

Packet Tracer Lab 19 Solution Guide

OSPF Neighbor Failure

Incident ID: INC-1019

Objective

This lab focuses on identifying and resolving an OSPF routing failure that prevents communication between headquarters and a branch office following scheduled routing maintenance.

Although local network communication remains operational at both sites, routing information is no longer being exchanged dynamically between the routers.

The objective is to troubleshoot the issue using a structured methodology, identify the root cause, restore OSPF neighbor relationships, and validate successful end-to-end communication.

Root Cause

During scheduled overnight routing maintenance, the Branch Router was incorrectly configured to advertise its WAN interface within **OSPF Area 1** instead of **Area 0**.

Instead of the correct configuration:

network 10.10.3.0 0.0.0.3 area 0

the router was configured with:

network 10.10.3.0 0.0.0.3 area 1

Because OSPF neighbors must share the same area on a common network segment, the adjacency between **R-WAN-HQ** and **R-BRANCH** failed to establish.

As a result:

- Branch routes were no longer exchanged.
- Headquarters could not reach the branch network.
- Branch users could not reach headquarters resources.
- Physical interfaces remained operational.

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Symptoms Observed

- Local network communication functioning normally.
- Default gateways reachable.
- WAN interfaces operational.
- Headquarters unable to reach branch resources.
- Branch unable to reach headquarters resources.
- OSPF neighbor relationship missing.
- Branch network absent from routing tables.

Troubleshooting Process

Troubleshooting Process

Step 1 — Verify Local Connectivity

From HR-PC1:

```
ping 192.168.50.10
```

This should succeed.

This confirms:

- Local routing is operational.
- VLAN routing is functioning correctly.

Step 2 — Test Branch Connectivity

```
ping 192.168.60.10
```

This should fail.

This indicates the issue affects communication between sites.

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Step 3 — Perform a Traceroute

tracert 192.168.60.10

Traffic should stop at the headquarters router rather than reaching the branch office.

This indicates routing beyond headquarters is unavailable.

Step 4 — Verify OSPF Neighbors

Access R-WAN-HQ.

Run:

show ip ospf neighbor

Observe that the Branch Router neighbor is no longer present.

Then verify on R-BRANCH.

show ip ospf neighbor

No OSPF neighbors should be established.

This is the primary indicator that the routing protocol itself is failing.

Step 5 — Verify the Routing Table

Run:

show ip route

Notice that the branch network:

192.168.60.0/24

is missing from the routing table.

This confirms the route is not being learned dynamically.

Step 6 — Review OSPF Configuration

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Review the OSPF configuration.

Example commands:

```
show running-config
```

or

```
show ip ospf interface serial0/0/0
```

Compare the configured OSPF area with the expected backbone area.

The serial interface should not be participating in:

Area 1

This is the primary indicator of the issue.

Commands Used

```
ping
```

```
tracert
```

```
show ip interface brief
```

```
show ip ospf neighbor
```

```
show ip route
```

```
show running-config
```

```
show ip ospf interface serial0/0/0
```

```
configure terminal
```

```
router ospf 1
```

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Resolution

Access **R-BRANCH** and correct the OSPF area assignment.

conf t

router ospf 1

no network 10.10.3.0 0.0.0.3 area 1

network 10.10.3.0 0.0.0.3 area 0

end

write memory

Validation

Successful resolution should include:

- OSPF neighbor relationship restored.
- Branch network present in the routing table.
- Successful ping from HR-PC1 to Branch-PC1.
- Successful ping from Branch-PC1 to the Application Server.
- Successful traceroute to the branch office.
- End-to-end communication restored.

Key Takeaways

- OSPF neighbors must belong to the same area on a shared network segment.
- Physical connectivity does not guarantee routing functionality.
- Missing routes often indicate a routing protocol issue rather than a physical failure.
- Always verify OSPF neighbor relationships before assuming a routing-table problem.

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- Small configuration errors introduced during maintenance can create organization-wide outages.
- Validate routing tables and connectivity after restoring OSPF adjacencies.
- Follow a structured troubleshooting methodology instead of making configuration changes based on assumptions.