



2.3. Configure and verify Layer 2 discovery protocols (Cisco Discovery Protocol and LLDP)

&

2.4. Configure and verify (Layer 2/Layer3) EtherChannel (LACP) (Troubleshooting)

Objective:

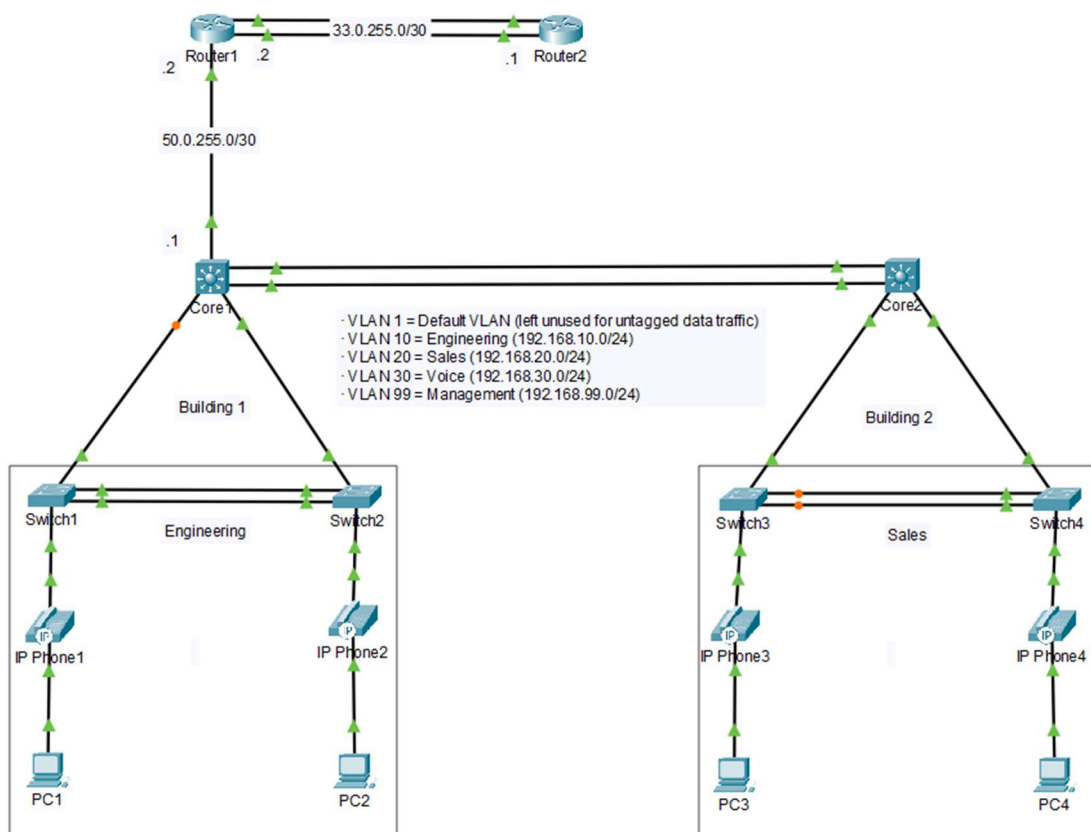
Use 'show' commands to verify EtherChannel, CDP, & LLDP configurations between network devices.

Topology

- **Topology not provided in this lab as it will give away some of the answers regarding interfaces 😊.**

VLAN Assignment

- **VLAN 1** = Default VLAN (left unused)
- **VLAN 10** = **Engineering** (192.168.10.0/24)
- **VLAN 20** = **Sales** (192.168.20.0/24)
- **VLAN 30** = **Voice** (192.168.30.0/24)
- **VLAN 99** = **Management** (192.168.99.0/24) (Native VLAN/Management)



NOTE: Becoming proficient with show commands is critical for real-world troubleshooting. In production environments, you often can't reconfigure devices right away, you first need to see what's happening. Show commands quickly reveal whether links are up, interfaces are bundled correctly, and devices are exchanging information. Mastering these commands saves time, reduces downtime, and helps pinpoint problems with accuracy.

This is an unofficial practice lab. Not affiliated with Cisco Systems, Inc.

Lab Tasks

Identify connectivity issues problems and apply fixes.

- Use show commands, to Identify which physical interfaces are participating in ALL channel-groups
- Use show commands, to verify the speed and duplex between channel-groups on Core1 and Core2
- Using show commands, record which devices (neighbors) are visible from Switch1, Switch2, Switch3, and Switch4
- Using show commands, validate which devices are using CDP or LLDP or both

ANSWERS BEYOND THIS POINT.
LET'S SEE HOW YOU DID!.....

Solution Key

1. Verify EtherChannel's

- Router1# show running-config

```
!
!
interface Loopback2
 ip address 2.2.2.2 255.255.255.255
!
interface Port-channel1
 ip address 33.0.255.1 255.255.255.252
!
interface GigabitEthernet0/0/0
 no ip address
 channel-group 1 mode on
 duplex auto
 speed auto
!
interface GigabitEthernet0/0/1
 no ip address
 channel-group 1 mode on
 duplex auto
 speed auto
!
interface GigabitEthernet0/0/2
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
!
```

On L2 & L3 switches, you can use the command used on Router1 or the following command:

- Core1# show etherchannel summary

```
Core1#show etherchannel sum
Core1#show etherchannel summary
Flags:  D - down          P - 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
        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(SD)          LACP        Fa0/1(I) Fa0/2(I)
Core1#
```

2. Verify Speed & Duplex on Core1 & Core2 Etherchannel.

Core1> enable

Core1# configure terminal

Core1# show interface port-channel 1

- Do the same on Core2

```
Core1#show interfaces port-channel 1
Port-channell1 is down, line protocol is down (disabled)
Hardware is EtherChannel, address is 0001.c98d.b684 (bia 0001.c98d.b684)
MTU 1500 bytes, BW 200000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Half-duplex, 200Mb/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
```

EtherChannel treats multiple physical links as one logical interface. For the bundle to work correctly, all member links must operate under the same conditions. If the speed or duplex settings differ, the switch cannot balance traffic consistently across the links. This mismatch can lead to dropped packets, erratic load balancing, or even cause the channel to fail to form. Ensuring identical speed and duplex on all interfaces guarantees stability and predictable performance of the EtherChannel.

3. Verify Switch Neighbors.

Switch1> enable

Switch1# show lldp neighbors

Switch1# show cdp neighbors

- Do the same on Switch2, Switch3, and Switch4

```
Switch1#show lldp neighbors
Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Device ID      Local Intf    Hold-time    Capability    Port ID
Core1          Fa0/22        120          R             Fa0/21

Total entries displayed: 1
Switch1#show cdp neighbors
Capability Codes: K - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID      Local Intrfce Holdtime     Capability    Platform    Port ID
Core1          Fas 0/22      136          S             3560         Fas 0/21
Switch1#
```

4. Validate whether LLDP and/or CDP are enabled

Router2> enable

Router2# show cdp

Router2# show lldp

```
Router2#show lldp
% LLDP is not enabled
Router2#show cdp
% CDP is not enabled
Router2#
```

- If enabled, you will not receive the message above