0/RP0/CPU0:router# show nsr ncd queue brief

                          Total        Accepted
          Queue         Packets         Packets
        NSR_LOW               0               0
       NSR_HIGH               0               0
```

clear nsr npl

To clear NSR NPL wheel statistics for a given client and instance, use the **clear nsr npl** command in XR EXEC mode.

clear nsr npl client *client-name* **instance** *client-instance-number* **wheels**

[*wheel-ID* | [**location** *node-id*]]

Table 1: Syntax Description

npl	Clear NSR NPL wheel statistics for a given client and instanceas specified.
wheels	Displays client's wheel information.
wheel-id	(Optional) Displays client's wheel information with respect to the specified wheel-id.
location *node-id*	(Optional) Displays information for the designated node.

Command Default

The location defaults to the current node in which the command is executing.

Command Mode

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Though this command is used to clear NSR NPL statistics for a given client instance and/or for a given wheel id, this command can also be used for debugging purpose to measure delta.

Task ID

Task ID	Operations
transport	execute

Use the **show nsr npl client bgp instance 0 wheels** command for checking counters:

```
Router# show nsr npl client bgp instance 0 wheels
NPL wheel '1' information
-------------------------
Wheel initialized, wheel ID: 1
Total msgs sent: 13, total acks received: 13
Last sequence number: 26
Total msgs received: 6, total acks sent: 6

Retransmission information
--------------------------
```

```
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 1, Next expected seq: 7, Max limit: 30
Last ISN update time: 'May 11 18:57:46.452.333'
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '2' information
-------------------------
Wheel initialized, wheel ID: 2
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '3' information
-------------------------
Wheel initialized, wheel ID: 3
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '4' information
-------------------------
Wheel initialized, wheel ID: 4
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0
```

```
Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0
```

Use the **clear nsr npl client bgp instance 0 wheels** command to clear counters.

```
Router# clear nsr npl client bgp instance 0 wheels
```

Now, use the show nsr npl client bgp instance 0 wheels command again for checking counters. You can see the cleared counters highlighted.

```
Router# show nsr npl client bgp instance 0 wheels
NPL wheel '1' information
-------------------------
Wheel initialized, wheel ID: 1
Total msgs sent: 0, total acks received: 0
Last sequence number: 26
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 1, Next expected seq: 7, Max limit: 30
Last ISN update time: 'May 11 18:57:46.452.333'
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '2' information
-------------------------
Wheel initialized, wheel ID: 2
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '3' information
-------------------------
Wheel initialized, wheel ID: 3
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
```

```
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0


NPL wheel '4' information
-------------------------
Wheel initialized, wheel ID: 4
Total msgs sent: 0, total acks received: 0
Last sequence number: 0
Total msgs received: 0, total acks sent: 0

Retransmission information
--------------------------
Total msgs retransmitted: 0, timeouts: 0
Num of entries in the queue: 0

Out of order information
------------------------
ISN: 0, Next expected seq: 0, Max limit: 30
Total msgs reassembled: 0
Total msgs drops: 0
Num of entries in the queue: 0
```

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 XR EXEC mode.

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

Use the **location** keyword and *node-id* argument to clear RAW statistics for a designated node.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows how to clear 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
```

The following example shows how to clear 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
```

clear tcp nsr client

To bring the nonstop routing (NSR) down on all the sessions that are owned by the specified client, use the **clear tcp nsr client** command in XR EXEC mode.

clear tcp nsr client {*ccb-address* | **all**} [**location** *node-id*]

Syntax Description

ccb-address	Client Control Block (CCB) of the NSR client.
all	Specifies all the clients.
location *node-id*	(Optional) Displays client information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

The location defaults to the current node in which the command is executing.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

The output of the **show tcp nsr client** command is used to locate the CCB of the desired client.

Use the **clear tcp nsr client** command to gracefully bring down NSR session that are owned by one client or all clients. In addition, the **clear tcp nsr client** command is used as a work around if the activity on the sessions freezes.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the nonstop routing (NSR) client is cleared for 0x482afacc. The two sessions had NSR already up before executing the **clear tcp nsr client** command. NSR is no longer up after executing the **clear tcp nsr client** command.

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

CCB          Proc Name    Instance     Sets       Sessions/NSR Up Sessions
0x482c10e0   mpls_ldp          1            2          3/1
0x482afacc   mpls_ldp          2            1          2/2

RP/0/RP0/CPU0:router# clear tcp nsr client 0x482afacc
RP/0/RP0/CPU0:router# show tcp nsr client brief

CCB          Proc Name    Instance     Sets       Sessions/NSR Up Sessions
0x482c10e0   mpls_ldp          1            2          3/1
0x482afacc   mpls_ldp          2            1          2/0
```

clear tcp nsr pcb

To bring the nonstop routing (NSR) down on a specified connection or all connections, use the **clear tcp nsr pcb** command in XR EXEC mode.

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

Syntax Description

pcb-address	PCB address range for the specific connection information. 0 to ffffffff. For example, the address range can be 0x482a4e20.
all	Specifies all the connections.
location *node-id*	(Optional) Displays connection information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

The output of the **show tcp nsr brief** command is used to locate the Protocol Control Block (PCB) of a desired connection.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the information for TCP connections is cleared:

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

Wed Dec 2 20:35:47.467 PST
------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------
PCB                VRF-ID   Local Address   Foreign Address NSR(US/DS)
0x00007f9e3c028538 0x60000000 3.3.3.3:646     5.5.5.5:17931    NA/Up
0x00007f9e3c021fb8 0x60000000 3.3.3.3:646     4.4.4.4:29301    NA/Up
0x00007f9e3c007248 0x60000000 3.3.3.3:646     12.1.105.2:32877 NA/Up
0x00007f9e3c010c78 0x60000000 3.3.3.3:646     6.6.6.6:56296    NA/Up
0x00007f9de4001798 0x60000000 3.3.3.3:12888   2.2.2.2:646      NA/Up
0x00007f9e3c04a338 0x60000000 3.3.3.13:179    2.2.2.13:13021   NA/Up
0x00007f9e3c026c78 0x60000000 3.3.3.3:179     4.4.4.4:15180    NA/Up
0x00007f9e3c019b38 0x60000000 3.3.3.3:179     8.8.8.8:21378    NA/Up
0x00007f9e3c029df8 0x60000000 3.3.3.22:179    2.2.2.22:24482   NA/Up
0x00007f9e3c064538 0x60000000 3.3.3.14:179    2.2.2.14:27569   NA/Up
```

```
0x00007f9e3c041008 0x60000000 3.3.3.25:179    2.2.2.25:29654   NA/Up

RP/0/RP0/CPU0:router# clear tcp nsr pcb 0x00007f9e3c028538
RP/0/RP0/CPU0:router# clear tcp nsr pcb 0x00007f9e3c021fb8
RP/0/RP0/CPU0:router# show tcp nsr brief

Wed Dec 2 20:35:47.467 PST
------------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------------
PCB                  VRF-ID   Local Address   Foreign Address NSR(US/DS)
0x00007f9e3c028538 0x60000000 3.3.3.3:646     5.5.5.5:17931    NA/Down
0x00007f9e3c021fb8 0x60000000 3.3.3.3:646     4.4.4.4:29301    NA/Down
0x00007f9e3c007248 0x60000000 3.3.3.3:646     12.1.105.2:32877 NA/Up
0x00007f9e3c010c78 0x60000000 3.3.3.3:646     6.6.6.6:56296    NA/Up
0x00007f9de4001798 0x60000000 3.3.3.3:12888   2.2.2.2:646      NA/Up
0x00007f9e3c04a338 0x60000000 3.3.3.13:179    2.2.2.13:13021   NA/Up
0x00007f9e3c026c78 0x60000000 3.3.3.3:179     4.4.4.4:15180    NA/Up
0x00007f9e3c019b38 0x60000000 3.3.3.3:179     8.8.8.8:21378    NA/Up
0x00007f9e3c029df8 0x60000000 3.3.3.22:179    2.2.2.22:24482   NA/Up
0x00007f9e3c064538 0x60000000 3.3.3.14:179    2.2.2.14:27569   NA/Up
0x00007f9e3c041008 0x60000000 3.3.3.25:179    2.2.2.25:29654   NA/Up
```

clear tcp nsr session-set

To clear the nonstop routing (NSR) on all the sessions in the specified session-set or all session sets, use the **clear tcp nsr session-set** command in XR EXEC mode.

clear tcp nsr session-set { *sscb-address* | **all**} [**location** *node-id*]

Syntax Description

sscb-address	Session-Set Control Block (SSCB) address range for the specific session set information. 0 to ffffffff. For example, the address range can be 0x482a4e20.
all	Specifies all the session sets.
location *node-id*	(Optional) Displays session set information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

The output of the **show tcp nsr session-set brief** command is used to locate the SSCB of the desired session-set.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the information for the session sets is cleared:

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

CCB               Proc Name         Instance  Sets       Sessions/NSR Up Sessions
0x482b5ee0        mpls_ldp             1        1          10/10

RP/0/RP0/CPU0:router# clear tcp nsr client 0x482b5ee0
RP/0/RP0/CPU0:router# show tcp nsr client brief

CCB               Proc Name         Instance  Sets       Sessions/NSR Up Sessions
0x482b5ee0        mpls_ldp             1        1          10/0
```

clear tcp nsr statistics client

To clear the nonstop routing (NSR) statistics of the client, use the **clear tcp nsr statistics client** command in XR EXEC mode.

clear tcp nsr statistics client {*ccb-address* | **all**} [**location** *node-id*]

Syntax Description

ccb-address	Client Control Block (CCB) of the desired client. For example, the address range can be 0x482a4e20.
all	Specifies all the clients.
location *node-id*	(Optional) Displays client information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the statistics for the NSR clients is cleared:

```
Router# show tcp nsr statistics client all

------------------------------------------------------------------
                    Node: 0/0/CPU0
------------------------------------------------------------------

==================================================================
CCB: 0xed30cd58
Name: bgp, Job ID: 1085
Connected at: Mon May 11 17:29:20 2020

Notification Statistics :          Queued     Failed      Delivered    Dropped
Init-Sync Done          :          4          0           4            0
Replicated Session Ready:             0           0           0            0
Operational Down        :          3          0           3            0
Init-Sync Stop Reading  :          3          0           3            0
```

```
Last clear at: Never Cleared

Router# clear tcp nsr statistics client all

Riuter# show tcp nsr statistics client all

------------------------------------------------------------
                    Node: 0/0/CPU0
------------------------------------------------------------

============================================================
CCB: 0xed30cd58
Name: bgp, Job ID: 1085
Connected at: Mon May 11 17:29:20 2020

Notification Statistics :         Queued     Failed  Delivered    Dropped
Init-Sync Done          :         0       0    0          0
Replicated Session Ready:            0          0       0             0
Operational Down        :         0       0    0          0
Init-Sync Stop Reading  :         0       0    0          0
Last clear at: Mon May 11 19:08:56 2020
```

clear tcp nsr statistics pcb

To clear the nonstop routing (NSR) statistics for TCP connections, use the **clear tcp nsr statistics pcb** command in XR EXEC mode.

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

Syntax Description

pcb-address	PCB address range for the specific connection information. 0 to ffffffff. For example, the address range can be 0x482a4e20.
all	Specifies all the connections.
location *node-id*	(Optional) Displays connection information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the NSR statistics for TCP connections is cleared:

```
RP/0/RP0/CPU0:router# show tcp nsr statistics pcb 0x482d14c8

============================================================
PCB 0x482d14c8
Number of times NSR went up: 1
Number of times NSR went down: 0
Number of times NSR was disabled: 0
Number of times switch-over occured : 0
IACK RX Message Statistics:
        Number of iACKs dropped because SSO is not up              : 0
        Number of stale iACKs dropped                              : 1070
        Number of iACKs not held because of an immediate match     : 98
TX Messsage Statistics:
        Data transfer messages:
            Sent 317, Dropped 0, Data (Total/Avg.) 2282700/7200
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
        Segmentation instructions:
            Sent 1163, Dropped 0, Units (Total/Avg.) 4978/4
```

```
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
                Dropped (TCP)     : 0
        NACK messages:
            Sent 0, Dropped 0
            Rcvd 0
                Success           : 0
                Dropped (Data snd): 0
        Cleanup instructions      :
            Sent 8, Dropped 0
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
Last clear at: Never cleared

RP/0/RP0/CPU0:router# clear tcp nsr statistics pcb 0x482d14c8
RP/0/RP0/CPU0:router# show tcp nsr statistics pcb 0x482d14c8

==============================================================
PCB 0x482d14c8
Number of times NSR went up: 0
Number of times NSR went down: 0
Number of times NSR was disabled: 0
Number of times switch-over occured : 0
IACK RX Message Statistics:
        Number of iACKs dropped because SSO is not up               : 0
        Number of stale iACKs dropped                               : 0
        Number of iACKs not held because of an immediate match      : 0
TX Messsage Statistics:
        Data transfer messages:
            Sent 0, Dropped 0, Data (Total/Avg.) 0/0
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
        Segmentation instructions:
            Sent 0, Dropped 0, Units (Total/Avg.) 0/0
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
                Dropped (TCP)     : 0
        NACK messages:
            Sent 0, Dropped 0
            Rcvd 0
                Success           : 0
                Dropped (Data snd): 0
        Cleanup instructions      :
            Sent 0, Dropped 0
            Rcvd 0
                Success           : 0
                Dropped (Trim)    : 0
Last clear at: Thu Aug 16 18:32:12 2007
```

clear tcp nsr statistics session-set

To clear the nonstop routing (NSR) statistics for session sets, use the **clear tcp nsr statistics session-set** command in XR EXEC mode mode.

clear tcp nsr statistics session-set {*sscb-address* | **all**} [**location** *node-id*]

Syntax Description

sscb-address	Session-Set Control Block (SSCB) address range for the specific session set information. 0 to ffffffff. For example, the address range can be 0x482a4e20.
all	Specifies all the session sets.
location *node-id*	(Optional) Displays session set information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the NSR statistics for session sets is cleared:

```
RP/0/RP0/CPU0:router# show tcp nsr statistics session-set all

==================Session Set Stats ==========================
SSCB 0x482b6684, Set ID: 1
Number of times init-sync was attempted  :3
Number of times init-sync was successful :3
Number of times init-sync failed         :0
Number of times switch-over occured      :0
Last clear at: Never Cleared

RP/0/RP0/CPU0:router# clear tcp nsr statistics session-set all
RP/0/RP0/CPU0:router# show tcp nsr statistics session-set all

==================Session Set Stats ==========================
SSCB 0x482b6684, Set ID: 1
Number of times init-sync was attempted  :0
```

```
Number of times init-sync was successful :0
Number of times init-sync failed         :0
Number of times switch-over occured      :0
Last clear at: Thu Aug 16 18:37:00 2007
```

clear tcp nsr statistics summary

To clear the nonstop routing (NSR) statistics summary, use the **clear tcp nsr statistics summary** command in XR EXEC mode.

clear tcp nsr statistics summary [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays statistics summary information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows how to clear the summary statistics:

```
Router# show tcp nsr statistics client all

------------------------------------------------------------
                    Node: 0/0/CPU0
------------------------------------------------------------

============================================================
CCB: 0xed30cd58
Name: bgp, Job ID: 1085
Connected at: Mon May 11 17:29:20 2020

Notification Statistics :      Queued     Failed  Delivered    Dropped
Init-Sync Done          :      4       0    4          0
Replicated Session Ready:         0          0       0             0
Operational Down        :      3       0    3          0
Init-Sync Stop Reading  :      3       0    3          0
Last clear at: Never Cleared

Router# clear tcp nsr statistics client all

Router# show tcp nsr statistics client all

------------------------------------------------------------
                    Node: 0/0/CPU0
------------------------------------------------------------
```

```
============================================================
CCB: 0xed30cd58
Name: bgp, Job ID: 1085
Connected at: Mon May 11 17:29:20 2020

Notification Statistics :      Queued     Failed  Delivered    Dropped
Init-Sync Done          :      0       0    0          0
Replicated Session Ready:         0          0       0             0
Operational Down        :      0       0    0          0
Init-Sync Stop Reading  :      0       0    0          0
Last clear at: Mon May 11 19:08:56 2020
```

clear tcp pcb

To clear TCP protocol control block (PCB) connections, use the **clear tcp pcb** command in XR EXEC mode.

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

Syntax Description

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

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

If the **clear tcp pcb all** command is used, the software does not clear a TCP connection that is in the listen state. If a specific PCB address is specified, then a connection in listen state is cleared.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the TCP connection at PCB address 0x00007f7da4007eb8 is cleared:

```
Router# show tcp brief

PCB                      VRF-ID      Recv-Q Send-Q Local Address          Foreign Address
        State
0x00007f7d4c011d38       0x60000000       0      0     :::22                  :::0
          LISTEN
0x00007f7d4c00cf68       0x00000000       0      0     :::22                  :::0
          LISTEN
0x00007f7d4c00c6a8       0x60000000       0      0     :::179                 :::0
          LISTEN
0x00007f7d4c007db8       0x00000000       0      0     :::179                 :::0
          LISTEN
0x00007f7d7003fab8       0x60000000       0      0     :::0                   :::0
          CLOSED
0x00007f7d7003afa8       0x00000000       0      0     :::0                   :::0
          CLOSED
```

```
0x00007f7d4c035378        0x60000000        0      0     133.1.2.2:25032        133.1.2.1:179
        ESTAB
0x00007f7da4007eb8  0x60000000        0      0     10.86.188.84:179       10.86.188.99:28148
   ESTAB
0x00007f7d700405e8        0x60000000        0      0     32.32.32.32:54157
149.127.13.12:57000  SYNSENT
0x00007f7da400cfe8        0x60000000        0      0     10.86.188.84:23
173.39.52.160:60586  ESTAB
0x00007f7d4c011aa8        0x60000000        0      0     0.0.0.0:22             0.0.0.0:0
           LISTEN
0x00007f7d70030218        0x00000000        0      0     0.0.0.0:22             0.0.0.0:0
           LISTEN
0x00007f7d70021da8        0x60000000        0      0     0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d4c006858        0x60000002        0      0     0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d4c000fd8        0x00000000        0      0     0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d7003a858        0x60000000        0      0     0.0.0.0:646            0.0.0.0:0
           LISTEN
0x00007f7d70035cd8        0x00000000        0      0     0.0.0.0:646            0.0.0.0:0
           LISTEN
0x00007f7d7002fa08        0x60000000        0      0     0.0.0.0:179            0.0.0.0:0
           LISTEN
0x00007f7d70028b28        0x00000000        0      0     0.0.0.0:179            0.0.0.0:0
           LISTEN
0x00007f7d70023188        0x00000000        0      0     0.0.0.0:0              0.0.0.0:0
           CLOSED

Router# clear tcp pcb 0x00007f7da4007eb8

Router# show tcp brief

   PCB                    VRF-ID      Recv-Q Send-Q Local Address          Foreign Address
        State
0x00007f7d4c011d38        0x60000000      0      0      :::22                  :::0
           LISTEN
0x00007f7d4c00cf68        0x00000000      0      0      :::22                  :::0
           LISTEN
0x00007f7d4c00c6a8        0x60000000      0      0      :::179                 :::0
           LISTEN
0x00007f7d4c007db8        0x00000000      0      0      :::179                 :::0
           LISTEN
0x00007f7d7003fab8        0x60000000      0      0      :::0                   :::0
           CLOSED
0x00007f7d7003afa8        0x00000000      0      0      :::0                   :::0
           CLOSED
0x00007f7d4c035378   0x60000000      0      0      133.1.2.2:25032        133.1.2.1:179
       ESTAB
0x00007f7da400cfe8   0x60000000      0      0     10.86.188.84:23        173.39.52.160:60586
    ESTAB
0x00007f7d4c011aa8        0x60000000      0      0      0.0.0.0:22             0.0.0.0:0
           LISTEN
0x00007f7d70030218        0x00000000      0      0      0.0.0.0:22             0.0.0.0:0
           LISTEN
0x00007f7d70021da8        0x60000000      0      0      0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d4c006858        0x60000002      0      0      0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d4c000fd8        0x00000000      0      0      0.0.0.0:23             0.0.0.0:0
           LISTEN
0x00007f7d7003a858        0x60000000      0      0      0.0.0.0:646            0.0.0.0:0
           LISTEN
0x00007f7d70035cd8        0x00000000      0      0      0.0.0.0:646            0.0.0.0:0
```

```
                LISTEN
0x00007f7d7002fa08          0x60000000      0       0       0.0.0.0:179             0.0.0.0:0
                LISTEN
0x00007f7d70028b28          0x00000000      0       0       0.0.0.0:179             0.0.0.0:0
                LISTEN
0x00007f7d70023188          0x00000000      0       0       0.0.0.0:0               0.0.0.0:0
                CLOSED
```

clear tcp statistics

To clear TCP statistics, use the **clear tcp statistics** command in

XR EXEC mode.

clear tcp statistics { **client** | **pcb** { **all** | *pcb-address* } | **summary**} **location** *node-id*

Syntax Description

client	(Optional) Clears statistics for all TCP clients.
pcb all	(Optional) Clears statistics for all TCP connections.
pcb *pcb-address*	Clears statistics for a specific TCP connection.
summary	Clears summary statistic for a specific node or connection.
location *node-id*	Clears TCP statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Though this command is used to clear incoming and outgoing TCP packet statiscs of all clients of given location, PCB, and summary statistics; this command can be used for debugging purpose to measure delta.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows that the statistics for the NSR clients is cleared:

```
Router# show tcp statistics client

Name     JID             IPv4-Stats                  IPv6-Stats
                   Sent-Packets Recv-Packets   Sent-Packets Recv-Packets
igmp     1151       5            9              0            3
mld      1156       9            4              4            0
pim      1157       8            3              5            2
pim6     1158       9            4              6            1
Router# clear tcp tatistics client

Riuter# show nsr statistics client

Name     JID             IPv4-Stats                  IPv6-Stats
                   Sent-Packets Recv-Packets   Sent-Packets Recv-Packets
```

```
igmp      1151       0            0            0            0
mld       1156       0            0            0            0
pim       1157       0            0            0            0
pim6      1158       0            0            0            0
```

clear udp statistics

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

clear udp statistics { **client** | **pcb** { **all** | *pcb-address* } | **summary** } **location** *node-id*

Syntax Description

client	(Optional) Clears statistics for all TCP clients.
pcb all	Clears statistics for all UDP connections.
pcb *pcb-address*	Clears statistics for a specific UDP connection.
summary	Clears UDP summary statistics.
location *node-id*	(Optional) Clears UDP statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Though this command is used to clear incoming and outgoing TCP packet statiscs of all clients of given location, PCB, and summary statistics; this command can be used for debugging purpose to measure delta.

Task ID

Task ID	Operations
transport	execute

Examples

The following example shows how to clear UDP summary statistics:

```
Router# show udp statistics summary
UDP statistics:
Rcvd: 121 Total, 121 drop, 0 no port
      0 checksum error, 0 too short
Sent: 121 Total, 0 error
0 Total forwarding broadcast packets
0 Cloned packets, 0 failed cloning

Router# clear udp statistics summary

Router# show udp statistics summary
UDP statistics:
Rcvd: 9 Total, 9 drop, 0 no port
      0 checksum error, 0 too short
Sent: 9 Total, 0 error
```

```
0 Total forwarding broadcast packets
0 Cloned packets, 0 failed cloning
```

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

XR Config 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

port-number	Forwards UDP broadcast packets to a specified port number. Range is 1 to 65535.
disable	Disables IP Forward Protocol UDP.
domain	Forwards UDP broadcast packets to Domain Name Service (DNS, 53).
nameserver	Forwards UDP broadcast packets to IEN116 name service (obsolete, 42).
netbios-dgm	Forwards UDP broadcast packets to NetBIOS datagram service (138).
netbios-ns	Forwards UDP broadcast packets to NetBIOS name service (137).
tacacs	Forwards UDP broadcast packets to TACACS (49).
tftp	Forwards UDP broadcast packets to TFTP (69).

Command Default

forward-protocol udp is enabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to specify that all UDP broadcast packets with port 53 or port 69 received on incoming HundredGigE interface 0/RP0/CPU0 are forwarded to 172.16.0.1. HundredGigE interface 0/RP0/CPU0 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 disable
RP/0/RP0/CPU0:router(config)# forward-protocol udp tftp disable
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/RP0/CPU0
RP/0/RP0/CPU0:router(config-if)# ipv4 helper-address 172.16.0.1
```

nsr process-failures switchover

To configure failover as a recovery action for active instances to switch over to a standby route processor (RP) or a standby distributed route processor (DRP) to maintain nonstop routing (NSR), use the **nsr process-failures switchover** command in XR Config mode. To disable this feature, use the **no** form of this command.

nsr process-failures switchover
no nsr process-failures switchover

Syntax Description

This command has no keywords or arguments.

Command Default

If not configured, a process failure of the active TCP or its applications (for example LDP, BGP, and so forth) can cause sessions to go down, and NSR is not provided.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to use the **nsr process-failures switchover** command:

```
RP/0/RP0/CPU0:router(config)# nsr process-failures switchover
```

service tcp-small-servers

To enable small TCP servers such as the ECHO, use the **service tcp-small-servers** command in XR Config 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

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

Command Default

TCP small servers are disabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

Task ID

Task ID	Operations
ipv4	read, write
ip-services	read, write

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 acl100
```

service udp-small-servers

To enable small User Datagram Protocol (UDP) servers such as the ECHO, use the **service udp-small-servers** command in XR Config 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

ip4	Specifies IPv4 small servers.
ipv6	Specifies IPv6 small servers.
max-servers	(Optional) Sets the number of allowable UDP small servers.
number	(Optional) Number value. Range is 1 to 2147483647.
no-limit	(Optional) Sets no limit to the number of allowable UDP small servers.
access-list-name	(Optional) Name of an access list.

Command Default

UDP small servers are disabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

Task ID

Task ID	Operations
ipv6	read, write
ip-services	read, write

Examples

The following example shows how to enable small IPv6 UDP servers and set the maximum number of allowable small servers to 10:

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

show nsr ncd client

To display information about the clients for nonstop routing (NSR) Consumer Demuxer (NCD), use the **show nsr ncd client** command in XR EXEC mode.

show nsr ncd client {*PID value* | **all** | **brief**} [**location** *node-id*]

Syntax Description

PID v alue	Process ID (PID) information for a specific client. The range is from 0 to 4294967295.
all	Displays detailed information about all the clients.
brief	Displays brief information about all the clients.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows detailed information about all the clients:

```
RP/0/RP0/CPU0:router# show nsr ncd client all

Client PID                          : 3874979
Client Protocol                     : TCP
Client Instance                     : 1
Total packets received              : 28
Total acks received                 : 0
Total packets/acks accepted         : 28
Errors in changing packet ownership  : 0
Errors in setting application offset : 0
Errors in enqueuing to client        : 0
Time of last clear                  : Never cleared
```

The following sample output shows brief information about all the clients:

```
RP/0/RP0/CPU0:router# show nsr ncd client brief
```

```
                            Total   Total   Accepted
Pid    Protocol   Instance    Packets Acks    Packets/Acks
3874979   TCP          1         28  0              28
```

This table describes the significant fields shown in the display.

Table 2: show nsr ncd client Command Field Descriptions

Field	Description
Client PID	Process ID of the client process.
Client Protocol	Protocol of the client process. The protocol can be either TCP, OSPF, or BGP.
Client Instance	Instance number of the client process. There can be more than one instance of a routing protocol, such as OSPF.
Total packets received	Total packets received from the partner stack on the partner route processor (RP).
Total acks received	Total acknowledgements received from the partner stack on the partner RP for the packets sent to the partner stack.
Total packets/acks accepted	Total packets and acknowledgements received from the partner stack on the partner RP.
Errors in changing packet ownership	NCD changes the ownership of the packet to that of the client before queueing the packet to the client. This counter tracks the errors, if any, in changing the ownership.
Errors in setting application offset	NCD sets the offset of the application data in the packet before queueing the packet to the client. This counter tracks the errors, if any, in setting this offset.
Errors in enqueuing to client	Counter tracks any queueing errors.
Time of last clear	Statistics last cleared by the user.

show nsr ncd queue

To display information about the queues that are used by the nonstop routing (NSR) applications to communicate with their partner stacks on the partner route processors (RPs), use the **show nsr ncd queue** command in XR EXEC mode.

show nsr ncd queue {**all** | **brief** | **high** | **low**} [**location** *node-id*]

Syntax Description

all	Displays detailed information about all the consumer queues.
brief	Displays brief information about all the consumer queues.
high	Displays information about high-priority Queue and Dispatch (QAD) queues.
low	Displays information about low-priority QAD queues.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows brief information about all the consumer queues:

```
RP/0/RP0/CPU0:router# show nsr ncd queue brief

                        Total        Accepted
          Queue         Packets       Packets
       NSR_LOW              992           992
      NSR_HIGH                0             0
```

This table describes the significant fields shown in the display.

Table 3: show nsr ncd queue Command Field Descriptions

Field	Description
Total Packets	Total number of packets that are received from the partner stack.

Field	Description
Accepted Packets	Number of received packets that were accepted after performing some validation tasks.
Queue	Name of queue. NSR_HIGH and NSR_LOW are the two queues. High priority packets flow on the NSR_HIGH queue. Low priority packets flow on the NSR_LOW queue.

show raw brief

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

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

Syntax Description

location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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.

Task ID

Task ID	Operations
transport	read

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
```

This table describes the significant fields shown in the display.

Table 4: show raw brief Command Field Descriptions

Field	Description
PCB	Protocol control block address. This is the address to a structure that contains connection information such as local address, foreign address, local port, foreign port, and so on.
Recv-Q	Number of bytes in the receive queue.
Send-Q	Number of bytes in the send queue.
Local Address	Local address and local port.

Field	Description
Foreign Address	Foreign address and foreign port.
Protocol	Protocol that is using the RAW IP socket. For example, the number 2 is IGMP, 103 is PIM, and 89 is OSPF.

show raw detail pcb

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

show raw detail pcb {*pcb-address* | **all**} **location** *node-id*

Syntax Description

pcb-address	Displays statistics for a specified RAW connection.
all	Displays statistics for all RAW connections.
location *node-id*	Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **show raw detail 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.

Task ID

Task ID	Operations
transport	read

Examples

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

```
RP/0/RP0/CPU0:router# show raw detail pcb 0x807e89c

============================================================
PCB is 0x807e89c, Family: 2, PROTO: 89
 Local host: 0.0.0.0
 Foreign host: 0.0.0.0

Current send queue size: 0
Current receive queue size: 0
Paw socket: Yes
```

This table describes the significant fields shown in the display.

Table 5: show raw detail pcb Command Field Descriptions

Field	Description
JID	Job ID of the process that created the socket.
Family	Network protocol. IPv4 is 2; IPv6 is 26.
PCB	Protocol control block address.
L4-proto	Layer 4 (also known as transport) protocol.
Laddr	Local address.
Faddr	Foreign address.
ICMP error filter mask	If an ICMP filter is being set, output in this field has a nonzero value.
LPTS socket options	If an LPTS option is being set, output in this field has a nonzero value.
Packet Type Filters	Packet filters that are being set for a particular RAW socket, including the number of packets for that filter type. Multiple filters can be set.

show raw extended-filters

To display information about active RAW IP sockets, use the **show raw extended-filters** command in XR EXEC mode.

show raw extended-filters {**interface-filter location** *node-id* | **location** *node-id* | **paktype-filter location** *node-id*}

Syntax Description

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

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **show raw extended-filters** 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.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show raw extended-filters** command:

```
RP/0/RP0/CPU0:router# show raw extended-filters location 0/RP0/CPU0

Wed Dec 2 20:50:58.389 PST
----------------------------------
JID: 1102
Family: 10
VRF: 0x60000000
PCB: 0x7fc4c4001f18
L4-proto: 255
Lport: 0
Fport: 0
```

This table describes the significant fields shown in the display.

Table 6: show raw extended-filters Output Command Field Descriptions

Field	Description
JID	Job ID of the process that created the socket.
Family	Network protocol. IPv4 is 2; IPv6 is 26.
PCB	Protocol control block address.
L4-proto	Layer 4 (also known as transport) protocol.
Laddr	Local address.
Faddr	Foreign address.
ICMP error filter mask	If an ICMP filter is being set, output in this field has a nonzero value.
LPTS socket options	If an LPTS option is being set, output in this field has a nonzero value.
Packet Type Filters	Packet filters that are being set for a particular RAW socket, including the number of packets for that filter type. Multiple filters can be set.

show raw statistics

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

show raw statistics { [| **pcb** | { **all** | *pcb-connection* }] | [| **clients** | { **location** *node-id* }] }

Syntax Description

clients	Displays statistics for all RAW clients.
pcb-address	Displays statistics for a specified RAW connection.
all	Displays statistics for all the clients.
location *node-id*	Displays RAW statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Use the **show raw statistics pcb all** command 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.

Use the **location** keyword and *node-id* argument to display RAW statistics for a designated node.

Use the **show raw statistics pcb clients**This command is used to display incoming and outgoing (IPv4 and IPv6) packet statistics of RAW clients

Task ID

Task ID	Operations
transport	read

Examples

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

```
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 the following example, statistics for all RAW connections are displayed:

```
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
```

In the following example, statistics for all RAW clients are displayed:

```
Router# show raw statistics clients location 0/RP0/CPU0

  Name         JID              IPv4-Stats                  IPv6-Stats
                          Sent-Packets  Recv-Packets  Sent-Packets  Recv-Packets
  igmp        1151             0             0             0             0
  mld         1156             0             0             0             0
  pim         1157             0             0             0             0
  pim6        1158             0             0             0             0
```

This table describes the significant fields shown in the display.

Table 7: show raw statistics pcb Command Field Descriptions

Field	Description
Send:	Statistics in this section refer to packets sent from an application to RAW.
Vrfid	VPN routing and forwarding (VRF) identification (vrfid) number.
xipc pulse received from application	Number of notifications sent from applications to RAW.
packets sent to network	Number of packets sent to the network.
packets failed getting queued to network	Number of packets that failed to get queued to the network.
Rcvd:	Statistics in this section refer to packets received from the network.
packets queued to application	Number of packets queued to an application.
packets failed queued to application	Number of packets that failed to get queued to an application.

show tcp brief

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

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

Syntax Description

location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

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

```
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
```

This table describes the significant fields shown in the display.

Table 8: show tcp brief Command Field Descriptions

Field	Description
TCPCB	Memory address of the TCP control block.
Recv-Q	Number of bytes waiting to be read.
Send-Q	Number of bytes waiting to be sent.
Local Address	Source address and port number of the packet.
Foreign Address	Destination address and port number of the packet.

Field	Description
State	State of the TCP connection.

show tcp detail

To display the details of the TCP connection table, use the **show tcp detail** command in XR EXEC mode.

show tcp detail pcb [*value* | **all**]

Syntax Description

pcb	Displays TCP connection information.
value	Displays a specific connection information. Range is from 0 to ffffffff.
all	Displays all connections information.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

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

```
Router# show tcp detail pcb all location 0/RP0/CPU0

Wed Dec 2 20:52:40.256 PST

============================================================
Connection state is ESTAB, I/O status: 0, socket status: 0
Established at Wed Dec 2 20:25:42 2015

PCB 0x7f9dec013cc8, SO 0x7f9dec013858, TCPCB 0x7f9dec013f28, vrfid 0x60000000,
Pak Prio: Medium, TOS: 192, TTL: 1, Hash index: 506
Local host: 2011:1:120::1, Local port: 25093 (Local App PID: 5714)
Foreign host: 2011:1:120::2, Foreign port: 179

Current send queue size in bytes: 0 (max 24576)
Current receive queue size in bytes: 0 (max 32768) mis-ordered: 0 bytes
Current receive queue size in packets: 0 (max 0)

Timer     Starts   Wakeups   Next(msec)
Retrans    193       60        0
Sendwind    0        0         0
```

show tcp dump-file

To display the details of the PCB state from a dump file , use the **show tcp dump-file** command in XR EXEC mode.

show tcp dump-file { *dump-file-name* | | **all** | | **list** | { *ipv4-address-of-dumpfiles* | *ipv6-address-of-dumpfiles* | | **all** } } { **location** *node-id* }

Syntax Description

all	Displays all connections information.
location *node-id*	Displays RAW statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Although the basic use of this command is to provide information about list of all TCP dump files, details of a specific or all TCP dumpfile files, you can also use this command can be used for debugging purpose or to monitor flow of TCP packets for a TCP connection.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show tcp dumpfile all location 0/RP0/CPU0** command:

```
Router# show tcp dumpfile list all location 0/RP0/CPU0

total 4
-rw-r--r-- 1 rpathark eng 3884 May 11 20:16 80_80_80_80.26355.179.cl.15892
```

show tcp extended-filters

To display the details of the TCP extended-filters, use the **show tcp extended-filters** command in XR EXEC mode.

show tcp extended-filters [**location** *node-id*]
peer-filter [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
peer-filter	(Optional) Displays connections with peer filter configured.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show tcp extended-filters** command for a specific location (0/RP0/CPU0):

```
RP/0/RP0/CPU0:router# show tcp extended-filters location 0/RP0/CPU0

Total Number of matching PCB's in database: 3
-----------------------------------
JID: 135
Family: 2
PCB: 0x4826c5dc
L4-proto: 6
Lport: 23
Fport: 0
Laddr: 0.0.0.0
Faddr: 0.0.0.0
ICMP error filter mask: 0x12

Flow Type: n/s
-----------------------------------

-----------------------------------
JID: 135
Family: 2
```

```
PCB: 0x4826dd8c
L4-proto: 6
Lport: 23
Fport: 59162
Laddr: 12.31.22.10
Faddr: 223.255.254.254
ICMP error filter mask: 0x12

Flow Type: n/s
-----------------------------------

-----------------------------------
JID: 135
Family: 2
PCB: 0x4826cac0
L4-proto: 6
Lport: 23
Fport: 59307
Laddr: 12.31.22.10
Faddr: 223.255.254.254
ICMP error filter mask: 0x12

Flow Type: n/s
-----------------------------------
```

show tcp nsr brief

To display the key nonstop routing (NSR) state of TCP connections on different nodes, use the **show tcp nsr brief** command in XR EXEC mode.

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

Syntax Description

location *node-id*	(Optional) Displays information for all TCP sessions for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows the administrative and operational NSR state of each TCP session in the NSR column:

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

Wed Dec 2 20:35:47.467 PST
----------------------------------------------------------------
Node: 0/RP0/CPU0
----------------------------------------------------------------
PCB                VRF-ID     Local Address   Foreign Address NSR(US/DS)
0x00007f9e3c028538 0x60000000 3.3.3.3:646     5.5.5.5:17931    NA/Up
0x00007f9e3c021fb8 0x60000000 3.3.3.3:646     4.4.4.4:29301    NA/Up
0x00007f9e3c007248 0x60000000 3.3.3.3:646     12.1.105.2:32877 NA/Up
0x00007f9e3c010c78 0x60000000 3.3.3.3:646     6.6.6.6:56296    NA/Up
0x00007f9de4001798 0x60000000 3.3.3.3:12888   2.2.2.2:646      NA/Up
0x00007f9e3c04a338 0x60000000 3.3.3.13:179    2.2.2.13:13021   NA/Up
0x00007f9e3c026c78 0x60000000 3.3.3.3:179     4.4.4.4:15180    NA/Up
0x00007f9e3c019b38 0x60000000 3.3.3.3:179     8.8.8.8:21378    NA/Up
0x00007f9e3c029df8 0x60000000 3.3.3.22:179    2.2.2.22:24482   NA/Up
0x00007f9e3c064538 0x60000000 3.3.3.14:179    2.2.2.14:27569   NA/Up
0x00007f9e3c041008 0x60000000 3.3.3.25:179    2.2.2.25:29654   NA/Up
```

This table describes the significant fields shown in the display.

Table 9: show tcp nsr brief Command Field Descriptions

Field	Description
PCB	Protocol Control Block (PCB).
Local Address	Local address and port of the TCP connection.
Foreign Address	Foreign address and port of the TCP connection.
NSR	Current operational NSR state of this TCP connection.
RevOnly	If yes, the TCP connection is replicated only in the receive direction. Some applications may need to replicate a TCP connection that is only in the receive direction.

show tcp nsr client brief

To display brief information about the state of nonstop routing (NSR) for TCP clients on different nodes, use the **show tcp nsr client brief** command in XR EXEC mode.

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

Syntax Description

location *node-id*	(Optional) Displays brief client information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

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

```
RP/0/RP0/CPU0:router# show tcp nsr client brief location 0/1/CPU0


CCB          Proc Name     Instance Sets Sessions/NSR Up Sessions
0x482bf378   mpls_ldp  1        1             1/1
0x482bd32c   mpls_ldp  2        1             0/0
```

This table describes the significant fields shown in the display.

Table 10: show tcp nsr client brief Command Field Descriptions

Field	Description
CCB	Client Control Block (CCB). Unique ID to identify the client.
Proc Name	Name of the client process.
Instance	Instance is identified as the instance number of the client process because there can be more than one instance for a routing application.
Sets	Set number is identified as the ID of the session-set.
Sessions/NSR Up Sessions	Total sessions in the set versus the number of the sessions in which NSR is up.

show tcp nsr detail client

To display detailed information about the nonstop routing (NSR) clients, use the **show tcp nsr detail client** command in XR EXEC mode.

show tcp nsr detail client {*ccb-address* | **all**} [**location** *node-id*]

Syntax Description

ccb-address	Client Control Block (CCB) address range for the specific client information. 0 to ffffffff. For example, the address range can be 0x482a4e20.
all	Displays nonstop routing (NSR) details all the clients.
location *node-id*	(Optional) Displays client information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows detailed information for all clients:

```
Router# show tcp nsr detail client all


============================================================
CCB 0x482b25d8, Proc Name mpls_ldp
Instance ID 1, Job ID 360
Number of session-sets 2
Number of sessions 3
Number of NSR Synced sessions 1
Connected at: Sun Jun 10 07:05:31 2007
Registered for notifications: Yes

============================================================
CCB 0x4827fd30, Proc Name mpls_ldp
Instance ID 2, Job ID 361
Number of session-sets 1
Number of sessions 2
Number of NSR Synced sessions 2
Connected at: Sun Jun 10 07:05:54 2007
Registered for notifications: Yes
```

```
==============================================================

Router# show tcp nsr detail client all location 1
Router# show tcp nsr detail client all location 0/1/CPU0

==============================================================
CCB 0x482bf378, Proc Name mpls_ldp
Instance ID 1, Job ID 360
Number of session-sets 1
Number of sessions 1
Number of NSR Synced sessions 1
Connected at: Sun Jun 10 07:05:41 2007
Registered for notifications: Yes

==============================================================
CCB 0x482bd32c, Proc Name mpls_ldp
Instance ID 2, Job ID 361
Number of session-sets 1
Number of sessions 2
Number of NSR Synced sessions 2
Connected at: Sun Jun 10 07:06:01 2007
Registered for notifications: Yes
```

show tcp nsr detail endpoint

To display detailed information about the nonstop routing (NSR) end-points, use the **show tcp nsr detail endpoint** command in XR EXEC mode.

show tcp nsr detail endpoint [**location** { **all** | *node-id* }]

Syntax Description

end-point	Displays detailed info about the SSO/NSR local and partner endpoints.
location { **all** | *node-id* }	(Optional) Displays client information for the designated node or all the nodes.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Apart from Tusing this command to show local and partner node end-point information in details, you can also use this command can be used in debugging of TCP NSR issues.

Examples

The following sample output shows detailed information for all end-points:

```
Router# show tcp nsr detail endpoint

------------------------------------------------------------
                    Node: 0/RP0/CPU0
------------------------------------------------------------

Local endpoint:
  Node id: 0x2000
  Endp handl: 0x7f6f7400c6a8

  Endp len: 46
  Bytestream:
0xaf2f6465762f69702f7463705f73736f10804018b2080c8e4c0b3aa8daa80128abcb130b5f9138ac81808
  Service name: /dev/ip/tcp_sso/8192
```

show tcp nsr detail pcb

To display detailed information about the nonstop routing (NSR) state of TCP connections, use the **show tcp nsr detail pcb** command in XR EXEC mode.

show tcp nsr detail pcb {*pcb-address* | **all**} [**location** *node-id*]

Syntax Description

pcb-address	PCB address range for the specific connection information. 0 to ffffffff. For example, the address range can be 0x482c6b8c.
all	Specifies all the connections.
location *node-id*	(Optional) Displays connection information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows the complete details for NSR for all locations:

```
RP/0/RP0/CPU0:router# show tcp nsr detail pcb all location 0/0/cpu0


==============================================================
PCB 0x482b6b0c, Client PID: 2810078
Local host: 5.1.1.1, Local port: 646
Foreign host: 5.1.1.2, Foreign port: 31466
SSCB 0x482bc80c, Client PID 2810078
Node Role: Active, Protected by: 0/1/CPU0, Cookie: 0x00001000

NSR State: Up, Rcv Path Replication only: No
Replicated to standby: Yes
Synchronized with standby: Yes
FSSN: 3005097735, FSSN Offset: 0

Sequence number of last or current initial sync: 1181461961
Initial sync started at: Sun Jun 10 07:52:41 2007
Initial sync ended   at: Sun Jun 10 07:52:41 2007

Number of incoming packets currently held: 1
```

```
         Pak#    SeqNum     Len     AckNum
        -----  ----------  -----  ----------
            1  3005097735      0  1172387202

Number of iACKS currently held: 0

==============================================================
PCB 0x482c2920, Client PID: 2810078
Local host: 5.1.1.1, Local port: 646
Foreign host: 5.1.1.2, Foreign port: 11229
SSCB 0x482bb3bc, Client PID 2810078
Node Role: Active, Protected by: 0/1/CPU0, Cookie: 0x00001000

NSR State: Down, Rcv Path Replication only: No
Replicated to standby: No
Synchronized with standby: No
NSR-Down Reason: Initial sync was aborted
NSR went down at: Sun Jun 10 11:55:38 2007

Initial sync in progress: No
Sequence number of last or current initial sync: 1181476338
Initial sync error, if any: 'ip-tcp' detected the 'warning' condition 'Initial sync operation
 timed out'
Source of initial sync error: Local TCP
Initial sync started at: Sun Jun 10 11:52:18 2007
Initial sync ended   at: Sun Jun 10 11:55:38 2007

Number of incoming packets currently held: 0

Number of iACKS currently held: 0

==============================================================
PCB 0x482baea0, Client PID: 2810078
Local host: 5.1.1.1, Local port: 646
Foreign host: 5.1.1.2, Foreign port: 41149
SSCB 0x482bb3bc, Client PID 2810078
Node Role: Active, Protected by: 0/1/CPU0, Cookie: 0x00001000

NSR State: Down, Rcv Path Replication only: No
Replicated to standby: No
Synchronized with standby: No
NSR-Down Reason: Initial sync was aborted
NSR went down at: Sun Jun 10 11:55:38 2007

Initial sync in progress: No
Sequence number of last or current initial sync: 1181476338
Initial sync error, if any: 'ip-tcp' detected the 'warning' condition 'Initial sync operation
 timed out'
Source of initial sync error: Local TCP
Initial sync started at: Sun Jun 10 11:52:18 2007
Initial sync ended   at: Sun Jun 10 11:55:38 2007

Number of incoming packets currently held: 0

Number of iACKS currently held: 0

==============================================================
PCB 0x482c35ac, Client PID: 2859233
Local host: 5:1::1, Local port: 8889
Foreign host: 5:1::2, Foreign port: 14008
SSCB 0x4827fea8, Client PID 2859233
Node Role: Active, Protected by: 0/1/CPU0, Cookie: 0x0000001c

NSR State: Up, Rcv Path Replication only: No
```

```
Replicated to standby: Yes
Synchronized with standby: Yes
FSSN: 2962722865, FSSN Offset: 0

Sequence number of last or current initial sync: 1181474373
Initial sync started at: Sun Jun 10 11:19:33 2007
Initial sync ended   at: Sun Jun 10 11:19:33 2007

Number of incoming packets currently held: 0

Number of iACKS currently held: 0

============================================================
PCB 0x482c2f10, Client PID: 2859233
Local host: 5:1::1, Local port: 8889
Foreign host: 5:1::2, Foreign port: 40522
SSCB 0x4827fea8, Client PID 2859233
Node Role: Active, Protected by: 0/1/CPU0, Cookie: 0x0000001b

NSR State: Up, Rcv Path Replication only: No
Replicated to standby: Yes
Synchronized with standby: Yes
FSSN: 3477316401, FSSN Offset: 0

Sequence number of last or current initial sync: 1181474373
Initial sync started at: Sun Jun 10 11:19:33 2007
Initial sync ended   at: Sun Jun 10 11:19:33 2007

Number of incoming packets currently held: 0

Number of iACKS currently held: 0
```

show tcp nsr detail session-set

To display the detailed information about the nonstop routing (NSR) state of the session sets on different nodes, use the **show tcp nsr detail session-set** command in XR EXEC mode.

show tcp nsr detail session-set {*sscb-address* | **all**} [**location** *node-id*]

Syntax Description

sscb-address	Session-Set Control Block (SSCB) address range for the specific session set information. 0 to ffffffff. For example, the address range can be 0x482c6b8c.
all	Specifies all the session sets.
location *node-id*	(Optional) Displays information for session sets for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows all the session sets:

```
RP/0/RP0/CPU0:router# show tcp nsr detail session-set all


============================================================
SSCB 0x482bc80c, Client PID: 2810078
Set Id: 1, Addr Family: IPv4
Role: Active, Protected by: 0/1/CPU0, Well known port: 646
Sessions: total 1, synchronized 1
Initial sync in progress: No
        Sequence number of last or current initial sync: 1181461961
        Number of sessions in the initial sync: 1
        Number of sessions already synced: 1
        Number of sessions that failed to sync: 0
        Initial sync started at: Sun Jun 10 07:52:41 2007
        Initial sync ended   at: Sun Jun 10 07:52:41 2007

============================================================
SSCB 0x482bb3bc, Client PID: 2810078
Set Id: 2, Addr Family: IPv4
Role: Active, Protected by: 0/1/CPU0, Well known port: 646
```

```
Sessions: total 2, synchronized 0
Initial sync in progress: Yes
        Sequence number of last or current initial sync: 1181476338
        Initial sync timer expires in 438517602 msec
        Number of sessions in the initial sync: 2
        Number of sessions already synced: 0
        Number of sessions that failed to sync: 0
        Initial sync started at: Sun Jun 10 11:52:18 2007

============================================================
SSCB 0x4827fea8, Client PID: 2859233
Set Id: 1, Addr Family: IPv6
Role: Active, Protected by: 0/1/CPU0, Well known port: 8889
Sessions: total 2, synchronized 2
Initial sync in progress: No
        Sequence number of last or current initial sync: 1181474373
        Number of sessions in the initial sync: 2
        Number of sessions already synced: 2
        Number of sessions that failed to sync: 0
        Initial sync started at: Sun Jun 10 11:19:33 2007
        Initial sync ended   at: Sun Jun 10 11:19:33 2007
```

show tcp nsr session-set brief

To display brief information about the session sets for the nonstop routing (NSR) state on different nodes, use the **show tcp nsr session-set brief** command in XR EXEC mode.

show tcp nsr session-set brief [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays information for session sets for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

A session set consists of a subset of the application's session in which the subset is protected by only one standby node. The TCP NSR state machine operates with respect to these session sets.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows all the session sets that are known to the TCP instance:

```
RP/0/RP0/CPU0:router# show tcp nsr session-set brief

------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------
SSCB               Client    LocalAPP    Set-Id Family  State  Protect-Node Total/US/DS
0x00007f9e14022508  4776    mpls_ldp#1     646   IPv4   SAYN   0/RP1/CPU0   5/0/5
0x00007f9e14022778  4776    mpls_ldp#1     647   IPv6   SAYN   0/RP1/CPU0   0/0/0
0x00007f9e14025018  5714         bgp#1       1   IPv4   SAYN   0/RP1/CPU0  58/0/58
0x00007f9e140257a8  5714         bgp#1       2   IPv6   SAYN   0/RP1/CPU0   2/0/2
```

The following sample output shows brief information about the session sets for location 0/RP0/CPU0:

```
RP/0/RP0/CPU0:router# show tcp nsr session-set brief location 0/RP0/CPU0

------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------
SSCB               Client    LocalAPP    Set-Id Family  State  Protect-Node Total/US/DS
0x00007f9e14022508  4776    mpls_ldp#1     646   IPv4   SAYN   0/RP1/CPU0   5/0/5
0x00007f9e14022778  4776    mpls_ldp#1     647   IPv6   SAYN   0/RP1/CPU0   0/0/0
```

```
0x00007f9e14025018  5714         bgp#1       1   IPv4   SAYN   0/RP1/CPU0  58/0/58
0x00007f9e140257a8  5714         bgp#1       2   IPv6   SAYN   0/RP1/CPU0   2/0/2
```

This table describes the significant fields shown in the display.

Table 11: show tcp nsr session-set brief Command Field Descriptions

Field	Description
SSCB	Unique ID for Session-Set Control Block (SSCB) to identify a session-set of a client.
Client	PID of the client process.
LocalAPP	Name and instance number of the client process.
Set-Id	ID of the session-set.
Family	Address family of the sessions added to the session set for IPv4 or IPv6.
Role	Role of the TCP stack for active or standby.
Protect-Node	Node that is offering the protection, for example, partner node.
Total/Synced	Total number of sessions in the set versus the sessions that have been synchronized.

show tcp nsr statistics client

To display the nonstop routing (NSR) statistics for the clients, use the **show tcp nsr statistics client** command in XR EXEC mode.

show tcp nsr statistics client {*ccb-address* | **all**} [**location** *node-id*]

Syntax Description

ccb-address	Client Control Block (CCB) address range for the specific statistics information for the client. 0 to ffffffff. For example, the address range can be 0x482c6b8c.
all	Specifies all the statistics for the clients.
location *node-id*	(Optional) Displays statistics for the client for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows all the statistics for the client:

```
RP/0/RP0/CPU0:router# show tcp nsr statistics client all


============================================================
CCB: 0x482b25d8
Name: mpls_ldp, Job ID: 360
Connected at: Thu Jan  1 00:00:00 1970

Notification Stats      : Queued  Failed  Delivered  Dropped
Init-Sync Done          :      0       0          0       0
Replicated Session Ready:      0       0          0       0
Operational Down        :      0       0          0       0
Last clear at: Sun Jun 10 12:19:12 2007


============================================================
CCB: 0x4827fd30
Name: mpls_ldp, Job ID: 361
Connected at: Sun Jun 10 07:05:54 2007
```

```
Notification Stats      : Queued  Failed  Delivered  Dropped
Init-Sync Done          :      1       0          1       0
Replicated Session Ready:      0       0          0       0
Operational Down        :      0       0          0       0
Last clear at: Never Cleared
```

show tcp nsr statistics npl

To display the nonstop routing (NSR) summary statistics across all TCP sessions of NPL clients, use the **show tcp nsr statistics npl** command in XR EXEC mode.

show tcp nsr statistics npl [**location** { **all** | *node-id* }]

Syntax Description

location *node-id*	(Optional) Displays information for the summary statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Although this command gives information about packet sent, received, dropped at NSR NPL based on queue priority, it is mostly used for debugging.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows the summary statistics sacross all TCP sessions of NPL clients:

```
Router# show tcp nsr statistics npl location all

------------------------------------------------------------
                    Node: 0/0/CPU0
------------------------------------------------------------


Prio Queue: Low
----------------
        Msg-type                                          Number
        ------------------------------------------------------------
        Sent Data                   :                      74

        Recv Data                   :                       4


        ****Drop Stats****

        Msg-type              Drop-reason                    Number
        ------------------------------------------------------------
        Send Drop:      <None>
        Recv Drop:      <None>


Prio Queue: High
```

```
----------------
        Msg-type                                                Number
        ------------------------------------------------------------
        Sent Data                   :                           13
        Sent Ack                    :                            7

        Recv Data                   :                           11
        Recv Ack                    :                           11


        ****Drop Stats****

        Msg-type              Drop-reason                         Number
        ------------------------------------------------------------
        Send Drop:      <None>
        Recv Drop:      <None>

------------------------------------------------------------
                    Node: 0/2/CPU0
------------------------------------------------------------


Prio Queue: Low
----------------
        Msg-type                                                Number
        ------------------------------------------------------------
        Sent Data                   :                            4

        Recv Data                   :                           74


        ****Drop Stats****

        Msg-type              Drop-reason                         Number
        ------------------------------------------------------------
        Send Drop:      <None>
        Recv Drop:      <None>


Prio Queue: High
----------------
        Msg-type                                                Number
        ------------------------------------------------------------
        Sent Data                   :                           11
        Sent Ack                    :                           11

        Recv Data                   :                           13
        Recv Ack                    :                            7


        ****Drop Stats****

        Msg-type              Drop-reason                         Number
        ------------------------------------------------------------
        Send Drop:      <None>
        Recv Drop:      <None>
```

show tcp nsr statistics pcb

To display the nonstop routing (NSR) statistics for a given Protocol Control Block (PCB), use the **show tcp nsr statistics pcb** command in XR EXEC mode.

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

Syntax Description

pcb-address	PCB address range for the specific connection information. 0 to ffffffff. For example, the address range can be 0x482c6b8c.
all	Specifies all the connection statistics.
location *node-id*	(Optional) Displays connection statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows all NSR statistics:

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

------------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------------

==================================================================
PCB 0x7f9e3c028538
Number of times NSR went up: 1
Number of times NSR went down: 0
Number of times NSR was disabled: 0
Number of times switch-over occured : 0
IACK RX Message Statistics:
Number of iACKs dropped because session is not replicated : 0
Number of iACKs dropped because init-sync is in 1st phase : 1
Number of stale iACKs dropped : 0
Number of iACKs not held because of an immediate match : 0
TX Messsage Statistics:
Data transfer messages:
Sent 47, Dropped 0, Data (Total/Avg.) 23021748224/489824430
```

```
IOVAllocs : 0
Rcvd 0
Success : 0
Dropped (Trim) : 0
Dropped (Buf. OOS): 0
Segmentation instructions:
Sent 105, Dropped 0, Units (Total/Avg.) 1862270976/17735914
Rcvd 0
Success : 0
Dropped (Trim) : 0
Dropped (TCP) : 0
NACK messages:
Sent 0, Dropped 0
Rcvd 0
Success : 0
Dropped (Data snd): 0
Cleanup instructions :
Sent 46, Dropped 0
Rcvd 0
Success : 0
Dropped (Trim) : 0
Last clear at: Never Cleared
```

show tcp nsr statistics session-set

To display the nonstop routing (NSR) statistics for a session set, use the **show tcp nsr statistics session-set** command in XR EXEC mode.

show tcp nsr statistics session-set {*sscb-address* | **all**} [**location** *node-id*]

Syntax Description

sscb-address	Session-Set Control Block (SSCB) address range for the specific session set information for the statistics. 0 to ffffffff. For example, the address range can be 0x482b3444.
all	Specifies all the session sets for the statistics.
location *node-id*	(Optional) Displays session set information for the statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows all session set information for the statistics:

```
RP/0/RP0/CPU0:router# show tcp nsr statistics session-set all

------------------------------------------------------------
Node: 0/RP0/CPU0
------------------------------------------------------------

==================Session Set Stats ============================
SSCB 0x7f9e14022508, Set ID: 646
Number of times init-sync was attempted :0
Number of times init-sync was successful :0
Number of times init-sync failed :0
Number of times switch-over occured :0
Number of times NSR has been reset :0
Last clear at: Wed Dec 2 20:44:48 2015


==================Session Set Stats ============================
SSCB 0x7f9e14022778, Set ID: 647
Number of times init-sync was attempted :0
Number of times init-sync was successful :0
```

```
Number of times init-sync failed :0
Number of times switch-over occured :0
Number of times NSR has been reset :0
Last clear at: Wed Dec 2 20:44:48 2015


==================Session Set Stats ============================
SSCB 0x7f9e14025018, Set ID: 1
Number of times init-sync was attempted :0
Number of times init-sync was successful :0
Number of times init-sync failed :0
Number of times switch-over occured :0
Number of times NSR has been reset :0
Last clear at: Wed Dec 2 20:44:48 2015


==================Session Set Stats ============================
SSCB 0x7f9e140257a8, Set ID: 2
Number of times init-sync was attempted :0
Number of times init-sync was successful :0
Number of times init-sync failed :0
Number of times switch-over occured :0
Number of times NSR has been reset :0
Last clear at: Wed Dec 2 20:44:48 2015
```

show tcp nsr statistics summary

To display the nonstop routing (NSR) summary statistics across all TCP sessions, use the **show tcp nsr statistics summary** command in XR EXEC mode.

show tcp nsr statistics summary [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays information for the summary statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If a value is not specified, the current RP in which the command is being executed is taken as the location.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **location** keyword is used so that active and standby TCP instances are independently queried.

Task ID

Task ID	Operations
transport	read

Examples

The following sample output shows the summary statistics for all TCP sessions:

```
Router# show tcp nsr statistics summary

====================Summary Stats=======================
Last clear at: Never Cleared
Notif Statistics:
Queued Failed Delivered Dropped
Init-sync Done : 7 0 7 0
Replicated Session Ready: 0 0 0 0
Operational Down : 0 0 0 0
Init-sync Stop Reading : 7 0 7 0
Clients Statistics:
Number of Connected Clients :2
Number of Disconnected Clients :0
Number of Current Clients :2
Session Sets Statistics:
Number of Created Session Sets :4
Number of Destroyed Session Sets:0
Number of Current Session Sets :4
Sessions Statistics:
Number of Added Sessions :65
Number of Deleted Sessions :0
Number of Current Sessions :65
InitSync Statistics:
Number of times init-sync was attempted :7
Number of times init-sync was successful :7
Number of times init-sync failed :0
```

```
Held packets and iacks Statistics:
Number of packets held by Active TCP :67
Number of held packets dropped by Active TCP :0
Number of iacks held by Active TCP :0
Number of held iacks dropped by Active TCP :0
Number of iacks sent by Standby TCP :0
Number of iacks received by Active TCP :0
QAD Msg Statistics:
Number of dropped messages from partner TCP stack(s) : 0
Number of unknown messages from partner TCP stack(s) : 0
Number of messages accepted from partner TCP stack(s) : 1341
Number of stale dropped messages from partner TCP stack(s) : 0
Number of messages sent to partner TCP stack(s) : 22480
Number of messages failed to be sent to partner TCP stack(s): 0
RX Msg Statistics:
Number of iACKs dropped because there is no PCB : 0
Number of iACKs dropped because there is no datapath SCB : 0
Number of iACKs dropped because session is not replicated : 0
Number of iACKs dropped because init-sync is in 1st phase : 1056
Number of stale iACKs dropped : 17
Number of iACKs not held because of an immediate match : 0
Number of held packets dropped because of errors : 0
TX Messsage Statistics:
Data transfer messages:
Sent 4533, Dropped 0
IOVAllocs : 0
Rcvd 0
Success : 0
Dropped (PCB) : 0
Dropped (SCB-DP) : 0
Dropped (Trim) : 0
Dropped (Buf. OOS): 0
Segmentation instructions:
Sent 14124, Dropped 0
Rcvd 0
Success : 0
Dropped (PCB) : 0
Dropped (SCB-DP) : 0
Dropped (Trim) : 0
Dropped (TCP) : 0
NACK messages:
Sent 0, Dropped 0
Rcvd 0
Success : 0
Dropped (PCB) : 0
Dropped (SCB-DP) : 0
Dropped (Data snd): 0
Cleanup instructions :
Sent 3608, Dropped 0
Rcvd 0
Success : 0
Dropped (PCB) : 0
Dropped (SCB-DP) : 0
Dropped (Trim) : 0
Audit Messsage Statistics:
Mark Session set messages:
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Audit Session messages:
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Sweep Session set messages:
```

```
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Session set audit response messages:
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Mark Session set ack messages:
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Mark Session set nack messages:
Sent 0, Dropped 0
Rcvd 0
Dropped : 0
Number of audit operations aborted: 0
```

show tcp packet-trace

To display the details of the packet traces of a PCB, use the **show tcp packet-trace** command in XR EXEC mode.

show tcp packet-trace *pcb-name* **location** *node-id*

Syntax Description

pcb-name	Displays packet traces for the specified PCB.
location *node-id*	(Optional) Clears the TCP connection for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Apart from using this command to provide packet trace of a particular TCP PCB, you can also use this command for debugging purposes or to monitor flow of TCP packets for a TCP connection if you configure the pak-rate for the TCP PCB.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show tcp packet-trace 0x00007f7d4c035378**command:

```
Router# show tcp packet-trace 0x00007f7d4c035378

============================================================
Packet traces for: PCB 0x7f7d4c035378, 133.1.2.2:25032 <-> 133.1.2.1:179, VRF 0x60000000

May 14 05:50:59.463>R --A--- SEQ 2125620474 ACK 3607271508 LEN     0 WIN 31533 (pak:
0x63bfeedb, line: 3855)
                    snduna 3607271489 sndnxt 3607271508 sndmax 3607271508 sndwnd 31552
                    rcvnxt 2125620474 rcvadv 2125653242 rcvwnd 32768
                    ao_option 0
May 14 05:50:59.463>D --A--- SEQ 2125620474 ACK 3607271508 LEN     0 WIN 31533 (pak:
0x63bfeedb, line: 932)
                    snduna 3607271508 sndnxt 3607271508 sndmax 3607271508 sndwnd 31533
                    rcvnxt 2125620474 rcvadv 2125653242 rcvwnd 32768
                    ao_option 0
May 14 05:51:15.719>R --A--- SEQ 2125620474 ACK 3607271508 LEN  1460 WIN 31533 (pak:
0x63bfeedb, line: 3855)
                    snduna 3607271508 sndnxt 3607271508 sndmax 3607271508 sndwnd 31533
                    rcvnxt 2125620474 rcvadv 2125653242 rcvwnd 32768
.
.
```

```
.
.
.
May 14 05:57:45.953>R --A-P- SEQ 2125717138 ACK 3607271622 LEN   496 WIN 31419 (pak:
0x63bffcbb, line: 3855)
                    snduna 3607271622 sndnxt 3607271622 sndmax 3607271622 sndwnd 31419
                    rcvnxt 2125717138 rcvadv 2125748446 rcvwnd 31308
                    ao_option 0
May 14 05:57:45.953>S --A--- SEQ 3607271622 ACK 2125717634 LEN     0 WIN   128 (pak:
0x63bffcbb, line: 2688)
                    snduna 3607271622 sndnxt 3607271622 sndmax 3607271622 sndwnd 31419
                    rcvnxt 2125717634 rcvadv 2125750402 rcvwnd 32768
                    ao_option 0
May 14 05:57:45.953>R (app read)
                    snduna 3607271622 sndnxt 3607271622 sndmax 3607271622 sndwnd 31419
                    rcvnxt 2125717634 rcvadv 2125750402 rcvwnd 32768
                    ao_option 0
```

show tcp pak-rate

To display the details of the packet rate of a PCB, for example, number of packets received, maximum packet-size in the last 30 seconds, number of packets allocated, and number of packets freed, use the **show tcp pak-rate** command in XR EXEC mode if 'pak-rate tcp stats-start is configured.

show tcp pak-rate { **mem-summary** | | **stats** } { **location** *node-id* }

Syntax Description

mem-summary		Displays the memory summary of the TCP packet rate of a PCB.
stats		Displays the statistics of the TCP packet rate of a PCB.
location	*node-id*	(Optional) Clears the TCP connection for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show tcp pak-rate mem-summary location 0/RP0/CPU0**command:

```
Router# show tcp pak-rate mem-summary location 0/0/CPU0

 Family  Index  Num Allocs  Num frees
 -------------------------------------
  IPv4     0          0          0
  IPv4     1          0          0
  IPv4     2          0          0
  IPv4     3          0          0
  IPv4     4          0          0
  IPv4     5          0          0
  IPv4     6          0          0
  IPv4     7          0          0
  IPv4     8          0          0
  IPv4     9          0          0
  IPv6     0          0          0
  IPv6     1          0          0
  IPv6     2          0          0
  IPv6     3          0          0
  IPv6     4          0          0
  IPv6     5          0          0
```

```
IPv6      6           0           0
IPv6      7           0           0
IPv6      8           0           0
IPv6      9           0           0
```

show tcp statistics

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

show tcp statistics {**client** | **pcb** {**all** *pcb-address*} | **summary** } [**location** *node-id*]

Syntax Description

client	Displays statistics of TCP clients.
pcb *pcb-address*	(Optional) Displays detailed statistics for a specified connection.
pcb all	(Optional) Displays detailed statistics for all connections.
summary	(Optional) Clears summary statistic for a specific node or connection.
location *node-id*	(Optional) Displays statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

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

```
RP/0/RP0/CPU0:router# show tcp statistics pcb 0x08091bc8

Statistics for PCB 0x8091bc8 VRF Id 0x60000000
Send:   0 bytes received from application
        0 xipc pulse received from application
        0 bytes 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 table describes the significant fields shown in the display.

Table 12: show tcp statistics Command Field Descriptions

Field	Description
vrfid	VPN routing and forwarding (VRF) identification (vrfid) number.
Send	Statistics in this section refer to packets sent by the router.
Rcvd:	Statistics in this section refer to packets received by the router.

show udp brief

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

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

Syntax Description

location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

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

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


PCB        VRF-ID Recv-Q Send-Q Local Address Foreign Address
0x7fb44c029678 0x60000000 0       0 :::35333       :::0
0x7fb44c028fa8 0x00000000 0       0 :::35333       :::0
0x7fb43000b708 0x60000000 0       0 :::49270       :::0
0x7fb43000b038 0x00000000 0       0 :::49270       :::0
0x7fb43001fbb8 0x60000000 0       0 :::123         :::0
0x7fb430010f28 0x00000000 0       0 :::123         :::0
0x7fb430009ea8 0x60000000 0       0 :::41092       :::0
0x7fb4300096b8 0x00000000 0       0 :::41092       :::0
0x7fb44c025008 0x60000000 0       0 :::161         :::0
0x7fb43000cda8 0x60000001 0       0 :::161         :::0
0x7fb43000d2d8 0x60000002 0       0 :::161         :::0
0x7fb43000d938 0x60000003 0       0 :::161         :::0
0x7fb43000df98 0x60000004 0       0 :::161         :::0
0x7fb43000e5f8 0x60000005 0       0 :::161         :::0
0x7fb43000ec58 0x60000006 0       0 :::161         :::0
0x7fb43000f2b8 0x60000007 0       0 :::161         :::0
0x7fb43000f918 0x60000008 0       0 :::161         :::0
0x7fb43000ff78 0x60000009 0       0 :::161         :::0
0x7fb4300046c8 0x00000000 0       0 :::161         :::0
0x7fb44c025f78 0x60000000 0       0 :::162         :::0
0x7fb44c02b1f8 0x60000001 0       0 :::162         :::0
```

```
0x7fb44c02b848 0x60000002 0       0 :::162         :::0
0x7fb44c02bea8 0x60000003 0       0 :::162         :::0
0x7fb44c02c508 0x60000004 0       0 :::162         :::0
0x7fb44c02cb68 0x60000005 0       0 :::162         :::0
0x7fb44c02d1c8 0x60000006 0       0 :::162         :::0
0x7fb44c02d828 0x60000007 0       0 :::162         :::0
0x7fb44c02de88 0x60000008 0       0 :::162         :::0
0x7fb44c02e4e8 0x60000009 0       0 :::162         :::0
0x7fb44c0258e8 0x00000000 0       0 :::162         :::0
0x7fb4300024d8 0x60000000 0       0 :::3503        :::0
0x7fb44c028628 0x60000000 0       0 :::32958       :::0
0x7fb44c028018 0x00000000 0       0 :::32958       :::0
0x7fb44c02a9e8 0x60000000 0       0 :::3799        :::0
0x7fb44c02a258 0x00000000 0       0 :::3799        :::0
0x7fb4300012e8 0x00000000 0       0 :::0           :::0
0x7fb44c023258 0x60000000 0       0 0.0.0.0:514   0.0.0.0:0
0x7fb44c027848 0x60000000 0       0 0.0.0.0:27202 0.0.0.0:0
0x7fb4300077e8 0x00000000 0       0 0.0.0.0:27202 0.0.0.0:0
0x7fb44c03cf48 0x60000000 0       0 0.0.0.0:123   0.0.0.0:0
0x7fb4300107e8 0x00000000 0       0 0.0.0.0:123   0.0.0.0:0
0x7fb430000c18 0x60000000 0       0 0.0.0.0:646   0.0.0.0:0
0x7fb44c022158 0x00000000 0       0 0.0.0.0:646   0.0.0.0:0
0x7fb44c0274e8 0x60000000 0       0 0.0.0.0:30613 0.0.0.0:0
0x7fb430006bf8 0x00000000 0       0 0.0.0.0:30613 0.0.0.0:0
0x7fb44c0270f8 0x60000000 0       0 0.0.0.0:50589 0.0.0.0:0
0x7fb430006008 0x00000000 0       0 0.0.0.0:50589 0.0.0.0:0
```

This table describes the significant fields shown in the display.

Table 13: show udp brief Command Field Descriptions

Field	Description
PCB	Protocol control block address. This is the address to a structure that contains connection information such as local address, foreign address, local port, foreign port, and so on.
Recv-Q	Number of bytes in the receive queue.
Send-Q	Number of bytes in the send queue.
Local Address	Local address and local port.
Foreign Address	Foreign address and foreign port.

show udp detail pcb

To display detailed information of the User Datagram Protocol (UDP) connection table, use the **show udp detail pcb** command in XR EXEC mode.

show udp detail pcb {*pcb-address* | **all**} [**location** *node-id*]

Syntax Description

pcb-address	Address of a specified UDP connection.
all	Provides statistics for all UDP connections.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show udp detail pcb all** command:

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

==============================================
PCB is 0x4822fea0, Family: 2, VRF: 0x60000000
 Local host: 0.0.0.0:3784
 Foreign host: 0.0.0.0:0

Current send queue size: 0
Current receive queue size: 0
==============================================
PCB is 0x4822d0e0, Family: 2, VRF: 0x60000000
 Local host: 0.0.0.0:3785
 Foreign host: 0.0.0.0:0

Current send queue size: 0
Current receive queue size: 0
```

This table describes the significant fields shown in the display.

Table 14: show raw pcb Command Field Descriptions

Field	Description
PCB	Protocol control block address.
Family	Network protocol. IPv4 is 2; IPv6 is 26.
VRF	VPN routing and forwarding (VRF) instance name.
Local host	Local host address.
Foreign host	Foreign host address.
Current send queue size	Size of the send queue (in bytes).
Current receive queue size	Size of the receive queue (in bytes).

show udp extended-filters

To display the details of the UDP extended-filters, use the **show udp extended-filters** command in XR EXEC mode.

show udp extended-filters {**location** *node-id* | **peer-filter** {**location** *node-id*}}

Syntax Description

location *node-id*	Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
peer-filter	Displays connections with peer filter configured.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read

Examples

The following is sample output from the **show udp extended-filters** command for a specific location (0/RP0/CPU0):

```
RP/0/RP0/CPU0:router# show udp extended-filters location 0/RP0/CPU0


JID: 1111
Family: 10
VRF: 0x60000000
PCB: 0x7fb44c029678
L4-proto: 17
Lport: 35333
Fport: 0
Laddr: 70:8653:f7f:0:303d:40ba:3200:0
Faddr: e297:ba:3200:0:3208::
ICMP error filter mask: 0x0
LPTS options: 0x0 / 0x5 / 0x0 / BOUND /
Flow Type: RADIUS
```

show udp statistics

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

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

Syntax Description

clients	(Optional) Clears statistics for all TCP clients.
pcb *pcb-address*	Displays detailed statistics for each connection.
pcb *all*	Displays detailed statistics for all connections.
location *node-id*	(Optional) Displays information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
summary	Displays summary statistics.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

UDP clones the received packets if there are multiple multicast applications that are interested in receiving those packets.

Task ID

Task ID	Operations
transport	read

Examples

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

```
Router# show udp statistics summary

UDP statistics:
Rcvd: 121 Total, 121 drop, 0 no port
      0 checksum error, 0 too short
Sent: 121 Total, 0 error
0 Total forwarding broadcast packets
0 Cloned packets, 0 failed cloning
```

This table describes the significant fields shown in the display.

Table 15: show udp Command Field Descriptions

Field	Description
Rcvd: Total	Total number of packets received.
Rcvd: drop	Total number of packets received that were dropped.
Rcvd: no port	Total number of packets received that have no port.
Rcvd: checksum error	Total number of packets received that have a checksum error.
Rcvd: too short	Total number of packets received that are too short for UDP packets.
Sent: Total	Total number of packets sent successfully.
Sent: error	Total number of packets that cannot be sent due to errors.
Total forwarding broadcast packets	Total number of packets forwarded to the helper address.
Cloned packets	Total number of packets cloned successfully.
failed cloning	Total number of packets that failed cloning.

tcp dump-file convert

To convert the TCP dump packet traces files to other readable formats such as pcap, text, or both, use **tcp dump-file convert** command in XR EXEC mode.

tcp dump-file convert { *pcap* | *text* | *all-formats* } { *all* | *binary_file_name* | *ipaddress* } **location** { *node-id* } **file** { *absolute file path* }

Syntax Description

pcap	Converts TCP dump packet traces files to pcap format.
text	Converts TCP dump packet traces files to text format.
all-format	Converts TCP dump packet traces files to both pcap and text format.
all	Collects TCP dump file data from all peers and nodes.
binary_file_name	Specifies the name of the dump file to be converted.
ipaddress	Specifies the IP address of the peer node.
location {*node-id*}	(Optional) Specifies the node to store the converted TCP dump file. The *node-id* is entered in the *rack/slot/module* notation, for example **location** *0/RP0/CPU0*. By default, the files are stored in the current node where the CLI command is executed.
file {*absolute file path* }	(Optional) Specifies the absolute file path where you want to store the converted TCP dump files. The file path is entertered in the *node/filename* notation, for example */harddisk:/demo1*. By default, the converted files are stored inside the file "decoded_dumpfiles" in the current node where the CLI command is executed or if you have provided the location the files are stored in that location.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 24.2.11	This command was introduced.

Usage Guidelines

Use this command to convert TCP dump packet traces files into text, pcap, or both readable formats.

Examples

The following example shows how to convert TCP packet traces files into text and pcap readable formats:

```
Router# tcp dump-file convert all-formats all
ascii file is saved at :
/harddisk:/decoded_dumpfiles/text_tcpdump_peer_all_node0_RP0_CPU0_2024_3_19_10_8_53.462070.txt
pcap file is saved at :
/harddisk:/decoded_dumpfiles/pcap_tcpdump_peer_all_node0_RP0_CPU0_2024_3_19_10_8_40.154838.pcap
[OK]
```

The following example shows how to filter TCP dump packet traces by ip address and convert them into text and pcap readable format:

```
Router# tcp dump-file convert all-formats ipaddress 1.1.1.2
ascii file is saved at :
/harddisk:/decoded_dumpfiles/text_tcpdump_peer_1_1_1_2_node0_RSP0_CPU0_2024_3_19_10_9_20.539021.txt
pcap file is saved at :
/harddisk:/decoded_dumpfiles/pcap_tcpdump_peer_1_1_1_2_node0_RSP0_CPU0_2024_3_19_10_9_20.539021.pcap
[OK]
```

The following example specifies a location where you want to store the converted TCP dump file:

```
Router# tcp dump-file convert all-formats all location 0/RP0/CPU0
ascii file is saved at :
/harddisk:/decoded_dumpfiles/text_tcpdump_peer_all_node0_RP0_CPU0_2024_3_19_12_53_35.12323.txt
pcap file is saved at :
/harddisk:/decoded_dumpfiles/pcap_tcpdump_peer_all_node0_RP0_CPU0_2024_3_19_12_53_35.12323.pcap
[OK]
```

The following example specifies the absolute file path where you want to store the converted TCP dump files:

```
Router# tcp dump-file convert text all file /harddisk:/demo2
ascii file is saved at : /harddisk:/demo2.txt
[OK]
```

tcp mss

To configure the TCP maximum segment size that determines the size of the packet that TCP uses for sending data, use the **tcp mss** command in XR Config mode.

tcp mss *segment-size*

Syntax Description

segment-size	Size, in bytes, of the packet that TCP uses to send data. Range is 68 to 10000 bytes.

Command Default

If this configuration does not exist, TCP determines the maximum segment size based on the settings specified by the application process, interface maximum transfer unit (MTU), or MTU received from Path MTU Discovery.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read, write

Examples

This example shows how to configure the TCP maximum segment size:

```
RP/0/RSP0/CPU0:router(config)# tcp mss 1460
RP/0/RSP0/CPU0:router(config)# exit

Uncommitted changes found, commit them? [yes]:
RP/0/RSP0/CPU0:router:Sep  8 18:29:51.084 : config[65700]: %LIBTARCFG-6-COMMIT :

Configuration committed by user 'lab'.   Use 'show commit changes 1000000596' to view the
changes.
Sep  8 18:29:51.209 : config[65700]: %SYS-5-CONFIG_I : Configured from console by lab
```

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 XR Config 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 *minutes*	(Optional) Specifies a value in minutes. Range is 10 to 30.
infinite	(Optional) Turns off the age timer.

Command Default

tcp path-mtu-discovery is disabled

age-timer default is 10 minutes

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Use the **tcp path-mtu-discovery** 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 the destination host the packet is not 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.

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to set 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 XR Config mode. To reset the default, use the **no** form of this command.

tcp selective-ack
no tcp selective-ack

Syntax Description

XR Config mode

This command has no keywords or arguments.

Command Default

TCP selective ACK is disabled.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was supported.

Usage Guidelines

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 automatically sends the first packet that is not acknowledged and then waits for the other TCP to respond with what is missing from the data stream. This method is inefficient in Long Fat Networks (LFN), such as high-speed satellite links in which the bandwidth * delay product is large and valuable bandwidth is wasted waiting for retransmission.

Task ID

Task ID	Operations
transport	read, write

Examples

In the following example, the selective ACK is enabled:

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

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 XR Config mode. To restore the default time, use the **no** form of this command.

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

Syntax Description

seconds	Time (in seconds) the software waits while attempting to establish a TCP connection. Range is 5 to 30 seconds.

Command Default

The default value for the synwait-time is 30 seconds.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was supported.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to configure the software to continue attempting to establish a TCP connection for 18 seconds:

```
RP/0/RP0/CPU0:router(config)# tcp synwait-time 18
```

tcp timestamp

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

tcp timestamp
no tcp timestamp

Syntax Description

This command has no keywords or arguments.

Command Default

A TCP time stamp is not used.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was supported.

Usage Guidelines

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 contains a time stamp 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.

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to enable the timestamp option:

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

tcp window-size

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

tcp window-size *bytes*
no tcp window-size

Syntax Description

bytes	Window size in bytes. Range is 2048 to 65535 bytes.

Command Default

The default value for the window size is 16k.

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.12	This command was supported.

Usage Guidelines

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

Task ID

Task ID	Operations
transport	read, write

Examples

The following example shows how to set the TCP window size to 3000 bytes:

```
RP/0/RP0/CPU0:router(config)# tcp window-size 3000
```