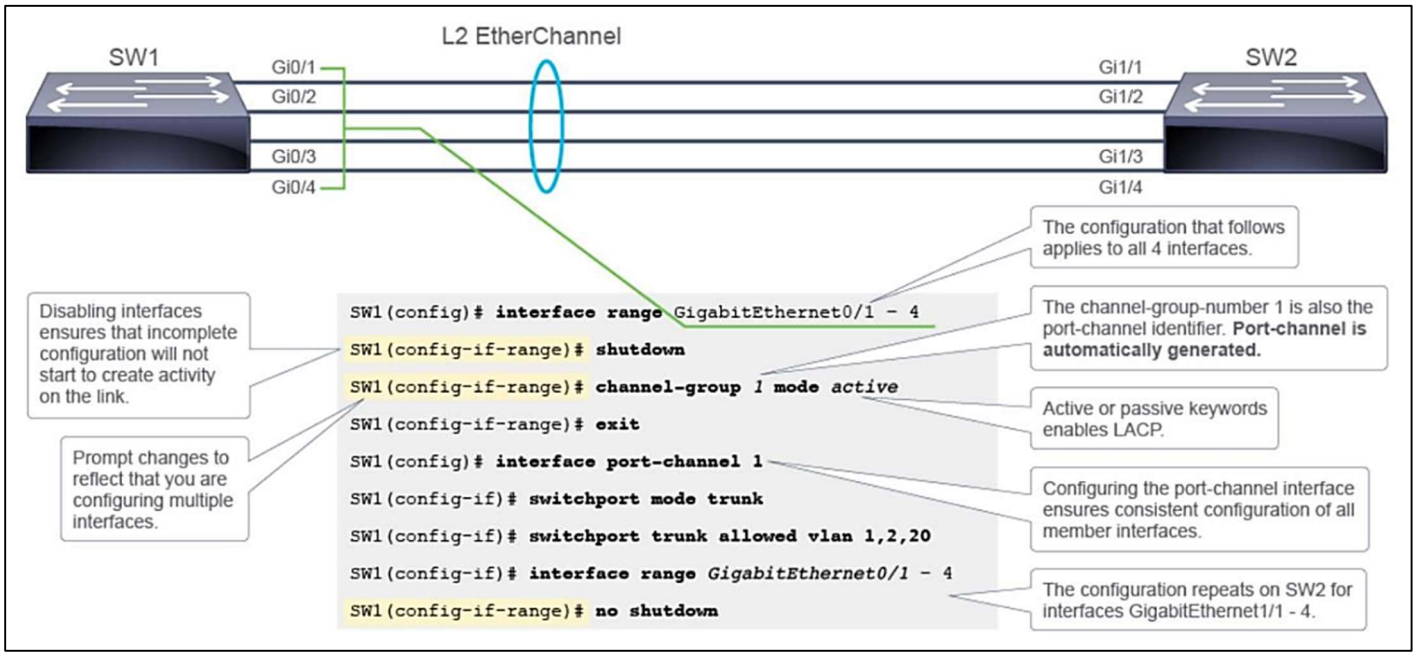
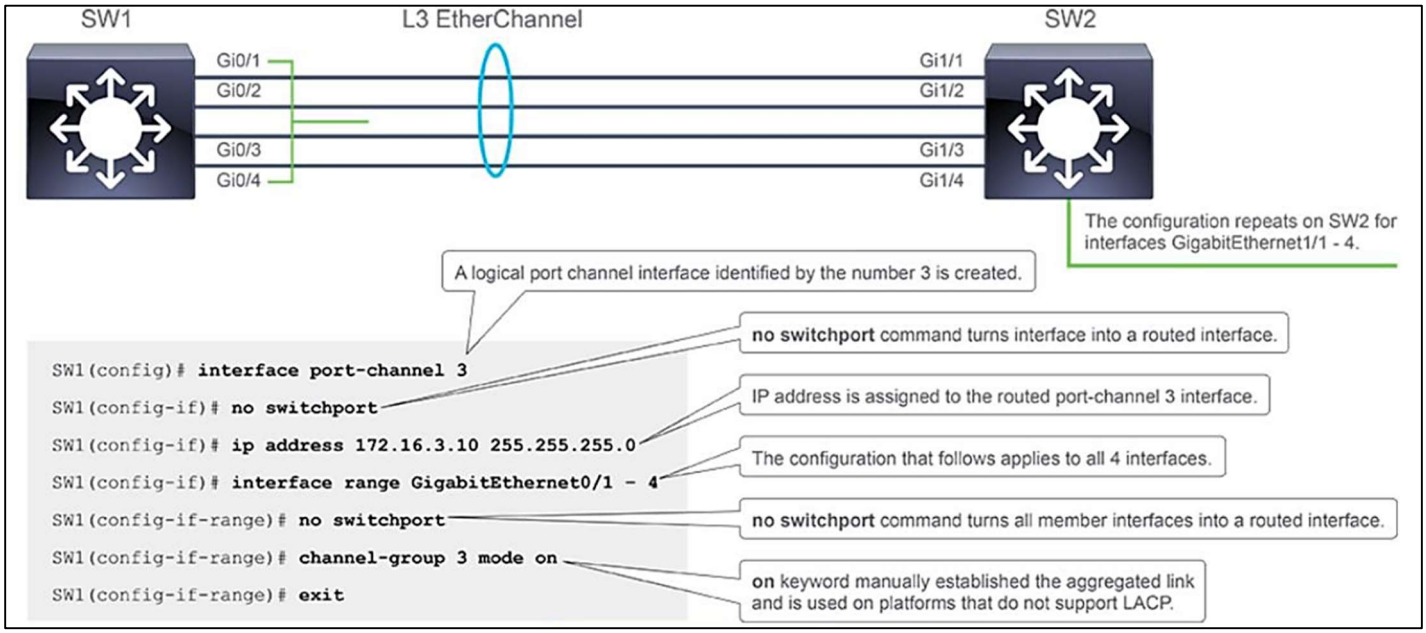
ETHERCHANNEL – LAYER 2



ETHERCHANNEL – LAYER 3



```
SW2# show etherchannel summary
Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        M - not in use, minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port
Number of channel-groups in use: 1
Number of aggregators:           1
Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------
1      Po1(SU)         LACP      Fa0/1(P)    Fa0/2(P)
```

The `show interface port-channel` command displays the general status of the logical port channel interface th represents the aggregated link. In the example, the interface port-channel 1 is operational.

```
SW1# show interface Port-channel1
Port-channel1 is up, line protocol is up (connected)
  Hardware is EtherChannel, address is 000f.34f9.9182 (bia 000f.34f9.9182)
  MTU 1500 bytes, BW 200000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
<... output omitted ...>
```

```
Switch# show etherchannel Port-channel
                Channel-group listing:
                ----------------------

Group: 1
----------
                Port-channels in the group:
                ---------------------------
Port-channel: Po1    (Primary Aggregator)
------------
Age of the Port-channel   = 4d:01h:29m:00s
<... output omitted ...>
Protocol            =   LACP
<... output omitted ...>
Ports in the Port-channel:
Index   Load   Port     EC state        No of bits
------+------+------+------------------+-----------
  0     00     Fa0/1    Active             4
  1     00     Fa0/2    Active             4
Time since last port bundled:    0d:00h:00m:18s    Fa0/2
```

Guidelines for Configuring EtherChannel

- PAgP is Cisco proprietary.
- LACP is defined in 802.3ad.
- You can combine from two to eight parallel links.
- All ports must be identical:
  - Same speed and duplex
  - Cannot mix Fast Ethernet and Gigabit Ethernet
  - Cannot mix PAgP and LACP
  - Must all be VLAN trunk or nontrunk operational status
- All links must be either Layer 2 or Layer 3 in a single channel group.
- To create a channel in PAgP, sides must be set to
  - Auto-Desirable
  - Desirable-Desirable
- To create a channel in LACP, sides must be set to
  - Active-Active
  - Active-Passive
- To create a channel without using PAgP or LACP, sides must be set to On-On.
- Do *not* configure a GigaStack gigabit interface converter (GBIC) as part of an EtherChannel.
- An interface that is already configured to be a Switched Port Analyzer (SPAN) destination port will not join an EtherChannel group until SPAN is disabled.
- Do *not* configure a secure port as part of an EtherChannel.
- Interfaces with different native VLANs cannot form an EtherChannel.
- When using trunk links, ensure all trunks are in the same mode—Inter-Switch Link (ISL) or dot1q.

Configuring Layer 2 EtherChannel

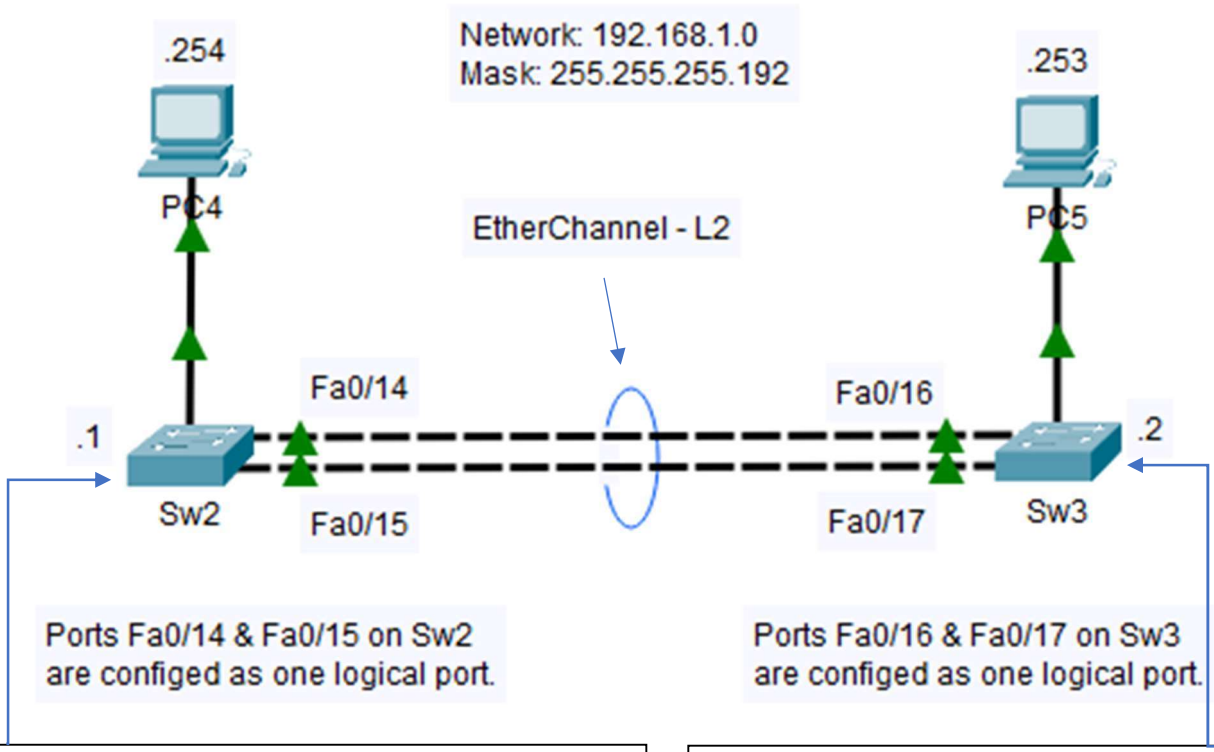
`Switch(config)#interface range fastethernet 0/1 - 4`	Moves to interface range configuration mode.
`Switch(config-if-range)#channel-protocol pagp`	Specifies the PAgP protocol to be used in this channel.
`Or`	
`Switch(config-if-range)#channel-protocol lacp`	Specifies the LACP protocol to be used in this channel.
`Switch(config-if-range)#channel-group 1 mode {desirable | auto | on | passive | active }`	Creates channel group 1 and assigns interfaces 01–04 as part of it. Use whichever mode is necessary, depending on your choice of protocol.

EtherChannel Config – using Layer 2 Switches

EtherChannel enables packets to be sent over several physical interfaces as if over a single interface. EtherChannel logically bonds several physical connections into one logical connection. The process offers redundancy and load balancing, while maintaining the combined throughput of physical links.

Benefits:

- The bandwidth of physical links is combined to provide increased bandwidth over the logical link.
- Load balancing is possible across the physical links that are part of the same EtherChannel.
- EtherChannel improves resiliency against link failure, as it provides link redundancy.



Sw2 ETHERCHANNEL CONFIG:

```
Switch#conf t
Enter configuration commands, one per line. End
with CNTL/Z.
Switch(config)#int fa0/14
Switch(config-if)#channel-group 1 mode on
Switch(config-if)#

Creating a port-channel interface Port-channel 1
%LINK-5-CHANGED: Interface Port-channel1, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
Port-channel1, changed state to up

Switch(config-if)#int fa0/15
Switch(config-if)#channel-group 1 mode on
Switch(config-if)#exit
Switch(config)#int fa0/15
Switch(config-if)#channel-group 1 mode on
```

Sw3 ETHERCHANNEL CONFIG:

```
Switch#conf t
Enter configuration commands, one per line. End
with CNTL/Z.
Switch(config)#int fa0/16
Switch(config-if)#channel-group 1 mode on
Switch(config-if)#

Creating a port-channel interface Port-channel 1
%LINK-5-CHANGED: Interface Port-channel1, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
Port-channel1, changed state to up

Switch(config-if)#int fa0/17
Switch(config-if)#channel-group 1 mode on
Switch(config-if)#exit
Switch(config)#int fa0/15
Switch(config-if)#channel-group 1 mode on
```