

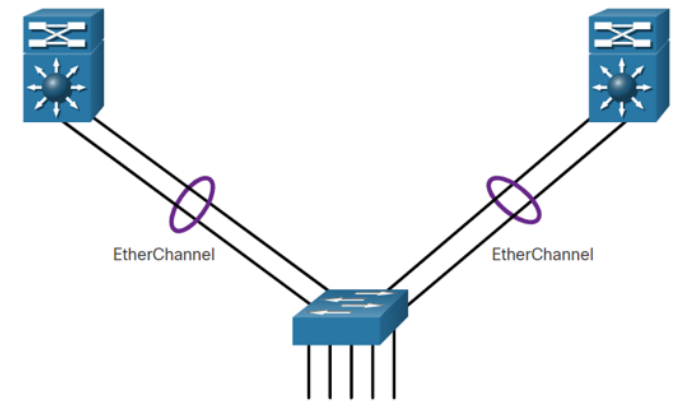
# EtherChannel

# Link Aggregation

**EtherChannel:** Allows you to combine multiple physical interfaces into one logical interface, which increases performance while maintaining redundancy.

- Provides fault-tolerance, load sharing, increase bandwidth and redundancy.
- Also known as **Port Aggregation (PAgP)**, **Link Aggregation (LACP)**, **channel bonding**, or multi-linking.

**Port channel:** Logical interface which operates at the speed of the combined physical interfaces.



# Advantages

- Configuration consistency throughout the links (same config).
- No need to upgrade the link to have more bandwidth.
- Load balancing between links
- Provides redundancy (1 physical link failing does not create a change in topology).

# Restrictions

- Interface types cannot be mixed (FastEthernet ↔ GigabitEthernet).
- Up to 8 Ethernet ports (800 Mbps or 8 Gbps). Cisco 2960 up to 6 EtherChannels
- Individual EtherChannel group member port config must be consistent on both sides (L2 ports, if it's a trunk → same native VLAN)

# AutoNegotiation Protocols

- **Port Aggregation Protocol (PAgP):**
  - Cisco proprietary. PAgP packets sent every 30 seconds.
- **Link Aggregation Control Protocol (LACP)**
  - IEEE specification (802.3ad). Multivendor environments

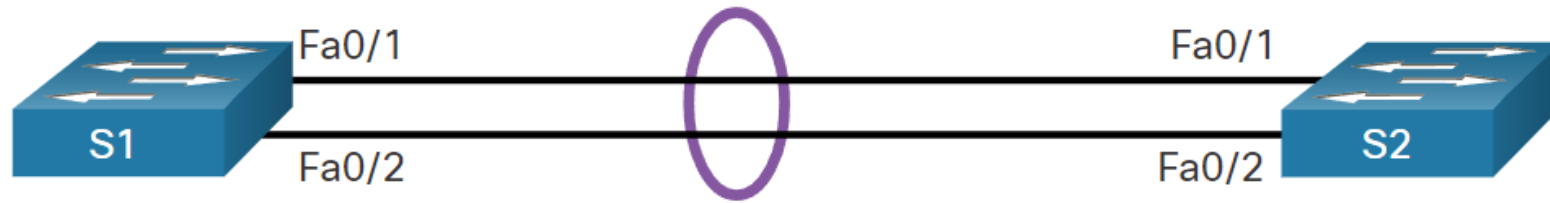
## Configuration Guidelines both ends

- Same EtherChannel support. Same speed and duplex.
- Same VLAN match (all interfaces to same VLAN or as a trunk) and Range of VLANs.

# PAgP # LACP Mode Settings

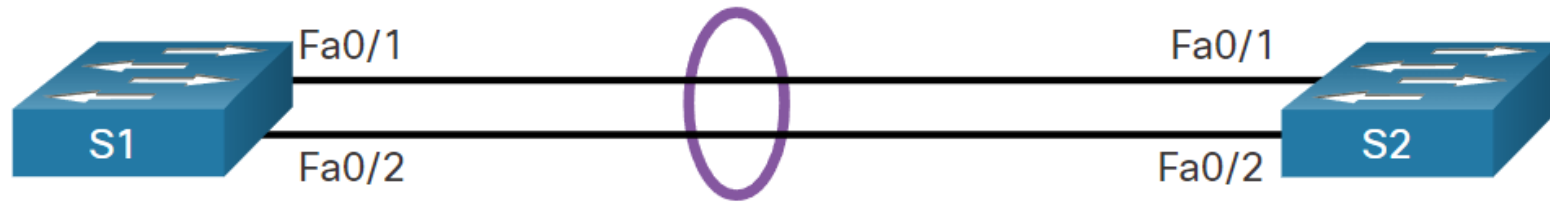
S1	S2	Channel Establishment
On # On	On # On	
On # On	Desirable/Auto # Active/Passive	
Desirable # Active	Desirable # Active	
Desirable # Active	Auto # Passive	
Auto # Passive	Desirable # Active	
Auto # Passive	Auto # Passive	

# LACP Configuration Example



```
S1(config)# interface range f0/1-2
S1(config-if-range)# channel-group 1 mode active
S1(config-if-range)# port-channel interface Port-channel 1
S1(config-if-range)# interface port-channel 1
S1(config-if)# switchport mode trunk
S1(config-if)# switchport trunk allowed vlan 1,2,20
S1(config-if)# end
S1# show interfaces port-channel
S1# show etherchannel summary
S1# show etherchannel port-channel
S1# show interfaces etherchannel
```

# PAgP Configuration Example



```
S1(config)# interface range f0/1-2
S1(config-if-range)# channel-group 1 mode desirable
S1(config-if-range)# port-channel interface Port-channel 1
S1(config-if-range)# interface port-channel 1
S1(config-if)# switchport mode trunk
S1(config-if)# switchport trunk allowed vlan 1,2,20
S1(config-if)# end
S1# show interfaces port-channel
S1# show etherchannel summary
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S1# show interfaces etherchannel
```