



## Configuring Fast EtherChannel and Gigabit EtherChannel

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This chapter describes how to configure Fast EtherChannel and Gigabit EtherChannel port bundles. The configuration tasks in this chapter apply to Fast Ethernet and Gigabit Ethernet switch ports on switching modules and fixed-configuration switches, as well as to supervisor engine Fast Ethernet and Gigabit Ethernet uplink ports.



**Note**

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For complete information on installing Catalyst 5000 family Ethernet, Fast Ethernet, and Gigabit Ethernet modules, refer to the *Catalyst 5000 Family Module Installation Guide*. For complete information on installing Catalyst 4000 family Fast Ethernet and Gigabit Ethernet modules, refer to the *Catalyst 4003 Installation Guide*.

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**Note**

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For complete syntax and usage information for the commands used in this chapter, refer to the *Command Reference* publication for your switch.

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This chapter consists of these sections:

- Understanding How EtherChannel Works, page 7-1
- Default EtherChannel Configuration, page 7-4
- Hardware Support for EtherChannel, page 7-4
- EtherChannel Configuration Guidelines and Restrictions, page 7-5
- Configuring EtherChannel, page 7-5
- EtherChannel Configuration Examples, page 7-11

## Understanding How EtherChannel Works

These sections describe how EtherChannel works:

- EtherChannel Overview, page 7-2
- Understanding Administrative Groups and EtherChannel IDs, page 7-2
- Understanding the Port Aggregation Protocol, page 7-2
- Understanding Frame Distribution, page 7-3

## EtherChannel Overview

Fast EtherChannel and Gigabit EtherChannel port bundles allow you to group multiple Fast or Gigabit Ethernet ports into a single logical transmission path between the switch and a router, host, or another switch.

Depending on your hardware, you can form an EtherChannel with up to eight compatibly configured Fast or Gigabit Ethernet ports on the switch. In addition, on the Catalyst 4000 family switches, you can configure an EtherChannel using ports from multiple modules. All ports in an EtherChannel must be the same speed.

The switch distributes frames across the ports in an EtherChannel according to the source and destination Media Access Control (MAC) addresses. If a port within an EtherChannel fails, traffic previously carried over the failed port switches to the remaining ports within the EtherChannel. A trap is sent upon a failure identifying the switch, the EtherChannel, and the failed link.

Both Fast and Gigabit EtherChannel bundles can be configured as trunk links. After a channel has been formed, configuring any port in the channel as a trunk applies the configuration to all ports in the channel. Identically configured trunk ports can be configured as an EtherChannel. For more information, refer to the “EtherChannel Configuration Guidelines and Restrictions” section on page 7-5 and to Chapter 12, “Configuring VLAN Trunks on Fast Ethernet and Gigabit Ethernet Ports.”

## Understanding Administrative Groups and EtherChannel IDs

Configuring an EtherChannel creates an administrative group, designated by an integer between 1 and 1024 inclusive, to which the EtherChannel belongs. You can assign an administrative group number manually or let the system software assign the next available administrative group number automatically.

Forming an EtherChannel without specifying an administrative group number creates a new automatically numbered administrative group consisting of the ports you configure as an EtherChannel. An administrative group can contain a maximum of eight ports.

You can define an EtherChannel administrative group without forming an EtherChannel. Only ports belonging to the same administrative group can form a single EtherChannel together.

In addition to the administrative group number, each EtherChannel is automatically assigned a unique EtherChannel ID. Use the **show channel group** *admin\_group* command to display the EtherChannel ID.

EtherChannel administrative group numbers are stored in NVRAM and remain the same after the switch is reset or power cycled. EtherChannel IDs are not saved in NVRAM. The ID can change if the EtherChannel is torn down and renegotiated, or if the switch is reset or power cycled.

## Understanding the Port Aggregation Protocol

The Port Aggregation Protocol (PAgP) facilitates the automatic creation of Fast EtherChannel and Gigabit EtherChannel links by exchanging packets between channel-capable ports. The protocol learns the capabilities of port groups dynamically and informs the neighboring ports.

After PAgP identifies correctly paired channel-capable links, it groups the ports into a channel. The channel is then added to the spanning tree as a single bridge port. A given outbound broadcast or multicast packet is transmitted out one port in the channel only, not out every port in the channel. In addition, outbound broadcast and multicast packets transmitted on one port in a channel are blocked from returning on any other port of the channel.

There are 4 user-configurable channel modes: **on**, **off**, **auto**, and **desirable**. PAgP packets are exchanged only between ports in **auto** and **desirable** mode. Ports configured in **on** or **off** mode do not exchange PAgP packets. The **auto** and **desirable** modes can be modified with the **silent** and **non-silent** keywords. Table 7-1 describes each mode.

**Table 7-1 Channel Modes**

Mode	Description
<b>on</b>	Forces the port to channel without negotiation. PAgP packets are not exchanged. The port is channeling regardless of how the peer port is configured. If the peer port is in <b>on</b> mode, a channel is formed. In any other mode, the peer port is placed in the errdisable state due to a channel misconfiguration.
<b>off</b>	Prevents the port from channeling. PAgP packets are not exchanged. The port is not channeling regardless of how the peer port is configured. No channel is formed.
<b>auto</b>	Places a port into a passive negotiating state, in which the port responds to PAgP packets it receives but does not initiate PAgP packet negotiation. A channel is formed only with another port group in <b>desirable</b> mode. (Default)
<b>desirable</b>	Places a port into an active negotiating state, in which the port initiates negotiations with other ports by sending PAgP packets. A channel is formed with another port group in either <b>desirable</b> or <b>auto</b> mode.
	Use the <b>silent</b> keyword when you are connecting to a “silent partner” (a device that is not generating BPDUs or other traffic). An example of a silent partner is a traffic generator that is not transmitting packets. Use this keyword with the <b>auto</b> or <b>desirable</b> mode. If you do not specify <b>silent</b> or <b>non-silent</b> , silent is assumed.
	Use the <b>non-silent</b> keyword when you are connecting to a device that will transmit BPDUs or other traffic. Use this keyword with the <b>auto</b> or <b>desirable</b> mode.

Both the **auto** and **desirable** modes allow ports to negotiate with connected ports to determine if they can form a channel, based on criteria such as port speed, trunking state, native VLAN, and so on.

Ports can form an EtherChannel when they are in different channel modes as long as the modes are compatible. For example:

- A port in **desirable** mode can form an EtherChannel successfully with another port that is in **desirable** or **auto** mode.
- A port in **auto** mode can form an EtherChannel with another port in **desirable** mode.
- A port in **auto** mode cannot form an EtherChannel with another port that is also in **auto** mode, since neither port will initiate negotiation.
- A port in **on** mode can form a channel only with a port in **on** mode, because ports in **on** mode do not exchange PAgP packets.
- A port in **off** mode will not form a channel with any port.

## Understanding Frame Distribution

EtherChannel distributes frames across the links in a channel based on the low-order bits of the source and destination Media Access Control (MAC) addresses of each frame. The frame distribution method is not configurable.

## Default EtherChannel Configuration

Table 7-2 shows the Fast EtherChannel and Gigabit EtherChannel default configuration.

**Table 7-2 Fast EtherChannel and Gigabit EtherChannel Default Configuration**

Feature	Default Value
Fast EtherChannel	Catalyst 5000 family and 2926G series switches: <ul style="list-style-type: none"> <li>• <b>auto silent</b> mode on copper Fast Ethernet ports</li> <li>• <b>auto non-silent</b> mode on fiber Fast Ethernet ports</li> </ul> Catalyst 4000 family, 2948G, and 2980G switches: <ul style="list-style-type: none"> <li>• <b>auto silent</b> mode on all Fast Ethernet ports</li> </ul>
Gigabit EtherChannel	Catalyst 5000 family and 2926G series switches: <ul style="list-style-type: none"> <li>• <b>auto non-silent</b> mode</li> </ul> Catalyst 4000 family, 2948G, and 2980G switches: <ul style="list-style-type: none"> <li>• <b>auto silent</b> mode on all Fast Ethernet ports</li> </ul>
Frame-distribution method	Source and destination MAC

## Hardware Support for EtherChannel

EtherChannel support is hardware-dependent. In general, you can use the **show port capabilities** command to determine whether your hardware supports EtherChannel, and to confirm which ports you can bundle into a single EtherChannel.

Hardware support for EtherChannel is as follows:

- On most Catalyst 5000 family modules, and on the 2926G series switches, each EtherChannel port bundle must consist of two or four contiguous ports on the same module. The ports in an EtherChannel must belong to the same port group (ports that share the same EtherChannel controller). Depending on the hardware, there might be additional restrictions. For example, on certain modules, you cannot form an EtherChannel with the last two ports in a port group unless the first two ports in the group already form an EtherChannel.
- On the Catalyst 5000 family Gigabit EtherChannel module (WS-X5010), an EtherChannel bundle can consist of any two to eight ports on the module. Ports in an EtherChannel do not have to be contiguous.
- On the Catalyst 4000 family switches, the Catalyst 2948G switch, and the Catalyst 2980G switch, an EtherChannel bundle can consist of any two to eight ports. Ports in an EtherChannel bundle do not have to be contiguous, and they do not have to be on the same module.

# EtherChannel Configuration Guidelines and Restrictions

If improperly configured, some EtherChannel ports are disabled automatically to avoid network loops and other problems. Use the following guidelines to avoid configuration problems:

- Assign all ports in an EtherChannel to the same VLAN, or configure them as trunk ports.
- If you configure the EtherChannel as a trunk, configure the same trunk mode on all the ports in the EtherChannel, on both ends of the link. Configuring ports in an EtherChannel in different trunk modes can have unexpected results.
- Configure all ports in an EtherChannel to operate at the same speed and duplex mode (full or half duplex).
- If you configure a broadcast limit on the ports, configure the broadcast limit as a percentage limit for the channeled ports. With a packets-per-second broadcast limit, unicast packets might get dropped for one second when the broadcast limit is exceeded.
- If the EtherChannel is composed of trunk ports, you must configure the same allowed VLAN range on all the ports. When the allowed VLAN range is not the same for all trunks in a channel, trunk ports on which a particular VLAN is not allowed will drop the packets for that VLAN while ports on which the VLAN is allowed will transmit the traffic. If the allowed VLAN range is not the same on all ports in the channel, the ports do not form a channel when set to the **auto** or **desirable** mode with the **set port channel** command.
- Configure all ports in an EtherChannel with the same GARP VLAN Registration Protocol (GVRP), GARP Multicast Registration Protocol (GMRP), and quality of service (QoS) parameters.
- Do not configure the ports in an EtherChannel as dynamic VLAN ports. You can adversely affect switch performance.
- Make sure port security is disabled on channeled ports. If you enable port security on a channeled port, the port shuts down when it receives packets with source addresses that do not match the secure address of the port.
- If you disable a port in a channel, it is treated as a link failure and its traffic is transferred to one or more of the remaining ports in the channel.
- Ensure that all ports in a channel have the same configuration on both ends of the channel.
- The hardware controlling channeling on the Catalyst 5000 family switches prevents certain ports or groups of ports from forming channels. For more information, refer to the “Hardware Support for EtherChannel” section on page 7-4.

## Configuring EtherChannel

These sections describe how to configure an EtherChannel bundle:

- Creating an EtherChannel, page 7-6
- Defining an EtherChannel Administrative Group, page 7-6
- Setting the EtherChannel Spanning-Tree Port Cost, page 7-7
- Setting the EtherChannel Spanning-Tree Port-VLAN Cost, page 7-8
- Removing an EtherChannel Bundle, page 7-9
- Displaying EtherChannel Configuration Information, page 7-9

- Displaying EtherChannel Traffic Statistics, page 7-10
- Displaying EtherChannel PAgP Statistics, page 7-11

## Creating an EtherChannel

You create an EtherChannel port bundle by specifying the ports in the channel and the channeling mode. When you create an EtherChannel, an administrative group number is assigned automatically if one is not already assigned to the specified ports. In addition, a channel ID is assigned.

The **silent** and **non-silent** keywords function only with the **auto** and **desirable** modes.

To create an EtherChannel port bundle, perform this task in privileged mode:

	Task	Command
Step 1	If you are unsure which ports you can configure as an EtherChannel, verify the EtherChannel capabilities for the module or switch you are configuring.	<b>show port capabilities</b> [ <i>mod_num</i> [/ <i>port_num</i> ]]
Step 2	Create an EtherChannel with the desired ports.	<b>set port channel</b> <i>port_list</i> [ <i>admin_group</i> ] <b>mode</b> { <b>on</b>   <b>off</b>   <b>desirable</b>   <b>auto</b> } [ <b>silent</b>   <b>non-silent</b> ]
Step 3	Verify the EtherChannel configuration.	<b>show port channel</b> [ <i>port_list</i> ]

This example shows how to create an EtherChannel bundle and verify the configuration:

```

Console> (enable) set port channel 7/5-6 on
Port(s) 7/5-6 are assigned to admin group 56.
Port(s) 7/5-6 channel mode set to on.
Console> (enable) show port channel
Port  Status      Channel          Admin Ch
      Mode                Group  Id
-----
 7/5  connected  on                56    835
 7/6  connected  on                56    835
-----

Port  Device-ID                Port-ID                Platform
-----
 7/5  069003103 (5500)          3/5                    WS-C5500
 7/6  069003103 (5500)          3/6                    WS-C5500
-----
Console> (enable)

```

## Defining an EtherChannel Administrative Group

You can define an EtherChannel administrative group manually to identify groups of ports that are allowed to form an EtherChannel bundle together. When you create an EtherChannel port bundle, an administrative group is defined automatically. Administrative group membership is limited by hardware restrictions.

The *admin\_group* can be any value between 1 and 1024 inclusive.

**Caution**

Modifying the EtherChannel administrative group on connected ports causes the specified ports to be removed from and then added to spanning tree (that is, a spanning-tree topology change occurs and the ports must enter listening and learning mode before returning to forwarding mode).

To define an EtherChannel administrative group, perform this task in privileged mode:

	Task	Command
Step 1	Define the administrative group by specifying the ports in the group.	<b>set port channel</b> <i>port_list</i> <i>admin_group</i>
Step 2	Verify the administrative group configuration.	<b>show channel group</b> [ <i>admin_group</i> ]

This example shows how to assign ports to an administrative group and verify the configuration:

```

Console> (enable) set port channel 7/5-6 50
Port(s) 7/5-6 are assigned to admin group 50.
Console> (enable) show channel group 50
Admin Port  Status      Channel          Channel
group       Mode              id
-----
   50  7/5  connected  auto silent      0
   50  7/6  connected  auto silent      0

Admin Port  Device-ID          Port-ID          Platform
group
-----
   50  7/5
   50  7/6
Console> (enable)

```

## Setting the EtherChannel Spanning-Tree Port Cost

To set the spanning-tree port cost for an EtherChannel, perform this task in privileged mode:

	Task	Command
Step 1	Determine the EtherChannel ID of the EtherChannel for which you want to set the port cost.	<b>show channel group</b> <i>admin_group</i>
Step 2	Set the spanning-tree port cost for an EtherChannel using the EtherChannel ID obtained in Step 1.	<b>set channel cost</b> { <i>channel_id</i>   <b>all</b> } <i>cost</i>

This example shows how to set the EtherChannel port path cost for channel ID 768:

```

Console> (enable) show channel group 20
Admin Port  Status      Channel  Channel
group       Mode      id
-----
   20  1/1  notconnect  on      768
   20  1/2  connected   on      768

```

```

Admin Port  Device-ID                               Port-ID                               Platform
group
-----
 20    1/1
 20    1/2  066510644(cat26-lnf(NET25))          2/1                               WS-C6009
Console> (enable)

Console> (enable) set channel cost 768 12
Port(s) 1/1,1/2 port path cost are updated to 31.
Channel 768 cost is set to 12.
Warning:channel cost may not be applicable if channel is broken.
Console> (enable)

```

## Setting the EtherChannel Spanning-Tree Port-VLAN Cost

To set the spanning-tree port-VLAN cost for an EtherChannel, perform this task in privileged mode:

	Task	Command
Step 1	Determine the EtherChannel ID of the EtherChannel for which you want to set the port-VLAN cost.	<b>show channel group</b> <i>admin_group</i>
Step 2	Set the spanning-tree port-VLAN cost for an EtherChannel using the EtherChannel ID obtained in Step 1.	<b>set channel vlancost</b> { <i>channel_id</i>   <b>all</b> } <i>cost</i>

This example shows how to set the EtherChannel VLAN cost for channel ID 768:

```

Console> (enable) show channel group 20
Admin Port  Status      Channel  Channel
group                               Mode     id
-----
 20    1/1  notconnect  on          768
 20    1/2  connected  on          768

Admin Port  Device-ID                               Port-ID                               Platform
group
-----
 20    1/1
 20    1/2  066510644(cat26-lnf(NET25))          2/1                               WS-C6009
Console> (enable)

Console> (enable) set channel vlancost 768 12
Channel 768 vlancost set to 12.
Console> (enable)

```

## Removing an EtherChannel Bundle

To return a Fast EtherChannel or Gigabit EtherChannel bundle to its default configuration, perform this task in privileged mode:

	Task	Command
Step 1	Return a channel to its default configuration (you must perform this task on both sides of the channel).	<b>set port channel</b> <i>port_list</i> <b>mode auto</b>
Step 2	Verify the configuration.	<b>show port channel</b> [ <i>mod_num</i> [/ <i>port_num</i> ]]

This example shows how to return a channel to its default configuration and how to verify the configuration:

```
Console> (enable) set port channel 7/5-6 mode auto
Port(s) 7/5-6 channel mode set to auto.
Console> (enable) show port channel
No ports channelling
Console> (enable)
```

## Displaying EtherChannel Configuration Information

To display EtherChannel configuration information, perform one of these tasks in privileged mode:

Task	Command
<ul style="list-style-type: none"> <li>Display EtherChannel configuration information by port.</li> </ul>	<b>show port channel</b> [ <i>mod_num</i> [/ <i>port_num</i> ]] <b>info</b> [ <b>spantree</b>   <b>trunk</b>   <b>protocol</b>   <b>gmrp</b>   <b>gvrp</b>   <b>qos</b> ]
<ul style="list-style-type: none"> <li>Display EtherChannel configuration information by EtherChannel administrative group.</li> </ul>	<b>show channel group</b> [ <i>admin_group</i> ] <b>info</b> [ <b>spantree</b>   <b>trunk</b>   <b>protocol</b>   <b>gmrp</b>   <b>gvrp</b>   <b>qos</b> ]
<ul style="list-style-type: none"> <li>Display EtherChannel configuration information by EtherChannel ID.</li> </ul>	<b>show channel</b> [ <i>channel_id</i> ] <b>info</b> [ <b>spantree</b>   <b>trunk</b>   <b>protocol</b>   <b>gmrp</b>   <b>gvrp</b>   <b>qos</b> ]

This example shows how to display EtherChannel configuration information by port:

```
Console> (enable) show port channel info
Switch Frame Distribution Method: mac both

Port  Status      Channel      Admin Channel  Speed Duplex Vlan
      mode
-----
7/5   connected    on          56      835 a-100 a-full 1
7/6   connected    on          56      835 a-100 a-full 1
-----

Port  ifIndex Oper-group Neighbor      Oper-Distribution  PortSecurity/
      Operator-Group Method           Dynamic port
-----
7/5   377      1             mac both
7/6   377      1             mac both
-----
```

```

Port  Device-ID                               Port-ID                               Platform
-----
7/5   069003103 (5500)                          3/5                                  WS-C5500
7/6   069003103 (5500)                          3/6                                  WS-C5500
-----

Port  Trunk-status Trunk-type   Trunk-vlans
-----
7/5   not-trunking negotiate    1-1005
7/6   not-trunking negotiate    1-1005
-----

Port  Portvlancost-vlans
-----
7/5
7/6
-----

Port  Port      Portfast Port      Port
      priority          vlanpri  vlanpri-vlans
-----
7/5      32 disabled      0
7/6      32 disabled      0
-----

Port  IP        IPX        Group
-----
7/5   on        auto-on   auto-on
7/6   on        auto-on   auto-on
-----

Port  GMRP      GMRP      GMRP
      status   registration forwardAll
-----
7/5   enabled   normal    disabled
7/6   enabled   normal    disabled
-----

Port  GVRP      GVRP      GVRP
      status   registration applicant
-----
7/5   disabled normal    normal
7/6   disabled normal    normal
-----

Port  Qos-Tx Qos-Rx Qos-Trust   Qos-DefCos
-----
7/5   -      -      untrusted   0
7/6   -      -      untrusted   0
-----

```

Console> (enable)

## Displaying EtherChannel Traffic Statistics

To display EtherChannel traffic statistics, perform this task in privileged mode:

Task	Command
Display EtherChannel traffic statistics.	<b>show channel</b> [ <i>channel_id</i> ] <b>mac</b>

This example shows how to display EtherChannel traffic statistics information for EtherChannel ID 835:

```

Console> show channel 835 mac
Channel  Rcv-Unicast          Rcv-Multicast          Rcv-Broadcast
-----
835                    0                      119200                  0

Channel  Xmit-Unicast          Xmit-Multicast          Xmit-Broadcast
-----
835                    0                      184171                  0

Channel  Rcv-Octet            Xmit-Octet
-----
835                    11283708              14942104

Channel  Dely-Exced MTU-Exced  In-Discard  Lrn-Discrd  In-Lost    Out-Lost
-----
835                    0              0              0              0              0              0
Console>

```

## Displaying EtherChannel PAgP Statistics

To display EtherChannel PAgP statistics, perform this task in privileged mode:

Task	Command
<ul style="list-style-type: none"> <li>Display EtherChannel PAgP statistics by port.</li> </ul>	<b>show port channel</b> <i>[mod_num[/i&gt;port_num]] <b>statistics</b></i>
<ul style="list-style-type: none"> <li>Display EtherChannel PAgP statistics by EtherChannel administrative group.</li> </ul>	<b>show channel group</b> <i>[admin_group]</i> <b>statistics</b>
<ul style="list-style-type: none"> <li>Display EtherChannel PAgP statistics by EtherChannel ID.</li> </ul>	<b>show channel</b> <i>[admin_group]</i> <b>statistics</b>

This example shows how to display EtherChannel PAgP statistics information by EtherChannel administrative group:

```

Console> show channel group 58 statistics
Port  Admin  PAgP Pkts  PAgP Pkts  PAgP Pkts  PAgP Pkts  PAgP Pkts  PAgP Pkts
      Group  Transmitted Received  InFlush   RetnFlush  OutFlush  InError
-----
7/5   58     194       81         0           0           0           0
7/6   58     204       85         0           0           0           0
Console>

```

## EtherChannel Configuration Examples

These sections contain Fast and Gigabit EtherChannel configuration examples:

- Four-Port Fast EtherChannel Configuration Example, page 7-12
- Two-Port Gigabit EtherChannel Configuration Example, page 7-14

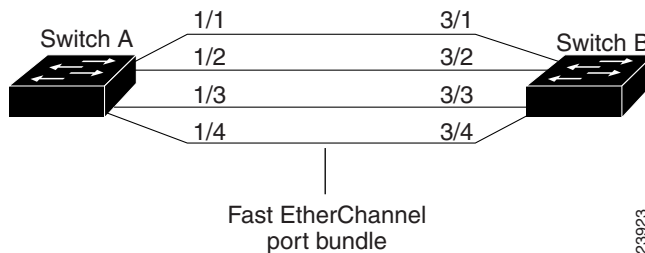
**Note**

For examples of configuring VLAN trunks on EtherChannel port bundles, see the “Example VLAN Trunk Configurations” section on page 12-11.

## Four-Port Fast EtherChannel Configuration Example

This example configuration shows how to configure a four-port Fast EtherChannel link between two switches. Figure 7-1 shows two switches connected through four 100BaseTX Fast Ethernet ports.

**Figure 7-1 Fast EtherChannel Port Bundle Example**



- Step 1** Make sure that all ports on Switch A and Switch B have the same port configuration, including VLAN membership, speed, and duplex.

```
Switch_A> (enable) set vlan 50 1/1-4
VLAN 50 modified.
VLAN 1 modified.
VLAN  Mod/Ports
-----
50    1/1-4
      2/1-2
      3/1-3
```

```
Switch_A> (enable) set port speed 1/1-4 100
Ports 1/1-4 transmission speed set to 100Mbps.
Switch_A> (enable) set port duplex 1/1-4 full
Ports 1/1-4 set to full-duplex.
Switch_A> (enable)
```

```
Switch_B> (enable) set vlan 50 3/1-4
VLAN 50 modified.
VLAN 1 modified.
VLAN  Mod/Ports
-----
50    3/1-4
```

```
Switch_B> (enable) set port speed 3/1-4 100
Ports 3/1-4 transmission speed set to 100Mbps.
Switch_B> (enable) set port duplex 3/1-4 full
Ports 3/1-4 set to full-duplex.
Switch_B> (enable)
```

**Step 2** You can confirm the channeling status of the switches using the **show port channel** command.

```
Switch_A> (enable) show port channel  
No ports channelling  
Switch_A> (enable)
```

```
Switch_B> (enable) show port channel  
No ports channelling  
Switch_B> (enable)
```

**Step 3** Configure the ports on Switch A to negotiate a Fast EtherChannel bundle with the neighboring switch. This example assumes that the neighboring ports on Switch B are in EtherChannel **auto** mode. The system logging messages provide information about the formation of the EtherChannel bundle.

```
Switch_A> (enable) set port channel 1/1-4 desirable  
Port(s) 1/1-4 channel mode set to desirable.  
Switch_A> (enable) %PAGP-5-PORTFROMSTP:Port 1/1 left bridge port 1/1  
%PAGP-5-PORTFROMSTP:Port 1/2 left bridge port 1/2  
%PAGP-5-PORTFROMSTP:Port 1/3 left bridge port 1/3  
%PAGP-5-PORTFROMSTP:Port 1/4 left bridge port 1/4  
%PAGP-5-PORTFROMSTP:Port 1/2 left bridge port 1/2  
%PAGP-5-PORTFROMSTP:Port 1/3 left bridge port 1/3  
%PAGP-5-PORTFROMSTP:Port 1/4 left bridge port 1/4  
%PAGP-5-PORTTOSTP:Port 1/1 joined bridge port 1/1-4  
%PAGP-5-PORTTOSTP:Port 1/2 joined bridge port 1/1-4  
%PAGP-5-PORTTOSTP:Port 1/3 joined bridge port 1/1-4  
%PAGP-5-PORTTOSTP:Port 1/4 joined bridge port 1/1-4  
  
Switch_B> (enable) %PAGP-5-PORTFROMSTP:Port 3/1 left bridge port 3/1  
%PAGP-5-PORTFROMSTP:Port 3/2 left bridge port 3/2  
%PAGP-5-PORTFROMSTP:Port 3/3 left bridge port 3/3  
%PAGP-5-PORTFROMSTP:Port 3/4 left bridge port 3/4  
%PAGP-5-PORTFROMSTP:Port 3/2 left bridge port 3/1-4  
%PAGP-5-PORTFROMSTP:Port 3/3 left bridge port 3/1-4  
%PAGP-5-PORTFROMSTP:Port 3/4 left bridge port 3/1-4  
%PAGP-5-PORTTOSTP:Port 3/1 joined bridge port 3/1-4  
%PAGP-5-PORTTOSTP:Port 3/2 joined bridge port 3/1-4  
%PAGP-5-PORTTOSTP:Port 3/3 joined bridge port 3/1-4  
%PAGP-5-PORTTOSTP:Port 3/4 joined bridge port 3/1-4
```

**Step 4** After the EtherChannel bundle is negotiated, use the **show port channel** command to verify the configuration.

```
Switch_A> (enable) show port channel
Port  Status      Channel  Channel  Neighbor  Neighbor
      mode      mode     status   device    device
-----
1/1   connected  desirable channel   WS-C4003  JAB023806 (Sw 3/1
1/2   connected  desirable channel   WS-C4003  JAB023806 (Sw 3/2
1/3   connected  desirable channel   WS-C4003  JAB023806 (Sw 3/3
1/4   connected  desirable channel   WS-C4003  JAB023806 (Sw 3/4
-----

Switch_A> (enable)

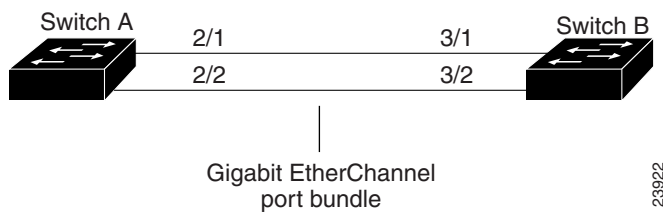
Switch_B> (enable) show port channel
Port  Status      Channel  Channel  Neighbor  Neighbor
      mode      mode     status   device    device
-----
3/1   connected  auto     channel   WS-C5000  009979082 (Sw 1/1
3/2   connected  auto     channel   WS-C5000  009979082 (Sw 1/2
3/3   connected  auto     channel   WS-C5000  009979082 (Sw 1/3
3/4   connected  auto     channel   WS-C5000  009979082 (Sw 1/4
-----

Switch_B> (enable)
```

## Two-Port Gigabit EtherChannel Configuration Example

This example configuration shows how to configure a two-port Gigabit EtherChannel link between two switches. Figure 7-2 shows two switches connected through four 1000BaseSX Gigabit Ethernet ports.

**Figure 7-2** Gigabit EtherChannel Port Bundle Example



- Step 1** Make sure that all ports on Switch A and Switch B have the same port configuration, such as VLAN membership.

```
Switch_A> (enable) set vlan 100 2/1-2
VLAN 100 modified.
VLAN 1 modified.
VLAN Mod/Ports
-----
100 2/1-2
```

```
Switch_A> (enable)
```

```
Switch_B> (enable) set vlan 100 3/1-2
VLAN 100 modified.
VLAN 1 modified.
VLAN Mod/Ports
-----
100 3/1-2
```

```
Switch_B> (enable)
```

- Step 2** You can confirm the channeling status of the switches using the **show port channel** command.

```
Switch_A> (enable) show port channel
No ports channelling
Switch_A> (enable)
```

```
Switch_B> (enable) show port channel
No ports channelling
Switch_B> (enable)
```

- Step 3** In this example, EtherChannel is configured **on** for all ports. If you configure ports **on**, you must configure the ports on both ends of the EtherChannel bundle **on**. The switches will not negotiate an EtherChannel port bundle automatically in **on** mode. The system logging messages provide information about the formation of the EtherChannel bundle.

```
Switch_A> (enable) set port channel 2/1-2 on
Port(s) 2/1-2 channel mode set to on.
Switch_A> (enable) %PAGP-5-PORTFROMSTP:Port 2/1 left bridge port 2/1
%PAGP-5-PORTFROMSTP:Port 2/2 left bridge port 2/2
%PAGP-5-PORTTOSTP:Port 2/1 joined bridge port 2/1-2
%PAGP-5-PORTTOSTP:Port 2/2 joined bridge port 2/1-2
```

```
Switch_B> (enable) set port channel 3/1-2 on
Port(s) 3/1-2 channel mode set to on.
Switch_B> (enable) %PAGP-5-PORTFROMSTP:Port 3/1 left bridge port 3/1
%PAGP-5-PORTFROMSTP:Port 3/2 left bridge port 3/2
%PAGP-5-PORTTOSTP:Port 3/1 joined bridge port 3/1-2
%PAGP-5-PORTTOSTP:Port 3/2 joined bridge port 3/1-2
```

- Step 4** After the EtherChannel bundle is negotiated, use the **show port channel** command to verify the configuration. If you configure only the ports on one side of the link **on**, the **show port channel** command will show that the ports are channeling, but no traffic will pass over the EtherChannel. Spanning-tree loops can occur, and eventually the switch will disable the incorrectly configured EtherChannel.

```
Switch_A> (enable) show port channel
Port  Status      Channel  Channel  Neighbor  Neighbor
      mode      mode      status   device    device    port
-----
 2/1  connected  on       channel  WS-C4003  JAB023806LN( 3/1
 2/2  connected  on       channel  WS-C4003  JAB023806LN( 3/2
-----
```

```
Switch_A> (enable)
```

```
Switch_B> (enable) show port channel
Port  Status      Channel  Channel  Neighbor  Neighbor
      mode      mode      status   device    device    port
-----
 3/1  connected  on       channel  WS-C4003  JAB023806JR( 2/1
 3/2  connected  on       channel  WS-C4003  JAB023806JR( 2/2
-----
```

```
Switch_B> (enable)
```