



Overview

Tasks

Solutions

Solutions:

Cisco switches support two protocols to form and maintain EtherChannels. PAgP is the Cisco proprietary protocol that is used to aggregate two or more links in a channel in a Cisco-only environment. It has three modes: - Auto - On - Desirable

LACP is an IEEE open standard that can be used between Cisco and non-Cisco devices to bundle multiple interfaces in a channel. It makes use of two mode: - Active - Passive

In this task, we are asked to configure PAgP on the Gig1/0 through Gig1/2 interfaces connecting Sw1 and Sw2. Likewise, LACP must be configured on the connections between Sw1 and Sw3 (Gig3/0 - 3/2). Moreover, we are asked to configure Sw1 to initiate the EtherChannel. So, the "active" state for LACP and the "desirable" state for PAgP must be configured on Sw1.

Initially, view your running-configuration and verify that all interfaces that will be bundled into an Etherchannel share the same configuration. If there are any configuration differences between interfaces those interfaces will not be part of your Etherchannel bundle.

Starting with the PAgP Etherchannel we plan to form between Sw1 and Sw2 we can see that all of the links contain the same configuration:

The three interfaces below on Sw1 are all configured the same, they are ready to be bundled:

```
Sw1#sh run | begin GigabitEthernet1/0
interface GigabitEthernet1/0
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet1/1
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet1/2
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
```

#####

The three interfaces below on Sw2 are all configured the same, they are ready to be bundled:

```
Sw2#show run | begin GigabitEthernet1/0
interface GigabitEthernet1/0
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet1/1
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet1/2
switchport trunk allowed vlan 100,200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
```

And let's perform the same verification on the interfaces connecting Sw1 to Sw3:

The three interfaces below on Sw1 are all configured the same, they are ready to be bundled:

```
Sw1#sh run | begin GigabitEthernet3/0
interface GigabitEthernet3/0
switchport trunk allowed vlan 200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet3/1
switchport trunk allowed vlan 200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
!
interface GigabitEthernet3/2
switchport trunk allowed vlan 200
switchport trunk encapsulation dot1q
switchport mode trunk
negotiation auto
```

#####

Lab Running

TIME RUNNING: 00:02:37

MARK FINISHED ☐

Please keep this window open while you're working on the lab. Labs that don't register activity will be automatically stopped.

Stop lab

Open lab

The three interfaces below on Sw3 are all configured the same, they are ready to be bundled:

```
Sw3#show run | begin GigabitEthernet3/0
interface GigabitEthernet3/0
  switchport trunk allowed vlan 200
  switchport trunk encapsulation dot1q
  switchport mode trunk
  negotiation auto
!
interface GigabitEthernet3/1
  switchport trunk allowed vlan 200
  switchport trunk encapsulation dot1q
  switchport mode trunk
  negotiation auto
!
interface GigabitEthernet3/2
  switchport trunk allowed vlan 200
  switchport trunk encapsulation dot1q
  switchport mode trunk
  negotiation auto
```

Now configure Etherchannel as required by the task:

```
Sw1:
interface range Gig1/0-2
  channel-group 1 mode desirable
!
interface range Gig3/0-2
  channel-group 2 mode active
```

```
Sw2:
interface range Gig1/0-2
  channel-group 1 mode auto
```

```
Sw3:
interface range Gig3/0-2
  channel-group 2 mode passive
```

Note that the numbers after the **channel-group** command are arbitrary. You could have used whatever values you wished.

Verification

The next step is to verify the EtherChannel on all the switches.

```
Sw1#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        N - not in use, no aggregation
       f - failed to allocate aggregator
```

```
       M - not in use, minimum links not met
       m - not in use, port not aggregated due to minimum links not met
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port
```

```
       A - formed by Auto LAG
```

```
Number of channel-groups in use: 2
Number of aggregators:          2
```

Group	Port-channel	Protocol	Ports		
1	Po1(SU)	PAgP	Gi1/0(P)	Gi1/1(P)	Gi1/2(P)
2	Po2(SU)	LACP	Gi3/0(P)	Gi3/1(P)	Gi3/2(P)

After we define the channel-group number, it automatically creates the corresponding port-channel interface, which is indicated as "Po" in the above output. In this particular output, both the Po1 and Po2 are in "SU" state, which indicates that the port channel is Layer 2 and is working correctly. Similarly, we can check the same on Sw2 and Sw3.

```
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        N - not in use, no aggregation
       f - failed to allocate aggregator
```

```
       M - not in use, minimum links not met
       m - not in use, port not aggregated due to minimum links not met
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port
```

```
       A - formed by Auto LAG
```

```
Number of channel-groups in use: 1
Number of aggregators:          1
```

Group	Port-channel	Protocol	Ports		
-----+-----+-----+-----					
1	Po1(SU)	PAgP	Gi1/0(P)	Gi1/1(P)	Gi1/2(P)

#####

```
Sw3#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        N - not in use, no aggregation
       f - failed to allocate aggregator

       M - not in use, minimum links not met
       m - not in use, port not aggregated due to minimum links not met
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port

       A - formed by Auto LAG

Number of channel-groups in use: 2
Number of aggregators:          2
```

Group	Port-channel	Protocol	Ports		
-----+-----+-----+-----					
2	Po2(SU)	LACP	Gi3/0(P)	Gi3/1(P)	Gi3/2(P)