CHAPTER 33

IBM Channel Attach Commands

Use the commands in this chapter to configure IBM channel attach interface features. For hardware technical descriptions and for information about installing the router interfaces, refer to the hardware installation and maintenance publication for your particular product.

For interface configuration information and examples, refer to the "Configuring IBM Channel Attach" chapter of the *Router Products Configuration Guide*.

For a conversion table of the modular products and Cisco 7000 series processors, refer to the "Platform Support" appendix.

adapter

Use the **adapter** internal LAN configuration command to configure an internal adapter interface on an internal LAN. Use the **no** form of this command to remove an internal adapter configuration.

adapter *adapter-number mac-address*
no adapter *adapter-number mac-address*

Syntax Description

adapter-number	A number in the range of 0 to 31 that uniquely identifies the relative adapter number (ADAPNO) on this interface. This value must correspond to the ADAPNO parameter configured in the corresponding VTAM XCA definition.
mac-address	The MAC address of this relative adapter. This is a hexadecimal value in the form of XXXX.XXXX.XXXX.

Default

This command has no defaults.

Command Mode

Internal LAN configuration

Usage Guidelines

Before you can configure an internal adapter interface, you must use the **bridge-group** internal LAN configuration command or the the **source-bridge** internal LAN configuration command to configure the bridging type. The only way to get packets to the CIP SNA feature is through bridging. These two commands are identical to their interface configuration forms.

For transparent bridging, the bridge-group statements identify the interfaces in the same bridge group. Frames are sent only to the interface in the same bridge group.

For source route bridging, the source bridge statements identify the interfaces in the same ring group. Frames are sent only to interfaces in the same ring group.

An Ethernet internal LAN can have a **bridge-group** command.

A Token Ring or FDDI internal LAN can have either a **bridge-group** or a **source-bridge** command, but not both.

Note If the **source-bridge** command is changed while adapters have active sessions, those sessions will be terminated.

Example

The following example configures an Ethernet internal LAN adapter on relative adapter 12 and MAC address 87AD.0462.3FDE:

```
interface channel 1/2
 lan ethernet 20
```

```
bridge-group 1
adapter 12 87AD.0462.3FDE
```

Related Commands

A dagger (†) indicates that the command is documented in another chapter.

bridge-group†
llc2
name
source-bridge†
lan

channel-protocol

Use the **channel-protocol** interface configuration command to define a data rate of either 3 megabytes per second or 4.5 megabytes per second for the Parallel Channel Adapter (PCA) card.

channel-protocol [**s** | **s4**]

Syntax Description

s	(Optional) Specifies a data rate of 3 megabytes per second.
s4	(Optional) Specifies a data rate of 4.5 megabytes per second.

Default

If no value is specified, the default data rate for the PCA is 3 megabytes per second.

Command Mode

Interface configuration

Usage Guidelines

This command is valid for a PCA adapter card configured on a CIP on the Cisco 7000 series.

Example

The following command specifies a data rate of 4.5 megabytes per second for the interface:

```
channel-protocol s4
```

claw

Use the **claw** interface configuration command to establish the IBM channel attach configuration for an ESCON Channel Adapter (ECA) interface or bus-and-tag Parallel Channel Adapter (PCA) interface on the Cisco 7000 series.

claw *path device-address ip-address host-name device-name host-app device-app* [**broadcast**]

Syntax Description

path	A hexadecimal value in the range of 0x0000 – 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON director switch), one digit for the control unit logical address, and one digit for the channel logical address. If not specified in the IOCP, the control unit logical address and channel logical address default to 0.
device-address	A hexadecimal value in the range of 0x00 – 0xFE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
ip-address	The IP address specified in the HOME statement of the host TCPIP application configuration file.
host-name	The host name specified in the device statement in the host TCPIP application configuration file.
device-name	The CLAW workstation name specified in the device statement in the host TCPIP application configuration file.
host-app	The host application name as specified in the host application file. When connected to the IBM TCP host offerings, this value will be **TCPIP**, which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application.
device-app	The CLAW workstation application specified in the host TCPIP application. When connected to the IBM TCP host offerings, this value will be **TCPIP**, which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application.
broadcast	(Optional) Enable broadcast processing for this subchannel.

Default

This command has no defaults.

Command Mode

Interface configuration

Usage Guidelines

This command defines information that is specific to the interface hardware and the IBM channels supported on the interface.

Example

The following example shows how to enable IBM channel attach routing on the CIP port 0, which is supporting a directly connected ESCON channel:

```
interface channel 3/0
ip address 198.92.0.1 255.255.255.0
claw 0100 00 198.92.0.21 CISCOVM EVAL TCPIP TCPIP
```

csna

Use the **csna** interface configuration command to specify the path and device/subchannel on a physical channel of the Cisco 7000 series router to communicate with an attached mainframe. Use the **no** form of this command to delete the CIP SNA (CSNA) path.

csna *path device* [**maxpiu** *value*] [**time-delay** *value*] [**length-delay** *value*]
no csna *path device*

Syntax Description

path	A 4-digit hexadecimal value in the range of 0x0000 through 0xFFFF. This value specifies the data path and consists of two digits for the physical connection (either on the mainframe or on the ESCON director switch), one digit for the control unit address, and one digit for the channel logical address. The control unit address and channel logical address must be specified. For PCA, use the value 0x0100.
device	The device address transmitted on the channel path to select the channel-attached device. For PCA (bus-and-tag), this value refers to the subchannel defined in the XCA major node on the host system.
maxpiu *value*	(Optional) 4096 through 65535. The maximum packet size in bytes that will be transmitted on the interface.
time-delay *value*	(Optional) 0 through 100. The number of milliseconds to delay before transmitting a received packet on the interface.
length-delay *value*	(Optional) 4096 through 65535. The amount of data to accumulate, in bytes, before transmitting on the interface.

Defaults

maxpiu *value*—20470 (0x4ff6)
time-delay *value*—10 ms
length-delay *value*—20470 (0x4ff6)

Command Mode

Interface configuration

Usage Guidelines

This command is valid for an ESCON or PCA card configured on a CIP on the Cisco 7000 series. This command is required for CSNA support over a physical channel.

Use the **maxpiu**, **time-delay**, and **length-delay** keywords to adjust the CIP interface transmission characteristics. You can set the maximum size of packet that the interface will transmit to match the packet size accepted by the host system. You can adjust the delay between the time a packet is received on one of the CIP internal interfaces and transmitted to the host. You can also adjust the transmit-to-host delay by changing the amount of data the CIP accumulates before transmitting to the host.

Changes to the delay values take effect immediately. Any change to the maximum packet size will take effect after the channel is reinitialized.

Using the **no csna** command terminates all subchannels (path and devices) configured on the channel and all LLC2 sessions established over the subchannels.

Example

The following example shows CSNA, offload, and CLAW configured on the CIP in slot 1, port 0. CSNA can be configured by itself, without dependency on offload or CLAW:

```
interface channel 1/0
 no ip address
 no keepalive
 offload c700 c0 172.18.1.217 TCPIP OS2TCP TCPIP TCPIP TCPIP API
 claw C700 A0 192.18.1.219 EVAL CISCOVM AAA BBB
 csna 0100 10
 csna 0100 11
 csna 0100 12
```

interface channel

Use the **interface channel** global configuration command to specify a channel attach interface and enter interface configuration mode.

interface channel *slot*/*port*

Syntax Description

slot	Specifies the slot number where the CIP is located. The value can be in the range of 0-5.
port	Specifies the port number where the CIP is located. The value can be in the range of 0-2. Port 0 and 1 are for physical interfaces. Port 2 is for configuring an internal LAN interface on the CIP.

Default

This command has no defaults.

Command Mode

Global configuatrion

Usage Guidelines

This command is used only on the Cisco 7000 series.

Example

The following example shows how to enter interface configuration mode for a CIP in slot 2 and begin configuring port 0:

```
interface channel 2/0
```

Related Commands

claw
csna
lan
max-llc2-sessions
offload

lan

Use the **lan** interface configuration command to configure an internal LAN on a CIP interface. Use the **no** form of the command to remove an internal LAN interface.

lan {**ethernet** | **tokenring** | **fddi**} *lan-id*
no lan {**ethernet** | **tokenring** | **fddi**} *lan-id*

Syntax Description

ethernet | **tokenring** | **fddi**	The interface type for this internal LAN.
lan-id	A number 0–31 that uniquely identifies this internal LAN on this CIP. This value must be unique between all internal LANs of the same interface type on a CIP.

Default

This command has no defaults.

Command Mode

Interface configuration

Usage Guidelines

An internal LAN can be configured only on CIP interface port 2. Interface port 2 represents an internal port on the CIP. You receive an error message if you attempt to configure an internal LAN on any CIP port other than port 2.

Example

The following example shows how to configure an internal LAN Ethernet with a LAN ID of 20 on the CIP in slot 1, port 2:

```
interface channel 1/2
 lan ethernet 20
```

max-llc2-sessions

Use the **max-llc2-sessions** internal adapter configuration command to specify the number of concurrent LLC2 sessions that will be supported on the CIP interface. Use the **no** form of this command to remove a value.

max-llc2-sessions *number*
no max-llc2-sessions *number*

Syntax Description

number	A value in the range of 0–4000.

Default

This command has no defaults.

Command Mode

Internal adapter configuration

Usage Guidelines

The the maximum number of LLC2 sessions can be configured only on CIP interface port 2. To specify an unlimited number of LLC2 sessions, either omit this command from the adapter configuration on CIP interface port 2, or use a value of 0.

When configured for an unlimited number of LLC2 sessions, the actual number of sessions is determined by the available memory on the CIP.

Example

The following example limits the maximum number of LLC2 sessions to 212.

```
max-llc2-sessions 212
```

name

Use the **name** internal adapter configuration command to give a name to the internal adapter. Use the **no** form of the command to remove the name assigned to an internal adapter.

name *name*
no name *name*

Syntax Description

name	A name that identifies this internal adapter.

Default

This command has no defaults.

Command Mode

Internal adapter configuration

Usage Guidelines

The *name* can be any string of up to 8 characters that does not include blanks.

Example

The following example assigns a name to an internal adapter interface.

```
name VTAM_B14
```

offload

Use the **offload** interface configuration command to configure an offload task on the CIP. Use the **no** form of this command to cancel the offload task on the CIP.

offload *path device-address ip-address host-name device-name host-app device-app host-link device-link* [**broadcast**]
no offload *path device-address*

Syntax Description

path	A hexadecimal value in the range of 0x0000 – 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON director switch), one digit for the control unit address, and one digit for the channel logical address. If not specified in the IOCP, the control unit address and channel logical address default to 0.
device-address	A hexadecimal value in the range of 0x00 – 0xFE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
ip-address	The IP address specified in the host TCPIP application configuration file.
host-name	The host name specified in the device statement in the host TCPIP application configuration file.
device-name	The CLAW workstation name specified in the device statement in the host TCPIP application configuration file.
host-app	The host application name as specified in the host application file. When connected to the IBM TCP host offerings, this value will be **TCPIP**, which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard-coded in the host application.
device-app	The CLAW workstation application specified in the host TCPIP application. When connected to the IBM TCP host offerings, this value will be **TCPIP**, which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard-coded in the host application.
host-link	The host application name providing the CLAW API link. For IBM compatible offload software, this will always be **TCPIP**.
device-link	The CLAW workstation application name providing the CLAW API link. For IBM compatible offload software, this will always be **API**.
broadcast	(Optional) Enable broadcast processing for this subchannel.

Default

This command has no defaults.

Command Mode

Interface configuration

Usage Guidelines

The **offload** command uses the same underlying configuration parameters as does the **claw** command.

Example

The following example shows how to enable IBM channel attach offload routing on the CIP port 0, which is supporting a directly connected ESCON channel:

```
interface channel 3/0
ip address 198.92.0.1 255.255.255.0
offload 0100 00 198.92.0.21 CISCOVM EVAL TCPIP API
```

show extended channel icmp-stack

Use the **show extended channel icmp-stack** privileged EXEC command to display information about the ICMP stack running on the CIP interfaces in a Cisco 7000 series.

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

Syntax Description

slot	Slot number.
port	Port number.
ip-address	(Optional) Offload IP address.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel icmp-stack** command:

```
router# show extended channel 4/0 icmp-stack

ICMP Statistics for IP Address 198.92.1.120
  InMsgs         : 200          InErrors        : 201          InDestUnreachs: 202
  InTimeExcds    : 203          InParmProbs     : 204          InSrcQuenchs  : 205
  InRedirects    : 206          InEchos         : 207          OutEchoReps   : 213
  OutTimestamps  : 214          OutTimestampReps: 215          OutAddrMasks  : 216
  OutAddrMaskReps: 217

ICMP Statistics for IP Address 198.92.1.121
  InMsgs         : 201          InErrors        : 202          InDestUnreachs: 203
  InTimeExcds    : 204          InParmProbs     : 205          InSrcQuenchs  : 206
  InRedirects    : 207          InEchos         : 208          OutEchoReps   : 214
  OutTimestamps  : 215          OutTimestampReps: 216          OutAddrMasks  : 217
  OutAddrMaskReps: 218
```

show extended channel ip-stack

Use the **show extended channel ip-stack** privileged EXEC command to display information about the IP stack running on the CIP interfaces in a Cisco 7000 series.

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

Syntax Description

slot	Slot number.
port	Port number.
ip-address	(Optional) IP address specified by the **offload** interface configuration command.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel ip-stack** command:

```
router# show extended channel ip-stack

IP Statistics for IP Address 198.92.1.120
  Forwarding     : fowarding    DefaultTTL     : 2           InReceives   : 3
  InHdrErrors    : 4            InAddrErrors   : 5           ForwDatagrams: 6
  InUnknownProtos: 7            InDiscards     : 8           InDelivers   : 1313371
  OutRequests    : 10           OutDiscards    : 11          OutNoRoutes  : 12
  ReasmTimeout   : 13           ReasmReqds     : 14          ReasmOKs     : 15
  ReasmFails     : 16           FragOKs        : 17          FragFails    : 18
  FragCreates    : 19           RoutingDiscards: 20

IP Statistics for IP Address 198.92.1.121
  Forwarding     : nofoward     DefaultTTL     : 3           InReceives   : 4
  InHdrErrors    : 5            InAddrErrors   : 6           ForwDatagrams: 7
  InUnknownProtos: 8            InDiscards     : 9           InDelivers   : 1313371
  OutRequests    : 11           OutDiscards    : 12          OutNoRoutes  : 13
  ReasmTimeout   : 14           ReasmReqds     : 15          ReasmOKs     : 16
  ReasmFails     : 17           FragOKs        : 18          FragFails    : 19
  FragCreates    : 20           RoutingDiscards: 21
```

show extended channel llc2

Use the **show extended channel llc2** privileged EXEC command to display information about the LLC2 sessions running on the CIP interfaces in a Cisco 7000 series.

show extended channel *slot/port* **llc2** [**admin** | **oper** | **stats**] [*lmac* [*lsap* [*rmac* [*rsap*]]]]

Syntax Description

slot	Slot number.
port	Port number.
admin	(Optional) Shows configured values.
oper	(Optional) Shows operational values.
stats	(Optional) Shows statistics.
lmac	(Optional) Local MAC address.
lsap	(Optional) Local SAP address, 0–256.
rmac	(Optional) Remote MAC address.
rsap	(Optional) Remote SAP address, 0–256.

Command Mode

Privileged EXEC

Usage Guidelines

The default mode of this command is to show the **admin** (configured) values.

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel llc2** command:

```
router# show extended channel 2/2 llc2 admin
     Vlan Token  0 vadapter   0 0004.0004.0004
  t1-time   = 1000  tpf-time  = 1000  trej-time = 3200  tbusy-tim = 9600
  idle-time =60000  local-win =    7  recv-wind =    7  N2        =    8
  N1        = 1033  ack-delay =  100  ack-max   =    3  nw        =    0
```

show extended channel statistics

Use the **show extended channel statistics** privileged EXEC command to display information about the CIP interfaces on the Cisco 7000 series. This command displays information that is specific to the interface hardware. The information is generally useful for diagnostic tasks performed by technical support personnel only.

show extended channel *slot*/*port* **statistics** [*path* [*device-address*]]

Syntax Description

slot	Slot number.
port	Port number.
path	(Optional) A hexadecimal value in the range of 0x0000 – 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON Director switch), one digit for the control unit address, and one digit for the channel logical address. If not specified, the control unit address and channel logical address default to 0.
device-address	(Optional) A hexadecimal value in the range of 0x00 – 0xFE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. For CLAW and offload support, the device address must have an even value.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel statistics** command:

```
router# show extended channel 3/0 statistics

Path: C300 - ESTABLISHED
                  Command             Selective     System     Device        CU
Dev   Connects    Retries    Cancels      Reset      Reset     Errors       Busy
 60          92         85          5          4          1          0          0
 61          94          0          4          3          1          0          0

                Blocks             Bytes             Dropped Blk     Fail
Dev-Lnk      Read      Write     Read   Write        Read      Write   memd  Con
 60-00          6          0      192       0           8          0      0    Y
 60-01         82          0     7373       0           0          0      0    Y
Total:         88          0     7565       0           8          0      0

 61-00          0          4        0     128           0          0      0    Y
 61-01          0         85        0    9081           0          0      0    Y
Total:          0         89        0    9209           0          0      0

Path C300
Total:         88         89     7565    9209           8          0      0

  Last stats 8 seconds old, next in 2 seconds
```

Table 33-1 describes the fields shown in the display.

Table 33-1 Show Extended Channel Statistics Field Descriptions

Field	Description
Path	The path from the CLAW, offload, or CSNA configuration. It tells which port on the switch is used by the channel side of the configuration.
Dev	The device address for each device. For CLAW you get two device addresses. In the configuration statement, you only specify the even address. Both CLAW and offload get two devices and CSNA gets 1.
Connects	The number of times the channel started a channel program on the device.
Command Retries	The number of times the CIP either had no data to send to the channel (for the read subchannel) or the number of times the CIP had no buffers to hold data from the channel (for the write subchannel). Every command retry that is resumed results in a connect. A command retry may be ended via a cancel.
Cancels	The host requested any outstanding operation to be terminated. It is a measure of the number of times the host program was started.
Selective Reset	Selective reset affects only one device, whereas a system reset affects all devices on the given channel. It is a reset of the device. On VM this will occur whenever you have a device attached and issue a CP IPL command.
System Reset	The number of times the system IPL command was issued. the command is always issued when the ECA is initialized, and one when the channel is taken off line.
Device Errors	Errors detected by the ECA or PCA due to problems on the link. This value should always be 0.
CU Busy	The number of times the adapter returned a control unit busy indication to the host. This occurs after a cancel or reset if the host requests an operation before the CIP has finished processing the cancel or reset.
Dev-Lnk	The first number is the device address. The second number is the logical link. Link 0 is always used for CLAW control messages. For IP datagram mode, link 1 is for actual datagram traffic. For offload, link 2 is for API traffic. For CSNA, the Dev-Lnk is not relevant.
Blocks Read/Blocks Write	CLAW uses the even subchannel for reads and the odd subchannel for writes. Each count is one IP datagram or one control message.
Bytes Read/Bytes Write	Bytes is the sum of the bytes in the blocks.
Dropped Blk Read/Write	If the router switch processor sends data to the CIP faster than it can send it to the channel, then the block is dropped. High values mean the host is not running fast enough. There are drops on write too. A write drop will occur if the CIP fails to get a MEMD buffer *n* times for a given block. See Failed memd counter.
Failed memd	The number of times the CIP could not obtain a MEMD buffer on the first try. If this value is high, try allocating more large buffers.
Con	For link 0, connect of Y means the system validation has completed. For all other links, it means the connection request sequence has completed. Con is an abbreviation for connected.

show extended channel subchannel

Use the **show extended channel subchannel** privileged EXEC command to display information about the CIP interfaces on the Cisco 7000 series. This command displays information that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

show extended channel *slot*/*port* **subchannel**

Syntax Description

slot	Slot number.
port	Port number.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel subchannel** command:

```
router# show extended channel 3/0 subchannel

Channel3/0: state up
  Flags: VALID ESCON LOADED RQC_PEND MEMD_ENABLED
  Link: C4, Buffers 0, CRC errrors 0, Load count 1
  Link Incident Reports
    inplicit 0, bit-error 0, link failed 0,
    NOS 0, sequence timeout 0, invalid sequence 0
  Neighbor Node - VALID
    Class: Switch          Type Number : 009033        Tag: C4
    Model: 001             Manufacturer: IBM
    Plant: 51              Sequence    : 000000010067
  Local Node - VALID
    Class: CTCA-standalone Type Number : C7000         Tag: 30
    Model: 0               Manufacturer: CSC
    Plant: 17              Sequence    : 00000C04953F
                                                                          Last
  Mode     Path Device                                                   Sense
  CLAW     C300   60   198.92.1.58 CISCOVM AUBURN TCPIP TCPIP             0000
  CLAW     C300   61   198.92.1.58 CISCOVM AUBURN TCPIP TCPIP             0080

  Last stats 1 seconds old, next in 9 seconds
```

The first line describes the status of the specified CIP and port. The status can be up, down, or administratively down:

```
Channel3/0: state up
```

The next line describes the flags on the CIP:

```
Flags: VALID ESCON LOADED RQC_PEND MEMD_ENABLED
```

- VALID—An adapter is installed. All displays should contain this.
- ESCON—The adapter is an ESCON adapter.

- LOADED—The microcode on the adapter is loaded.
- RQC_PEND—The adapter is attempting to send status to the channel.
- MEMD_ENABLED—The adapter is allowed to send and receive datagrams.
- SIGNAL—The ECA signal light is detected.

The next line displays Link Incident Reports:

```
Link Incident Reports
  inplicit 0, bit-error 0, link failed 0,
  NOS 0, sequence timeout 0, invalid sequence 0
```

Link Incidents are errors on an ESCON channel. These errors are reported to the host operating system and are recorded here for additional information.

Implicit incidents indicate a recoverable error occurred in the ECA.

Bit errors indicate the bit error rate threshold was reached. The bit error rate threshold is 15 error bursts within 5 minutes. An error burst is defined as a time period of 1.5+/-.5 seconds during which one or more code violations occurred. A code violation error is caused by an incorrect sequence of 10 bit characters.

Link failed means a loss of synchronization or light has occurred.

NOS means the channel or switch transmitted the Not Operational Sequence.

Sequence timeout occurs when a connection recovery timeout occurs or when waiting for the appropriate response while in the transmit OLS (off-line sequence) state.

Invalid Sequence occurs when a UD or UDR is recognized in the wait for offline sequence state. UD is an unconditional disconnect and UDR is an unconditional disconnect response.

The neighbor node describes the channel or switch. The local node describes the router. The VALID flag shows information has been exchanged between the router and channel or switch.

The information displayed under Neighbor Node is as follows:

```
Neighbor Node - VALID
  Class: Switch          Type Number : 009033        Tag: C4
  Model: 001             Manufacturer: IBM
  Plant: 51              Sequence    : 000000010067
```

Class will be switch or channel depending on whether the connection is a switched point-to-point connection or a point-to-point connection. The type number describes the model of switch or processor. The TAG describes the physical location of the connector. Model is a further classificiation of type. Manufacturer describes who made switch or processor. Plant and sequence are manufacturer specific information to uniquely define this one device.

The information displayed under Local Node is as follows:

```
Local Node - VALID
  Class: CTCA-standalone Type Number : C7000         Tag: 30
  Model: 0               Manufacturer: CSC
  Plant: 17              Sequence    : 00000C04953F
```

The class will be CTCA. The type number and model define the router. The tag is the slot and port where the channel interface processor resides. Manufacturer will always be CSC (for Cisco Systems). Plant is the location where the CIP was manufactured. Sequence is the base ethernet address assigned to the RP.

The last three lines show currently configured information for the inbound and outbound channel connections:

```
                                                                                Last
Mode      Path Device                                                          Sense
CLAW      C300   60   198.92.1.58 CISCOVM AUBURN TCPIP TCPIP                    0000
CLAW      C300   61   198.92.1.58 CISCOVM AUBURN TCPIP TCPIP                    0080
```

Mode can be CLAW, offload, or CSNA. Path, device, ip address, and names are from the CLAW command. Since CLAW and offload commands define two devices, both devices are shown. Last sense is the two bytes of sense data transmitted to the host at the time of the last unit exception. Normally the value will be 0000 if no unit exception has occurred, or 0080 to indicate that a resetting event has occurred. Resetting events occur whenever an ESCON device starts unless the first command is a 0x02 read command. The CLAW read subchannel always starts with a 0x02 read command so a resetting event will not occur.

show extended channel tcp-stack

Use the **show extended channel tcp-stack** privileged EXEC command to display information about the TCP stack running on the CIP interfaces in a Cisco 7000 series.

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

Syntax Description

slot	Slot number.
port	Port number.
tcp-stack	IP address for the TCP stack on the CIP.
ip-address	(Optional) IP address specified in an **offload** interface configuration command.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show channel tcp-stack** command:

```
router# show extended channel tcp-stack

TCP Statistics for IP Address 198.92.1.120
  RtoAlgorithm: other        RtoMin      : 101          RtoMax      : 102
  MaxConn     : 103          ActiveOpens : 104          PassiveOpens: 105
  AttemptFails: 106          EstabResets : 107          CurrEstab   : 108
  InSegs      : 109          OutSegs     : 110          RetransSegs : 111
  InErrs      : 112          OutRsts     : 113

TCP Statistics for IP Address 198.92.1.121
  RtoAlgorithm: constant     RtoMin      : 102          RtoMax      : 103
  MaxConn     : 104          ActiveOpens : 105          PassiveOpens: 106
  AttemptFails: 107          EstabResets : 108          CurrEstab   : 109
  InSegs      : 110          OutSegs     : 111          RetransSegs : 112
  InErrs      : 113          OutRsts     : 114
```

show extended channel udp-listeners

Use the **show extended channel udp-listeners** privileged EXEC command to display information about the UDP listener sockets running on the CIP interfaces in a Cisco 7000 series.

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

Syntax Description

slot	Slot number.
port	Port number.
udp-listeners	Specifies UDP listener port display.
ip-address	(Optional) IP address specified in an **offload** interface configuration command.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show channel udp-listeners** command:

```
router# show extended channel 4/0 udp-listeners 198.92.1.120

UDP Listener: IP Address 198.92.1.120       LocalPort 0

UDP Listener: IP Address 198.92.1.120       LocalPort 1

UDP Listener: IP Address 198.92.1.120       LocalPort 2

UDP Listener: IP Address 198.92.1.120       LocalPort 3

UDP Listener: IP Address 198.92.1.120       LocalPort 4

router# show extended channel 4/0 udp-listeners 198.92.1.121

UDP Listener: IP Address 198.92.1.121       LocalPort 0

UDP Listener: IP Address 198.92.1.121       LocalPort 1

UDP Listener: IP Address 198.92.1.121       LocalPort 2

UDP Listener: IP Address 198.92.1.121       LocalPort 3

UDP Listener: IP Address 198.92.1.121       LocalPort 4
```

show extended channel udp-stack

Use the **show extended channel udp-stack** privileged EXEC command to display information about the UDP stack running on the CIP interfaces in a Cisco 7000 series.

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

Syntax Description

slot	Slot number.
port	Port number.
udp-stack	Selects UDP stack display.
ip-address	(Optional) IP address specified in an **offload** interface configuration command.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show extended channel udp-stack** command:

```
router# show extended channel udp-stack

UDP Statistics for IP Address 198.92.1.120
  InDatagrams : 300          NoPorts     : 301
  InErrors    : 302          OutDatagrams: 303

UDP Statistics for IP Address 198.92.1.121
  InDatagrams : 301          NoPorts     : 302
  InErrors    : 303          OutDatagrams: 304
```

show interfaces channel

Use the **show interfaces channel** privileged EXEC command to display information about the CIP interfaces on the Cisco 7000 series. This command displays information that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

show interfaces channel *slot*/*port* [**accounting**]

Syntax Description

slot	Slot number.
port	Port number.
accounting	(Optional) Shows interface accounting information.

Command Mode

Privileged EXEC

Sample Display

The following is sample output on the Cisco 7000 from the **show interfaces channel** command:

```
Router# show interfaces channel 3/0

Channel3/0 is up, line protocol is up
  Hardware is cxBus IBM Channel
  Internet address is 198.92.1.145, subnet mask is 255.255.255.248
  MTU 4096 bytes, BW 0 Kbit, DLY 0 usec, rely 255/255, load 1/255
  Encapsulation CHANNEL, loopback not set, keepalive not set
  ECA type daughter card
  Data transfer rate 12 Mbytes  Number of subchannels 1
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 0:00:04
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

Table 33-2 describes the fields shown in the display.

Table 33-2 Show Interfaces Channel Field Descriptions

Field	Description
Channel... is {up | down | administratively down}	Indicates whether the interface hardware is currently active (whether synchronization is achieved on an ESCON channel, or whether operational out is enabled on a parallel channel) and whether it has been taken down by an administrator.

Field	Description
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol think the line is usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	IP address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopbacks are set or not.
keepalive	Indicates whether keepalives are set or not.
daughter card	Type of adapter card.
Data transfer rate	Rate of data transfer.
Number of subchannels	Number of subchannels.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. These asterisks (***) indicate the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31}ms (and less than 2^{32}ms) ago.
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.

Field	Description
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.
CRC	Number of code violation errors seen on the ESCON interface, where a received transmission character is recognized as invalid. On a parallel interface, the number of parity errors seen.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. This value is always 0.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data. This value is always 0.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment. This value is always 0.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
output errors	Number of output errors.
collisions	Number of collisions detected. This value is always 0.

Field	Description
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down. On the Channel Interface Processor, (CIP) this may occur if the host software is not requesting data
restarts	Number of times the controller was restarted because of errors.