

# 13 Managing Ethernet Modules

This chapter describes User Interface commands for Ethernet and Fast Ethernet modules. These commands can be used with all OmniStack Ethernet (10 Mbps, 100 Mbps, and 10/100) ports. All 10/100 Ethernet ports are auto-sensing.

## **Port Mirroring and Port Monitoring**

Port mirroring and monitoring can be used on all Ethernet modules. Port mirroring and monitoring are described at the end of Chapter 17, “Managing Groups and Ports.”

## **Fast Ethernet Backbones**

Fast Ethernet ports can be used as backbone links. The switch has two features that can improve the performance and flexibility of Ethernet backbones. OmniChannel aggregates the bandwidth of up to four (4) Fast Ethernet ports. This feature allows you to scale Fast Ethernet links from 100 Mbps to 800 Mbps in 100 Mbps increments. OmniChannel is described in *OmniChannel* on page 13-7. Fast Ethernet ports also support the 802.1Q tagging mechanism, enhancing the compatibility of ports with other vendors' equipment. 802.1Q is described in Chapter 14, “Managing 802.1Q Groups.”

## **Variety of Connector Options**

Fast Ethernet ports use copper RJ-45 or fiber SC connectors. Ethernet 10 Mbps modules use copper RJ-45 connectors. Refer to Chapter 1, “OmniStack Switches,” for more detailed information on Ethernet connectors.

# The Ethernet Management Menus

The **10/100** sub-menu is described in this chapter. This sub-menu is part of the physical **inter-**  
**face** sub-menu, which displays as shown below:

Command	Physical Interface Menu
slipc	Configure SLIP (Serial Line IP) on a TTY Port
10/100	Enter the 10/100BaseT sub-menu
atm	Enter the ATM Management sub-menu

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When you enter **10/100** at a system prompt, you enter the High-Density—10/100 Ethernet configuration sub-menu. This sub-menu displays as follows:

Command	10/100 Menu
10/100vc	View 10/100 Port Configuration Table
10/100cfg	Configure 10/100 Port Parameters
crechnl	Create a Fast Ethernet Channel
delechnl	Delete a Fast Ethernet Channel
addprtchnl	Add port/s to a fast Ethernet Channel
delprtchnl	Delete port/s from a fast Ethernet Channel
chnlinfo	Display channel configuration parameters

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The commands in this sub-menu below **crechnl** are used to configure OmniChannel; docu-  
mentation for OmniChannel begins on page 13-7.

## Configuring 10/100 Auto-Sensing Ethernet Ports

The **10/100cfg** command allows you to enable auto-negotiation as well as configure link speed (10 or 100 Mbps) and the link mode (full or half-duplex) on 10/100 Ethernet ports.

Follow these steps to configure a 10/100 port:

1. Enter **10/100cfg** at the system prompt and press **<Enter>**.
2. The system displays a prompt asking for the slot and port number:

**Enter Slot/Interface :**

Enter the slot number, a slash (/), and the port number of the Ethernet port that you want to configure. Press **<Enter>**.

3. The system prompts you to enable or disable auto-sensing:

**Autonegotiate [y,n, or quit] (Currently enabled (y)) :**

Enter **y** to enable auto-negotiation or **n** to disable auto-negotiation. Auto-negotiation can be used to determine the link speed *and* the link mode (full or half) of the connection.

If you choose **y** to enable auto-negotiation, the system will automatically detect whether the connection speed of the attached device is 10 Mbps or 100 Mbps. It can also determine whether the link mode of the connection is half- or full-duplex.

If you enable auto-negotiation, continue with step 6.

If you choose **n** to disable auto-negotiation, then you will be prompted for the Line Speed. Continue on with the next step.

4. If you chose to disable auto-sensing, then the following prompt displays showing the current line speed:

**Line Speed [100 or 10] (Currently 100) :**

Select whether you want the port to operate at 10 Mbps or 100 Mbps. The port will operate at this speed until you change it through the **10/100cfg** command later. Press **<Enter>** after you enter the Line Speed. The new line speed will take effect; no reboot is required. Continue with the next step.

### ♦ Important Note ♦

On the OmniStack 4016 or 5024, the port link may go down when changing line speeds between 10 and 100. Disconnect the end device (i.e., a PC) when changing line speeds.

5. The following prompt displays, showing the current link mode:

**Link Mode [Full, Half] (Currently (H)alf Duplex) :**

Enter **F** to set the port to full-duplex mode or **H** to set the port to half-duplex mode. In full-duplex mode, the full 100 or 10 Mbps of bandwidth is used for data traveling on each direction of the cable. Press **<Enter>** after you enter the Mode. The new mode will take effect; no reboot is required. You have completed the configuration of this port.

6. Since you have enabled auto-negotiation, the port will automatically sense the line speed of the connection. You can also further enable auto-negotiation for the link mode. When following prompt displays:

**Link Mode [Half or Auto] (Currently (H)alf Duplex) :**

select whether you want the port to auto-sense the duplex mode (**Auto**) or whether you want the port to default to half-duplex mode (**Half**). Enter an **A** for auto-sensing or enter an **H** for half-duplex.

If you set the mode to half-duplex, then the port will always run in half-duplex. If you set the mode to **Auto**, then the port will automatically detect whether the connection is half- or full-duplex and then operate in that mode. You have completed the configuration of this port.

## Configuring High-Density Ethernet Ports

The **10/100cfg** command allows you to configure the link mode (full or half-duplex) for 10 Mbps and 100 Mbps Ethernet ports (i.e., non-10/100 ports).

Follow these steps to configure a non-10/100 Ethernet port:

1. Enter **10/100cfg** at the system prompt and press <Enter>.
2. The system displays a prompt asking for the slot and port number:

**Enter Slot/Interface :**

Enter the slot number, a slash (/), and the port number of the Ethernet port that you want to configure. Press <Enter>.

3. The following prompt displays, showing the current link mode:

**Link Mode [Full, Half] (Currently (H)alf Duplex) :**

Enter **F** to set the port to full-duplex mode or **H** to set the port to half-duplex mode. In full-duplex mode, the full 100 or 10 Mbps of bandwidth is used for data traveling on each direction of the cable. Press <Enter> after you enter the Mode. The new mode will take effect; no reboot is required.

**◆ Important ◆**

Do not plug 100 Mbps non-auto-negotiating links into 10 Mbps Ethernet ports

## Viewing Configurations for Ethernet Ports

The **10/100vc** command allows you to view the current status of Ethernet ports. Ethernet 10/100 ports can auto-sense the connection speed of the attached device.

Entering **10/100vc** displays information similar to the following:

10/100 Configure Values for all slots

Slot/ Intf	Auto- negotiate	DETECTED		SET	
		Line Speed	Duplex Mode	Line Speed	Duplex Mode
3/ 1	enabled	?	?	auto	half-d
3/ 2	enabled	10	HALF-D	auto	half-d
3/ 3	enabled	100	HALF-D	auto	half-d
3/ 4	enabled	100	HALF-D	auto	half-d
3/ 5	enabled	?	?	auto	half-d
3/ 6	enabled	10	HALF-D	auto	half-d
3/ 7	enabled	100	HALF-D	auto	half-d
3/ 8	enabled	?	?	auto	half-d

**Slot/Intf.** The slot and port number (Intf) where this Ethernet port is located.

**Auto-negotiate.** Indicates whether auto-negotiation is enabled on this 10/100 port. If enabled, the port will automatically sense whether the attached device operates at 10 Mbps or 100 Mbps and adjust accordingly. If disabled, the port does not automatically detect the connection speed and instead uses the line speed you configure through the **10/100cfg** command. You enable or disable auto-negotiation through **10/100cfg**. A value of **n/a** in this column means the port does not support auto-sensing and the line speed defaults to either 10 or 100 Mbps.

The next set of columns are divided into DETECTED and SET. The columns under DETECTED are the current operational **Line Speed** or **Duplex Mode**. The columns under SET are the configured values; these configured values will either be defaults or the values configured through **10/100cfg**.

**Line Speed.** Indicates the speed (in Mbps) at which the port is currently operating (DETECTED) or configured to operate (SET).

DETECTED values will be **10** (Mbps), **100** (Mbps), or a question mark (?). A question mark (?) in this column indicates the port is not connected to a device.

SET values will be **auto**, **10** (Mbps,) or **100** (Mbps). The **auto** setting means auto-sensing is enabled and the Line Speed will equal the speed for which the attached device is configured.

**Duplex Mode.** Indicates whether the port is operating (DETECTED) or configured (SET) for half- or full-duplex mode.

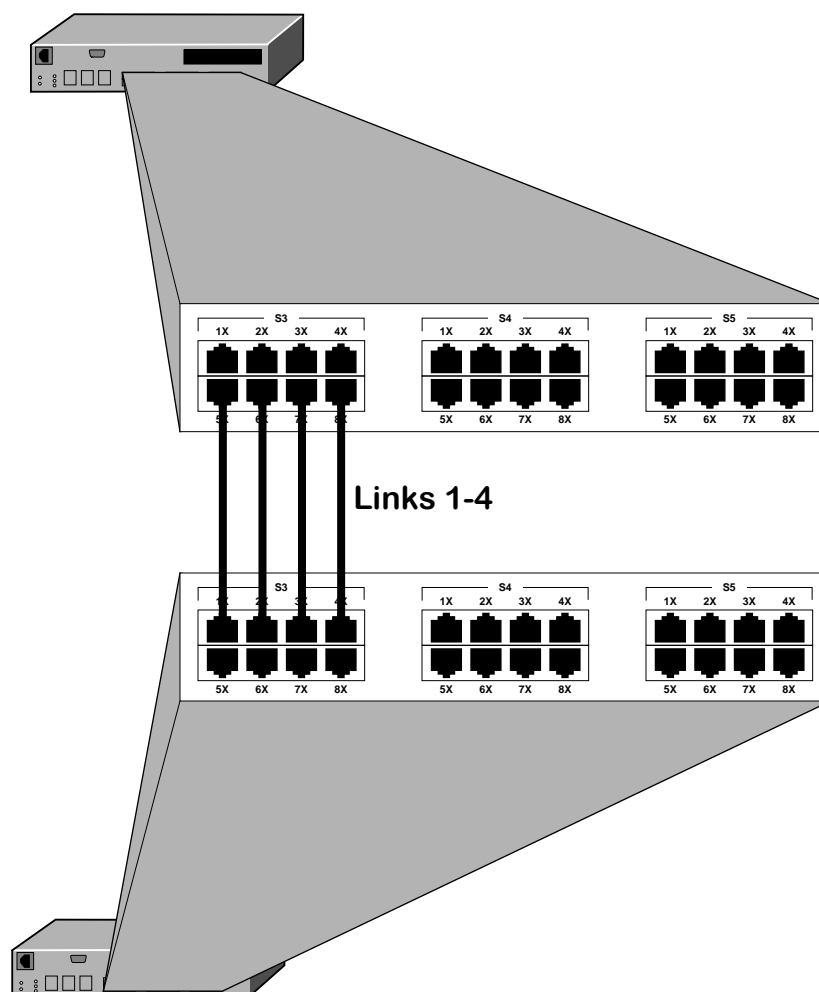
DETECTED values will be half-duplex (**HALF-D**), full-duplex (**FULL-D**), or a question mark (?). A question mark (?) in this column indicates the port is not connected to a device.

SET values will be auto-sensing (**auto**), half-duplex (**half-d**), or full-duplex (**full-d**). If this value is **auto**, then the switch automatically sets the duplex mode to the network device's setting. If this value is **half-d**, then the port will always run in half-duplex mode. If this value is **full-d**, then the port will always run in full-duplex mode. You configure the duplex mode through the **10/100cfg** command. Note that you can only configure a 10/100 port for full-duplex if you disable auto-sensing.

## OmniChannel

OmniChannel allows you to increase the bandwidth of Fast Ethernet backbones by combining the capacity of up four (4) Fast Ethernet ports into one channel. The combined channel operates within Spanning Tree as one virtual port, and can provide up to 800 Mbps (in full-duplex mode) of bandwidth. (In full-duplex mode, 400 Mbps is supported in each direction of the OmniChannel.) This feature is useful for Ethernet-intensive networks that need to increase bandwidth capacity without setting up ATM backbones using OC-3 or OC-12 connections.

The OmniChannel feature operates only on 10/100 and Fast Ethernet ports. It does not operate on 10 Mbps ports.



**Up to Four 100 Mbps Links May Comprise an OmniChannel Backbone**

OmniChannel balances the traffic load among links by MAC address. MAC addresses are assigned to physical links in the OmniChannel in a round-robin fashion. The first MAC address learned will transmit and receive data on the first link. The second MAC address learned will transmit and receive over the second link, and so on regardless of the bandwidth requirements of each MAC address.

## Creating an OmniChannel

You use the **crechnl** command to create an OmniChannel. Follow these steps:

1. Enter **crechnl**.
2. The following prompt displays:

**Channel Number ( 2):**

Enter the identification number you want to assign to this OmniChannel. By default, the software lists the next available channel number in parentheses. In this example, the next available channel number is **2**. If you want to select the default, simply press <Return>. Otherwise, enter the channel number and press <Return>.

3. The following prompt displays:

**To select a port, use the convention - Slot/Physical Port.**

**For eg. 2/1 is used to select Physical Port 1 on Slot 2**

**Primary Slot/Port:**

Enter the slot and port that the switch will initially use as the Spanning Tree virtual port for this channel. Each OmniChannel is considered a single virtual port within the network, so only one physical port will participate in Spanning Tree.

**◆ Note ◆**

After a reboot or after a loss of a connection, the first port in an OmniChannel that the switch brings up will become the primary port. Therefore, one of the ports you choose as the secondary port (explained in Step 4 below) could become the primary port and thus participate in Spanning Tree.

If the port you enter is already part of another OmniChannel, then it cannot be used in a second OmniChannel. The following message displays for those ports that are already part of another OmniChannel:

**Primary port in use**

4. The following prompt displays:

**To select a port, use the convention - Slot/Physical Port.**

**For eg. 2/1 is used to select Physical Port 1 on Slot 2**

**Secondary Slot/Port:**

Enter the other ports that will be used in this OmniChannel. Up to four (4) Fast Ethernet Ports may participate in an OmniChannel. Therefore you can specify up to three (3) additional ports which will initially become secondary ports. These secondary ports must be on the same module as the primary port. Secondary ports do not participate in the Spanning Tree algorithm; they are used for data transmission only.

**◆ Note ◆**

As explained in Step 3 above, a port that you initially configure as a secondary port can become a primary port.



**Specifying a Range of Ports.** To specify a range of ports, enter the slot number, a slash (/), the port number for the first secondary port, a dash (-), and then the port number for the last secondary port. For example, to specify ports 3, 4, and 5 on the Fast Ethernet module in slot 2 as secondary ports in an OmniChannel, you would enter:

**2/3-5**

**Specifying Multiple Ports.** To specify multiple ports (on the same module) that are not physically contiguous, enter the slot number, a slash (/), the port number for the first secondary port, a comma (,), and then the slot and port for the next secondary port. For example, to specify ports 3 and 5 on the Fast Ethernet module in slot 2, you would enter:

**2/3, 2/5**

The order that you specify secondary ports is important. In the event of a failure on the primary port, the first secondary port specified will become the primary port in the OmniChannel and participate in Spanning Tree.

Messages will display informing you that secondary ports were saved in flash memory:

**Successfully saved sec port in flash**  
**Successfully saved sec port in flash**

◆ **Note** ◆

If the switch contains more than twelve Ethernet ports, an OmniChannel can only be created using ports one through twelve.

## Adding Ports to an OmniChannel

After you create an OmniChannel through the **crechnl** command, you can add more secondary ports to the same channel as long as the channel contains less than 4 ports. You use the **addprtchnl** command to add ports to an OmniChannel. Follow these steps:

1. Enter **addprtchnl**.
2. The following prompt displays:

**Channel Number :**

Enter the channel number to which you want to add secondary ports. You can check the current port assignments for a given OmniChannel by using the **chnlinfo** command, which is described in *Viewing OmniChannel Parameters* on page 13-12.

3. The following prompt displays:

**To select a port, the convention - Slot/Physical Port or Slot/Phy.**  
**Port Range.** For eg. 2/1 is used to select Physical Port 1 on Slot 2 and 2/2-4 selects physical ports 2,3 and 4 on Slot 2  
**Slot/Port(s):**

Enter the additional ports that will be part of this OmniChannel. All the ports you enter will initially be secondary ports (i.e., they do not participate in the Spanning Tree algorithm and are used for data transmission only). You can specify up to 4 ports on an OmniChannel; only 3 of the ports can be secondary ports.

**Specifying a Range of Ports.** To specify a range of ports, enter the slot number, a slash (/), the port number for the first secondary port, a dash (-), and then the port number for the last secondary port. For example, to specify ports 3, 4, and 5 on the Fast Ethernet module in slot 2 as secondary ports in an OmniChannel, you would enter:

**2/3-5**

**Specifying Multiple Ports.** To specify multiple ports (on the same module) that are not physically contiguous, enter the slot number, a slash (/), the port number for the first secondary port, a comma (,), and then the slot and port for the next secondary port. For example, to specify ports 3 and 5 on the Fast Ethernet module in slot 2, you would enter:

**2/3, 2/5**

Messages will display informing you that secondary ports were saved in flash memory:

**Successfully saved sec port in flash**  
**Successfully saved sec port in flash**

## Deleting an OmniChannel

You can delete any existing OmniChannel through the **delchnl** command. Follow these steps:

1. Enter **delechnl**.
2. The following prompt displays:

**Channel to be deleted:**

Enter the channel number that you want to delete. You can obtain information on a channel through the **chnlinfo** command, which is described in *Viewing OmniChannel Parameters* on page 13-12. Press <Return> and the channel, along with all port assignments, will be deleted.

## Deleting Ports from an OmniChannel

You can delete ports from an OmniChannel using the **delptrchnl** command. Follow these steps:

1. Enter **delptrchnl**.
2. The following prompt displays:

**Channel Number :**

Enter the channel number on which you want to delete ports. You can check the current port assignments for a given OmniChannel by using the **chnlinfo** command, which is described in *Viewing OmniChannel Parameters* on page 13-12.

3. The following prompt displays:

**To select a port, the convention - Slot/Physical Port or Slot/Phy.  
Port Range. For eg. 2/1 is used to select Physical Port 1 on Slot  
2 and 2/2-4 selects physical ports 2,3 and 4 on Slot 2  
Slot/Port(s):**

Enter the port(s) that you want to delete from this OmniChannel.

### Important Note

If you delete the primary port a secondary port will become the new primary port. The secondary port that will take over this role is the first secondary port specified through the **crechnl** command.

**Deleting a Range of Ports.** To delete a range of ports, enter the slot number, a slash (/), the port number for the first port, a dash (-), and then the port number for the last port. For example, to delete ports 3, 4, and 5 on the Fast Ethernet module in slot 2, you would enter:

**2/3-5**

**Deleting Multiple Ports.** To delete multiple ports (on the same module) that are not physically contiguous, enter the slot number, a slash (/), the port number for the first port, a comma (,), and then the slot and port for the next port. For example, to delete ports 3 and 5 on the Fast Ethernet module in slot 2, you would enter:

**2/3, 2/5**

## Viewing OmniChannel Parameters

You can view the current configuration parameters and port assignments for an OmniChannel by using the **chnlinfo** command. Follow these steps:

1. Enter **chnlinfo**.
2. The following prompt displays:

**Enter channel number for which information is required:**

Enter the channel number for which you want to view information. If you want to view information on all OmniChannels in the switch, then simply press <Enter>.

3. A screen similar to the following displays:

Displaying channel 2			
Channel Id	Phy. Port	Port Status	Mac Count
=====			
2	5/6	Inactive	0
	5/7	Inactive	0
3	5/3	Active	35
	5/4	Active	34
	5/5	Active	34

The following sections describe the variables in this table.

**Channel Id.** The identification number assigned to this OmniChannel during the **crechnl** configuration procedure.

**Phy. Port.** The physical slot and port number for all ports included in the OmniChannel. The slot number is listed first, then a slash (/), and then the port number on the Ethernet module.

**Port Status.** The current operational status of this physical port. If the port is **Active**, then a cable is connected and data is capable of passing to and from the port. If the port is **Inactive**, then a cable may not be attached or the port is inoperational for hardware or software reasons.

**Mac Count.** The current number of MAC addresses that have been learned on this port. A separate MAC count is given for each physical port in the OmniChannel.