LACP Port Channels/Etherchannels in Cisco

Creating and Managing Link Aggregation

This is a generic cheat sheet and not for a specific use case.

What is EtherChannel?

EtherChannel is Cisco's technology that allows you to bundle multiple physical links between switches into a single logical link. This provides increased bandwidth, redundancy, and load balancing while appearing as a single link to Spanning Tree Protocol.

Benefits of EtherChannel

- **Increased Bandwidth** - Combine multiple links for higher throughput
- **Redundancy** - If one link fails, traffic continues on remaining links
- **Load Balancing** - Traffic distributed across multiple physical links
- **STP Optimization** - Appears as single link to Spanning Tree Protocol
- **No Convergence Delay** - Link failures don't trigger STP recalculation

EtherChannel vs Single Links

Scenario	Single Link	EtherChannel
2 x 1Gbps links	1Gbps usable	2Gbps usable
Link failure	Total outage	Degraded performance
STP behavior	Multiple paths	Single logical path
Load distribution	None	Automatic

EtherChannel Protocols

LACP (Link Aggregation Control Protocol)

- **IEEE 802.3ad standard** (industry standard)
- **Dynamic negotiation** between switches
- **Automatic configuration** and maintenance
- **Better interoperability** between vendors
- **Recommended protocol** for new deployments

PAgP (Port Aggregation Protocol)

- **Cisco proprietary** protocol
- **Dynamic negotiation** between Cisco switches only
- **Legacy protocol** - LACP preferred
- **Limited to Cisco devices**

Static EtherChannel

- **No negotiation protocol** used
- **Manual configuration** on both ends
- **Less flexible** than dynamic protocols
- **Used when protocol negotiation** not desired

LACP Modes

LACP Channel Modes

Mode	Description	Behavior
active	Actively initiates LACP negotiation	Sends LACP packets
passive	Responds to LACP negotiation	Waits for LACP packets
on	Forces channel without LACP	No protocol negotiation

LACP Mode Combinations

Switch A	Switch B	Result
active	**active**	✅ Channel forms
active	**passive**	✅ Channel forms
passive	**passive**	❌ Channel fails
on	**on**	✅ Channel forms (no LACP)
active	**on**	❌ Incompatible

Basic LACP Configuration

Step 1: Create Port-Channel Interface

```
Switch(config)# interface port-channel 1
Switch(config-if)# description Link to Distribution Switch
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan 10,20,30
```

Step 2: Configure Physical Interfaces

```
Switch(config)# interface range gigabit0/1-2
Switch(config-if-range)# description LACP to Distribution Switch
Switch(config-if-range)# switchport mode trunk
Switch(config-if-range)# switchport trunk allowed vlan 10,20,30
Switch(config-if-range)# channel-group 1 mode active
```

Complete Example Configuration

```
! Create Port-Channel interface
interface port-channel 1
 description LACP Bundle to Core Switch
 switchport mode trunk
 switchport trunk allowed vlan 10,20,30,40

! Configure member interfaces
interface range gigabit0/1-4
 description Member of Port-Channel 1
 switchport mode trunk
 switchport trunk allowed vlan 10,20,30,40
 channel-group 1 mode active
```

Verification and Troubleshooting

Essential Show Commands

View EtherChannel Summary

```
Switch# show etherchannel summary
```

Output Example:

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

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------
1      Po1(SU)         LACP      Gi0/1(P)    Gi0/2(P)
```

Detailed EtherChannel Information

```
Switch# show etherchannel 1 detail
Switch# show etherchannel 1 port-channel
```

LACP-Specific Information

```
Switch# show lacp neighbor
Switch# show lacp 1 neighbor detail
Switch# show lacp 1 counters
```

Interface Status

```
Switch# show interfaces port-channel 1
Switch# show interfaces gigabit0/1 etherchannel
```

Port-Channel Flags

Flag	Meaning
S	Layer 2 (switched)
R	Layer 3 (routed)
U	In use (up)
D	Down
P	Bundled in port-channel
I	Stand-alone (individual)
H	Hot-standby
s	Suspended

Port Flags in EtherChannel

Flag	Meaning
P	Port is bundled and active
I	Port is individual (not bundled)
s	Port is suspended
H	Port is in hot-standby
D	Port is down

EtherChannel Requirements

Configuration Requirements

✅ **All ports must have identical configuration:**

- Same VLAN configuration
- Same trunk/access mode

- Same speed and duplex
- Same spanning-tree settings

✅ **Physical requirements:**

- Same media type
- Same cable length (within reason)
- Connected to same pair of switches

Common Configuration Mismatches

❌ **VLAN mismatch** - Different allowed VLANs ❌ **Mode mismatch** - Trunk vs Access mode ❌ **Speed/Duplex mismatch** - Different interface settings ❌ **STP mismatch** - Different spanning-tree configurations

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Remember: All member interfaces in an EtherChannel must have identical configurations. Use LACP (active mode) for best interoperability and automatic negotiation. Always verify your EtherChannel status after configuration!

This document is part of the Cisco networking training materials by Dan Mill Training.