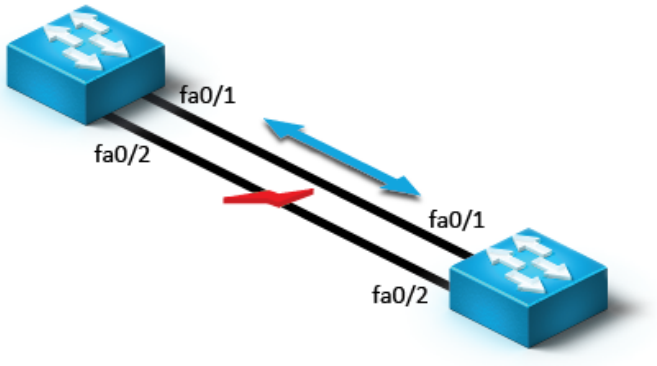
6.6.9 EtherChannel Facts

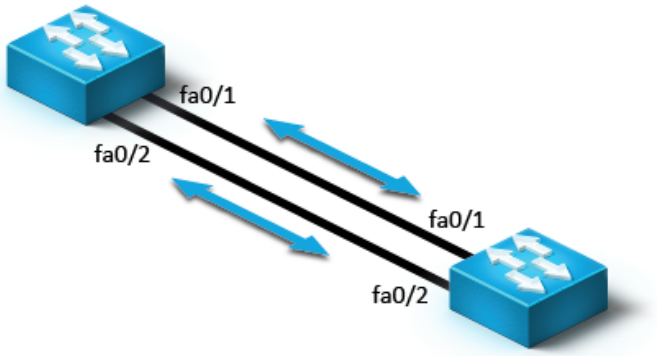
EtherChannel combines multiple ports on a Cisco switch into a single logical link between two switches. With EtherChannel:

- You can combine 2–8 ports into a single link.
- All links in the channel group are used for communication between the switches.
- Bandwidth between switches is increased.
- Automatic redundant paths between switches are established. If one link fails, communication will still occur over the other links in the group.
- Spanning tree convergence times are reduced.

Without EtherChannel, only one link is used.



With EtherChannel, both links are used.



EtherChannel Configuration Protocols

Cisco switches can use the following protocols for EtherChannel configuration:

Protocol	Description
Port Aggregation Protocol (PAgP)	Port Aggregation Protocol prevents loops, limits packet loss due to misconfigured channels, and aids in network reliability. PAgP operates in the following modes: ▪ Auto mode places the port into a passive negotiating state and forms an EtherChannel if the port receives PAgP packets. While in this mode, the port does not initiate the negotiation. ▪ Desirable mode places the port in a negotiating state to form an EtherChannel by sending PAgP packets. A channel is formed with another port group in either the auto or desirable mode.
Link Aggregation Control Protocol (LACP)	Link Aggregation Control Protocol is based on the 802.3ad standard and has similar functions to PAgP. LACP is used when configuring EtherChannel between Cisco switches and non-Cisco switches that support 802.3ad. LACP operates in the following modes: ▪ Passive mode places the port into a passive negotiating state and forms an EtherChannel if the port receives LACP packets. While in this mode, the port does not initiate the negotiation.

	▪ Active mode places the port in a negotiating state to form an EtherChannel by sending LACP packets. A channel is formed with another port group in either the active or passive mode.

EtherChannel Configuration Commands

The following table shows common commands that configure EtherChannel:

Command	Action
Switch(config-if)#channel-protocol lacp Switch(config-if)#channel-protocol pagp	Selects the EtherChannel protocol on the interface.
Switch(config-if)#channel-group *[1-8]* mode auto Switch(config-if)#channel-group *[1-8]* mode desirable	Selects the PAgP mode on the interface.
Switch(config-if)#channel-group *[1-8]* mode active Switch(config-if)#channel-group *[1-8]* mode passive	Selects the LACP mode on the interface.
Switch(config-if)#no channel-group *[1-8]*	Disables EtherChannel on the interface.
Switch#show etherchannel	Displays EtherChannel details on the switch.
Switch#show etherchannel summary	Displays EtherChannel information for a channel with a one-line summary per channel group.

Each channel group has its own number. All ports assigned to the same channel group are viewed as a single logical link.

The following commands configure GigabitEthernet 0/1 and 0/2 interfaces to actively initiate the negotiation of an EtherChannel with the PAgP protocol and a channel group of 5:

```
Switch>ena
Switch#conf t
Switch(config)#int range gi 0/1 - 2
Switch(config-if-range)#channel-protocol pagp
Switch(config-if-range)#channel-group 5 mode desirable
```

The following commands configure FastEthernet 0/1 through 0/4 interfaces to form an EtherChannel with the LACP protocol if the other device actively initiates the EtherChannel connection:

```
Switch>ena
Switch#conf t
Switch(config)#int range ga 0/1 - 4
Switch(config-if-range)#channel-protocol lacp
Switch(config-if-range)#channel-group 3 mode passive
Switch(config-if-range)#duplex full
```

Troubleshoot EtherChannel Configuration

Use the following guidelines to troubleshoot an EtherChannel configuration:

- Make sure that all ports in an EtherChannel use the same protocol (PAgP or LACP):
  - If the **channel-group** command is used with the **desirable** option on one switch (PAgP), the other switch must use either **desirable** or **auto**.
  - If the **channel-group** command is used with the **active** option (LACP), the other switch must use either **active** or **passive**.
- Verify that all ports in the EtherChannel have the same speed and duplex mode. LACP requires that the ports operate only in full-duplex mode.
- Check the channel group number. A port cannot belong to more than one channel group at the same time.
- Verify that all ports in the EtherChannel have the same access VLAN configuration or are VLAN trunks with the same allowable VLAN list and the same native VLAN.

- Check the spanning tree configuration. If you do not configure EtherChannel, the spanning tree algorithm identifies each link as a redundant path to the other bridge and puts one of the ports in a blocking state.
- Check the port type and number. You can configure an LACP EtherChannel with up to 16 Ethernet ports of the same type. Up to eight ports can be active, and up to eight ports can be in standby mode.
- Be sure to enable all ports in an EtherChannel. A port in an EtherChannel that is disabled using the **shutdown** interface configuration command is treated as a link failure, and its traffic is transferred to one of the remaining ports in the EtherChannel.

Do not configure more than six EtherChannels on one switch.