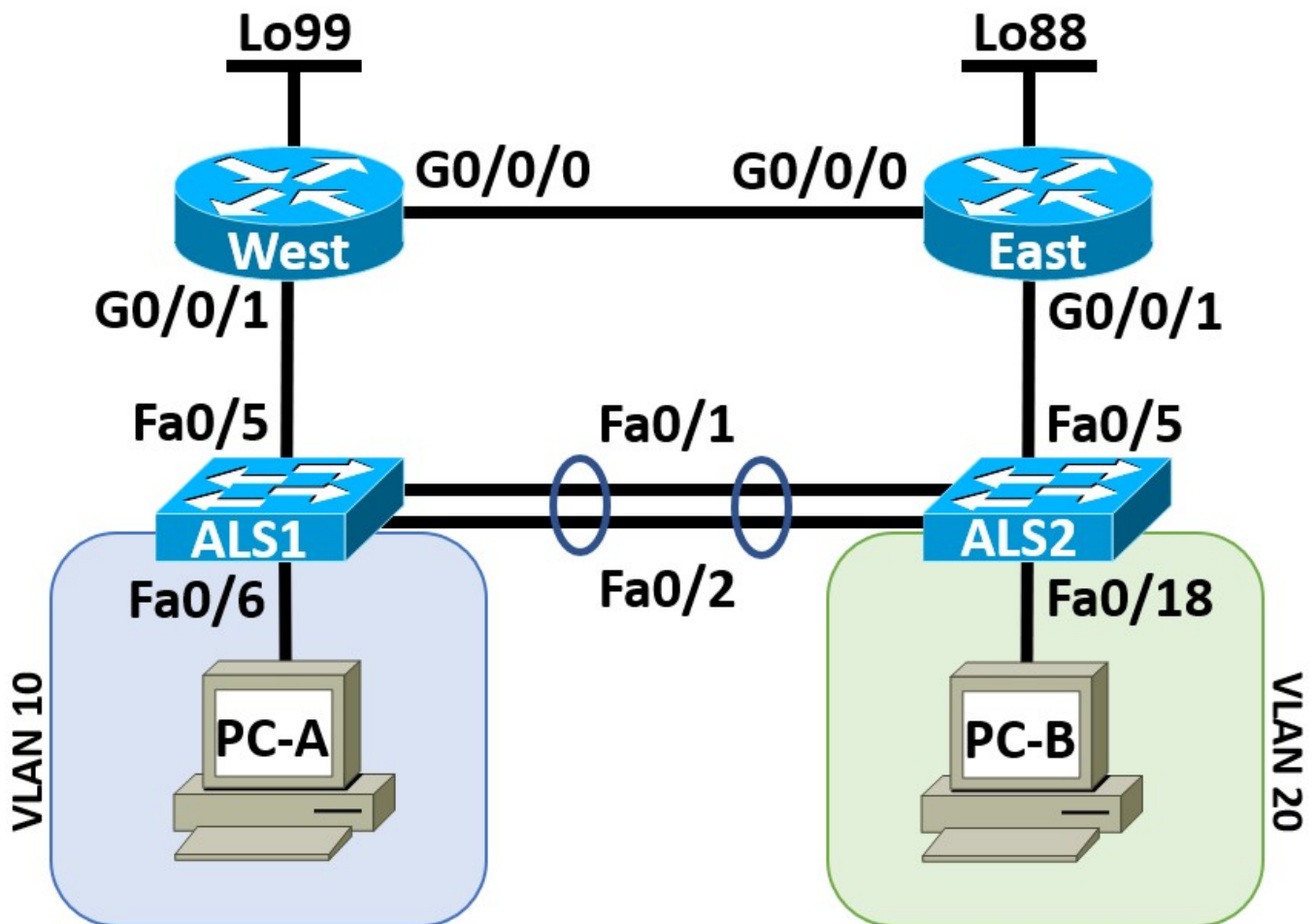


CCNA: Routing & Switching Essentials

Troubleshooting (Layer 3) – [NETLAB Edition](#)

Topology Diagram



These labs were created with Cisco 4300 series routers using IOS XE 16 and Cisco 2960 series switches. If you use any other device, you may need to adjust the broken configurations accordingly prior to beginning the lab.

Note: Make sure that the routers and switches have been erased and have no startup configurations before adding the broken configurations. All usernames (if any) are “**admin**”, all passwords (if any) are “**cisco**”.

IP Addressing Table

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local	Default Gateway
West	Lo99	9.3.3.1 /29	2001:DB8:DEAD::99/64	FE80::1	N/A
	G0/0/0	10.100.5.2 /30			
	G0/0/1.10				
	G0/0/1.20	10.20.20.1 /27			
	G0/0/1.30				
	G0/0/1.40		2001:DB8:ACAD:D100::1/64		
	G0/0/1.50				
East	Lo88	8.8.8.8 /25	2001:DB8:FACE::88/64	FE80::3	N/A
	G0/0/0		2001:DB8:FADE:1::1/64		
	G0/0/1.10		2001:DB8:ACAD:A100::3/64		
	G0/0/1.20				
	G0/0/1.30	10.30.30.3 /24			
	G0/0/1.40				
	G0/0/1.50				
ALS1	VLAN 40	10.40.40.10 (DHCP)	N/A	N/A	10.50.50.2
	VLAN 50	10.50.50.50 /25			
ALS2	VLAN 30	10.30.30.10 (DHCP)	N/A	N/A	10.50.50.2
	VLAN 50	10.50.50.100 /25			
PC-A	NIC	10.10.10.10 (DHCP)	2001:DB8:ACAD:A100::X		10.10.10.2 FE80::1
PC-B	NIC	10.20.20.10 (DHCP)	2001:DB8:ACAD:B100::X		10.20.20.2 FE80::1

Part 1: Basic Understanding of the Topology

- East and West should be configured for HSRP (IPv4). VLANs 10, 30, & 50 traffic should go West. VLANs 20 & 40 should go East.
- West will be the DHCPv4 server for VLANs 10 & 30 and East will serve for VLANs 20 & 40. For IPv6, VLAN 10 will get their address from West, VLAN 20 will get theirs from East.

VLAN	VLAN Name
10	Square
20	Circle
30	Triangle
40	Cross
50	MGMT&NATIVE
99	Blackhole

Part 2: Verify Network Connectivity

Step 1: Verify end-to-end connectivity.

- a. Take corrective action if results are other than expected.

From	Protocol	To	Expected Results	Success?	
PC-A	ping (IPv4 & IPv6)	PC-B	Ping should be successful.		
PC-A	ping (IPv4 & IPv6)	Loopback 88	Pings should be successful.		
PC-A	ping (IPv4 & IPv6)	Loopback 99	Pings should be successful.		
PC-B	ping (IPv4 & IPv6)	Loopback 88	Pings should be successful.		
PC-B	ping (IPv4 & IPv6)	Loopback 99	Pings should be successful.		
PC-A	ping (IPv4)	ALS1 VLAN 50	Ping should be successful.		
PC-A	ping (IPv4)	ALS2 VLAN 50	Ping should be successful.		
PC-A	ping (IPv4)	10.30.30.10	Ping should be successful.		
PC-A	ping (IPv4)	10.40.40.10	Ping should be successful.		

Note: It may be necessary to disable the PC firewall for pings to be successful

Step 2: Verify redundancy by simulating Internet failure.

- a. Take corrective action if results are other than expected.

From	Command	To	Expected Results	Success?
PC-A	tracert (IPv4)	Loopback 88	Trace should route through West.	
PC-B	tracert (IPv4)	Loopback 88	Trace should go direct to Lo88.	
PC-A	tracert (IPv4)	Loopback 99	Trace should go direct to Lo99.	
PC-B	tracert (IPv4)	Loopback 99	Trace should route through East.	

- b. Issue the **shutdown** command on East's & West's G0/0/0 (you must do both).

From	Command	To	Expected Results	Success?
PC-A	tracert (IPv4)	Loopback 88	Trace should route through West.	
PC-B	tracert (IPv4)	Loopback 88	Trace should go direct to Lo88.	
PC-A	tracert (IPv4)	Loopback 99	Trace should go direct to Lo99.	
PC-B	tracert (IPv4)	Loopback 99	Trace should route through East.	

- c. Issue the **no shutdown** command on East's & West's G0/0/0.

Step 3: Verify redundancy by simulating a default-gateway failure.

- a. Take corrective action if results are other than expected.
- b. Issue the **shutdown** command on West's G0/0/1.

From	Command	To	Expected Results	Success?
PC-A	tracert (IPv4)	Loopback 88	Trace should go direct to Lo88.	
PC-B	tracert (IPv4)	Loopback 88	Trace should go direct to Lo88.	
PC-A	tracert (IPv4)	Loopback 99	Trace should route through East.	
PC-B	tracert (IPv4)	Loopback 99	Trace should route through East.	

- c. Issue the **no shutdown** command on West's G0/0/1.
- d. Issue the **shutdown** command on East's G0/0/1.

From	Command	To	Expected Results	Success?
PC-A	tracert (IPv4)	Loopback 88	Trace should route through West.	
PC-B	tracert (IPv4)	Loopback 88	Trace should route through West.	
PC-A	tracert (IPv4)	Loopback 99	Trace should go direct to Lo99.	
PC-B	tracert (IPv4)	Loopback 99	Trace should go direct to Lo99.	

- e. Issue the **no shutdown** command on East's G0/0/1.
- f. Verify that the preferred settings are currently set.

From	Command	To	Expected Results	Success?
PC-A	tracert (IPv4)	Loopback 88	Trace should route through West.	
PC-B	tracert (IPv4)	Loopback 88	Trace should go direct to Lo88.	
PC-A	tracert (IPv4)	Loopback 99	Trace should go direct to Lo99.	
PC-B	tracert (IPv4)	Loopback 99	Trace should route through East.	

Part 3: Documentation

- a. This page of the lab needs to be turned in for the lab to be considered complete.

NAME #1	NAME #2	Reservation ID#	Date Completed

Step 1: Document the problems in the lab

- a. Please list the device, the technology (protocol) related to the issue in addition to any steps taken to resolve the issue itself.

No.	Device	Issue and Solution
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		