

Packet Tracer Lab 21 Solution Guide

Critical Link Down Investigation

Incident ID: INC-1021

Objective

This lab focuses on identifying and restoring WAN connectivity following scheduled maintenance.

Although the local Branch B network remains fully operational, communication with Headquarters and the remainder of the enterprise has been disrupted.

The objective is to troubleshoot the issue using a structured methodology, identify the root cause, restore WAN connectivity, and validate successful enterprise communication.

Root Cause

The WAN interface connecting Headquarters to Branch B (**Serial0/0/1 on R-HQ**) was placed into an administratively down state during scheduled maintenance.

As a result:

- Branch B lost its OSPF neighbor relationship with Headquarters.
- Dynamic routes to remote networks were removed.
- Headquarters services became unreachable.
- Communication with Branch A and Branch C was interrupted.

Symptoms Observed

- Branch B local network functioning normally.
- Default gateway reachable.
- Local workstation communication operational.
- Headquarters resources unreachable.

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- Branch-to-branch communication unavailable.
- WAN interface administratively down.
- OSPF neighbor lost.

Troubleshooting Process

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Step 1 — Verify Local Connectivity

From a Branch B workstation:

ping 192.168.60.1

Should succeed.

This confirms:

- Layer 2 connectivity
- Local routing
- Default gateway availability

Step 2 — Test Enterprise Connectivity

Attempt:

ping 192.168.10.10

Should fail.

Also test:

ping 192.168.40.10

Should fail.

Step 3 — Verify Interface Status

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On R-BRANCH-B:

show ip interface brief

Students observe that the WAN connection is down.

Step 4 — Verify OSPF

show ip ospf neighbor

Students discover the Headquarters neighbor is no longer established.

Step 5 — Verify Routing

show ip route

Remote enterprise routes are no longer present.

Commands Used

ping

show ip interface brief

show ip ospf neighbor

show ip route

show running-config

Resolution

Resolution

On R-HQ:

conf t

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interface serial0/0/1

no shutdown

end

write memory

Wait for OSPF to re-establish the neighbor relationship.

Validation

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Successful resolution should include:

- Successful ping to Headquarters.
- Successful ping to the DNS Server (**192.168.40.10**).
- Successful ping to the File Server (**192.168.40.20**).
- Successful communication with Branch A.
- Successful communication with Branch C.
- OSPF neighbor relationship restored.
- WAN interface operational.

Key Takeaways

- WAN failures can isolate an entire regional office while local services continue functioning.
- Always verify local connectivity before assuming a complete network outage.
- Interface status should be verified early in the troubleshooting process.
- OSPF neighbor relationships provide valuable insight into WAN health.
- Dynamic routing depends on stable physical connectivity.

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- Follow a structured troubleshooting methodology and validate service restoration after repairs.