

Offload Alias Support on a CMCC Adapter

This feature module describes the Offload Alias feature on a Cisco Mainframe Channel Connection (CMCC) adapter in a Cisco router. This document provides an overview of the Offload Alias feature including a description of the feature's benefits and supported platforms, configuration information, and a description of the new and modified commands.

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Feature Overview

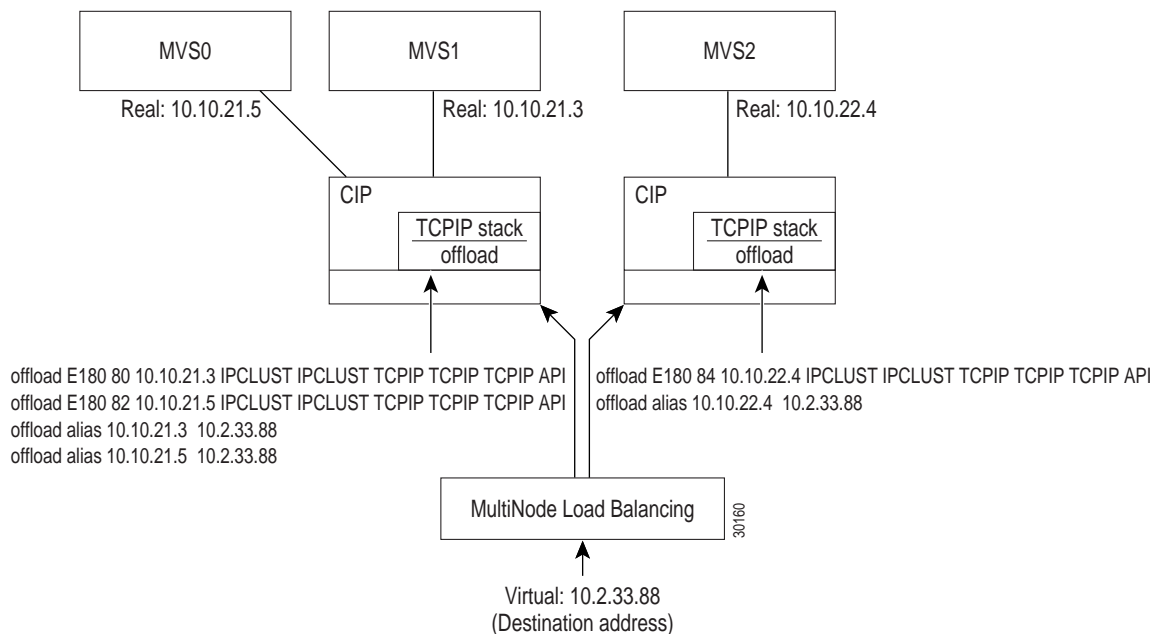
The Offload Alias feature allows multihomed IP addresses for offload devices. This feature enables dispatch-based load-balancing access to mainframe hosts through TCP/IP offload devices that are configured on a CMCC adapter. The Offload Alias feature supports load-balancing access to multiple hosts by allowing you to associate multiple real IP addresses with a virtual IP address at the offload device on a CMCC adapter. Each of the real IP addresses is associated with a common single virtual IP address, or alias, for client access.

Figure 1 shows an example of TCP/IP offload devices that are configured on two different CIP adapters, which are connected to multiple mainframe hosts using three different real IP addresses. The figure depicts the benefit that can be achieved when configuring offload alias support on a CMCC adapter in a networking environment that supports MultiNode Load Balancing (MNLB)—such as the MNLB Feature Set for LocalDirector.

The scenario shown in Figure 1 assumes that any of the configured hosts in the offload environment support the same services that a potential client seeks. A client specifies a virtual IP address, 10.2.33.88, as the destination address for those services. Using offload alias support, the virtual IP address 10.2.33.88 represents any of the three hosts (at real IP addresses 10.10.21.5, 10.10.21.3, or 10.10.22.4) as potential offload servers.

Upon receipt of the virtual IP address from a client, a networking architecture that supports MNLB can assess the load at any of the associated real IP addresses of the hosts supported by the offload devices. Based upon the load information, the load-balancing software forwards the packet to a particular real IP address. The destination IP address within the packet always appears as the virtual IP, or alias, address.

Figure 1 Two Offload Devices Using the Same Virtual IP Address to Access Multiple Real IP Addresses



Benefits

The Offload Alias feature provides the following benefit:

- Dispatch-based load-balancing access to offload-supported hosts when used within a network that supports MNLB.

Related Features and Technologies

When configured with offload alias support, the following features enable dispatch-based load-balancing functions to hosts supported by the offload devices:

- MultiNode Load Balancing Forwarding Agent in Cisco IOS release 12.0(5)T and later
- MNLB Feature Set for LocalDirector

Related Documents

Refer to the following documents to find additional information about configuring TCP/IP offload support and other features in the Cisco IOS software for CMCC adapters:

- Cisco IOS Release 12.0 *Bridging and IBM Networking Command Reference*
- Cisco IOS Release 12.0 *Bridging and IBM Networking Configuration Guide*

Refer to the following documents to find additional information about MNLB support in Cisco IOS software and other Cisco products:

- Cisco IOS release 12.0(5)T *MultiNode Load Balancing Forwarding Agent* feature module
- *MultiNode Load Balancing Feature Set for LocalDirector User Guide*

Supported Platforms

- Cisco 7000 series with RSP7000—Supports CIP adapters
- Cisco 7200 series—Supports the ECPA and PCPA adapters
- Cisco 7500 series—Supports CIP adapters

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

The following MIB was extended for offload alias support:

- CISCO-CIPTCPIP-MIB

For descriptions of supported MIBs and how to use MIBs, see the Cisco MIB web site on CCO at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

RFCs

No new or modified RFCs are supported by this feature.

Configuration Tasks

See the following sections for configuration tasks for the Offload Alias feature. Each task in the list indicates if the task is optional or required.

- Configuring TCP/IP Offload (Required)
- Configuring Offload Alias (Required)

Configuring TCP/IP Offload

The TCP/IP offload feature enables configuration of a TCP/IP stack on a CMCC adapter to perform TCP/IP offload processing for an attached host. You configure TCP/IP offload features on the physical interface of a CMCC adapter. Before you configure offload alias support, you must configure the CMCC adapter to support TCP/IP offload to the host.

To configure TCP/IP offload, perform the following steps beginning in global configuration mode:

Step	Command	Purpose
1	Router(config)# interface channel slot/port	Selects the interface on which to configure TCP/IP offload support. The <i>port</i> value differs by the type of CMCC adapter: <ul style="list-style-type: none"> • CIP—<i>Port</i> value corresponds to the physical interface, which is port 0 or 1. • CPA—<i>Port</i> value corresponds to port 0.
2	Router(config-if)# ip address address mask	Assigns an IP address and network mask to the selected interface.
3	Router(config-if)# offload path device-address ip-address host-name device-name host-app device-app host-link device-link [broadcast] [backup]	Defines the offload parameters for this device.

For detailed information about configuring TCP/IP offload support to a host, see the Cisco IOS Release 12.0 *Bridging and IBM Networking Configuration Guide*.

Configuring Offload Alias

The Offload Alias feature allows you to assign up to 8 virtual IP addresses to a single real IP address for an offload device. You must configure TCP/IP offload support before configuring support for offload aliases. Offload aliases are configured on the physical interface of a CMCC adapter.

To configure offload alias support on a CMCC adapter, perform the following steps beginning in global configuration mode:

Step	Command	Purpose
1	Router(config)# interface channel slot/port	Selects the interface that is configured for TCP/IP offload support. The <i>port</i> value differs by the type of CMCC adapter: <ul style="list-style-type: none"> • CIP—<i>Port</i> value corresponds to the physical interface, which is port 0 or 1. • CPA—<i>Port</i> value corresponds to port 0.
2	Router(config-if)# offload alias real-ip alias-ip	Assigns a virtual IP address (alias) to the real IP address of an offload device.

Verifying Offload Alias Configuration

To configure and verify offload alias support on a CMCC adapter, perform the following steps:

- Step 1** Configure offload and offload alias support on the CMCC adapter as shown in the following example:
- ```
interface channel 3/1
 ip address 10.10.21.1 255.255.255.0
 offload E180 83 10.10.21.3 IPCLUST IPCLUST TCPIP TCPIP TCPIP API
 offload alias 10.10.21.3 10.2.33.88
```
- Step 2** Create a static route from the alias IP address to the real IP address as shown in the following example:
- ```
ip route 10.2.33.88 255.255.255.255 10.10.21.3
```
- Step 3** Run a server, such as Telnet, on the host supported by the offload device.
- Step 4** From a client device, run Telnet to the host using the alias IP address, which is 10.2.33.88 in this configuration example.

Monitoring and Maintaining Offload Alias Configuration

The following **show** commands provide output according to any alias IP configurations that apply:

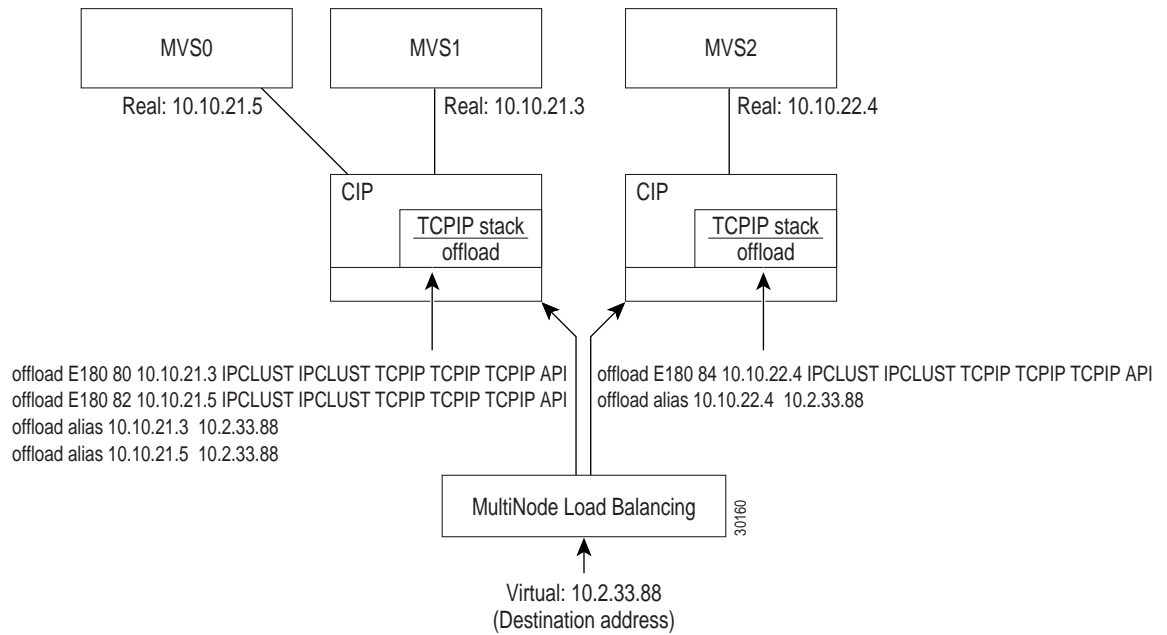
Command	Purpose
Router# show extended channel slot/port icmp-stack [ip-address]	Displays information about the Internet Control Message Protocol (ICMP) stack running on the CMCC channel interfaces.
Router# show extended channel slot/port ip-stack [ip-address]	Displays information about the IP stack running on CMCC channel interfaces.
Router# show extended channel slot/port tcp-connections [[loc-ip-addr [loc-port [rem-ip-addr [rem-port]]] [detail summary]	Displays information about the Transmission Control Protocol (TCP) sockets on a CMCC channel interface.
Router# show extended channel slot/port tcp-stack [ip-address]	Displays information about the TCP stack running on CMCC channel interfaces.
Router# show extended channel slot/port udp-stack [ip-address]	Displays information about the UDP stack running on the CMCC channel interfaces.

Configuration Example

The following example shows an offload alias configuration on two routers with CIP adapters that provide offload support to three MVS hosts.

Figure 2 shows the architecture for this example and the relationship of the IP addresses on the host and offload devices. The alias IP address for each of the MVS hosts is 10.2.33.88 in this example. Each host has a unique real IP address that is associated with the alias IP address in the offload configuration on the CMCC adapter.

Figure 2 Offload Alias Support on Multiple CMCC Adapters to Multiple Hosts



Router 1 Configuration

```

! Select the physical channel interface
!
interface channel 3/1
!
! Assign an IP address to the channel interface
!
ip address 10.10.21.1 255.255.255.0
!
! Configure other router network characteristics
!
no ip directed-broadcast
ip route-cache flow
no ip mroute-cache
no ip redirects
no keepalive
!
! Configure TCP/IP offload and alias support to MVS0 and MVS1
!
offload E180 80 10.10.21.3 IPCLUST IPCLUST TCPIP TCPIP TCPIP API
offload E180 82 10.10.31.5 IPCLUST IPCLUST TCPIP TCPIP TCPIP API
offload alias 10.10.21.3 10.2.33.88
offload alias 10.10.31.5 10.2.33.88
    
```

Router 2 Configuration

```

! Select the physical channel interface
!
interface channel 3/1
!
! Assign an IP address to the channel interface
!
ip address 10.10.22.2 255.255.255.0
!
! Configure other router network characteristics
!
no ip directed-broadcast
ip route-cache flow
no ip mroute-cache
no ip redirects
no keepalive
!
! Configure TCP/IP offload and alias support to MVS2
!
offload E180 84 10.10.22.4 IPCLUST IPCLUST TCPIP TCPIP TCPIP API
offload alias 10.10.22.4 10.2.33.88

```

Command Reference

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

- **offload alias**
- **show extended channel icmp-stack**
- **show extended channel ip-stack**
- **show extended channel tcp-connections**
- **show extended channel tcp-stack**
- **show extended channel udp-stack**

In Cisco IOS Release 12.0(1)T or later, you can search and filter the output for **show** and **more** commands. This functionality is useful when you need to sort through large amounts of output, or if you want to exclude output that you do not need to see.

To use this functionality, enter a **show** or **more** command followed by the “pipe” character (`|`), one of the keywords **begin**, **include**, or **exclude**, and an expression that you want to search or filter on:

```
command | { begin | include | exclude } regular-expression
```

Following is an example of the **show atm vc** command in which you want the command output to begin with the first line where the expression “PeakRate” appears:

```
show atm vc | begin PeakRate
```

For more information on the search and filter functionality, refer to the Cisco IOS Release 12.0(1)T feature module titled *CLI String Search*.

offload alias

To assign a virtual IP address to a real IP address for an offload device on a CMCC adapter, use the **offload alias** interface configuration command. To remove the alias IP address, use the **no** form of this command.

offload alias *real-ip alias-ip*
no offload alias *real-ip alias-ip*

Syntax Description

real-ip Real IP address of the offload-supported device.
alias-ip Virtual IP address for the offload-supported device.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(7)T	This command was introduced.

Usage Guidelines

Configure the **offload alias** command after you configure TCP/IP offload support on a CMCC adapter.

You can configure up to 8 different alias IP addresses for each real IP address of an offload device. You can assign the same alias IP address to multiple real IP addresses.

Examples

The following example configures TCP/IP offload support on a CMCC adapter for a host located at real IP address 10.10.21.3 with an alias IP address of 10.2.33.88:

```
interface channel 3/1
  offload E180 80 10.10.21.3 IPCLUST IPCLUST TCPIP TCPIP TCPIP API
  offload alias 10.10.21.3 10.2.33.88
```

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
show extended channel icmp-stack	Displays information about the ICMP stack running on the CMCC channel interfaces.
show extended channel ip-stack	Displays information about the IP stack running on CMCC channel interfaces.
show extended channel tcp-connections	Displays information about the TCP sockets on a channel interface.
show extended channel tcp-stack	Displays information about the TCP stack running on CMCC adapter interfaces.
show extended channel udp-stack	Displays information about the UDP stack running on the CMCC adapter interfaces.

show extended channel icmp-stack

To display information about the Internet Control Message Protocol (ICMP) stack running on the CMCC channel interface, use the **show extended channel icmp-stack** EXEC command.

show extended channel *slot/port* icmp-stack [*ip-address*]

Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
icmp-stack	Selects ICMP stack display.
<i>ip-address</i>	(Optional) IP address specified by the offload or offload alias interface configuration commands or the tn3270-server pu command. If the <i>ip-address</i> is an alias address, then all ICMP stacks configured for that alias address are shown.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(7)T	Alias addresses field added to the output.

Usage Guidelines

The **show extended channel icmp-stack** command is valid on both physical and virtual channel interfaces.

Examples

The following example shows sample output from the **show extended channel icmp-stack** for an offload device at real IP address 10.10.21.3 and alias IP address of 10.2.33.88:

```
Router#show extended channel 3/1 icmp-stack

ICMP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
  InMsgs      : 0          InErrors      : 0          InDestUnreachs: 0
  InTimeExcds : 0          InParmProbs   : 0          InSrcQuenchs  : 0
  InRedirects : 0          InEchos       : 0          OutEchoReps   : 0
  OutTimestamps : 0       OutTimestampReps: 0       OutAddrMasks  : 0
  OutAddrMaskReps: 0
```

Table 1 describes the fields shown in the display.

Table 1 show extended channel icmp-stack Field Descriptions

Field	Description
Alias addresses	Virtual IP addresses assigned to the real IP address of an offload device.
InMsgs	Total number of ICMP messages which the entity received. Note that this counter includes all those counted by icmpInErrors.
InErrors	Number of ICMP messages which the entity received but determined as having ICMP-specific errors (for example, bad ICMP checksums or bad length).
InDestUnreachs	Number of ICMP Destination Unreachable messages received.
InTimeExcds	Number of ICMP Time Exceeded messages received.
InParmPrbs	Number of ICMP Parameter Problem messages received.
InSrcQuenchs	Number of ICMP Source Quench messages received.
InRedirects	Number of ICMP Redirect messages received.
InEchos	Number of ICMP Echo (request) messages received.
OutEchoReps	Number of ICMP Echo Reply messages sent.
OutTimestamps	Number of ICMP Timestamp (request) messages sent.
OutTimestampReps	Number of ICMP Timestamp Reply messages sent.
OutAddrMasks	Number of ICMP Address Mask Request messages sent.
OutAddrMaskReps	Number of ICMP Address Mask Reply messages sent.

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
pu (direct)	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

show extended channel ip-stack

To display information about the IP stack running on CMCC channel interfaces, use the **show extended channel ip-stack** EXEC command.

show extended channel *slot/port* **ip-stack** [*ip-address*]

Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
ip-stack	Selects IP stack display.
<i>ip-address</i>	(Optional) IP address specified by the offload or offload alias interface configuration commands or the tn3270-server pu command. If the <i>ip-address</i> is an alias address, then all IP stacks configured for that alias address are shown.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(7)T	Alias addresses field added to the output.

Usage Guidelines

The **show extended channel ip-stack** command is valid on both physical and virtual channel interfaces.

Examples

The following example shows sample output from the **show extended channel ip-stack** for an offload device at real IP address 10.10.21.3 and alias IP address of 10.2.33.88:

```
Router#show extended channel 3/1 ip-stack
IP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
Forwarding      : no           DefaultTTL      : 64           InReceives    : 16
InHdrErrors    : 0           InAddrErrors   : 0           ForwDatagrams : 0
InUnknownProtos: 0           InDiscards     : 0           InDelivers    : 16
OutRequests    : 7           OutDiscards    : 0           OutNoRoutes   : 0
ReasmTimeout   : 60          ReasmReqds     : 0           ReasmOKs     : 0
ReasmFails     : 0           FragOKs        : 0           FragFails     : 0
FragCreates    : 0           RoutingDiscards: 0
```

The following example shows sample output from the **show extended channel ip-stack** when you specify the alias IP address for an offload device at real IP address 10.10.21.3:

```
Router#show extended channel 3/1 ip-stack 10.2.33.88

IP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
Forwarding      : no           DefaultTTL      : 64           InReceives    : 16
InHdrErrors    : 0           InAddrErrors   : 0           ForwDatagrams : 0
InUnknownProtos: 0           InDiscards     : 0           InDelivers    : 16
OutRequests    : 7           OutDiscards    : 0           OutNoRoutes   : 0
ReasmTimeout   : 60          ReasmReqds     : 0           ReasmOKs     : 0
ReasmFails     : 0           FragOKs        : 0           FragFails     : 0
FragCreates    : 0           RoutingDiscards: 0
```

Table 2 describes the fields shown in the display.

Table 2 show extended channel ip-stack Field Descriptions

Field	Description
Alias addresses	Virtual IP addresses assigned to the real IP address of an offload device.
OutDiscards	Number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). Note that this counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.
OutNoRoutes	Number of IP datagrams discarded because no route could be found to transmit them to their destination. Note that this counter includes any packets counted in ipForwDatagrams which meet this 'no-route' criterion. Note that this includes any datagrams which a host cannot route because all of its default gateways are down.
ReasmTimeout	Maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.
ReasmReqds	Number of IP fragments received which needed to be reassembled at this entity.
ReasmOKs	Number of IP datagrams successfully reassembled.
ReasmFails	Number of failures detected by the IP reassembly algorithm (for example, timed out or errors). Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.
FragOKs	Number of IP datagrams that have been successfully fragmented at this entity.

Table 2 show extended channel ip-stack Field Descriptions (continued)

Field	Description
FragFails	Number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could (for example, because their Don't Fragment flag was set).
FragCreates	Number of IP datagram fragments that have been generated as a result of fragmentation at this entity.
RoutingDiscards	Number of routing entries which were chosen to be discarded even though they are valid. One possible reason for discarding such an entry could be to free-up buffer space for other routing entries.

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
pu (direct)	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

show extended channel tcp-connections

To display information about the Transmission Control Protocol (TCP) sockets on a channel interface, use the **show extended channel tcp-connections** EXEC command.

```
show extended channel slot/port tcp-connections [[loc-ip-addr [loc-port [rem-ip-addr [rem-port]]] [detail | summary]
```

Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
tcp-connections	Specifies TCP connections display.
<i>loc-ip-addr</i>	(Optional) Local IP address. IP address of the local connection endpoint, which can be an alias address for offload devices. Restricts the output to those connections with a matching local IP address.
<i>loc-port</i>	(Optional) Local TCP port. This is the TCP port of the local connection endpoint. Restricts the output to those connections with a matching local TCP port. An asterisk (*) is a wildcard that matches every port.
<i>rem-ip-addr</i>	(Optional) Remote IP address. IP address of the remote connection endpoint. Restricts the output to those connections with a matching remote IP address.
<i>rem-port</i>	(Optional) Remote TCP port. TCP port of the remote connection endpoint. Restricts the output to those connections with a matching remote TCP port.
detail	(Optional) Prints detailed information about every matching connection.
summary	(Optional) This is the default. Prints a summary of all matching connections.

Defaults

No default behavior or values.

Command Modes

EXEC for summary and privileged EXEC for detail.

Command History

Release	Modification
11.0	This command was introduced.
12.0(7)T	Alias addresses field added to the output.

Usage Guidelines

The **show extended channel tcp-connections** command is valid on both physical and virtual channel interfaces. If no IP addresses or TCP ports are specified, all TCP connections are displayed in a summary for the specified interface.

The command displays detailed information about a large number of sessions and can take a long time. Consider restricting the output by IP address and TCP port to connections of interest.

Examples

The following example shows sample output from the **show extended channel tcp-connections** command when you specify the **detail** keyword for an offload device at real IP address 10.10.21.3 with an alias address of 10.2.33.88:

```
Router#show extended channel13/1 tcp-connections 10.10.21.3 detail

Stack Address 10.10.21.3:
Local IP Addr  Port  Remote IP Addr  Port  State          In Bytes  Out Bytes Addr
0.0.0.0        23   0.0.0.0         0     listen         0         0
10.2.33.88     23   70.70.5.140     61954 establish    59        105
```

Table 3 describes the fields shown in the display.

Table 3 show extended channel tcp-connections Field Descriptions

Field	Description
Stack Address	Real IP address of the TCP/IP stack or offload device.
Local IP Addr	Local IP address on the connection.
State	State of this TCP connection. The only value that can be set by a management station is deleteTCB(12). Accordingly, it is appropriate for an agent to return a 'badValue' response if a management station attempts to set this object to any other value. If a management station sets this object to the value deleteTCB(12), then this has the effect of deleting the TCB (as defined in RFC 793) of the corresponding connection on the managed node, resulting in immediate termination of the connection. As an implementation-specific option, a RST segment can be sent from the managed node to the other TCP endpoint (note however that RST segments are not sent reliably).
In Bytes	Number of bytes sent for this TCP connection. Note To support SNMP Version 1 Managers, this variable is supplied as a 32-bit value, which can wrap very frequently.
Out Bytes	Number of bytes received for this TCP connection. Note To support SNMP Version 1 Managers, this variable is supplied as a 32-bit value, which can wrap very frequently.

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
pu (direct)	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.
show extended channel tcp-stack	Displays information about the TCP stack running on CMCC adapter interfaces.

show extended channel tcp-stack

To display information about the TCP stack running on CMCC adapter interfaces, use the **show extended channel tcp-stack** EXEC command.

show extended channel *slot/port tcp-stack* [*ip-address*]

Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
tcp-stack	Specifies TCP stack display.
<i>ip-address</i>	(Optional) IP address specified by the offload or offload alias interface configuration commands or the tn3270-server pu command. If the <i>ip-address</i> is an alias address, then all TCP stacks configured for that alias address are shown.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(7)T	Alias addresses field added to the output.

Usage Guidelines

The **show extended channel tcp-stack** command is valid on both physical and virtual channel interfaces. If no *ip-address* argument is specified, then information is displayed for all IP addresses configured on the specified interface.

Examples

The following example shows sample output from the **show extended channel tcp-stack** command when you specify the real IP address for an offload device at 10.10.21.3:

```
Router#show extended channel 3/1 tcp-stack 10.10.21.3

TCP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
RtoAlgorithm: vanj      RtoMin      : 1000      RtoMax      : 64000
MaxConn      : -1      ActiveOpens : 0          PassiveOpens: 1
AttemptFails: 0      EstabResets : 0          CurrEstab   : 2
InSegs       : 16      OutSegs     : 7          RetransSegs : 0
InErrs       : 0      OutRsts     : 0
```

The following example shows sample output from the **show extended channel tcp-stack** command when you specify the alias IP address for an offload device at 10.2.33.88:

```
Router#show extended channel 3/1 tcp-stack 10.2.33.88

TCP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
RtoAlgorithm: vanj      RtoMin      : 1000      RtoMax      : 64000
MaxConn      : -1      ActiveOpens : 0          PassiveOpens: 1
AttemptFails: 0      EstabResets : 0          CurrEstab   : 2
InSegs       : 16      OutSegs     : 7          RetransSegs : 0
InErrs       : 0      OutRsts     : 0
```

Table 4 describes the fields shown in the display.

Table 4 show extended channel tcp-stack Field Descriptions

Field	Description
Alias addresses	Virtual IP addresses assigned to the real IP address of an offload device.
RtoAlgorithm	Algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
RtoMin	Minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.
RtoMax	Maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.
MaxConn	Limit on the total number of TCP connections the entity can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
ActiveOpens	Number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
PassiveOpens	Number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
AttemptFails	Number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.

Table 4 show extended channel tcp-stack Field Descriptions (continued)

Field	Description
EstabResets	Number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
CurrEstab	Number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
InSegs	Total number of segments received, including those received in error. This count includes segments received on currently established connections.
OutSegs	Total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
RetransSegs	Total number of segments retransmitted. That is, the number of TCP segments transmitted containing one or more previously transmitted octets.
InErrs	Total number of segments received in error (for example, bad TCP checksums).

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
pu (direct)	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.
show extended channel tcp-connections	Displays information about the TCP sockets on a channel interface.

show extended channel udp-stack

To display information about the UDP stack running on the CMCC adapter interfaces, use the **show extended channel udp-stack** EXEC command.

```
show extended channel slot/port udp-stack [ip-address]
```

Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
udp-stack	Selects UDP stack display.
<i>ip-address</i>	(Optional) IP address specified by the offload or offload alias interface configuration commands or the tn3270-server pu command. If the <i>ip-address</i> is an alias address, then all UDP stacks configured for that alias address are shown.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(7)T	Alias addresses field added to the output.

Usage Guidelines

The **show extended channel udp-stack** command is valid on both physical and virtual channel interfaces.

Examples

The following examples show sample output from the **show extended channel udp-stack** command when you specify the real IP address or the alias IP address, for an offload device at real IP address 10.10.21.3 and alias IP address of 10.2.33.88:

```
Router#show extended channel 3/1 udp-stack 10.10.21.3
```

```
UDP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
  InDatagrams : 6          NoPorts      : 6
  InErrors    : 0          OutDatagrams: 1
```

```
Router#show extended channel 3/1 udp-stack 10.2.33.88
```

```
UDP Statistics for IP Address 10.10.21.3
Alias addresses: 10.2.33.88
  InDatagrams : 6          NoPorts      : 6
  InErrors    : 0          OutDatagrams: 1
```

Table 5 describes the fields shown in the display.

Table 5 show extended channel udp-stack Field Descriptions

Field	Description
Alias addresses	Virtual IP addresses assigned to the real IP address of an offload device.
InDatagrams	Total number of UDP datagrams delivered to UDP users.
NoPorts	Total number of received UDP datagrams for which there was no application at the destination port.
InErrors	Number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
OutDatagrams	Total number of UDP datagrams sent from this entity.

Related Commands

Command	Description
offload (interface)	Configures an offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in offload mode. Also can be used to configure individual members of an offload backup group for the IP Host Backup feature.
pu (direct)	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

Glossary

real IP address—IP address used to access a specific network destination, such as an offload-supported host.

virtual IP address—IP address that is configured in software and assigned to real IP addresses.

