

Etherchannel Configuration and Troubleshooting

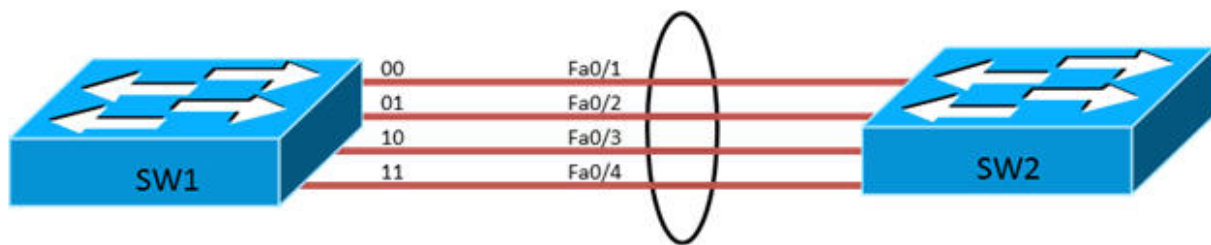
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What It's About

As technology advances, so does our need for faster networks with higher bandwidths. Etherchannel technology meets this need by providing an option for increasing bandwidth on network backbones without adding new equipment on existing networks.

Etherchannel works by bundling together multiple lines between switches and grouping them logically as a single connection.



This connection is seen by the switches as a single connection by all network traffic and does not negatively affect any traffic flow. The switches are capable of load-balancing traffic across all interfaces included in the etherchannel. If a link were to go down, it would not interrupt the flow of traffic, the switches would simply re-route all traffic around the link and keep the etherchannel alive.

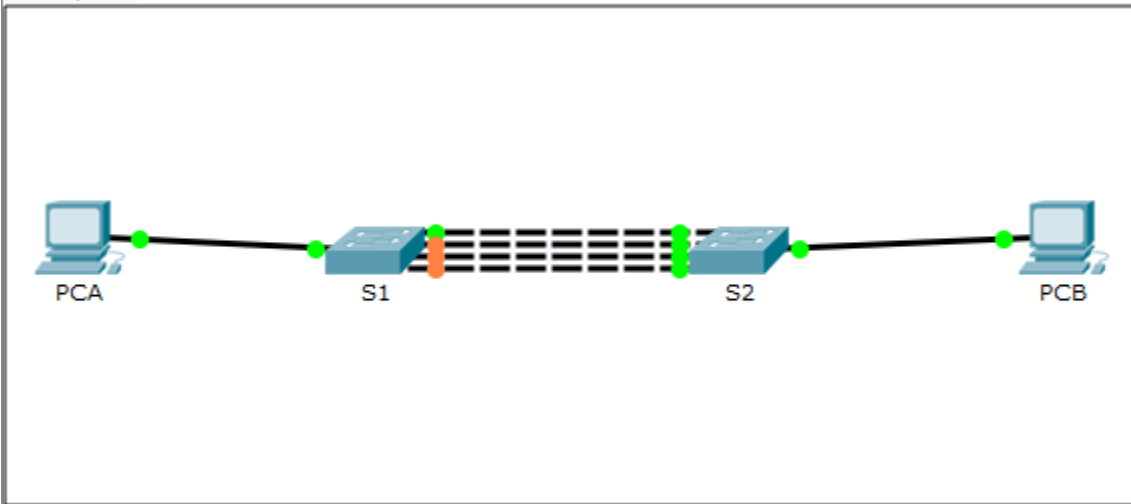
Etherchannel supports up to eight links between switches and achieving the following speeds:

Network Technology	Top Speeds Achieved with Etherchannel
Fast Ethernet	800Mbps
Gigabit Etherchannel	8Gbps
10 Gigabit Etherchannel	80Gbps

Setting up Etherchannel: The Basics

Step-by-Step guide with Commands (Follow Along Lab Included in PKT)

Set-Up Lab

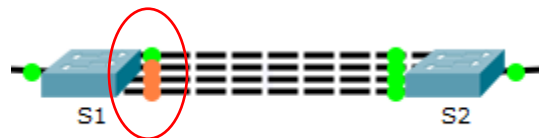


Commands used are noted in **BOLD** text.

1. Disable all ports on the switch that you plan to associate with the port-channel.
 - a. This can be done quickly by selecting all the affiliated interfaces with a range command.
 - i. S1(config)# **interface range fa0/1-4**
 - ii. S1(config-if)# **shutdown**
 - iii. Perform the same commands on S2
2. Set all ports to trunking or access and assign them to the same native vlan.
 - i. S1(config-if)# **switchport mode trunk**
 - ii. S1(config-if)# **switchport trunk native vlan 99**
3. Create the port-channels by adding the interfaces to the appropriate channel groups.
 - a. Both switches must use the same channel number, you can choose any number from 1-6. Here is where you can designate the type of etherchannel you want with the **mode** command. In this example, we will use **active** (LACP).
 - i. S1(config-if)# **channel-group 1 mode active**

4. Configure the created port-channels with the *int port-channel x* command.
 - a. Set the port-channels to the correct native vlans.
 - i. S1(config)# **interface port-channel 1**
 - ii. S1(config-if)# **switchport mode trunk**
 - iii. S1(config-if)# **switchport trunk native vlan 99**
5. Perform steps 2-4 on S2.
6. After setting up both switches, bring the interfaces back up with the *no shutdown* command.
 - i. S1(config)# **interface range fa0/1-4**
 - ii. S1(config-if)# **no shutdown**
 - iii. Perform the same commands on S2
7. After a few moments, the interface link lights should all turn green and converge.
8. If all links remain green, ping PC2 from PC1, the ping should be successful.

If at least one of the lights remains orange, this is an indication that the etherchannel has not formed correctly and troubleshooting must be performed.



Step-by-Step: Configuring Vlan Access

In this part of the lab, we will use the lab you configured in the previous section.

Configuring VLAN access on etherchannel is identical to configuring access on an individual interface.

1. Create VLAN 10 on each switch:
 - a. S1(config)# **interface vlan 10**
 - b. S1(config-if)# **exit**
 - c. S1(config)# **vlan 10**
2. Open the port-channel interface and set vlans 10 and 99 as the only allowed vlans across the interface.
 - a. S1(config)# **interface port-channel 1**
 - b. S1(config-if)# **switchport trunk allowed vlan add 10**
 - c. S1(config-if)# **switchport trunk allowed vlan add 99**

Configuring allowed vlans across an etherchannel interface is a good way of forcing load-balancing in your network.

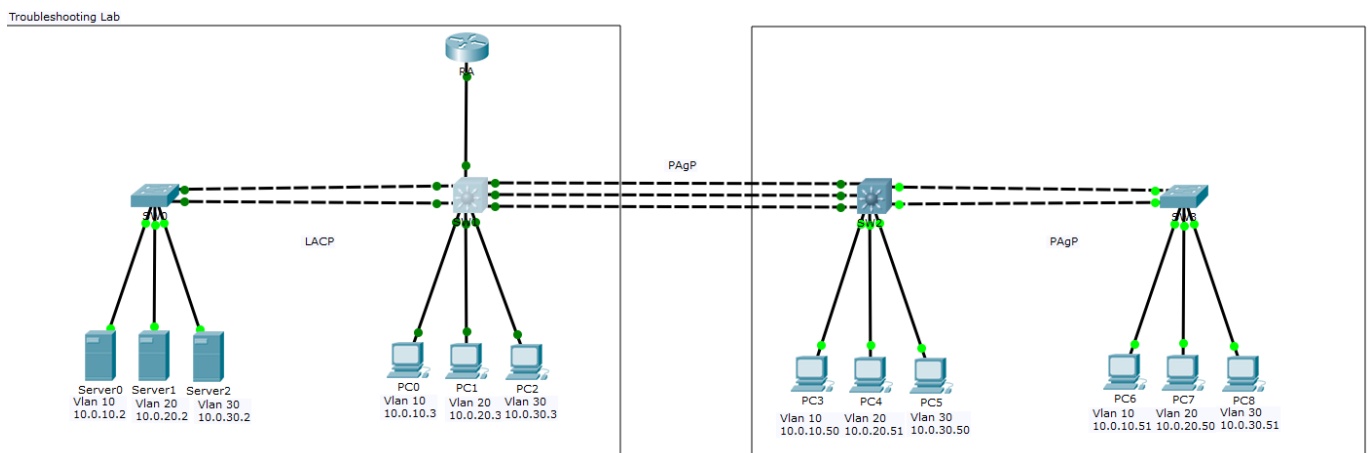
Testing Your Skills

Troubleshooting Lab

In the provided lab, there are four devices with three different etherchannels between them. The computers and servers are networked on three separate vlans using a router-on-a-stick network design.

Currently, there is one or more issues with EACH etherchannel connection. In total, there are **four** mistakes preventing each machine from communicating with one another.

If you are having any difficulties, the answers are displayed in the Lab Solutions section.

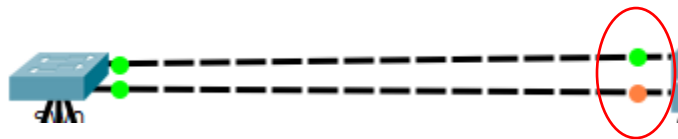


Etherchannel Quick Reference Guide

Setup for Trunking

1. Disable all ports on the switch that you plan to associate with the port-channel.
2. Set all ports to trunking and assign them to the same native vlan.
3. Create the port-channels by adding the interfaces to the appropriate channel groups.
 - a. Use the same port-channel number between both switches.
4. Configure the created port-channels with the *int port-channel x* command.
 - a. Set the port-channels to the correct native vlans.
5. After setting up both switches, bring the interfaces back up with the *no shutdown* command.
6. After a few seconds, the interface link lights should all turn green and converge.

If one of the lights remains orange, this is an indication that the etherchannel has not formed correctly.



Troubleshooting

Ensure the following:

1. All interfaces on both switches are set to the same port-channel.
2. Ensure that you are using the correct mode when adding interfaces to the port-channel.

Will an EtherChannel Form?					
LACP			PAgP		
	Active	Passive		Desirable	Auto
Active	Yes	Yes	Desirable	Yes	Yes
Passive	Yes	No	Auto	Yes	No

3. Ensure that you are using the same Etherchannel protocol.
4. Ensure all ports are on the same speed and same duplex mode.
5. Ensure that all interfaces AND port-channels are set to trunking with the same native vlan.

Etherchannel Show Commands

Listed below are some helpful commands to help you troubleshoot issues you may find while configuring etherchannel.

show interfaces port-channel [X]	Displays the configuration of a specific EtherChannel interface. Useful for determining duplex speeds, line status, and packet statistics.
show interfaces etherchannel	Displays all ports currently associated with etherchannel, their status, and their configuration.
show interfaces switchport	Harder to navigate due to excessive information, but will give you a full run-down on your port-channels and their configurations.

```
SW1#show interfaces port-channel 1
Port-channel 1 is down, line protocol is down (disabled)
  Hardware is EtherChannel, address is 0001.9694.206d (bia
0001.9694.206d)
  MTU 1500 bytes, BW 300000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 300Mb/s
  input flow-control is off, output flow-control is off
  Members in this channel: Fa0/1 ,Fa0/2 ,
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output
drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    956 packets input, 193351 bytes, 0 no buffer
      Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0
abort
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
```

```
SW1#show interfaces switchport
Name: Po1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: down
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 99
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: All
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none
```

```
SW1#show interfaces etherchannel
FastEthernet0/1:
Port state      = 1
Channel group   = 1          Mode = Passive      Gcchange = -
Port-channel    = Po1        GC      = -         Pseudo port-
channel = Po1
Port index      = 0          Load = 0x00        Protocol =
LACP

Flags: S - Device is sending Slow LACPDUs   F - Device is
sending fast LACPDUs

      A - Device is in active mode.          P - Device is in
passive mode.

Local information:

      LACP port      Admin      Oper      Port
Port
Port      Flags      State      Priority      Key      Key
Number      State
Fa0/1      SA        down      32768        0x0      0x0      0x1

Age of the port in the current state: 00d:03h:21m:22s
```


Lab Solutions

Troubleshooting Lab

Between SW0 and SW1

-Both connections are set to passive.

-SW0 has the wrong native vlan.

Between SW1 and SW2

-SW2 has ports fa0/22-24 set to the wrong port-channel.

Between S2 and S3

-The port-channel between S2 and S3 only allow vlans 10 and 30.