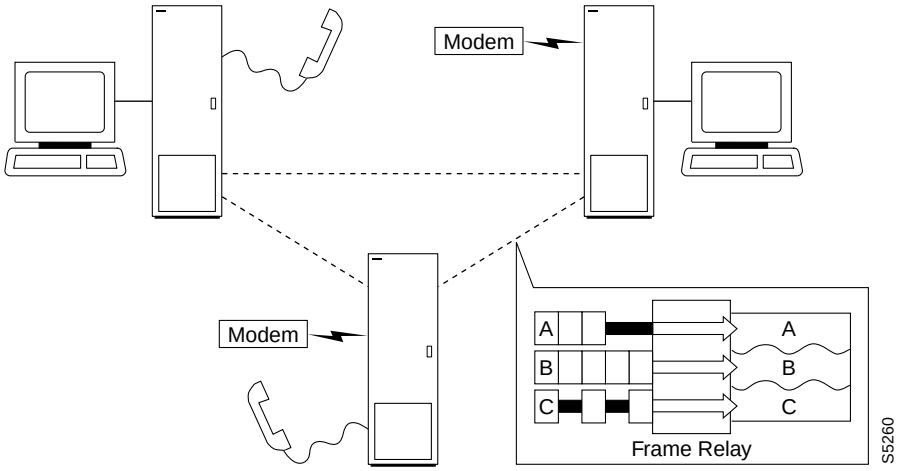
CHAPTER 9

Frame Relay Connections



The frame relay commands let you add, configure, delete, and specify statistical reporting for frame relay connections. In addition to describing the commands, this chapter tells you how to:

- Set up a frame relay connection
- Set up a frame relay connection group
- Use frame relay classes
- Use interface control templates
- Configure channel utilization
- Set channel priorities
- Display statistics

The frame relay commands in this chapter operate on an FRP/FRI card set in an IPX or an FRM/FRI or UFM/UFI card set in an IGX. For the frame relay commands that operate on an FRSM in an AXIS shelf (connected to a BPX), refer to the *AXIS Command Supplement*. For the frame relay commands that operate on the FastPADs and supporting service cards, refer to the FastPAD manuals.

For a greater number of lower-speed connections, the Port Concentrator Shelf (PCS) is available. The PCS is an external device that requires an FRM-2/FRI-2 card set in the IGX or an FRC-2/FRI-2 in an IPX. The node automatically recognizes an FRM-2 or FRC-2 and accepts commands for the PCS.

Note A connection is the same as a PVC (permanent virtual circuit).

Physical and Logical Frame Relay Ports

This section describes the command-related issues for physical and logical frame relay ports.

In the IPX and IGX, the frame relay-only cards are the FRP, FRM and UFM card sets. (The FTM supports frame relay, voice, and serial data but is not described in this manual.) In the FRP and FRM, both physical and logical ports can exist. The UFM has *logical* ports and *physical* lines.

Physical and Logical Ports on an FRM

In the FRP and FRM card sets, a *logical* port is a convention that applies to a T1 or E1 back card. In contrast, the ports on an X.21 or V.35 back card are physical. The reason that T1 and E1 ports on an FRP or FRM card set are logical is that these ports utilize one, bi-directional connector. To support the range of possible PVCs, the traffic passes through a de-multiplexer on a T1 or E1 FRI. Therefore, although only one connector exists on the card, the frame relay commands accept port numbers 1–24 (T1) or 1–31 (E1). When a frame relay command takes the parameter *slot.port*, the port in this case is logical, and the node tracks it accordingly.

Note Keep in mind the distinction between a logical *port* and a logical *channel*: a logical channel is one or more DS0s.

Logical Ports and Physical Lines on a UFM

On the UFI back cards, the presence of multiple physical lines adds a parameter to the connection identifier. When you identify a UFM channel, use the format *slot.port line.DS0_range*. Due to the architecture of the software, *port* is a logical specification, and *line* is a physical specification. The range of logical ports is 1–250. The number of physical lines (hardware connectors) on the UFI-8T1 and UFI-8E1 is 8 (regardless of whether the front card is a UFM-4C or UFM-8C). The range of DS0s is 1–24 for T1 and 1–31 for E1. For X.21 back cards, the range of lines is 1–10. The range for HSSI lines is 1–4.

Setting Up a Frame Relay Connection

Frame relay connections can exist between the following cards:

- FRP, FRM, or UFM to any FRP, FRM or UFM.
- FRP, FRM, or UFM to ASI (ATM): This path supports frame relay-to-network interworking
- FRP, FRM, or UFM to an FRSM in an AXIS: Frame relay encapsulated in ATM and terminated on an AXIS.
- FRP, FRM, or UFM to a FastPAD port.

An IPX or IGX provides a Permanent Virtual Circuit (PVC) Frame Relay Service for interconnecting user-devices (routers, bridges, and packet switches). The PVCs are internally created on the node and rely on FastPacket switching. The user-device connects to the frame relay back card in the node. The back card provides the adaptation layer function to convert between the frame relay format and the FastPacket format.

In addition to the interface cards listed just listed, frame relay connections require a trunk card. Trunk cards can be the NTC or AIT in an IPX or an NTM, BTM, or ALM/B in an IGX. Because frame relay is a purchased option, Cisco must enable it on each node intended to carry frame relay traffic.

A variety of external user-devices can operate with an IPX or IGX. The configuration on these devices must be appropriate for the type of interface on the back card.

The following is the sequence of commands for bringing up a frame relay port and adding a frame relay connection.

Step 1 Activate a frame relay port with the **upfrport** command.

Step 2 Use **cnffrport** to specify the frame relay parameters for the frame relay service.

An optional command may be applicable to a Port Concentrator Shelf (PCS): you can use **cnffrcport** to configure the concentrated link between the PCS and frame relay cards.

Step 3 Use the **dspcls** command to view the existing frame relay classes. Decide on a class if a suitable class exists, otherwise create a suitable class using the **cnffrcls** command. Use the class number in the **addcon** command.

Step 4 Use the **vt** command to access the node at the remote end of the proposed frame relay connection, then use the **upfrport** and **cnffrport** commands as in steps 1 and 2.

Step 5 Use the **addcon** command on the local node to add the frame relay connection.

Setting Up a Frame Relay Connection Group

A frame relay *group* is a routing entity in which you can include up to 16 individual frame relay connections (or *virtual circuits*). Subsequently, the network can route the connections as a group.

1 Use the **addcongrp** command to set up a frame relay connection group. For example, if you want a connection group between local node “alpha” and remote node “beta,” enter:

addcongrp beta.1

The *group name* consists of the *remote node name* and a *group number*. The “1” is the number of the group between alpha and beta. The network establishes the connection group with the group name “beta.1” on node alpha. On node beta, the group name is “alpha.1.” You can specify any unused group number in the range 1–255. If you do not specify the group number, the system assigns the next higher, unused number.

After you finish **addcongrp**, the group exists but does not yet contain any frame relay circuits.

2 Initially, a group is empty. Use the **grpcon** command to assign up to a maximum of 16 frame relay connections to a group. The connections you include in the group must be inter-node, non-bundled, frame relay connections that already exist (through **addcon**). For example, to assign the connection 8.1.101 to the beta.1 connection group, enter:

grpcon beta.1 8.1.101

After you have assigned the group members, you can modify the routing parameters of the whole group (all the individual circuits in the group) by using the group name (*remote nodename.group number*) in the **cnfcos**, **upcon**, **dncon**, **cnfpref**, **dsprts**, and **dspcons** commands. For individual connections in the group, you can specify non-connection parameters such as the fail state, loop state, and configuration. Other frame relay connection group commands are:

— **dspcongrp,** which displays the details of a connection group.

— **dspcongrps,** which displays all connection groups at the node.

— **delcongrp,** which deletes a connection group. Before deleting a group, you must empty the connection group by using the **delcon** command.

Using Frame Relay Classes

For each frame relay connection you add, you must specify a *frame relay class*. A frame relay class is a set of parameters that specify the bandwidth and congestion-prevention characteristics for a connection. Cisco provides 10 predefined classes, but you can modify any of the 10 frame relay classes with **cnffrcls**. To see the parameters in all connection classes, execute **dspfrcls**. A frame relay class is relevant only at the time you add a connection with **addcon**. Once the connection exists, the system uses the parameters but does not keep track of the class number.

Apart from using the **cnffrcls** command, you can change one or more frame relay parameters with the **addcon** command. When you add a frame relay connection with **addcon**, a prompt appears requesting a frame relay class. At this prompt you can do one of the following:

- Enter the number of a pre-defined class. The range is 1–10.
- Enter the number of a class modified with the **cnffrcls** command. The range is 1–10.
- Override one or more parameters in a connection class by typing the class number — *without pressing the Return key* — then continue the line by typing either a new value or an asterisk (*) for each parameter. Separate each item with a space and no comma.

If you are overriding class parameters, the asterisk causes the connection to use the existing value of the parameter in that class. Most parameters are bi-directional and have the format *parameter/parameter*. If you want to keep a value for both directions, enter a single *. If you want to change a value for only one direction, enter the parameter in the form */*new_parameter* or *new_parameter*/*. When you type individual parameters, you need to enter characters only up to the last changed item. Before the last item, you must enter new values or * as a place holder.

The parameters in the list that follows make up a frame relay class. Collectively, the name of these parameters is *frp_bw*. For most parameters, you can specify the value for each direction of the connection, so most parameter names appear in the format *parameter/parameter*. ForeSight (FST) is the exception because ForeSight automatically applies to both directions.

- **MIR/MIR** is defined as fr_MIR_Tx /fr_MIR_Rx, where fr_MIR is the minimum information rate for the connection. The range for MIR is 2.4 Kbps–2048 Kbps.
- **CIR/CIR** is defined as fr_CIR_Tx and fr_CIR_Rx, where fr_CIR is defined as the committed information rate guaranteed to the user.

  The full range of values for frame relay cards is 0–2048 Kbps. Note that a CIR of 0 is not a standard setting. The standard range is 2.4 Kbps–2048 Kbps. CIR = 0 is a valid parameter only if the connection terminates at both ends on either a UFM, FRM or FRP. Before you can specify CIR = 0 with either **addcon** or **cnffrcls**, you must enable IDE-to-DE mapping with the **cnffrport** command. If you do not first enable IDE-to-DE mapping, the range for CIR is 2.4 Kbps - 2048 Kbps. Additionally, the CIR = 0 specification is necessary at only one end of the connection.

  The Port Concentrator Shelf does not support CIR = 0. On the FRP-2 and FRM-2 cards sets, the range for CIR is 2.4 Kbps–2048 Kbps.

- **VC_Q/VC_Q** is defined as fr_vc_q_Tx/fr_vc_q_Rx, where fr_vc_q Tx is the transmit VC maximum queue depth. Specify the VC_Q in bytes within the range 1–65535.

  OR

  Bc/Bc is defined as fr_Bc_Tx /fr_Bc_Rx. If you have selected Frame Relay Forum standard parameters (through the **cnfsysparm** command), the Committed Burst (Bc) parameter is used instead off vc_q. Bc is defined as the amount of data the network can accept over a variable time interval Tc for committed delivery on a specific PVC. Specify Bc in bytes in the range 1–65535. Bc has meaning for only FST connections. The relationship between Bc and VC_Q is:

  $$Bc = VC\_Q / ((1 – (CIR/port\ speed))$$

- **PIR/PIR** is defined as fr_PIR_Tx /fr_PIR_Rx, where fr_PIR_Tx is the peak transmit rate for the PVC. The PIR range is 2.4–2048 Kbps. You can also specify the value 0 to cause PIR to default to the port speed. Thus, you can modify PIR, leave it the same, or set it to the port speed.

  OR

  Be/Be is defined as fr_Be_Tx /fr_Be_Rx. If you have selected Frame Relay Forum standard parameters (through the **cnfsysparm** command), the PVC uses Excess Burst (Be) instead of PIR. Be is the *amount* of transmit/receive data above the number of bytes set by Bc if enough extra bandwidth is available. Specify Be in bytes within the range 1–65535. Delivery of Be-data is not guaranteed. Be has meaning to only ForeSight. The relationship between Be and PIR is:

  $$Be = Bc * ((PIR/CIR) - 1)$$

- **Cmax/Cmax** is defined as fr_cmax_Tx /fr_cmax_Rx, where cmax is the maximum credits the connection can accrue. This parameter is specified in packets in the range 1–255.
- **ECNQ_thresh/ECNQ_thresh** are the transmit and receive threshold settings for the explicit congestion notification control queues. ECNQ_thresh is a byte-value in the range 1–65535.
- **QIR/QIR** is defined as fr_QIR_Tx /fr_QIR_Rx where fr_QIR is the quiescent information rate for the connection, which is the initial transmit rate after a period of inactivity on the channel. If you do not specify the quiescent receive rate fr_QIR_Rx, the system sets it set to the transmit value. The values are specified in Kbps and must be in the range MIR–PIR. In addition, you can specify the value 0 to default to the MIR. QIR has meaning for only ForeSight connections.
- **FST** enables or disables ForeSight for a connection. Valid entries are “y” (use ForeSight) or “n” (do not use ForeSight). If the ForeSight status changes, the network reroutes the connection.
- **%utl/%utl** are the percentage transmit and receive utilization settings for the frame relay class. This value is specified as a percentage in the range 0%–100%.

Using Interface Control Templates

X.21 ports use a *fixed, active* control template. In contrast, although V.35 and V.28 ports use an active control template, you can set the signals that are active to on or off. These ports cannot use *looped, conditioned, near,* or *far.*

Configuring Channel Utilization

You can use the **cnfchutl** command to enter the expected channel utilization of a frame relay circuit into the system. This command helps the system allocate the proper bandwidth to the circuit.

Setting Channel Priorities

A frame relay connection has either low or high priority. The default is low priority. You can use **cnfchpri** to assign a high priority to a circuit or to re–assign a high priority circuit to low priority.

Displaying Statistics

Nodes collect statistics for frame relay traffic, channel utilization, and Explicit Congestion Notification. Use **dspchstats** to display these statistics. Use **clrchstats** to clear the statistics and start collecting new statistics. To display frame relay usage and error statistics, use **dspportstats**.

Summary of Commands

This table lists the full name and starting page of the description for each frame relay command.

Mnemonic	Name	Page
addcon	Add connection	9-7
addcongrp	Add connection group	9-16
addfrport	Add frame relay port	9-18
cnfchpri	Configure channel priority	9-21
cnfcondsc	Configure connection descriptor	9-23
cnffrcls	Configure frame relay class	9-25
cnffrcon	Configure frame relay connection	9-28
cnffrcport	Configure frame relay port on a Port Concentrator Shelf	9-31
cnffrport	Configure frame relay port	9-33
cnfict	Configure interface control template	9-43
cpyict	Copy interface control template	9-48
delcon	Delete connection	9-51
delcongrp	Delete connection group	9-53
delfrport	Delete frame relay port	9-55
dnfrport	Down frame relay port	9-57
dspchcnf	Display channel configuration	9-59
dspchstats	Display channel statistics	9-61
dspcon	Display connection	9-64
dspcongrp	Display connection group	9-66
dspcongrps	Display connection groups	9-68
dspcons	Display connections	9-70
dspfrcls	Display frame relay class	9-78
dspfrport	Display frame relay port	9-80
dspict	Display interface control template	9-87
dspportids	Display port IDs	9-93
dspportstats	Display port statistics	9-95
grpcon	Group connections	9-100
prtchcnf	Print channel configuration	9-103
prtcongrps	Print connection groups	9-104
prtcons	Print connections	9-105
prtict	Print interface control template	9-107
upfrport	Up frame relay port	9-108

addcon

Adds a frame relay connection to the network. After you add a connection, the system automatically routes the connection. The node on which you execute **addcon** is the *owner* of the connection. The concept of ownership is important because you must specify automatic rerouting and preferred routing information at the node that owns the connection. See the **cnfpref** and **cnfcos** descriptions for information on automatic rerouting. Before it actually adds the connection, the system displays the parameters you have specified and a prompt for confirmation.

Note For cards with Y-cable redundancy specified, you can add connections to only primary cards.

Each frame relay connection (and associated user-device) is locally identified by a unique DLCI. (No two connections in a node can have the same DLCI.) The total DLCI range is 1–1023. DLCIs 16–1007 typically are available for local and remote channels. DLCIs 1–15 and 1008–1022 are reserved by ANSI standards. DLCI 1023 is reserved for LMI.

Only a UFM could come close to using all DLCIs. The maximum number of connections on a UFM is 1000. The maximum number of frame relay connections on an FRC or FRM is 252.

If a user-device can automatically determine the network configuration by using the LMI, you do not need to specify the DLCIs in the network to the device. If a device cannot interrogate the network to determine the DLCIs in the network, you must specify the network DLCIs to the user-device.

As the following sections describe, four types of frame relay connections exist.

Normal Connections

A *normal* connection is a single PVC where each endpoint is defined by *slot.port.DLCI*. For example:

addcon 4.2.200 alpha 6.1.300 2

defines a connection from the local node slot 4, logical port 2, and a DLCI of 200 to node alpha, slot 6, port1 and a DLCI of 300. The last argument “2” is the frame relay class (see “Using Frame Relay Classes” for details).

Bundled Connections

Connection bundling creates a full mesh of connections between two groups of frame relay ports with a single execution of the **addcon** command. When you add a bundle between two groups of ports, you create a connection between each port of one group of ports and each port of the other group of ports. Each group of frame relay ports can include up to four ports. Consequently, the maximum number of connections in a bundle is 16 (resulting from a full mesh of connections between two groups of four ports each). Note that a Port Concentrator Shelf does not support bundling. Characteristics of connection bundling are:

- The number of ports used at each end of the bundle does not have to be the same.
- All of the ports used in a group must be on the same card.
- Only the FRP Model D and the FRM Model D support connection bundles.
- All of the ports used for a bundle must be contiguous. For example, a bundle on a card may not consist of only ports 1, 3, and 4.
- The syntax for specifying a group of ports for a connection bundle is *slot.port[xport]*.

When you create a connection bundle is created with **addcon**, you do not explicitly specify the required DLCI at each endpoint of each connection. Instead, the DLCIs are automatically assigned using global addressing with the Port IDs, which have been previously assigned to the ports. Consequently, you must first assign a Port ID (other than 0) to every port to which you plan to assign a connection bundle. Use **cnffrport** to assign a Port ID or **dspport** to see an existing Port ID.

For example, the command

addcon 6.1x3 alpha 7.2x3 1

defines a single connection bundle between a local group of 3 ports (ports 1, 2, and 3 on card 6) and a remote group of 2 ports (ports 2 and 3 on card 7). The resulting connection bundle consists of the following six connections:

local node slot 6.port 1 to node alpha slot 7.port 2

local node slot 6.port 1 to node alpha slot 7.port 3

local node slot 6.port 2 to node alpha slot 7.port 2

local node slot 6.port 2 to node alpha slot 7.port 3

local node slot 6.port 3 to node alpha slot 7.port 2

local node slot 6.port 3 to node alpha slot 7.port 3

Each connection in the bundle is assigned the parameters of the same frame relay class (class 1, in the example above). Notice that no DLCIs were specified for the six connections. The DLCIs are automatically assigned using the Port IDs of the ports.

As an example, assume that the following Port IDs had been previously assigned for the five ports.

port 6.1 Port ID = 22

port 6.1 Port ID = 534

port 6.3 Port ID = 487

port 7.2 Port ID = 92

port 7.3 Port ID = 796

As a result of the **addcon** command, the six connections that you create are automatically assigned DLCIs using global addressing as follows.

6.1.*92* – 7.2.*22*

6.1.*796* – 7.3.*22*

6.2.*92* – 7.2.*534*

6.2.*796* – 7.3.*534*

6.3.*92* – 7.2.*487*

6.3.*796* – 7.3.*487*

The **dspcons** display shows the entire bundle as a single item. Therefore, you cannot see the automatically assigned DLCIs on the **dspcons** screen. (The automatically assigned DLCIs in the preceding list appear in italics.) To see the DLCIs, use **dspcon**, as in the following example:

dspcon 6.1x3 alpha 7.2x3

The preceding shows one screen for the whole bundle then an additional screen for each connection in the bundle. The assigned DLCIs appear in these individual connection display screens.

Grouped Connections

A frame relay connection you assign to a group is a *grouped* connection. A group can consist of up to 16 connections. Grouping involves three commands: **addcon**, **addcongrp**, and **grpcon**. First, before you can assign connections to a group, they must already exist as normal frame relay connections (through **addcon**). Next, define a *connection group* for the node using the **addcongrp** command. Lastly, add each connection to the group using the **grpcon** command. Refer to the descriptions of **addcongrp** and **grpcon** for more details.

Frame Forwarding Connections

A non-frame relay data connection (such as HDLC or SDLC) that is routed through frame relay cards can bypass a router or take advantage of DFM at higher data rates. The format *slot.port*.* identifies a frame forwarding connection. An example is:

addcon 11.2.* alpha 12.3.* 2

The "*" indicates to the node that a DLCI is meaningless.

Full Name

Add connection

Syntax

addcon <local_channel> <remote_node> <remote_channel> <frame_relay_class | [individual parameters]> [route_avoid]

If you request help for **addcon** at the command line prompt, the Help line shows *type* as a parameter. When you are using **addcon** for a frame relay connection, *type* is actually the *frame relay class* described earlier in this chapter in the section titled "Using Frame Relay Classes." As stated in "Using Frame Relay Classes," you can optionally change the parameters on the command line. Optionally, you can override any or all of the parameters in the frame relay class by specifying the parameters that appear as *frp_bw* and *avoid* in the Help display. See the forthcoming "Optional Parameters" table. Note also that you do not enter the *coding* parameter shown on the Help line.

Related Commands

delcon, dncon, dspcon, dspcons, upcon

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1 (local addressing)

addcon 6.1.100 beta 6.2.200 3

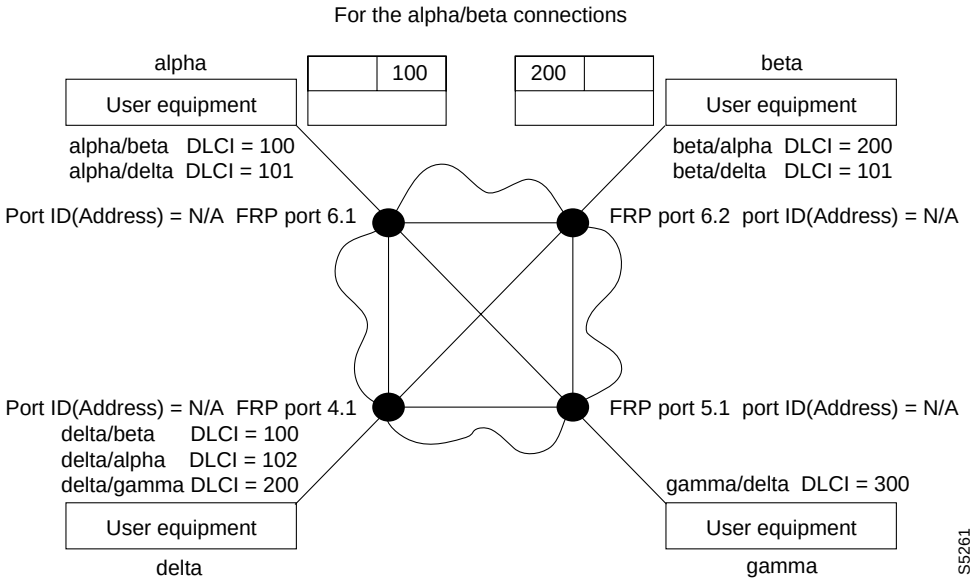
addcon 6.1 101 delta 4.1.102 2

addcon 4.1.100 beta 6.2.101 4

addcon 4.1.200 gamma 5.1.300 1

Description

Execute the preceding commands at node Alpha to configure the following network.



Example 2a

addcon 9.1.200 gamma 8.1.300 1

Description

Add a connection between the user-device at alpha port 9.1 and the user-device at gamma port 8.1. The user-device at alpha refers to the connection using local DLCI 200. The user-device at gamma refers to this connection using local DLCI 300. The DLCIs have only local significance, so a DLCI must apply to only one connection.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 23 1996 10:12 PST

Local    RemoteRemote   Route
Channel  NodeName Channel State TypeCCompressionCode  Avoid   COS     O
 5.1     beta    25.1       Ok   256  7/8          0   L
 9.1.100 gamma   8.1.200    Ok    fr                          0       L
 9.1.200 gamma   8.1.300    Ok    fr                          0       L
 9.2.400 beta    19.2.302   Ok    fr                          0       L
 14.1    gamma   15.1       Ok    v                           0       L




Last Command: addcon 9.1.200 gamma 8.1.300 1

Next Command:
```

Example 2b

addcon 9.1.100 beta 6.2.300 2

Description

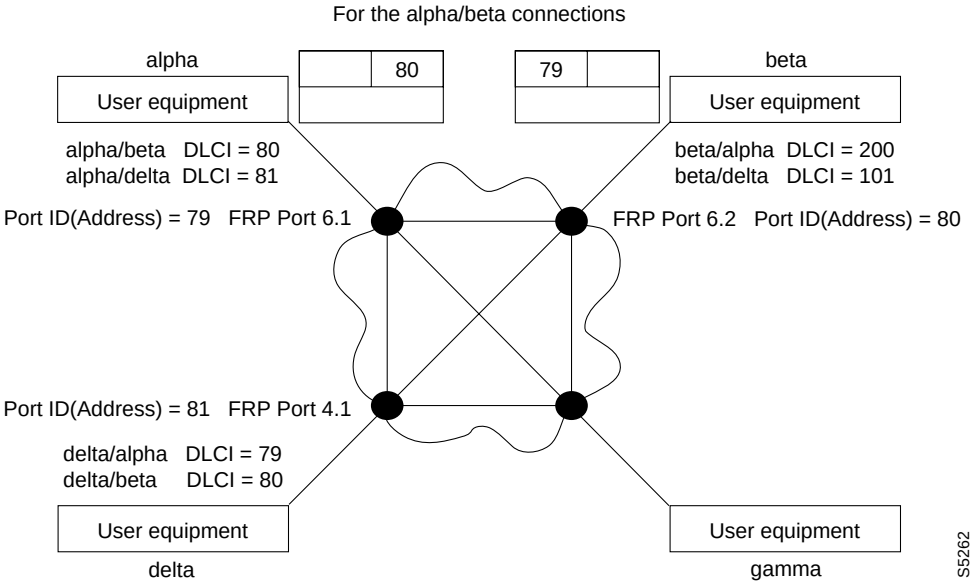
Add another connection at local port 9.1. A DLCI of 100 is used at the local node. A DLCI of 300 can be used at both beta gamma because the DLCIs have only local significance.

Example 3(global addressing)

addcon 6.1.80 beta 9.2.79 2
addcon 6.1.81 gamma 4.1.79 1
addcon 4.1.80 beta 6.2.81 5

Description

The network to configure in this example is as the follows:



Example 4 (bundle connections)

addcon 8.1x3 alpha 19.2x4 1

Description

Add a bundle of connections between frame relay ports 8.1-3 on node gamma and 19.2-4 on node alpha. For this bundle, the network routes traffic between gamma port 8.2 and alpha port 19.2.

System Response

```
pubsipx3       VT    SuperUser       IPX 8     8.2.00    Jan. 3 1997  19:41 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type      Compress  Code COS
  8.1x3          alpha       19.2x4           Ok     fr




This Command: addcon 8.1x3 alpha 19.2x4 1


Add these connections (y/n)?
```

Example 5 (frame forwarding)

addcon 8.2.* alpha 19.2.* 1

Description

Add a frame forwarding connection between the local node's port 8.2 and 19.2 on node alpha.

System Response

```
Local    Remote  Remote                                  Route
Channel  NodeNameChannelState   Type    CompressionCodeAvoid   COS     O
6.1      beta    25.2    Ok     256      7/8                   0       R
8.1.200  alpha   9.1.100 Ok     fr                             0       R
8.2.300  beta    19.1.101Ok     fr                             0       R
15.1     alpha   14.1    Ok     v                              0       R




This Command: addcon 8.2.* alpha 19.2.* 1


Add these connections (y/n)?
```

Example 6 (modifying bandwidth)

addcon 8.3.101 beta 19.3.201 7 * * * * 30/30 * * Y 80/80

Description

Parameters specified by frame relay class 7 for this connection are modified by substituting 30 for Cmax in both directions, enabling ForeSight, and reducing percent utilization from 100% to 80%.

System Response

```
gamma          TRM   YourID:1        IPX 16    8.2   Mar. 23 1996 12:10 CST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type   Compression  Code Avoid COS O
 6.1        beta        25.2        Ok     256                 7/8         0  R
 8.1.200    alpha       9.1.100     Ok     fr                              0  R
 8.2.300    beta        19.1.101    Ok     fr                              0  R
 15.1       alpha       14.1        Ok     v                               0  R




Last Command: dspcons


Next Command: addcon 8.3.101 beta 19.3.201 7 * * * * 30/30 * * Y 80/80
```

Table 9-1 addcon–Parameters

Parameter	Description
local channel	Specifies the local channel to connect in the format: slot.port.DLCI | x port | .* On an FRP or FRM, the range for *port* is 1–24 or 1–31. On a UFM, the range for *port* is 1–250. (For connections on a UFM, *line* is not necessary because of the mapping of port to line through **addfrport**). The range for DLCIs is 16–1007.
node	Specifies the name of the remote node at the other end of the connection.
remote channel	Specifies the frame relay channel at the other end of the connection in the following format: slot.port.DLCI | x port | .*
frame relay class	Specifies a frame relay class. Entering a frame relay class is a shortcut for specifying bandwidth parameters. You must enter a frame relay class, but then you can modify any of the bandwidth parameters specified by the class. To do so, do not press Return after you type the class number but continue typing either a value for the parameter or a * to keep the current value. The system does not display the parameters, but the description of the frp_bw parameters in the"Optional Parameters" table that follows shows the order and ranges of the parameters you can specify. The node comes with 10 predefined frame relay classes. You can view the parameters in a frame relay class by using the **dspcls** command and modify a class with **cnffrcls**. For more details on the parameters and the frame relay classes, refer to "Using Frame Relay Classes" earlier in this chapter.

Table 9-2 addcon–Optional Parameters

Parameter	Description
frp_bw	Optionally specifies individual bandwidth parameters. The parameter name "frp_bw" is the label for the bandwidth parameters described here. The slash (/) between the repeated parameter name shows that you can specify a value for each direction. (FST is the exception.)Two parameters can be either the (default) Cisco versions or the Frame Relay Forum standard parameters. To switch between Cisco and Frame Relay Forum, use the **cnfsysparm** command. Note that all parameters you select with **cnfsysparm** are network-wide and not confined to the current connection addition. The switchable parameters are as follows: Cisco Parameters — Standard Parameters PIR (peak information rate) — Be (excess burst) VC_Q (VC queue depth) — Bc (committed burst) When you are using the Cisco parameter set, the names and order of specification are as follows: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl When you are using the parameters with the two Frame Relay Forum versions, the names and order of specification are as follows: MIR/MIR, CIR/CIR, Bc/Bc, Be/Be, Cmax/Cmax, ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl For the definition of each parameter and important information on setting CIR=0, refer to the section titled "Using Frame Relay Classes" earlier in this chapter.
avoid	Specifies the type of trunk or route to avoid for the connection. The default is no avoidance. To specify an *avoid* value, type it after the frame relay class or — if you override the frame relay class — after the frp_bw values. Be sure to include the asterisk (*). The *avoid* parameters are: ***s** Avoid satellite trunks. ***t** Avoid terrestrial trunks. ***z** Avoid trunks using zero-code suppression techniques that modify any bit position to prevent long strings of zeros.

addcongrp

Defines a frame relay connection group between the local node and the specified remote node. The resulting connection group is a routing entity that is initially empty and into which individual connections (virtual circuits) may be added using the **grpcon** command. Connections added to a group must be of the inter-node, non-bundled, frame relay type. The connections must have the same routing parameters, such as owner, class of service (COS), routing state, route restrictions, and ForeSight enable status.

Connection grouping permits a node to have up to 1000 frame relay connections. A connection group can have up to 16 connections. Up to 250 connection groups can exist at a node. The **addcongrp** parameters, remote node name, followed by the period (“.”), followed by the group number, combine to provide a unique connection group name. If the remote node name only is entered in the command, the system automatically generates the period (“.”) and the group number. For group number, the system uses the next unused number between the two nodes. An example of a connection group name between the alpha and beta nodes is:

beta.1	at alpha
alpha.1	at beta

If a second group is created between alpha and beta with the **addcongrp** command but with no specified group number, the automatically generated group names for the second group would be:

beta.2	at alpha
alpha.2	at beta

Full Name

Add connection group

Syntax

addcongrp <remote node>[.group number]

Related Commands

delcongrp, grpcon, delcon, dspcongrps, dspcons, dspcongrp

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

addcongrp gamma

Description

Add a connection group gamma. If you enter only the remote node name, the system automatically generates a group number.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:49 MST

Only to                          Route
gamma            Count  State   Avoid  COS  FST  Owner
gamma.1          0                              Local









Last Command: addcongrp gamma


Next Command:
```

Table 9-3 addcongrp–Parameters

Parameter	Description
remote node	Uses the name of the remote node as the name of the group.

Table 9-4 addcongrp–Optional Parameters

Parameter	Description
group number	Specifies the number of a group. The range of group numbers is 1–250. A period separates the name of the remote node and the group number.

addfrport

Activates a logical frame relay port on either an FRP, FRM, or UFM card set. The **addfrport** command applies to a T1 or E1 line. It does not apply to an FRM with a V.11 or V.35 back card or to a Port Concentrator Shelf.

The **addfrport** command adds a logical frame relay port by using the slot number of the FRM or and the DS0/timeslots that make up the logical port. On a UFM, the logical ports span the whole range of physical lines: you associate the logical ports to the lines as needed, then include the DS0s as the last field of the argument. Table 9-5 lists the error and warning messages for this command.

Table 9-5

Messages	Reason for Message
"Slot is out of range"	Line number not correct for T1/E1.
"Line must first be upped"	Line is down.
"invalid channel range"	Channel is out of range 1–24 or 1–31 (no 16 for E1).
"Channel is busy"	Channel is already assigned to a logical por.t
"You cannot use signalling channel 16" (E1)	CAS channel 16 included in logical port (E1). CCS permits the use of channel 16 but not in all countries.
"Invalid rate"	Entered rate is not 56 Kbps or 64 Kbps.
"This rate is available for single channel only"	Entered rate is 56 Kbps, but multiple channels specified.

Full Name

Add Frame Relay port T1/E1

Syntax

For FRP or FRM card sets: addfrport <slot.port> [DS0 channel] [56 | 64]

For UFM card sets: addfrport <slot.port> <line.DS0_channel>

Related Commands

upcln, delfrport, cnffrcport, cnffrport, dspfrport

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

addfrport 21.9 –15

Description

Add a single frame relay port that occupies DS0s (timeslots) in the range 9–15. For a T1 line, this channel rate is 7 x 64 Kbps = 448 Kbps, as the screen example shows. The card is an FRP.

System Response

```
gamma          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 17:28 CST

Port configuration for FRP 21

From       Chan       Speed      Interface  State
1          9–15       448        FRI T1     INACTIVE




Last Command: addfrport 21.9–15


Next Command:
```

Table 9-6 addfrport–Parameters

Parameter	Description
slot.port (for FRP or FRM series)	Specifies the FRI T1 or E1 line number and the logical port number. For example, 8.14 is physical slot 8 and timeslot (or *channel*) 14.
slot.port line.DS0 channel (for UFM series)	For the UFM card sets, this parameter specifies the slot and logical port, the physical line (the connector), and one or more contiguous DS0s. The range of logical ports is 1–250. The range of lines is 1–4 for the UFM-4C and 1–8 for the UFM-8C. Note the space between the port and line.

Table 9-7 addfrport–Optional Parameters

Parameter	Description
– chan	Specifies that multiple DS0/timeslots should form one logical port. A "–" separates the starting and ending DS0s/timeslots). Timeslots must be contiguous. An example is **addfrport** 8.1–5. The system uses the lowest DS0/timeslot number as the logical port number and shows this in related displays.
rate	Specifies the rate of a single, logical port. By default, a single logical port (or channel) is 64Kbps. A single DS0 (timeslot) may be 56 Kbps or 64 Kbps. If you do not enter a rate, it is 64 Kbps. For example, **addfrport** 8.14 56 specifies a rate of 56 Kbps for 8.14.

clrfrcportstats

Clears port statistics for FRM-2 or FRP-2 physical ports connected to a Port Concentrator Shelf. To see the statistics that you clear with **clrfrcportstats**, execute **dspfrcportstats**. The controller card collects statistics from the FRM-2 or FRP-2 once per minute. Because **clrfrcportstats** clears statistics on the controller card, it may not clear statistics generated within the last minute.

Full Name

Clear FRC/FRM port statistics

Syntax

clrfrcportstats <slot.port | *>

Related Commands

dspfrcportstats

Attributes

Privilege	1–5
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	No

Table 9-8 clrfrcportstats–Parameters

Parameter	Description
slot,port | *	Slot and port of the physical port. The range for *port* is 1–4. An asterisk (*) specifies all FRC-2/FRM-2 physical ports.

cnfchpri

Sets the channel priority for a frame relay connection. The Channel Priority feature permits some frame relay connections to receive a higher priority within a port queue than other frame relay traffic on a per-connection basis. The default priority is low. You can configure frame relay LMI ports to communicate the priority to a router. You must change the priority on both ends of a connection.

Full Name

Configure frame relay channel priority

Syntax

cnfchpri <connection> <priority>

Related Commands

dspchcnf

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnfchpri 9.1.100 h

Description

Configure a high priority for frame relay connection 9.1.100.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 16:00 PST

Conn:  9.1.100    gamma       8.1.200     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6      5/5       256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: LOCAL  Restriction: NONE  COS: 0                    Status: OK
Group: NONE  Priority: H  TestRTD: 0 msec

Path:     alpha   14--13beta    15--15gamma
Pref:     Not Configured


alpha 9.1.100                                      gamma 8.1.200
FRP:   OK                                          FRP:   OK
FRI:   OK                                          FRI:   OK


Last Command: cnfchpri 9.1.100 h


Next Command:
```

Table 9-9 cnfchpri–Parameters

Parameter	Description
channels	Specifies the channel or range of channels. The format is *slot.port.DLCI*.
h | l	The priority: h = high; l = low.

cnfcondsc

Assigns a user-specified, reference description to a connection. The connection descriptor is independently configurable at each end of a connection**.** To remove a descriptor, enter this command and specify a null descriptor. A descriptor cannot be deleted in a job, just reconfigured. The **dspcon** and **dspcons +d** commands display any existing connection descriptors.

Full Name

Configure connection description

Syntax

cnfcondsc <channel> <descriptor>

Related Commands

dspcon, dspcons

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnfcondsc 5.1 gracie’s_fax

Description

Give a descriptive name to channel 5.1. In this example, the name “gracie's_fax” is given to the connection 5.1. If a descriptor is desired for the other end of the connection, the user can “**vt**” to the other end of the connection and use the **cnfcondsc** command on that connection. The same name can be assigned or a different name.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2     Mar. 15 1996 15:40 PST

Conn:  5.1        beta        25.1        256 7/8    Desc: gracie's_FAX



Owner: REMOTE  Restriction: NONE  COS: 0                    Status: OK
Compression: NONE

Path:     alpha   10-- 7beta
Pref:     Not Configured


alpha 5.1                                          beta 25.1
SDP:   OK                                          SDP:   OK
SDI:   OK                                          SDI:   OK
Clock: OK                                          Clock: OK

Last Command: cnfcondsc 5.1 gracie's_fax


Next Command:
```

Table 9-10 cnfcondsc–Parameters

Parameter	Description
channel	Specifies the local voice, data, frame relay, or ATM channel to describe.
descriptor	Specifies a string of up to 20 displayable characters. The descriptor cannot begin with a number, and no spaces are allowed.

cnffrcls

Configures a system-wide frame relay connection class. Refer to the section titled “Using Frame Relay Classes” at the beginning of this chapter for a definition of a frame relay class. The following are characteristics of this command:

- Network-wide classes should be configured only when all nodes are reachable.
- Beware of conflicting values with existing, joined networks.
- Changing a class does not affect any existing connections. An altered frame relay class affects only connections that are added using the changed class.

Full Name

Configure Frame Relay class

Syntax

cnffrcls <class_num> [<BW params>] [<description>]

Related Commands

addcon, dspfrcls

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnffrcls 1 *

Description

Configure frame relay class #1 to operate with ForeSight. The list of * parameters leaves those parameters unchanged, and “y” enables ForeSight. Because the utilization and description parameters are not entered, any existing values for these parameters remain in effect.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 16:05 PST

                        Frame Relay Connection Classes

 #    MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR   FST
.6/9.6   9.6/9.6  65535/65535    128/128  10/10  65535/65535  9.6/9.6  y
   % Util: 100/100 Description: "Default 9.6"
 2 19.2/19.2 19.2/19.2 65535/65535     */*      10/10  65535/65535 19.2/19.2 n
   % Util: 100/100 Description: “Default 19.2"
 3   16/16     16/16   65535/65535     */*      10/10  65535/65535   16/16   n
   % Util: 100/100 Description: “Default 16"
 4   32/32     32/32   65535/65535     */*      10/10  65535/65535   32/32   n
   % Util: 100/100 Description: “Default 32"
 5   56/56     56/56   65535/65535     */*      10/10  65535/65535   56/56   n
   % Util: 100/100 Description: “Default 56"


Last Command: cnffrcls 1 * * * * * * * y


Continue (y): y
```

System Response (continued)

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 16:03 PST

                        Frame Relay Connection Classes

 #    MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR   FST
 6   64/64     64/64   65535/65535     */*      10/10  65535/65535   64/64   n
   % Util: 100/100 Description: “Default 64"
 7  128/128   128/128  65535/65535     */*      10/10  65535/65535  128/128  n
   % Util: 100/100 Description: “Default 128"
 8  192/192   192/192  65535/65535     */*      10/10  65535/65535  192/192  n
   % Util: 100/100 Description: “Default 192"
 9  256/256   256/256  65535/65535     */*      10/10  65535/65535  256/256  n
   % Util: 100/100 Description: "Default 256"
10  512/512   512/512  65535/65535     */*      10/10  65535/65535  512/512  n
   % Util: 100/100 Description: “Default 512"


Last Command: cnffrcls 1 * * * * * * * y


Next Command:
```

Table 9-11 cnffrcls–Parameters

Parameter	Description
class number	Specifies the connection class to configure. The range is 1–10.

Table 9-12 cnffrcls–Optional Parameters

Parameter	Description
frp_bw	Optionally specifies individual bandwidth parameters. The parameter name "frp_bw" is the label for the bandwidth parameters described here. The slash (/) between the repeated parameter name shows that you can specify a value for each direction. (FST is the exception.)Two parameters can be either the (default) Cisco versions or the Frame Relay Forum standard parameters. To switch between Cisco and Frame Relay Forum, use the **cnfsysparm** command. Note that all parameters you select with **cnfsysparm** are network-wide and not confined to the current connection addition. The switchable parameters are as follows: Cisco Parameters — Standard Parameters PIR (peak information rate) — Be (excess burst) VC_Q (VC queue depth) — Bc (committed burst) When you are using the Cisco parameter set, the names and order of specification are as follows: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl When you are using the parameters with the two Frame Relay Forum versions, the names and order of specification are as follows: MIR/MIR, CIR/CIR, Bc/Bc, Be/Be, Cmax/Cmax, ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl For the definition of each parameter and important information on setting CIR=0, refer to the section titled "Using Frame Relay Classes" earlier in this chapter.
description	Any text string up to 25 characters terminated by a <RET>. This is used to provide the user with a descriptive identifier for the class.

cnffrcon

Configures frame relay bandwidth parameters or enables ForeSight for an individual connection. Be sure the MIR you specify is appropriate. If it is too high, bandwidth is wasted. If it is too low, the connection may drop data. The statistics reports are the best source of information to help you decide what the MIR should be.

The PIR usually is set to the port speed. You can specify a lower PIR if other constraints on the data generation rate exist. Be sure the PIR you specify is appropriate. If it is too low, frames are dropped. If it is too high, bandwidth may be wasted unless the network has ForeSight.

The Cmax, VC Q, and ECN Q values should be changed by only knowledgeable users and when tuning data is available to support the determination of appropriate values. These values affect system buffering resources, so any change from the defaults requires caution. Refer to the *Release 8.2 System Manual* for more details on connection parameters.

If the connection type has ForeSight (FST = y), the result of the last test round trip delay command (Test RTD) is displayed. Note that this is not the current RTD but the result of the last, user-specified test. High or low connection priority is displayed for both standard frame relay connections and ForeSight connections.

The node checks the bandwidth parameters to promote efficient use of network bandwidth. The following messages reflect the checks on bandwidth usage.

Error	Min cannot exceed peak.
Warning	Min exceeds this port's speed.
Warning	Sum of mins exceeds port's speed.
Warning	Peak exceeds this port's speed.

Warning messages are informational and do not indicate that the command is failing to execute. Error messages indicate the command is not executing.

When you specify the frp_bw parameters, enter all changes (or unchanged values indicated by an asterisk) on the line. You must specify either a change or a place-holder (*) up to at least the last changed value (after which place-holders are unnecessary). Decide on any changes before starting this command. The parameters section of this command description lists frp_bw parameters. The section “Using Frame Relay Classes” at the beginning of this chapter describes the parameters.

Full Name

Configure Frame Relay Connection

Syntax

cnffrcon <channel> [parameters]

Related Commands

addcon, dspcon

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnffrcon 8.1.200

Description

Configure frame relay port 8.1.200.

System Response

```
gamma          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 17:28 CST

Conn:  8.1.200    alpha       9.1.100     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6      5/5       256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: REMOTE  Restriction: NONE  COS: 0                   Status: OK
Group: NONE  Priority: L  TestRTD: 0 msec

Path:     gamma   15--15beta    13--14alpha
Pref:     Not Configured


gamma 8.1.200                                    alpha 9.1.100
FRP:   OK                                        FRP:   OK
FRI:   OK                                        FRI:   OK


Last Command: cnffrcon 8.1.200


Next Command:
```

Table 9-13 cnffrcon–Optional Parameters

Parameter	Description
channel	Specifies the channel to configure connection parameters. The command configures connection information for one channel at a time. You cannot specify a set of channels. The channel has the following format: slot.port.DLCI

Table 9-14 cnffrcon–Optional Parameters

Parameter	Description
parameters	Specifies the bandwidth parameters in the following format: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl See "Using Frame Relay Classes" in this chapter for information on the bandwidth parameters. A slash indicates you can specify a value for each direction. FST is either ForeSight enable (y) or disable (n). A "*" is a place-holder for a parameter you do not change.

cnffrcport

Configures the port speed and percent of utilization on the concentrated link of a Port Concentrator Shelf (PCS). This is not a standard command. Primarily, you would use **cnffrcport** to adjust the rate on the concentrated link due to some unusual system configuration.

Because this command applies to the FRC interface (the concentrated link) rather than the user port for the CPE, the port number and the range of speeds is the same as that of the FRP or FRM card. Thus, the port numbers are 1–4 with rates varying from 56 Kbps through 2 Mbps. During port configuration, a prompt for each parameter appears. To keep the current value of the parameter, press the Return key without typing anything.

Full Name

Configure frame relay port

Syntax

cnffrcport <slot.port> <percent utilization>

Related Commands

upfrport, dnfrport, dspfrport, dspcd

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnffrcport 6.1 512 88

Description

Reconfigure PCS port 6.1 to have a speed of 512 Kbps and a concentrated link utilization of 88%. (Note that executing **dspcd** for this slot would show a port count of 44, which indicates that the card set supports a PCS. The Configured Clock of 512 Kbps by itself does not indicate a PCS because a standard FRP-2 or FRM-2 also supports this rate.

System Response

```
minnow         TN    SuperUser       IPX 8     8.2       Aug. 30 1996 10:16 PST

Physical Port: 6.1            [INACTIVE]
Interface:  FRI-X21 DCE                       Configured Clock:   512 Kbps
Clocking:   Normal                            Measured Rx Clock:    0 Kbps
                                        Min Flags / Frames           1
Port ID                      1022
Port Queue Depth            65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold         65535       T391 Link Intg Timer        10 sec
DE Threshold                  100 %     N391 Full Status Poll        6 cyl
Signalling Protocol          None       EFCI Mapping Enabled        No
Asynchronous Status            No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer       15       IDE to DE Mapping          Yes
N392 Error Threshold            3       Interface Control Template
N393 Monitored Events Count     4          Lead      I
Communicate Priority           No          State   ON
Upper/Lower RNR Thresh  75%/ 25%       Concentrated Link Util    88%

Last Command: cnffrcport 6.1 512 88


Next Command:
```

Table 9-15 cnffrcport–Parameters

slot.port	Specifies the card slot and port number. Because the port number is that of the concentrated link rather than the user port number, the range is 1–4 (not 1–44).
speed	Specifies the port clock speed for a 2.0 Mbps FRP-2 or FRM-2. The display shows the *configured* speed as Configured Clock and the *actual* speed as Measured Rx Clock. The available speeds are: 1 port (selected speeds, 56–2048 Kbps) 2 ports (selected speeds, 56–1024 Kbps) 3 ports (selected speeds, 56–672 Kbps) 4 ports (selected speeds, 56–512 Kbps)
utilization	Specifies the percent of utilization of the concentrated link.

cnffrport

Configures the parameters of a frame relay port. The the **cnffrport** command applies to the FRP/FRI, FRM/FRI, and UFM/UFI.This command also applies to the FRM-2 or FRP-2. A less-used command for the concentrated link between the PCS and FRM-2 or FRP-2 is **cnffrcport**.

During port configuration, a prompt for each parameter appears. To keep the current value of the parameter, press the Return key without typing anything. When a parameter is not configurable for a particular application, the parameter appears shaded. You can mix the data rate for each of the ports if the total for all ports does not exceed the maximum composite data rate that the card set supports. The first of the following tables shows the supported data rates for individual T1 and E1 lines

Table 9-16 .

Data Rates at 56 Kbps Increments				Data Rates at 64 Kbps Increments			
56	112	168	224	64	128	192	256
280	336	392	448	320	384	448	512
504	560	616	672	576	640	704	768
728	784	840	896	832	896	960	1024
952	1008	1064	1120	1088	1152	1216	1280
1176	1232	1288	1344	1344	1408	1472	1536
1400	1456	1512	1568	1600	1664	1728	1792
1624	1680	1736	1792	1856	1920	1984	2048

The following table shows the available data rates on a single, PCS user-port. For the FRP-2 and FRM-2 cards, the maximum composite data rate over the 44 logical, user-ports is 1.792 Mbps.

Table 9-17

Data Rates in Kbps							
9.6	14.4	16	19.2	32	38.4	48	56
64	112	128	168	192	224	256	280
320	336	384					

For a PCS, some additional rules for assigning data rates to the 44 ports apply:

- No single user-port should have a speed greater than 384 Kbps.
- The total for each group of 11 ports should not exceed 448Kbps. The software allows higher rates, but the system may drop data if user-equipment passes data above the aggregate total of 448 Kbps.
- The port numbers for the 11-port groups are 1–11, 12–22, 23–33, and 34–44.

Signalling Protocol Timers

This section introduces the implementation of two signalling timers and related parameters you can specify through the **cnffrport** command.

Periodically, devices use *signalling* to request the status of other, connected devices or networks. The signalling can be a simple confirmation of the other device's existence or more detailed information, such as the DLCIs, bandwidth, and state of all PVCs. The signalling described here occurs between:

- The user-equipment and a frame-relay port across the user-to-network interface (UNI)
- Frame relay ports in the network across the network-to-network interface (NNI)

Periodically, frame relay ports within the network transmit a Status Enquiry and wait for a Status response. These exchanges occur across the UNI and the NNI. At the UNI, the user-equipment periodically sends a series of Status Enquiries and awaits a Status response for each enquiry. At the NNI of any network, a frame relay port can generate Status Enquiries and, at alternate times, receive Status Enquiries. In this way, the signalling between networks mirror each other. (The figure on the next page shows the three possible exchanges.) The timers for Status Enquiry and Status response and other, related parameters are the:

- *Link integrity timer* - the time period between each Status Enquiry that either the user-equipment or a frame relay port in the network generates
- *Polling verification timer* - a time period in which a frame relay port waits for a Status response to a Status Enquiry that the port generated
- *Error threshold* - the number of missing or erroneous events that triggers a Port Communication Failure
- *Monitored events count* - the number of events in a polling cycle
- *Full status polling cycle* - a polling cycle in which the port that has sent the Status Enquiry waits for detailed status information

In the preceding list, an *event* is either a Status Enquiry or a Status response. The meaning of event depends on whether the link integrity timer or the polling verification timer is waiting for the event. The link integrity timer waits for Status responses. The polling verification timer waits for Status Enquiries.

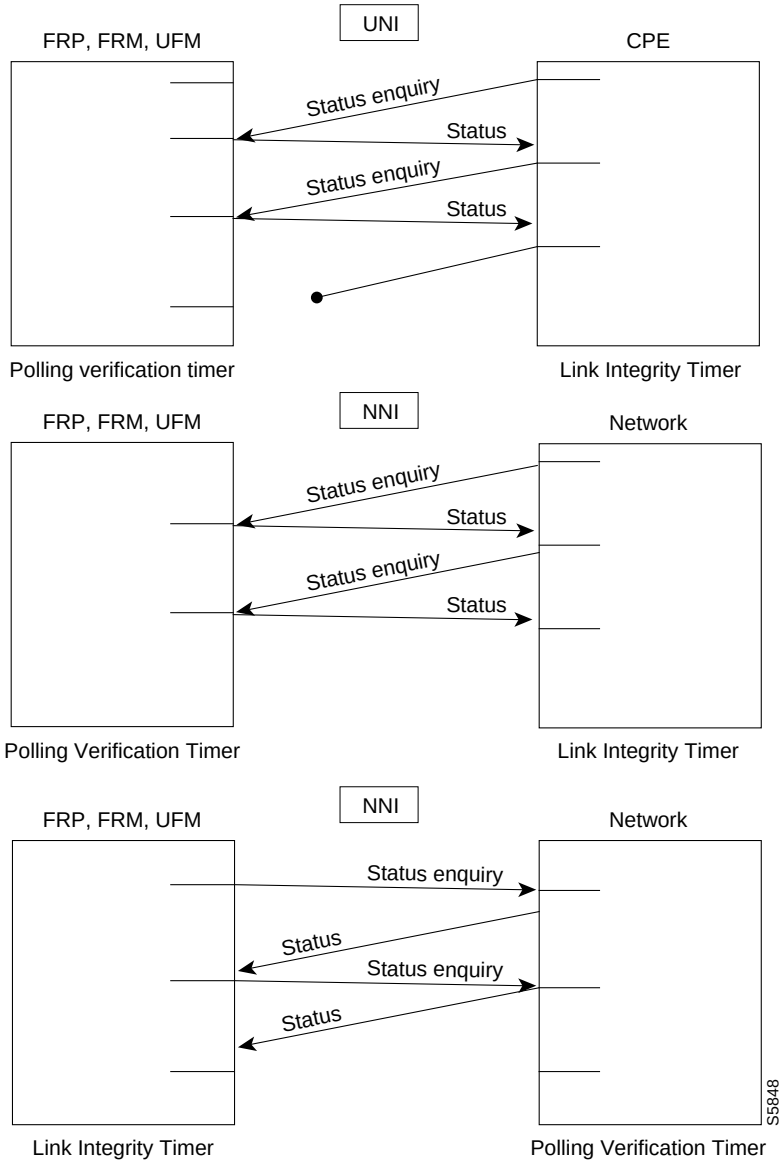
Most Status Enquiries contain a sequence number only. After sending these simple Status Enquiries, the polling device checks for the sequence number. Periodically, a *full status polling cycle* takes place, in which the polling device waits for all applicable information, such as the status of all connections that cross the NNI. For signalling across the UNI, the Frame Relay Forum has recommended a full status polling cycle at every sixth polling cycle. The Frame Relay Forum has not recommended a frequency for the NNI. The **cnffrport** command lets you select a frequency in the range of once every 1 - 10 polling cycles.

The frame relay port or user-device counts a user-specified number of errors out of a user-specified number of attempts before it signals a Port Communication Failure. These parameters are the *error threshold* and the *monitored events count*, respectively. The defaults for these parameters are 3 and 4, respectively. To use the defaults in an example: if 3 out of 4 events are either missing or erroneous within the specified time period, the port signals a Port Communication Failure (a minor alarm).

An event has a user-specified amount of time to arrive. The allowed time period for the arrival of a valid event is the number of seconds you assign to a timer. If an enquiry or response is missing or bad within the timer value, the event is failed. Again, using all default values in an example: if the polling verification timer is 15 seconds and no Status Enquiry arrives within that time, the port records a missing Status Enquiry. If no Status Enquiry arrives during the next two 15-second periods,

the port signals a Port Communication Failure. In the UNI example in the figure, the third Status Enquiry does not arrive. Note that each time a Status Enquiry arrives, the polling verification timer restarts counting at 0 seconds rather than waiting until the specified number of seconds has elapsed.

Whether the port is on a UNI or NNI, the polling verification timer setting must be longer than the link integrity timer. (Refer to the forthcoming **cnffrport** parameters table for values.) You cannot set the link integrity timer for the user-equipment with **cnffrport**. Usually, the link integrity timer on user-equipment is 10 seconds, which you can verify by executing **dspportstats** and counting the number of seconds between statistical updates. On the NNI, you can set both timers (they use either Annex A or Annex D).



The 1 Mbps FRI

The data rates available with the 1 Mbps FRI are as follows:

Table 9-18

Port Data Rates in *Kbps* for 1Mbps FRI			
1024	512	256	128
896	448	224	112
768	384	192	64
672	336	168	56

The rules for assigning data rates to the four ports when using the 1 Mbps FRI are as follows:

- If you assign a data rate of 672 Kbps or higher on any port, you cannot use any other port.
- If you assign a data rate of between 384 Kbps and 512 Kbps to any port, you can specify a second port with an available data rate of 512 Kbps or less.
- If you assign a data rate of 336 Kbps to any port, you can specify two other ports for any available data rates of 336 Kbps or less.
- If the data rate of any port does not exceed 256 Kbps, you can specify all four ports with any available data rates of 256 Kbps or less.

Full Name

Configure frame relay port

Syntax (T1/E1 ports on UFM)

cnffrport <slot.port> <line.DS0_range> <port queue depth> <ecn queue threshold> <de threshold> <signalling protocol> <*protocol parameters*>

Syntax (T1/E1 ports on UFM)

cnffrport <slot.port> <port queue depth> <ecn queue threshold> <de threshold> <signalling protocol> <*protocol parameters*>

Syntax (All other ports)

cnffrport <slot.port> (for an FRM or FRP) | <slot.port> <line.DS0> (for a UFM)

[speed]	[clocking]
[port type]	[port ID]
[port queue depth]	[ECN q_threshold]
[de_threshold]	[signalling protocol]
[*protocol parameters*]	[min-flags-bet-frames]

Related Commands

upfrport, dnfrport, dspfrport

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnffrport 3.1 48000 48000 100 n N Y 1

Description

Change frame relay port 3.1 to have queue depths of 48000. The interface in this example is a T1.

System Response

```
pubsigx1       TN    SuperUser       IGX 32    8.2       Sep. 10 1996 16:25 GMT

Port:       3.1               [ACTIVE  ]
Interface:  FRI-T1                          Configured Clock:    64 Kbps
Clocking:   None                            Measured Rx Clock: None
                                      Min Flags / Frames           1
Port ID                        -      Channel Range                1
Port Queue Depth           48000      OAM Pkt Threshold            3 pkts
ECN Queue Threshold        48000      T391 Link Intg Timer        10 sec
DE Threshold                 100 %    N391 Full Status Poll        6 cyl
Signalling Protocol         None      EFCI Mapping Enabled        No
Asynchronous Status           No      CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15      IDE to DE Mapping          Yes
N392 Error Threshold           3      Channel Speed               64
N393 Monitored Events Count    4
Communicate Priority          No
Upper/Lower RNR Thresh  75%/ 25%

Last Command: cnffrport 3.1 48000 48000 100 n N Y 1


Next Command:
```

Example 2

cnffrport 5.1 256 n 12000 10000 100 a N N 15 3 4 3 y y 100 Y 1

Description

Reconfigure frame relay port 8.1 to change queue depths. This is a V.351 interface, so optional parameters begin with the clock speed specification (which has a default of 256 Kbps). An explanation of the screen appears after the screen example.

System Description

```
padma       VT    SuperUser       IPX 8     8.2       Sep. 10 1996 16:39 GMT

Port:       5.1               [ACTIVE  ]
Interface:  FRI-V35 DCE                      Configured Clock:   256 Kbps
Clocking:   Normal                           Measured Rx Clock:  256 Kbps
                                        Min Flags / Frames           1
Port ID                          0
Port Queue Depth           12000       OAM Pkt Threshold             3 pkts
ECN Queue Threshold        10000       T391 Link Intg Timer         10 sec
DE Threshold                 100 %     N391 Full Status Poll         6 cyl
Signalling Protocol  Annex A UNI       EFCI Mapping Enabled        Yes
Asynchronous Status           No       CLLM Enabled/Tx Timer  Yes/100 msec
T392 Polling Verif Timer      15       IDE to DE Mapping           Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead    CTS    DSR    DCD
Communicate Priority          No          State   ON     ON     ON
Upper/Lower RNR Thresh  75%/ 25%

Last Command: cnffrport 5.1 256 NORMAL 0 12000 10000 100 a N N 15 3 4 3 y y 100
Y 1

Next Command:
```

The screen in Example 2 shows the following:

• Port Queue Depth	12000	Depth of port queue is set at 12000 bytes.
• ECN Queue Depth	10000	Port queue must reach 10000 bytes before FECN and BECN bits are set.
• DE Threshold	100	Port buffer level must be at 100% of capacity before dropping DE frames.
• Signalling Protocol	Annex A	The selected protocol for the UNI.
• Asynchronous Status	N	No asynchronous messages to user-device; wait for polling from user-device.
• Polling Verify Timer	15	15 seconds heartbeat period
• Error Threshold	3	3 failures trigger port comm failure
• Monitored Events Count	4	4 events are monitored
• Communicate Priority	N	Do not communicate port priority to user-device.
• Upper RNR Threshold	75	75% of buffer capacity triggers receiver not ready condition
• Lower RNR Threshold	25	25% of buffer capacity clears a receiver not ready condition
• Minimum Flags/Frame	1	One flag exists for each FR data frame.

Note The following table describes both mandatory and optional parameters because some parameters are mandatory for T1/E1 lines and optional for other line types.

Table 9-19 cnffrport–Parameters

Parameter	Description
slot.port	Specifies the logical port on the FRP, FRM, or UFM in the format *slot.port*. For a T1/E1 line, port is a logical number. For a Port Concentrator Shelf, *port* refers to the logical port in the range 1–44.
interface type	Specifies a an interface type for a Port Concentrator Shelf. This parameter applies to only the user interface display and not the PCS. System software does not detect the interface type in the PCS. To change the user-interface type, you must change a card in the PCS.
slot.port line	Specifies the UFM slot, port, and line number, where *port* can be 1–250, and *line* can be 1–8. Note that the maximum number of T1/E1 lines per node is 32. This maximum could be, for example, spread over 4 UFM-8C card sets that utilize all 8 lines on each back card.
speed	Specifies a port clock speed in Kbps for a 2.0 Mbps UFM, FRP, or FRM. The *configured* speed appears under the Configured Clock heading. The *actual* clock rate appears under the Measured Rx Clock heading. Note that this option does not apply to T1/E1 lines because these line types use 64 or 56 Kbps timeslots. The range of speeds according to the number of active ports is as follows: • 1 port (selected speeds, 56–2048 Kbps) • 2 ports (selected speeds, 56–1024 Kbps) • 3 ports (selected speeds, 56–672 Kbps) • 4 ports (selected speeds, 56–512 Kbps) Refer to the table at the beginning of this command description for the available clock rates for all port combinations.
clocking	Specifies the port's clock type for V.35 and X.21 lines. *Clocking* does not apply to T1, E1, or Port Concentrator lines. The clock is either *normal* or *looped*. Four combinations of clocking are available for the FRI-V.35. Two combinations of clocking are available for the FRI-X.21. Note that the clock and data direction in DCE mode is the opposite of the direction for DTE mode. • FRP or FRM is DCE with normal clocking (V.35 and X.21) • FRP or FRM is DCE with looped clocking (V.35 only) • FRP or FRM is DTE with normal clocking (V.35 and X.21) • FRP or FRM is DTE with looped clocking (V.35 only) For a description of looped and normal clocking, refer to the *IGX Reference Manual*, the *IPX Reference Manual*, or the *System Manual*.
port type	Specifies the port type as either "FR" for frame relay or "ATM" for asynchronous transfer mode. Specify "ATM" when the node uses an AIP or BTM for a V.35 circuit interface to a frame relay port. The *port type* also configures alarm reporting and other miscellaneous functions for a port. This parameter does not apply to ports on a Port Concentrator Shelf. When you use **cnffrport** in a job, the *port type* parameter follows *slot.port*. This parameter is not necessary in standard use of **cnffrport**. Valid entries are V.35, X.21, PORT, or LINE (where LINE indicates a T1 or E1 line).

Parameter	Description
port ID	Specifies the DLCI associated with the port (0–1024) {0}. A node uses this number when you add bundled connections. Otherwise, port ID can be used as a network destination number in global addressing. The *port ID* does not apply to T1, E1, or PCS ports.
port queue depth	Specifies the maximum bytes in the transmission queue at the UFM, FRP, or FRM port. The range is 0–65535 bytes. The default is 65535 bytes.
ecn queue threshold	Specifies the threshold at which the system begins to generate explicit congestion notification (BECN and FECN bits) for the port. The range is 0–65535 bytes. The default is 65535 bytes.
de threshold	Specifies the port queue depth above which the system discards frames with a set Discard Eligibility (DE) bit. The range is 0–100%. The default is 100%. A threshold of 100% disables DE for the port because a queue cannot contain more than 100% of its capacity.
signalling protocol	Specifies the LMI operation mode. The range is 0–255. The default is LMI=2. The system recognizes the following definitions: LMI = 0 LMI is disabled at this port. LMI = 1 Cisco LMI and the asynchronous update process is enabled at this port. Greenwich Mean Time is also enabled. LMI = 2 LMI is disabled at this port. LMI = 3 Cisco LMI is enabled at this port, but asynchronous update process is disabled. LMI = 4 The port configuration is UNI using CCITT Q.933 Annex A parameters. LMI = 5 The port configuration is UNI using ANSI T1.617 Annex D parameters. LMI = 6 The port configuration is NNI using CCITT Q.933 Annex A parameters. LMI = 7 The port configuration is NNI using ANSI T1.617 Annex D parameters.
asynchronous status	Specifies whether the node should send unsolicited LMI update messages when they appear or wait for the user-device to poll. Enter y (yes) or n (no).
polling verify timer	Specifies a Link Integrity Verification Timer heartbeat (keep-alive) period. The range is 5–30. The default is 15. Set the timer to 5 secs. more than the setting in the user equipment.
error threshold	Specifies the number of failures in the monitored events that cause the “keep alive” process to report an alarm. The theoretical range is 0–255. The valid range is 1–10. A threshold of 0 reverts to 1. A threshold greater than 10 reverts to 10.
monitored events count	Specifies the number of monitored events for the “keep alive” process. It has a theoretical range of 0–255 and a valid range of 1–10. A port communication-fail condition is cleared after this number of successful polling cycles. A value of 0 reverts to 1, and a value more than 10 reverts to 10.
communicate priority	Specifies whether the system should communicate the SNA priority of the connections to the user-device on the port. Enter y (yes) or n (no). (SNA priority is either H or L.)

Parameter	Description
upper/lower RNR threshold	Specifies the *receiver not ready* (RNR) thresholds. The upper threshold is the number of receiver not ready indications from the user equipment before an alarm is generated for this port. The lower RNR threshold is the number of indications from the user equipment before an alarm is cleared. The range is 1–255. The default for the upper RNR threshold is 75. The default for the lower RNR threshold is 25.
Enable EFCI to BECN mapping	Directs the system to map the Frame Relay BECN bit to the EFCI bit in a FastPacket.
ForeSight over port	Specifies whether the system should use CLLM over the port.
min. flags/frame	Specifies the minimum number of flags between frames when the direction of transmission is from the node to the user-equipment. Any value greater than 0 is valid on the UFM, FRP or FRM. The default is 1. On a Port Concentrator Shelf, the range is 1–16.
OAM FastPacket threshold	Specifies how many OAM FastPackets must arrive from a remote NNI port before the local port generates "A-bit = 0" in the signalling protocol message to the locally attached device. The range for this parameter is 0–15 packets. The default is 3 packets. A 0 disables this function. The *OAM FastPacket threshold* setting applies to UNI and NNI ports. The following two paragraphs provide a more detailed explanation of the A-bit and *OAM FastPacket threshold* usage. On any frame relay port (UNI or NNI) that is using a signalling protocol (Cisco LMI, Annex A, or Annex D), the FRP or FRM provides a Status message to the attached equipment in response to a Status Enquiry message or as an Asynchronous Update. These Status messages contain details about every PVC configured on the port. In particular, the "PVC Active" bit (the A-bit) represents whether a PVC is active (A-bit=1) or out of service (A-bit = 0). If the other end of the connection PVC on a UNI port, the only conditions that can cause the local frame relay card to send an A-bit=0 are: • The PVC being "down" (intentionally taken out of service) • The PVC being failed for any reason (such as a hardware failure, trunk failure with no ability to reroute, and so on) If the other end of the PVC terminates on an NNI port, one additional condition can cause the local UFM, FRP, or FRM to send an A-bit=0 to the local device: if the remote NNI port on the card receives an A-bit=0 from the remote network over the remote NNI, then the local card can propagate an A-bit=0 out the local port. The mechanism by which the remote card notifies the local card of the A-bit=0 coming from the remote network is OAM FastPackets. The local node sends one OAM FastPacket every 5 seconds for as long as the A-bit coming from the remote network is 0.
link integrity timer (T391)	Specifies the interval after which the system sends Status Enquiry messages across the NNI port. The range for the interval is 5–30 seconds. The default is 6 seconds. Both networks do not need to have the same T391 value. On a frame relay NNI port, the Link Integrity Timer (T391) specifies how often the UFM, FRP, or FRM generates a Status Enquiry message to the attached network using the selected NNI signalling protocol (Annex A or Annex D). The card should receive a Status message for every Status Enquiry message it transmits. If the frame relay card receives no responses or invalid responses, a Port Communication Failure results. (This causes a minor alarm.) Using the default values for N392 Error Threshold and N393 Monitored Events Count in an example: an error occurs when no response (or a bad response) arrives for 3 out of the last 4 Status Enquiry messages. (The default for N392 Error Threshold is 3. For N393 Monitored Events Count, the default is 4.)

Parameter	Description
N392 error threshold	Specifies the number of bad or undelivered responses to Status Enquiry messages that can occur before the system records a Port Communication Failure. The range is 1–10. The default is 3. See the description of the *link integrity timer* parameter for example usage.
N393 monitored events count	Specifies the number of Status Enquiry messages in a period wherein the system waits for responses to the enquiries. The range is 1–10. The default is 4. See the description of the *link integrity timer* parameter for example usage.
full status polling cycle (N391)	Specifies the interval at which the system sends the Full Status Report request for all PVCs across the NNI port. The range is 1–255 polling cycles. The default is 10 cycles. The Full Status reports the status of *all* the connections across the NNI.
card type	Specifies the card type when you enter the **cnffrport** command in a job. This parameter is not available except when you specify **cnffrport** in a job by using the **addjob** command. During the job specification, you enter the *card type* just after the *slot.port* during the command specification phase of **addjob**. Valid *card types* are “V.35,” “X.21,” “port,” and “line,” where “line” indicates a T1 or E1 line.
CLLM status Tx Timer	Specifies an interval for the system to send ForeSight congestion messages across the NNI. The range is 40 ms–350 ms. The default is 100 ms. Both networks must be Cisco WAN Switching networks.
IDE to DE mapping	Specifies whether the destination system should map the internal DE bit (IDE) status in the FastPacket or ATM cell to the frame relay DE bit at the destination. Enter y (yes) or n (no). If you specify the non-standard case of CIR=0 with either **addcon** or **cnffrcls**, you must first enable *IDE to DE mapping*. Refer to the section titled “Using Frame Relay Classes” for important information on setting CIR=0.
interface control template	Specifies the control leads available on the V.35 and X.21 physical frame relay ports and the meaning for each lead.
channel range	Specifies the DS0s for the T1 or E1 logical port. The value can be 1 or a contiguous combination in the range 1–24 for T1 or 1–31 for E1. For example, 7–12 indicates 6 DS0s for the port, starting with DS0 7. Before you use this command, specify the valid channel range with the **addfrport** command.
channel speed	Specifies the bandwidth available to a logical port. The speed is 64 Kbps times the number of DS0s you specify with the *channel range* parameter.

cnfict

Configures the interface control template signals. Each interface control lead must be individually configured. (Each data channel has a default interface control template for its active, conditioned, and looped-near and far states.) The signals available to **cnfict** depend on the type of back card and whether the port mode is DCE or DTE. On an IPX, the applicable front cards are the SDP, LDP, FRP, CDP (for data), and FTC (for data). On an IGX, the applicable front cards are the LDM, HDM, FRM, UFM, CVM (for data), and FTM (for data).

Note The **cnfict** command is not valid for V.11 and X.21 interfaces. For FRP V.35 and Port Concentrator V.35 and V.28 interfaces, only the active template is usable, and you can configure the leads to on or off.

When Y-cable redundancy is in effect, the control template configuration for the data channels terminating at the primary slot also applies to the data channels of the secondary slot. Any configuration information you attempt to apply to the secondary slot is ignored. The following lists which leads are configurable for each type of data interface supported by the IPX or IGX. The entries under the "IPX or IGX Name" column indicate the abbreviations to use when you specify input or output leads on the command line.

Table 9-20

Configurable Lead Listing

Source	IPX/IGX name	RS-232C	RS-232D	RS-449	V.35	X.21	Fast EIA	CCITT (ITU-T) Equivalent	Function
DTE	RTS	CA	CA	RS	C		F4	105	Request to Send
DCE	CTS	CB	CB	CS	D		F4	106	Clear to Send
DCE	DSR	CC	CC	DM	E		F3	107	Data Set Ready
DCE	DCD	CF	CF	RR	F		F7	109	Data Carrier Detect (RLSD)
DCE	QM	QM	QM						Equalizer Mode
DTE	pin 11	11	11						Sometimes used for Data
DCE	SDCD	SCF	SCF					122	Secondary Data Carrier Detect
DCE	SCTS	SCB	SCB					121	Secondary Clear to Send
DTE	STxD	SBA	SBA				F5	118	Secondary Transmit Data
DTE	NS			NS			F7		New Sync
DCE	SRxD	SBB	SBB				F5	119	Secondary Receive Data
DCE	DCR	DCR							Divided Receiver Clock
DTE	RL		RL	RL			F6		Remote Loopback
DTE	SRTS	SCA	SCA					120	Secondary Request to Send
DTE	DTR	CD	CD	TR	H		F3	108.2	Data Terminal Ready
DCE	SQ	CG	CG	SQ				110	Signal Quality Detect
DCE	RI	CE	CE	IC	J**			125	Ring Indicator
DTE	SF	CH	CH	SF				111	Signal Rate Select (to DCE)

Configurable Lead Listing (Continued)

Source	IPX/IGX name	RS-232C	RS-232D	RS-449	V.35	X.21	Fast EIA	CCITT (ITU-T) Equivalent	Function
DCE	SI	CI	CI	SI				112	Signal Rate Select (to DTE)
DTE	BSY	BSY		IS			F1		Busy (In Service)
DCE	SB		TST	SB			F1		Test Indicator
DTE	LL			LL			F2		Local Loopback
DCE	TM			TM	K**		F6		Test Mode
DTE	SS			SS					Select Standby
DTE	C					C			Control
DCE	I					I			Indicator

Asterisk (**) indicate the listing is applicable to only an SDP or HDM card. Pins 11 and 23 on an RS-232 port are bi-directional, and their default direction is input. See the **cnfcldir** command for information on changing the direction of these pins. The **cpyict** command can be used to copy an interface control template from one data channel to another. The template can then be edited using the **cnfict** command. The **dspbob** command displays the state of leads at specified intervals.

The preceding list shows the equivalence between RS-232C, RS-232D, RS-449, V.35, and X.21 interfaces. An IPX or IGX treats leads impartially for non-interleaved connections. Any signal arriving on an EIA pin at one end may be transmitted to any pin at the other end. An imposed maximum of 12 EIA leads applies to any interface type. For interleaved EIA connections, the “Fast EIA” column shows which leads are carried in the interleaved bytes in the data packets. All remaining leads are carried in traditional control lead packets.

Full Name

Configure interface control template

Syntax

cnfict <port> <template> <output> <source>

Related Commands

addextlp, dspict, tstport

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cnfict 25.1 a cts on

Description

Configure the active interface control template for channel 25.1 to CTS-on. This means that when the port is active, the CTS lead is asserted.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 17:36 MST

Data Channel:      25.1
Interface:         RS232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead    Output Value
 RI      OFF                           DSR     ON
 CTS     ON                            SRxD    ON
 DCR     OFF                           DCD     ON
 SCTS    ON                            SDCD    ON
 SQ      ON



Last Command: cnfict 25.1 a cts on


Next Command:
```

Example 2

cnfict 9.1 a rts on

Description

Configure the active interface control template to have RTS-on. This means that when the port is active. the RTS lead is asserted.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 23 1996 10:23 PST

Port:       9.1               [ACTIVE  ]
Interface:  FRI-V35 DTE                      Configured Clock:   256 Kbps
Clocking:   Normal                           Measured Rx Clock:    0 Kbps
Port ID                        7
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer         6 sec
DE Threshold                 100 %     N391 Full Status Poll       10 cyl
Signalling Protocol         None       ForeSight (CLLM)            No
Asynchronous Status           No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer      15       Interface Control Template
N392 Error Threshold           3          Lead       State
N393 Monitored Events Count    4           RTS        ON
Communicate Priority          No           DTR        ON
Upper/Lower RNR Thresh  75%/ 25%
Min Flags / Frames             1

Last Command: cnfict 9.1 a rts on


Next Command:
```

Example 3

cnfict 31.1 n dsr on

Description

Configure the near interface control template for 31.1, to DSR on (DDS trunk).

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 17:38 MST

Data Channel:      31.1
Interface:         DDS-4   OCU Config
Clocking:          Looped

            Interface Control Template for Connection while NEAR EXT LOOPED

 Lead    Output Value                  Lead    Output Value
 DSR     ON                            CTS     ON
 DCD     ON




Last Command: cnfict 31.1 near dsr on


Next Command:
```

Table 9-21 cnfict–Parameters

Parameter	Description		
port	Specifies the data channel or frame relay port whose interface control template you want to configure. Specify the port in the format *slot.port*		
template	Specifies which interface control template to configure for the channel and has the format: a/c/l/n/f. Valid entries are:		
	Entry	**Template**	**Description**
	a	Active	The "active" control template is in effect while the data channel is active (normal operation) i.e. when the connection is routed and not failed.
	c	Conditioned	The "conditioned" control template is in effect when conditioning is applied to the data channel. The conditioned template is used when the network detects that it cannot maintain the connection because of card failures or lack of bandwidth (The connection is failed.)
	l	Looped	The "looped" template is in effect when the data channel is being looped back in either direction. The looped template is used when **addloclp** or **addrmtlp** has been used to loop the connection within the network.
	n	Near loopback	The "near" template is in effect when running a **tstport n** or an **addextlp n** on a port. The port is configured such that the external near modem is placed in a loopback.
	f	Far loopback	The "far" template is in effect when running a **tstport f** or an **addextlp f** on a port. The port is configured such that the external far-end modem is placed in a loopback.
	The only valid template for a frame relay port, X.21 or V.35, is the ACTIVE template. Also, all the output leads have steady state values and do not follow local or remote inputs.		
output	Specifies the output lead to configure. Valid abbreviations for output leads are listed in the previous parameter (template). Configurable output leads vary depending on the type of data interface: RS-232, V.35, X.21, or RS-449.		
source	Specifies how the lead is to be configured and has the format: on | off |local|remote input delay Delay is an optional parameter. The following lists the valid source choices:		
	on	The output lead is asserted.	
	off	The output lead is inhibited.	
	l	(for local) indicates that the output follows a local lead.	
	r	(for remote) indicates that the output follows a remote lead.	
	input	The name of the local or remote input lead that the output lead follows.	
	delay	The time in milliseconds that separates the "off" to "on" lead transitions. Delay is valid *only* when the output lead is CTS and the input lead is local RTS. "On" to "Off" lead transitions are not subject to this delay.	

cpyict

Copies all control template information associated with a given channel: the active template information, the conditioned template information, and the looped template information near, far. Once copied, the control template information may be edited with the **cnfict** command. See the **cnfict** command for more information on interface control templates.

Full Name

Copy SLDP/LDP/FRP interface control template

Syntax

cpyict <source_port> <destination_port>

Related Commands

cnfic, dspict

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

cpyict 25.1 25.2

Description

Copy the interface control template on channel 25.1 to channel 25.2

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 17:40 MST

Data Channel:      25.2
Interface:         RS232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead    Output Value
 RI      OFF                           DSR     ON
 CTS     ON                            SRxD    ON
 DCR     OFF                           DCD     ON
 SCTS    ON                            SDCD    ON
 SQ      ON



Last Command: cpyict 25.1 25.2


Next Command:
```

Example 2

cpyict 25.1 25.2

Description

Copy the frame relay interface control template on port 25.1 to 25.2

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 17:40 MST

Data Channel:      25.2
Interface:         RS232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead    Output Value
 RI      OFF                           DSR     ON
 CTS     ON                            SRxD    ON
 DCR     OFF                           DCD     ON
 SCTS    ON                            SDCD    ON
 SQ      ON



Last Command: cpyict 25.1 25.2


Next Command:
```

Table 9-22 cpyict–Parameters

Parameter	Description
source channel	Specifies the data channel or frame relay port.
destination channel	Specifies the data channel or frame relay port you want to receive the copied control template information.

delcon

Removes connections from the network. A prompt appears for confirming the deletion. Connections can be deleted from the node at either end of the connection. Do not delete a connection when the node at the other end of the connection is unreachable. The unreachable node will not recognize the deletion. It is especially important not to delete a connection to an unreachable node and then connect that channel to another node. Channel connections are added to the network with the **addcon** command.

Full Name

Delete connections

Syntax

delcon <channel(s)>

Related Commands

addcon, dspcon, dspcons

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

delcon 25.1

Description

Delete connection 25.1. The connections to delete are highlighted. A prompt asks you to confirm the deletion. Respond with “y” for yes. Connection 25.1 is deleted.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:43 MST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid COS O
 19.1.101   gamma       8.2.300    Ok     fr                           0  L
 19.2.302   alpha       9.2.400    Ok     fr                           0  R
 25.2       gamma       6.1        Ok     256                 7/8      0  L




Last Command:


Next Command: delcon 25.1
```

Table 9-23 delcon–Parameters

Parameter	Description
channel	Specifies the channel or set of channels in the following format: slot.port.DLCI.

delcongrp

Deletes a group. The group must be empty (all connections must first have been removed with the **delcon** command). You can delete a group from either the local or remote end of the group.

Full Name

Delete connection group

Syntax

delcongrp [remote node] <connection group>

Related Commands

dspcongrp, grpcon, delcon, dspcongrps, dspcons, addcongrp

Attributes

Privilege	1
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

delcongrp gamma.1

Description

Delete connection group gamma.1.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 16:19 MST

                                    Route
Group            Count  State  Avoid  COS  FST  Owner









Last Command:

Next Command:  delcongrp gamma.1
```

Table 9-24 delcongrp–Parameters

Parameter	Description
remote node	Specifies the name of the remote node of the connection group.
group number	Specifies the number of the group (between 1 and 250) to delete between the local and remote nodes.

delfrport (T1/E1)

The information in this description applies to only frame relay ports using a T1 or E1 line. The **delfrport** command deletes logical ports on FRP, FRM, or UFM cards and "unassigns" associated DS0/timeslots. The deleted DS0/timeslots are available for you to assign to new logical ports (with the **addfrport** command). The port display (normally visible through **dspfrport** command) appears regardless of successful port deletion. The screen displays the defined port numbers for the specified line. The following lists the error and warning messages for this command.

Table 9-25

Messages	Reason for Message
"Slot is out of range"	Line number not correct for FRP T1/E1
"Port does not exist"	Logical port number does not exist
"You must first down the port"	Logical port is up
"You must first down the port"	Specified port is not first DS0/timeslot of logical port

Full Name

Delete frame relay port

Syntax

For FRM or FRP: delfrport <slot.port>

For UFM: delfrport <slot.port> <line.ds0_range>

Related Commands

addfrport, dspfrport, dnfrport

Attributes

Privilege	1
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

delfrport 8.1

Description

Delete frame relay port 8.1

System Response

```
alpha TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 17:28 CST

Port configuration for FRP 8

From       Chan    Speed   Interface   State
1          9-15    448     FRI T1      ACTIVE
20         20-24   320     FRI T1      ACTIVE




Last Command: delfrport 8.1


Next Command:
```

Table 9-26 delfrport (T1/E1)–Parameters

Parameter	Description
slot	Specifies the physical FRP or FRM T1 or E1 line. The range of logical port numbers is 1–24 for T1 lines and 1–31 for E1 lines.
port	Specifies the logical port number of the port to delete.

dnfrport

Deactivates (“downs”) the specified frame relay port. Before deactivating a port, you must delete all connections on the port (see **delcon** description).

Full Name

Down Frame Relay port

Syntax

For FRM or FRP: dnfrport <slot.port>

For UFM: dnfrport <slot.port> <line.ds0_range>

Related Commands

cnffrport, dspfrport, upfrport

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

delfrport 3.1

Description

Down frame relay port 3.1

System Response

```
pubsigx1       TN    SuperUser       IGX 32    8.2      Aug. 14 1996 03:49 GMT

Port:       3.1               [INACTIVE]
Interface:  FRI-T1                            Configured Clock:    64 Kbps
Clocking:   None                              Measured Rx Clock: None
                                        Min Flags / Frames           1
Port ID                          -      Channel Range                1
Port Queue Depth             65535      OAM Pkt Threshold            3 pkts
ECN Queue Threshold          65535      T391 Link Intg Timer        10 sec
DE Threshold                   100 %    N391 Full Status Poll        6 cyl
Signalling Protocol           None      EFCI Mapping Enabled        No
Asynchronous Status             No      CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer        15      IDE to DE Mapping          Yes
N392 Error Threshold             3      Channel Speed               64
N393 Monitored Events Count      4
Communicate Priority            No
Upper/Lower RNR Thresh  75%/ 25%

Last Command: dnfrport 3.1


Next Command:
```

Table 9-27 dnfrport–Parameters

Parameter	Description
slot	Specifies the slot number of the frame relay card with the port to down.
port	Specifies the port number to deactivate on the card specified by *slot*. On an FRP or FRM, the range is 1–24 or 1–31. On a UFM, the range is 1–250.
line	The physical line on UFM card sets.

dspchcnf

Displays configuration details for voice, data, or frame relay channels.

Voice channels display:	Utilization, Adaptive Voice, Gain, Dial Type, Interface Type, and OnHook and Conditioning specifications.
Data channels display:	Maximum EIA Update Rate, Percentage Utilization, DFM Pattern Length, and DFM Status.
Frame relay channels display:	Minimum Information Rate, VC Queue Buffer Size or Bc, Peak Information Rate or Be, Maximum Credits, ECN Queue Buffer Size, Quiescent Information Rate, ForeSight enabled or not, and Percentage Utilization.

If the channel specified is a voice channel, the display includes configuration details for all channels on the specified circuit line starting with the specified channel. If the channel specified is a data channel, the display includes configuration details for all channels on the specified data card (CDP, SDP or LDP) starting with the specified channel. If the channel specified is a frame relay channel, the display includes configuration details for all channels on the specified FRP port starting with the specified channel. If you specify a frame relay port only with no DLCI, the display includes configuration details for all channels on the frame relay port specified. The display also indicates either Cisco parameters or standard Frame Relay parameters.

Full Name

Display channel configuration

Syntax

dspchcnf [channel]

Related Commands

cnfchadv, cnfchdfm, cnfchdl, cnfcheia, cnfchgn, cnfchpri, cnfchutl, cnffrcon

Attributes

Privilege	1–6
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspchcnf 9.1

Description

Display configuration values for all channels on frame relay port 9.1

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 15:56 PST

                Frame Relay Channel Configuration  Port: 9.1

 Channel    MIR   CIR  VC Q Depth    PIR  Cmax  ECN QThresh   QIR   FST   % Util
 9.1.100    9.6   9.6         5      256    10     65535      9.6    n      100









Last Command: dspchcnf 9.1


Next Command:
```

Table 9-28 dspchcnf–Parameters

Parameter	Description
channel	Specifies the channel at which the display begins. The format is *slot.port.DLCI*. The DLCI parameter is optional.

dspchstats

Displays traffic statistics and the statistics collection period for the specified channel. The display shows when the statistics were last cleared and the time that has elapsed during the current collection period. The statistical parameters include:

- Number of frames transmitted
- Average frame size in bytes
- Average frame rate in frames per second
- Number of packets transmitted
- Average packet rate in packets per second
- Percentage utilization of the channel

For each parameter, the values appear in the following categories:

- From the port (received from the attached device into the node)
- To the network (transmitted from the node into the network)
- Discarded (received from the attached device but not transmitted to the network)
- From the network (received from the network into the node)
- To the port (transmitted from the node to the attached device)
- Discarded (received from the network but not transmitted to the attached device)

The **dspchstats** command also displays ECN (Explicit Congestion Notification) statistics.

- FECN: Lists number of frames sent to the receiving end router with the FECN (Forward Explicit Congestion Notification) bit set and the ratio of these frames to the total number of frames sent. This is a measure of frame relay congestion and the extent to which the receiving router has been informed of frames received that encountered congestion.
- BECN: Lists number of frames sent to the transmitting end router with the BECN (Backward Explicit Congestion Notification) bit set and the ratio of these frames to the total number of frames sent. This is a measure of frame relay congestion and the extent to which the transmitting router has been informed of frames received that encountered congestion.
- Min-Pk. bytes rcvd: Lists number of bytes received at the receiving end router during the greatest minute-peak of bytes received.
- minutes congested: Lists number of congested minutes of received data since the command started.

Full Name

Display frame relay channel statistics

Syntax

dspchstats <channel> [interval]

Related Commands

clrchstats, cnfchstats

Attributes

Privilege	1–6
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspchstats 5.1.100

Description

Display the channel statistics for connection 5.1.100

System Response

```
pubsipx1       TN    SuperUser       IPX 16    8.2    Aug. 7 1996 04:04 PDT

Channel Statistics: 5.1.100       Cleared: July 25 1996 06:07
MIR: 9.6 kbps           Collection Time: 12 day(s) 21:48:41     Corrupted: YES
                     Frames   Avg Size Avg    Util          Packets     Avg
                              (bytes) (fps) (%)                      (pps)
From Port:                0          0      0    0
To Network:               0          0      0    0            58732         0
Discarded:                0          0      0    0
From Network:             1          5      0    0                1         0
To Port:                  0          0      0    0
Discarded:                1          5      0    0                1         0
                   ECN Stats:  Avg Rx VC Q:             0    ForeSight RTD    --
Min-Pk bytes rcvd:          0  FECN Frames:             0    FECN Ratio (%)    0
Minutes Congested:          0  BECN Frames:             0    BECN Ratio (%)    0
Frames rcvd in excess of CIR:       0  Bytes rcvd in excess of CIR:         0
Frames xmtd in excess of CIR:       0  Bytes xmtd in excess of CIR:         0

This Command: dspchstats 5.1.100


Hit DEL key to quit:
```

Table 9-29 dspchstats–Parameters

Parameter	Description
channel	Specifies the channel. The command displays connection information for one channel at a time, so you cannot specify a range of channels. The format for channel is *slot.port.*

Table 9-30 dspchstats–Optional Parameters

Parameter	Description
interval	Specifies the refresh interval for displaying data. The range is 1–60 seconds. The default is 1 second.

dspcon

Displays connection information for a channel. The information displayed includes:

- The channel number at both the local and remote ends of the connection
- The node name at both ends of the connection
- The type or data rate of the connection
- The routing restriction
- The class of service (COS) of the connection
- The connection route, which lists the end nodes and any intermediate nodes
- The preferred route for the connection (if configured)
- The status of the cards associated with the connection
- Any Y-cable conflicts (LDI, CDP for example)
- The compression status (VAD on or off, ADPCM on or off, DFM on or off, frame relay compression on or off)
- The connection bandwidth parameter values for frame relay
- The connection descriptor (if configured)
- The circuit round trip delay (RTD) if ForeSight is enabled

A failure that affects the connection flashes on the screen. For frame relay NNI ports, the NNI value indicates the A-bit value received over the NNI from the remote network. The possible status messages are:

- OK Connection OK.
- FAILED Connection failed.
- MISSING DLCI was deleted in other network at NNI. A previous status report indicated a valid DLCI present but an updated report did not.
- UNUSED indicates the UNI port does not support reporting of NNI A-bit status.

Full Name

Display connections

Syntax

dspcon <slot.port.DLCI>

Related Commands

addcon, cnfcondsc, cnfcos, cnfpref, dspcons

Attributes

Privilege	1–6
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspcon 19.1.101

Description

Display connection information for frame relay channel 19.1.101

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:42 MST

Conn:  19.1.101   gamma       8.2.300     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6  65535/65535   256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: LOCAL  Restriction: NONE  COS: 0                    Status: OK
Group: NONE  Priority: L  TestRTD: 0 msec

Path:     beta    15--15gamma
Pref:     Not Configured


beta 19.1.101                                    gamma 8.2.300
FRP:   OK                                        FRP:   OK
FRI:   OK                                        FRI:   OK


Last Command: dspcon 19.1.101


Next Command:
```

Table 9-31 dspcon–Parameters

Parameter	Description
channel	Specifies the channel in the format *slot.port.DLCI*. The **dspcon** command displays information for one connection at a time.

dspcongrp

Displays detailed information for a connection group.

Full Name

Display connection with a group

Syntax

dspcongrp [remote nodename] <connection group>

Related Commands

delcongrp, grpcon, delcon, dspcongrps, dspcons, addcongrp

Attributes

Privilege	1
Jobs	No
Log	No
Node	IPX, BGX, IGX
Lock	No

Example 1

dspcongrp gamma 1

Description

Display connection group gamma.1

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:56 MST

 Local      Remote      Remote                    Only in          Route
 Channel    NodeName    Channel    State  Type     Group            Avoid COS O
 19.1.101   gamma       8.2.300    Ok     fr(Grp)  gamma.1                0  L




Last Command: dspcongrp gamma.1


Next Command:
```

Table 9-32 dspcongrp–Parameters

Parameter	Description
remote node	Specifies the name of the remote node of the connection group.
group number	Specifies the number of the group (between 1 and 250) between the local and remote nodes to display.

dspcongrps

Displays current connection groups.

Full Name

Display connection groups

Syntax

dspcongrps [node name | group name]

Related Commands

delcongrp, grpcon, delcon, dspcongrp, dspcons, addcongrp

Attributes

Privilege	1
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspcongrps

Description

Display all the current connection groups

System Response

```
beta          TRM     YourID:1         IPX 32    8.2   Mar. 15 1996 15:56 MST

 Route
Group      Count   State      Avoid       COS FST        Owner
gamma.1    1          Ok                   0    n         Local
gamma.2    6          Ok                   0    n         Local
gamma.3    12         Ok                   0    n         Local









Last Command: dspcongrps


Next Command:
```

Example 2

dspcongrps alpha

Descriptions

Display the connection groups between the local node and the remote node *alpha*

Example 3

dspcongrps alpha.1

Descriptions

Display connection group *alpha.1*

Table 9-33 dspcongrps–Optional Parameters

Parameter	Description
remote node	Specifies the name of the remote node.
group number	Specifies the remote node name and group number of the connection to display.

dspcons

Displays information about the connections on an IPX or IGX node. The following table lists all possible information headings that appear in the display. The actual headings that appear depend on the choice of selected optional parameters–including no parameters. Entering the command with no parameters display all connections. The screen examples reflect various optional parameters, beginning with no parameters.

Table 9-34

Fields	Description	
Local Channel	The connection's channel at this node.	
Remote Node Name	The name of the node at the other end of the connection.	
Remote Channel	The connection's channel at the remote node.	
State	The state of the connection(s) are as follows	
	State	**Description**
	OK	routed, A-bit = 1
	Down	downed
	Failed	unrouted, but trying; A-bit = 0
Type	The type of connection. For example, this can be frame relay, frame relay with interworking, voice, data, and so on.	
Only __	If one parameter pre-empts another, this heading appears with the accepted parameter type. To name two examples: if the parameter is –d for data or –fail for failed connections only, this heading becomes either "Only d" or Only fail," respectively.	
Code	The encoding used for data connections (7/8 = data byte is 7 bits of user data plus a "1" in the last bit position, 8/8 = data byte is 8 bits of user data, 8/8I = data byte is 8 bits of inverted user data).	
Route Avoid	The type of lines to avoid when routing (satellite lines, terrestrial lines, lines with zero code suppression).	
Compression	The type of compression applied to the connection (PCM, PCM and VAD, ADPCM, VAD and ADPCM for voice connections), (DFM for data connections).	
COS	The Class Of Service.	
A-bit	A-bit status at both ends of the connection.	
Descriptor	The connection descriptor string.	
Loopback	This is not a heading but rather the standard loopback symbols indicating the presence of a test loop. See the "Troubleshooting" chapter for an explanation of these symbols.	

Full Name

Display connections

Syntax

dspcons [*start_channel*] [*nodename*] [+d] [–f] [–v] [–d] [–g] [–atfr] [–abit] [–fabit] [–fail] [–down]

where

start_channel	is the starting channel to display
nodename	specifies that connections for only the named node appear in the display
+d	equals display the connection's optional descriptor specified by the **cnfcondsc** command
–f	equals display frame relay connection only
–v	equals display only voice connections
–d	equals display only data connections and do so in Kbps.
–g	equals display only grouped connections
–atfr	equals frame relay to ATM interworking connections (also displays atfr with ForeSight)
–abit	equals show status of the A-bit
–fabit	equals show only connections with failed A-bits
–fail	equals show only failed connections
–down	equals show only downed connections

Note Some parameters may supersede other parameters.

Related Commands

addcon, cnfchadv, chfchdfm

Attributes

Privilege	1–6
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspcons

Description

Displays all connections

System Response

```
sw83           VT    SuperUser       IPX 16    8.2       Feb. 14 1996 12:58 PST

 From           Remote      Remote
 3.1.27         NodeName    Channel         State  Type      Compress  Code COS
 3.1.27         sw86        13.1.1.27       Ok     atfst                  0
 3.1.28         sw86        13.1.1.28       Ok     atfst                  0
 3.1.29         sw86        13.1.1.29       Ok     atfst                  0
 3.1.30         sw86        13.1.1.30       Ok     atfst                  0
 3.1.31         sw86        13.1.1.31       Ok     atfst                  0
 3.1.32         sw86        13.1.1.32       Ok     atfst                  0
 3.1.33         sw86        13.1.1.33       Ok     atfst                  0
 3.1.34         sw86        13.1.1.34       Ok     atfst                  0
 3.1.35         sw86        13.1.1.35       Ok     atfst                  0
 3.1.36         sw86        13.1.1.36       Ok     atfst                  0
 3.1.37         sw86        13.1.1.37       Ok     atfst                  0
 3.1.38         sw86        13.1.1.38       Ok     atfst                  0
 3.1.39         sw86        13.1.1.39       Ok     atfst                  0

This Command: dspcons


Continue?
```

Example 2

dspcons 19.1

Description

Display connections starting with 19.1. This example shows frame and data connections.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:37 MST

 Local      Remote      Remote                                        Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid COS O
 19.1.101   gamma       8.2.300    Ok     fr                           0  L
 19.2.302   alpha       9.2.400    Ok     fr                           0  R
 25.1       alpha       5.1        Ok     256                 7/8      0  L
 25.2       gamma       6.1        Ok     256                 7/8      0  L









Last Command: dspcons 19.1


Next Command:
```

Example 3

dspcons 19.1.101 +d

Description

Display connections starting at 19.1.101 and include any connection descriptors. (A connection descriptor is specified by the **cnfcondsc** command.)

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:39 MST

 Local      Remote      Remote
 Channel    NodeName    Channel    State  Type           Descriptor
 19.1.101   gamma       8.2.300    Ok     fr             Igantius
 19.2.302   alpha       9.2.400    Ok     fr             Xavier
 25.2       gamma       6.1        Ok     256            Jogues









Last Command: dspcons +d


Next Command:
```

Example 4

dspcons –f

Descriptions

Display frame relay connections only.

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 15:38 MST

 Local      Remote      Remote            Only                       Route
 Channel    NodeName    Channel    State  f       Compression  Code Avoid COS O
 19.1.101   gamma       8.2.300    Ok     fr                            0  L
 19.2.302   alpha       9.2.400    Ok     fr                            0  R









Last Command: dspcons –f


Next Command:
```

Example 5

dspcons –abit

Descriptions

Display connections and show the status of the A-bit on the local and remote nodes.

System Response

```
sw83           VT    SuperUser       IPX 16    8.2      Feb. 14 1996 13:02 PST

 Local          Remote      Remote                    Local     Remote
 Channel        NodeName    Channel         State      A-bit     A-bit
 3.1.1          sw86        13.1.1.1        Ok        OK        OK
 3.1.2          sw86        13.1.1.2        Ok        OK        OK
 3.1.3          sw86        13.1.1.3        Ok        OK        OK
 3.1.4          sw86        13.1.1.4        Ok        OK        OK
 3.1.5          sw86        13.1.1.5        Ok        OK        OK
 3.1.6          sw86        13.1.1.6        Ok        OK        OK
 3.1.7          sw86        13.1.1.7        Ok        OK        OK
 3.1.8          sw86        13.1.1.8        Ok        OK        OK
 3.1.9          sw86        13.1.1.9        Ok        OK        OK
 3.1.10         sw86        13.1.1.10       Ok        OK        OK
 3.1.11         sw86        13.1.1.11       Ok        OK        OK
 3.1.12         sw86        13.1.1.12       Ok        OK        OK
 3.1.13         sw86        13.1.1.13       Ok        OK        OK

This Command: dspcons -abit


Continue?
```

Table 9-35 dspcons–Optional Parameters

Parameter	Description
start channel	Specifies the channel to begin the display. Specify *start channel* in one of the following formats: *slot.port.DLCI* (frame relay channel) *remote node.group_name* (frame relay group connection) If you do not specify a starting channel, the display begins at the first connection.
node name	Specifies that only connections to this remote node from the local note be displayed. If no "nodename" is designated, connections from the local node to all other nodes are displayed
–v	Voice only
–d	Data only
–f	Frame relay only
–atfr	Interworking connections
–g	Grouped connections
+d	Connection descriptor
–abit	A-bit status
–fabit	A-bit errors
–fail	Failed connections
–down	Downed connections
type	Types listed in Syntax section. The state that may be displayed for frame relay and NNI connection types includes: OK: Connection OK, A-bit = 1. FAILED: Connection failed, A-bit = 0. MISSING: DLCI was deleted in other network NNI. A previous status report indicated a valid DLCI present but an updated report did not. UNUSED: The UNI port does not support reporting of NNI A-bit status.

dspfrcls

Displays the configuration of a frame relay class. Network-wide classes are available to provide a shortcut for adding frame relay connections. Refer to the section titled “Using Frame Relay Classes” at the beginning of this chapter for a definition of a frame relay class.

Full Name

Display Frame Relay classes

Syntax

dspfrcls

Related Commands

addcon, cnffrcls

Attributes

Privilege	1–2
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspfrcls

Description

Display the Frame Relay class configurations

The screen display is the same as that for the **cnffrcls** command.

System Response

```
sw83           TN    SuperUser       IPX 16    8.2      Aug. 23 1996 13:43 GMT

                        Frame Relay Connection Classes

 #    MIR       CIR     VC Q Depth       PIR      Cmax     ECN QThresh
 1  9.6/9.6   9.6/9.6  65535/65535       */*      10/10    65535/65535
   QIR:  9.6/9.6  FST: n % Util: 100/100 Description: “Default 9.6"
 2 19.2/19.2 19.2/19.2 65535/65535       */*      10/10    65535/65535
   QIR: 19.2/19.2 FST: n % Util: 100/100 Description: “Default 19.2"
 3   16/16     16/16   65535/65535       */*      10/10    65535/65535
   QIR:   16/16   FST: n % Util: 100/100 Description: “Default 16"
 4   32/32     32/32   65535/65535       */*      10/10    65535/65535
   QIR:   32/32   FST: n % Util: 100/100 Description: “Default 32"
 5   56/56     56/56   65535/65535       */*      10/10    65535/65535
   QIR:   56/56   FST: n % Util: 100/100 Description: “Default 56"


This Command: dspfrcls


Continue?
```

dspfrport

Displays information on frame relay cards and physical and logical ports. The applicable card sets are the FRP, FRM, and UFM. The content of the information display depends on the arguments you include with the command. The information can be:

- The status of all frame relay ports in a node
- General information on all ports on a selected FRP, FRM, or UFM card
- Configuration information on a single frame relay port.

The following are examples of the **dspfrport** command syntax:

dspfrport	Display the states of all frame relay ports in the node.
dspfrport 8	Display the port states for FRP in slot 8.
dspfrport 8.1	Display the configuration for port 1 of the FRP in slot 8.
dspfrport 6.44	Display the configuration for logical port 44 of the FRP-2 in slot 6.

The following is a list of possible displayed port parameters for a single port. For a more detailed description of these parameters, refer to the **cnffrport** command.

Table 9-36

Parameters	Parameters
Port number	Polling Verification Timer
DLCI number	Error Threshold
State: Active or inactive	Monitored Events Count
Interface Type: V.35 or X.21, DCE or DTE	Priority Communicated
Configured clock speed in Kbps	The lead states in the Interface Control Template
Measured clock speed in Kbps	Receiver Not Ready Thresholds
The port VC queue depth in bytes	Flags per frame
The VC queue ECN threshold in bytes	OAM FastPacket Threshold (for NNI ports)
The DE threshold	Link Integrity Timer (for NNI ports FRP rev. F/H or above)
The Signalling Protocol	Full Status Polling cycle (for NNI ports)
Asynchronous Status	

Full Name

Display Frame Relay port

Syntax

dspfrport [slot | slot.port]

Related Commands

cnffrport, upfrport, dnfrport

Attributes

Privilege	1–2
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspfrport

Description

Display the port status of the frame relay ports in the node.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 15:48 PST

FRP Port States
Port  ID   State
9.1   0    ACTIVE
9.2   0    ACTIVE
9.3   0    INACTIVE
9.4   0    INACTIVE









Last Command: dspfrport


Next Command:
```

Example 2

dspfrport 5

Description

Display the status of the ports on the FRP in slot 5.

System Response

```
pubsipx1       TN    SuperUser       IPX 16    8.2    Sep. 7 1996  02:11 PDT

Port configuration for FRP 5

Port   ID       Speed     Interface           State       Protocol     Port Type
1      0        256       FRI-V35 (DCE)       ACTIVE      None         FR
2      0        256       FRI-V35 (DCE)       INACTIVE    None         FR
3      0        256       FRI-V35 (DCE)       INACTIVE    None         FR
4      0        256       FRI-V35 (DCE)       INACTIVE    None         FR









Last Command: dspfrport 5


Next Command:
```

Example 3

dspfrport 5.1

Description

Display port status for logical frame relay port 5.1. In the example, note the range of channels.

System Response

```
sw109          VT    SuperUser       IGX 16    8.2 Jan. 21 1997 18:14 GMT

Port:       5.1               [ACTIVE  ]
Interface:  E1B                              Configured Clock:   960 Kbps
Clocking:   None                             Measured Rx Clock: None

Port ID                        -       Min Flags / Frames           1
Port Queue Depth           32000       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer        10 sec
DE Threshold                 100 %     N391 Full Status Poll        6 cyl
Signalling Protocol         None       EFCI Mapping Enabled        No
Asynchronous Status           No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Channel Speed               64
N393 Monitored Events Count    4       Line Number                  1
Communicate Priority          No       Channel Range              1-15
Upper/Lower RNR Thresh  75%/ 25%

Last Command: dspfrport 5.1


Next Command:
```

Example 4

dspfrport 5

Description

Display port status for all the Port Concentrator ports at slot 5.

System Response

```
tecate          LAN   SuperUser       IPX 16    8.2     Apr. 6 1996  09:59 PST

Port configuration for FRP 5

Port   ID       Speed     Interface           State       Protocol
1      0        64        V.35    (DCE)       ACTIVE      None
2      0        64        V.35    (DCE)       ACTIVE      None
3      0        38.4      V.11    (DTE)       ACTIVE      None
4      0        38.4      V.11    (DCE)       ACTIVE      None
5      0        38.4      V.11    (DCE)       ACTIVE      None
6      0        38.4      V.11    (DTE)       ACTIVE      None
7      0        19.2      V.11    (DCE)       ACTIVE      None
8      0        19.2      V.28    (DCE)       ACTIVE      None
9      0        19.2      V.28    (DTE)       ACTIVE      None
10     0        38.4      V.28    (DCE)       INACTIVE    None
11     0        38.4      V.28    (DCE)       INACTIVE    None
12     0        38.4      V.28    (DCE)       INACTIVE    None

Last Command: dspfrport 5


Continue?
```

Example 5

dspfrport 6.44

Description

Display port configuration for frame relay port 6.44 (a Port Concentrator port)

System Response

```
singha         TN    SuperUser       IPX 32    8.2       July 7 1996  13:38 GMT

Port:       6.44               [FAILED]
Interface:  V.11    DCE                      Configured Clock:  38.4 Kbps
Clocking:   Normal                           Startup Rx Clock:     0 Kbps
                                       Min Flags / Frames           1
Port ID                        0
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer        10 sec
DE Threshold                 100 %     N391 Full Status Poll        6 cyl
Signalling Protocol         None       EFCI Mapping Enabled        No
Asynchronous Status           No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead      I
Communicate Priority          No          State   ON
Upper/Lower RNR Thresh  75%/ 25%

Last Command: dspfrport 6.44


Next Command:
```

dspfrcport

Displays physical port configuration for FRM-2 or FRP-2 ports connected to a Port Concentrator.The following is a list of possible displayed parameters for a port.

Note The screen displayed with this command includes fields for standard frame relay ports on the FRM card. Only the fields in the following table have meaning for a Port Concentrator.

Table 9-37

Field	Meaning
Interface	Always *FRI-X.21 DCE* for PCS ports.
Clocking	Always *Normal* for PCS ports.
Port Type	Specifies port type, always FR (Frame Relay) for PCS ports.
Port ID	Specifies the DLCI for the port, always 1022 for PCS ports.
Port Queue Depth	Specifies the maximum bytes queued for transmission from the FRM-2 or FRP-2 port. The range is 0–65535; 65535 is the default.
DE Threshold	Specifies the port depth queue above which frames with the Discard Eligibility bit set will be discarded. Valid entries are 0–100%, with a default of 100%. 100% effectively disables DE for the port.
Signalling Protocol	For Frame Relay ports, specifies LMI operation mode. For PCS ports, this is set to *None*.
Measured Rx Clock	The actual speed of received data as clocked by the FRM-2 or FRP-2. Under normal operation, this should always display the fixed concentrated link speed of 512 Kbps. Clock speed is measured by the FRM-2 or FRP-2 once per minute
Concentrated Link Util	Current utilization percentage of the concentrated link. Utilization is defined as the percentage of the fixed link speed (512K) used for data. Since the maximum allowable aggregate for each link's 11 ports is 448 Kbps, 88% is the maximum value for this field.
Min Flags / Frames	Specifies the minimum number of flags per frame. All values greater than zero are valid; the default is 1.
OAM Pkt Threshold	Specifies the OAM FastPackets used within the local node to transmit the NNI status from the remote network. The range of values is 0–15 packets. The default is 3. A 0 disables this function.

Full Name

Display FRC-2/FRM-2 port configuration

Syntax

dspfrcport <slot.port> <interval>

Related Commands

dspfrcport, dspbob

Attributes

Privilege	1–2
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspfrcport 3.1

Description

Display the configuration of port 3.1.

System Response

```
tecate         LAN   SuperUser       IPX 16 8.2     Apr. 6 1996  10:25 PST
Physical Port:       3.1           [ACTIVE]
Interface:  FRI-X.21 DCE                      Configured Clock:   512 Kbps
Clocking:   Normal                           Measured Rx Clock:  512 Kbps
Port Type                     FR       Min Flags / Frames           1
Port ID                     1022
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer         6 sec
DE Threshold                 100 %     N391 Full Status Poll       10 cyl
Signalling Protocol         None       ForeSight (CLLM)            No
Asynchronous Status           No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead I
Communicate Priority          No          State   ON
Upper/Lower RNR Thresh  75%/ 25%       Concentrated Link Util 88%


Last Command: dspfrcport 3.1


Next Command:
```

Table 9-38 dspfrport–Parameters

Parameter	Description
slot.port	Specifies the physical slot and port of the frame relay card set. The range is 1–4.
interval	Specifies the screen update interval in seconds. The default is 5 seconds

dspict

Displays interface control template information for data channels and frame relay ports. The information includes:

The specified channel.
The type of template: a, c, l, n, or f.
The associated output leads and their status:

ON.
OFF.
Following a local input.
Following a remote input.

For frame relay ports, the entire port configuration scree is displayed (see **dspfrport** command). The input being followed is specified, when applicable. Any RTS to CTS delay is also shown.

Full Name

Display interface control template

Syntax

dspict <port> <template>

Related Commands

cnfict, cpyict

Attributes

Privilege	1–2
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspict 25.1 a

Description

Display the active interface control template for channel 25.1

System Response

```
beta           TRM   YourID:1        IPX 32    8.2    Mar. 15 1996 17:33 MST

Data Channel:      25.1
Interface:         RS232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead    Output Value
 RI      OFF                           DSR     ON
 CTS     ON                            SRxD    ON
 DCR     OFF                           DCD     ON
 SCTS    ON                            SDCD    ON
 SQ      ON



Last Command: dspict 25.1 a


Next Command:
```

Example 2

dspict 9.1 a

Description

Display the frame relay data channel 9.1 interface control template

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 23 1996 10:26 PST

Port:       9.1               [ACTIVE  ]
Interface:  FRI-V35 DTE                       Configured Clock:   256 Kbps
Clocking:   Normal                            Measured Rx Clock:    0 Kbps
Port ID                        7
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer         6 sec
DE Threshold                 100 %     N391 Full Status Poll       10 cyl
Signalling Protocol         None       ForeSight (CLLM)            No
Asynchronous Status           No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer      15       Interface Control Template
N392 Error Threshold           3          Lead       State
N393 Monitored Events Count    4           RTS        ON
Communicate Priority          No           DTR        ON
Upper/Lower RNR Thresh  75%/ 25%
Min Flags / Frames             1

Last Command: dspict 9.1 a


Next Command:
```

Table 9-39 dspict–Parameters

Parameter	Description
port	Specifies the physical slot and port of the frame relay card set.
template	Specifies the template. Choices are a, c, n, l, and f.

dsppcs

Displays status and level information for either a specific Port Concentrator Shelf or all Port Concentrators attached to the node. When the command has a specific slot number for an argument, information appears for each concentrated link. The information for each concentrated link (see Example 1) is as follows:

Status, where “OK” means the FRM-2 or FRP-2 is communicating with the PCS, and “Failed” means the FRM-2 or FRP-2 is not communicating with the PCS on the concentrated link.

- Status, where “OK” means the FRM-2 or FRP-2 is communicating with the PCS, and “Failed” means the FRM-2 or FRP-2 is not communicating with the PCS on the concentrated link.
  - No Test means no test (**tstpcs** command) has occurred since last reset.
  - Passed means the last PCS test (**tstpcs** command) detected no errors in the PCS hardware.
  - Failed means the last PCS test (**tstpcs** command) detected errors in the PCS hardware.
  - Testing means a test (**tstpcs** command) is in progress.
- FW Revision is the firmware revision of the PCS module.
- Boot PROM Date is the boot firmware date of PCS module.
- Boot PROM Revision is the boot firmware revision of PCS module.

When the command executes without a specified slot, a general status statement and the firmware revision for each port appear (see Example 2).

Full Name

Display Port Concentrator Shelf

Syntax

dspport [slot]

Related Commands

cnffrport, dspfrcport, dspfrcbob, dspportstats

Attributes

Privilege	1–3
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dsppcs 6

Description

Display PCS information for port 6

System Response

```
singha         TN    SuperUser       IPX 32    8.2       July 7 1996  14:04 GMT

Detailed Port Concentrator Display For FRP in slot 6

Link Number:         1                Link Number:         3
Status:              Failed           Status:              OK
Test Status:         No Test          Test Status:         Passed
FW Revision:                          FW Revision:         P3
Boot PROM Date:                       Boot PROM Date:      11/9/95
Boot PROM Revision:                   Boot PROM Revision:  P3

Link Number:         2                Link Number:         4
Status:              Failed           Status:              OK
Test Status:         No Test          Test Status:         Passed
FW Revision:                          FW Revision:         P3
Boot PROM Date:                       Boot PROM Date:      11/9/95
Boot PROM Revision:                   Boot PROM Revision:  P3


Last Command: dsppcs 6

 Next Command:
```

Example 2

dsppcs

Description

Display information for all Port Concentrator Shelves

System Response

```
singha         TN    SuperUser       IPX 32    8.2    July 7 1996  14:02 GMT

Port Concentrator Status

Slot.Port    Status        FW Revision
6.1          Failed
6.2          Failed
6.3          OK            P3
6.4          OK            P3









Last Command: dsppcs


Next Command:
```

Table 9-40 dsppcs–Optional Parameters

Parameter	Description
slot	Specifies slot associated with the ports you want to display.

dspportids

Displays *port ids*. The id is a user-specified identifier for a particular frame relay port where several virtual circuits share the same physical interface. The port id can be any numeric value in the range 1 to 1024. The command for specifying port ids is **cnffrport**. Note that a Port Concentrator does not use port ids.

Full Name

Display port IDs

Syntax

dspport IDs

Related Commands

cnffrport

Attributes

Privilege	1–2
Jobs	No
Log	No
Node	IPX, IGX
Lock	No

Example 1

dspportids

Description

Display the port IDs throughout the network

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 15:55 PST

Frame Relay Port IDs
ID   Node
7    alpha    |
9    alpha    |









Last Command: dspportids


Next Command:
```

dspportstats

Displays a summary of port statistics for a frame relay port. Statistics include the data byte count in the transmit and receive directions and error counts associated with the port. The display indicates the date and time the statistics were cleared and the amount of time since the node last cleared the statistics. *Bytes transmitted* indicates the amount of data transmitted from the port to the user-device. *Bytes received* indicates the amount of data received from the user-device at the port.

Corrupted statistics result from channel/port loopbacks or port tests. A “yes” in this field indicates that such loopback or port test have occurred since the statistics were last cleared. The statistics for User-to-Network Interfaces (UNI) ports (connections to user-devices) are displayed with one screen. The following lists the usage statistics displayed in screen 1.

Table 9-41

Frame Errors	LMI Statistics	Misc. Statistics
Invalid CRC	Status Enquiries Received	Average TX Port Q
Invalid Alignment	Status Xmit	FECN Frames
Invalid Frame Length	Update Xmit	FECN Ratio (%)
Invalid Frame Format	Invalid Requests	BECN Frames
Unknown DLCIs	Sequence # Mismatches	BECN Ratio (%)
Last Unknown DLCI	Timeouts	Resource Overflow
	Signalling Protocol	DE Frames Dropped

Network to Network (NNI) ports require two screens to display all the parameters. The first screen is the same as described previously for UNI ports, the second screen is displayed by responding with a “y” for yes to the Continue? prompt. The second screen compares receive LMI statistics with transmit LMI statistics. The LMI receive statistics are repeated from the middle column of the first screen and displayed again for easy comparison. The following lists the usage statistics in screen 2.

Table 9-42

LMI Receive Protocol Stats	LMI Transmit Protocol Stats
Status Enquiries Received	Status Inquiries Transmitted
Status Transmitted	Status Received
Asynchronous Status Transmitted	Asynchronous Status Received
Sequence # Mismatches	Sequence # Mismatches
Timeouts	Timeouts
Invalid Frames	
Signalling Protocol	

The command displays the following statistics: frame error, LMI, and miscellaneous. A summary and description of these statistics follows:

Table 9-43 Frame Error Statistics

Frame Error Statistics	
Statistics	**Description**
CRC errors	Based on a CRC CCITT 16-bit frame check sequence, which is a cyclic redundancy check. If the frame received at a port has an incorrect CRC, it is flagged as a CRC error, and the frame is discarded.
Alignment error	Frame was not an integral number of bytes.
Frame length errors	Frames < 5 bytes or >4096 bytes.
Frame format errors	Occurs when either of the least significant bits in the first two bytes of the frame relay header are set incorrectly. These two bytes are the frame's address field. The first byte's least significant bit is defined to be a zero, meaning that there is a second byte to the address. The second byte's least significant bit is defined to be a one, meaning this is the last byte of the address because it's a two byte address field.
Unknown DLCI	Occurs when a frame arrives at a frame relay port and the DLCI has not been mapped and the frame is discarded.
Last unknown DLCI	Displayed so that the user can see the unknown DLCI.

Table 9-44 LMI Statistics

LMI Statistics	
Statistics	**Description**
Status inquiries transmitted/received	The number of Status Inquiry messages transmitted and received from the user-device.
Status transmit/received	The number of Status messages sent to the user-device.
Async status Xmit	The number of asynchronous status messages sent to the user-device.
Invalid requests	The number of invalid requests received from the user-device.
Timeouts	The number of LMI protocol timeouts.
Sequence number mismatches	The number of LMI protocol sequence number mismatches.
Signalling protocol	The protocol selected for this frame relay port interface, Cisco LMI, Annex A UNI, Annex D UNI, Annex A NNI, or Annex D NNI.

Table 9-45 Miscellaneous Statistics

Miscellaneous Statistics	
Statistics	**Description**
Average queue depth	The average fill of the VQ queue at the input of the FRP.
BECN frames	Number Explicit Congestion Notification frames transmitted to the receiving router Number of Explicit Congestion Notification frames transmitted to the transmitting router. Percentage of BECN frames sent to the total number of frames sent
FECN frame	The percentage of FECN frames sent to the total number of frames sent.
Rsrc overflow	Resource overflow indicates the number of times the port shut down due to receive frame buffer overflow or receive queue entries.
DE Frames Dropped	The total number of frames with Discard Eligibility that were discarded.

Full Name

Display Frame Relay port statistics

Syntax

dspportstats <slot.port> [interval]

Related Commands

clrportstats

Attributes

Privilege	1–6
Jobs	No
Log	No
Node	IPX, IGX
Lock	Yes

Example 1

dspportstats 4.1

Description

Display the port statistics for Frame Relay port 4.1.

System Response

```
alpha32        LAN   SuperUser       IPX 32    8.2     Mar. 21 1996 12:44 PST

Port Statistics for 4.1         Cleared: Mar. 21 1996 09:45          Snapshot
Port Speed: 256 kbps    Collection Time: 0 day(s) 02:56:48      Corrupted: NO

                      Bytes      Average (kbps)     Util (%)         Frames
From Port:                0            0               0                0
To Port:                  0            0               0                0
Frame Errors               LMI Receive Protocol Stats   Misc Statistics
Invalid CRC            0   Status Enq Rcvd          0   Avg Tx Port Q         0
Invalid Alignment      0   Status Xmit              0   FECN Frames           0
Invalid Frm Length     0   Asynch Xmit              0        Ratio (%)        0
Invalid Frm Format     0   Seq # Mismatches         0   BECN Frames           0
Unknown DLCIs          0   Timeouts                 0        Ratio (%)        0
Last Unknown DLCI      0   Invalid Req              0   Rsrc Overflow         0
                           Sig Protocol:  None          DE Frms Dropd         0


Last Command: dspportstats 4.1


Continue to next page? (y/n)
```

Enter “y” to see subsequent screens.

```
alpha32        LAN   SuperUser       IPX 32    8.2     Mar. 21 1996 12:49 PST

Port Statistics for 4.1         Cleared: Mar. 21 1996 09:45
Port Speed: 256 kbps    Collection Time: 0 day(s) 03:03:42      Corrupted: NO

                      Bytes      Average (kbps)     Util (%)         Frames
From Port:                0            0               0                0
To Port:                  0            0               0                0
LMI Receive Protocol Stats LMI Transmit Protocol Stats  CLLM (ForeSight) Stats
Status Enq Rcvd          0 Status Enq Xmit      --      Frames Rcvd       --
Status Xmit              0 Status Rcd           --      Bytes Rcvd        --
Asynch Xmit              0 Asynch Rcvd          --      Frames Xmt        --
Seq # Mismatches         0 Seq # Mismatches     --      Bytes Xmt         --
Timeouts                 0 Timeouts             --      CLLM Failures     --
Invalid Frames           0

Sig Protocol: None

This Command: dspportstats 4.1


Hit DEL key to quit:
```

Table 9-46 dspportstats–Parameters

Parameter	Description
slot	Specifies the Frame Relay card set slot.
port	Specifies the port on the back card. The range is 1–4 for the FRI-V.35 or FRI-X.21 back cards. For channelized ports, the range is 1–24 or 1–31 for a FRI-T1 or FRI-E1, respectively, and 1-250 for a UFI back card.

Table 9-47 dspportstats–Optional Parameters

Parameter	Description
interval	Specifies the refresh interval time for data. The range is 1–60 seconds. The default interval is 1 second.

grpcon

Adds a connection to a group. Adding a connection to a group has two prerequisites:

- The connection must already exist on the node (see the **addcon** command).
- The group must already exist (see the **addcongrp** command).

Use **grpcon** to add either a single connection or a range of connections to a group. Through the optional [channel ... channel] format, you can add up to 16 connections to a group with one command. Only inter-node, non-bundled frame relay connections can go into a group. Grouped connections must also have the same endpoints, routing characteristics, and ForeSight-enable status.

The first connection added to a group determines the routing characteristics for the entire group. All subsequent connections must match the first connection's characteristics of ownership, COS, routing state, routing restrictions, and ForeSight. Attempting to add a mismatched connection results in the error message "mismatched connection/group." For example, the ownership of both the connection group and the connection itself must be either local or remote. After you add a connection to a group, you can specify non-connection parameters for an individual connection in the group. Examples of non-connection parameters are fail state and loop state.

No single command exists to remove an individual connection from a group. To remove a connection from a group, first delete the connection using **delcon** then add it again with **addcon**.

Full Name

Add Frame Relay connections to group

Syntax

grpcon <connection group> <chan> [<chan> ... <chan>]

Related Commands

delcongrp, addcongrp, delcon, dspcongrps, dspcons, dspcongrp

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

grpcon beta.1 9.2.400

Description

Add connection 9.2.400 to group beta.1

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 23 1996 10:16 PST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid COS O
 5.1        beta       )25.1       Ok     256                 7/8         0  L
 9.1.100    gamma       8.1.200    Ok     fr                              0  L
 9.1.200    gamma       8.1.300    Ok     fr                              0  L
 9.2.400    beta        19.2.302   Ok     fr(Grp)                         0  L
 14.1       gamma       15.1       Ok     v                               0  L




Last Command: dspcons


Next Command: grpcon beta.1 9.2.400
```

Example 2

grpcon alpha.1 8.4.330 8.4.331 8.4.340

Description

Add multiple FR connections, for example, 8.4.330, 8.4.331, and 8.4.340 to group beta.1

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 23 1996 10:16 PST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid COS O
 5.1        beta       )25.1       Ok     256                 7/8         0  L
 9.1.100    gamma       8.1.200    Ok     fr                              0  L
 9.1.200    gamma       8.1.300    Ok     fr                              0  L
 9.2.400    beta        19.2.302   Ok     fr(Grp)                         0  L
 14.1       gamma       15.1       Ok     v                               0  L




Last Command: grpcon beta.1 9.2.400


Next Command: grpcon alpha.1 8.4.330 8.4.331 8.4.340
```

Table 9-48 grpcon–Parameters

Parameter	Description
group name	Specifies the name of the existing group. It has the format: remote node.group number
channel	Specifies the connection(s) to add to the group.

prtchcnf

Prints the configuration details for voice channels or data channels. This command uses the same syntax, and prints the same information as is displayed using the dspchcnf command. See the **dspchcnf** command for syntax and output information.

Full Name

Print channel configurations

Syntax

prtchcnf [start_channel] (see **dspchcnf** description)

Related Commands

dspschcnf

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

prtcongrps

Prints information for all groups of which this node is an endpoint. This command uses the same syntax, and prints the same information as is displayed using the **dspcongrps** command. See the **dspcongrps** command for syntax and output information.

Full Name

Print connection group

Syntax

prtcongrps [node name | group name] (see the **dspcongrps** command)

Related Commands

dspcongrps

Attributes

Privilege	1–6
Jobs	Yes
Log	No
Node	IPX, IGX
Lock	Yes

prtcons

Prints a summary of connections terminated at the IPX or IGX node. This command uses the same syntax and prints the same information as is displayed using the **dspcons** command. See the **dspcons** command for syntax and output information.

Full Name

Print connection

Syntax

prtcons [start_channel] [nodename] [type] [+d]

Related Commands

dspcons

Attributes

Privilege	1–6
Jobs	Yes
Log	No
Node	IPX, IGX
Lock	Yes

Table 9-49 prtcons–Optional Parameters

Parameter	Description
start channel	Specifies the channel to begin the display. Specify *start channel* in one of the following formats: *slot.port.DLCI* (frame relay channel) *remote node.group_name* (frame relay group connection) If no starting channel is specified, the display begins with the first connected channel.
node name	Specifies that only connections to the remote node from the local note are displayed. If no “nodename” is designated, connections from the local node to all other nodes are displayed.
–v	Voice only
–d	Data only
–f	Frame relay only
–atfr	Interworking connections
–g	Grouped connections
+d	Connection descriptor
–abit	A-bit status
–fabit	A-bit errors
–fail	Failed connections
–down	Downed connections
type	Types listed in Syntax section. The state that may be displayed for frame relay and NNI connection types includes: OK:Connection OK, A-bit = 1. FAILED:Connection failed, A-bit = 0. MISSING: DLCI was deleted in other network NNI. A previous status report indicated a valid DLCI present but an updated report did not. UNUSED: The UNI port does not support reporting of NNI A-bit status.

prtict

Prints a data channel's interface control template. The **prtict** command uses the same syntax and prints the same information as **dspict**. See the **dspict** description for output information.

Full Name

Print interface control template

Syntax

prtict <port> <template>

Related Commands

dspict

Attributes

Privilege	1–2
Jobs	Yes
Log	No
Node	IPX, IGX
Lock	Yes

Table 9-50 prtict–Parameters

Parameter	Description
port	Specifies the physical slot and port of the frame relay card set.
template	Specifies the template. Choices are a, c, n, l, and f.

upfrport

Activates a port on a frame relay card. The applicable cards are all versions of the FRP, FRM, and UFM series of cards. If the port has not been configured through the **cnffrport** command, a set of default configuration values apply.

With a Port Concentrator Shelf (PCS), *upping* the first port causes the FRP-2 or FRM-2 to begin communicating with the four PCS modules and to download code to them if necessary.

Full Name

Up Frame Relay port

Syntax

For FRM or FRP: upfrport <slot.port>

For UFM: upfrport <slot.port> <line>

Related Commands

dnfrport, cnffrport

Attributes

Privilege	1–2
Jobs	Yes
Log	Yes
Node	IPX, IGX
Lock	Yes

Example 1

upfrport 9.2

Description

Activate port 2 on the FRP in slot 9.

System Response

```
alpha          TRM   YourID:1        IPX 16    8.2    Mar. 15 1996 15:51 PST

Port:       9.2               [ACTIVE  ]
Interface:  FRI-V35 DTE                       Configured Clock:   256 Kbps
Clocking:   Normal                            Measured Rx Clock:    0 Kbps
Port ID                        0
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer         6 sec
DE Threshold                 100 %     N391 Full Status Poll       10 cyl
Signalling Protocol         None       ForeSight (CLLM)            No
Asynchronous Status           No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer      15       Interface Control Template
N392 Error Threshold           3          Lead       State
N393 Monitored Events Count    4           RTS        ON
Communicate Priority          No           DTR        ON
Upper/Lower RNR Thresh  75%/ 25%
Min Flags / Frames             1

Last Command: upfrport 9.2


Next Command:
```

Table 9-51 upfrport–Parameters

Parameter	Description
slot	Specifies slot number of the card containing the port.
port	Specifies the port. The ranges are: 1–250 on a UFM 1–4 on an FRP or FRM 1–44 on an FRP-2 or FRM-2.
line	Applies to UFM only. The line is the physical connector. The range is 1–8 for T1 or E1.