

Packet Tracer Lab 19

Branch Office Connectivity Incident Investigation

Incident ID: INC-1019

Difficulty

Advanced

Estimated Time

30–45 Minutes

Skills Covered

- OSPF Troubleshooting
- Dynamic Routing Verification
- WAN Connectivity Validation
- OSPF Neighbor Relationships
- Routing Table Analysis
- Traceroute Analysis
- Structured Troubleshooting Methodology
- Enterprise Routing Operations

Scenario

Following scheduled overnight routing maintenance, employees at the branch office have reported they are unable to access internal corporate resources hosted at headquarters.

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Branch users can successfully communicate with devices located on their local network, including their default gateway, but all attempts to access headquarters systems—including the BridgeOpsOne Application Server—are unsuccessful.

Headquarters personnel have also reported they are unable to communicate with systems located at the branch office.

Initial infrastructure monitoring indicates that WAN interfaces remain operational and no physical link failures have been detected.

You have been assigned as the network engineer responsible for identifying the issue, restoring communication between headquarters and the branch office, and validating that normal operations have been restored.

Customer Report

Reported By: Branch Operations Manager

Users Affected: All Branch Office Users

Business Impact:

Branch users cannot access headquarters resources including:

- BridgeOpsOne Application Server
- Internal business applications
- Shared corporate resources

Headquarters personnel are also unable to communicate with branch office devices.

Issue Started:

Shortly after scheduled overnight routing maintenance.

Priority: High

Goal

- Identify the cause of the routing failure.
- Restore communication between headquarters and the branch office.

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- Validate end-to-end connectivity.
- Verify routing between both sites.
- Document your findings.

Environment

The lab environment includes:

- Headquarters Core Switch
- Distribution Switch
- Edge Router
- WAN Router
- Branch Router
- Branch Switch
- HR Workstation
- Finance Workstation
- Engineering Workstation
- Branch Workstations
- Internal Application Server
- OSPF Area 0 Routing

Known Variables

- HR-PC1: **192.168.10.10/24**, Default Gateway: **192.168.10.1**
- SERVER01: **192.168.50.10/24**, Default Gateway: **192.168.50.1**
- BRANCH-PC1: **192.168.60.10/24**, Default Gateway: **192.168.60.1**
- BRANCH-PC2: **192.168.60.11/24**, Default Gateway: **192.168.60.1**
- The transit network between **R-EDGE** and **R-WAN-HQ** is **10.10.2.0/30**.

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- The WAN transit network between **R-WAN-HQ** and **R-BRANCH** is **10.10.3.0/30**.
- Local network connectivity remains operational at both headquarters and the branch office.
- Headquarters users can successfully access local corporate resources, including **SERVER01**.
- WAN interfaces remain operational and no physical link failures have been reported.
- Communication between headquarters and the branch office is unavailable.
- Recent routing maintenance was completed overnight.
- Follow a structured troubleshooting methodology before making configuration changes.

Troubleshooting Mindset

During troubleshooting, think through the following questions:

- Is the issue isolated to the branch office?
- Are all router interfaces operational?
- Are routing neighbors being established correctly?
- Is the branch network being learned dynamically?
- Where does communication stop?
- Have recent routing configuration changes impacted connectivity?

Focus on validating each layer of connectivity before assuming the root cause.

Expected Outcome

By the end of this lab, users should successfully restore communication between headquarters and the branch office.

Users should also be able to explain the troubleshooting methodology used to identify and resolve the routing issue.

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Optional BridgeOpsOne Workflow

This section is optional but recommended for users who want a more realistic operations-center experience.

1. Create an Initial Update

Create a customer-safe incident update describing:

- Branch office connectivity loss
 - Headquarters communication failure
 - Investigation underway
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2. Save Timeline Updates

Provide 2–3 operational updates describing:

- Investigation progress
- Validation performed
- Routing observations

Save each update to your Command Center timeline.

3. Create a Final Resolution Statement

Summarize:

- Root cause
- Corrective actions
- Current routing status
- Validation completed

Real-World Relevance

This issue simulates realistic troubleshooting commonly encountered in:

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- Network Operations Centers (NOC)
- Enterprise Routing Operations
- MSP Network Support
- Enterprise IT
- Network Engineering

The purpose of this lab is to develop:

- Dynamic routing troubleshooting skills
- OSPF operational validation
- Structured troubleshooting methodology
- Enterprise routing analysis
- Operational communication

Deliverables

At the conclusion of this lab, users should be able to:

- Explain the issue.
- Describe the troubleshooting methodology.
- Restore communication between headquarters and the branch office.
- Demonstrate successful end-to-end connectivity.
- Validate routing functionality.
- Communicate findings clearly.

Hints

If you become stuck during troubleshooting, consider the following:

- Verify local connectivity before assuming a WAN outage.
- Confirm router interfaces are operational.

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- Compare successful local communication with failed remote communication.
- Verify OSPF neighbor relationships.
- Review the routing table carefully.
- Determine whether the branch network is present in the routing table.
- Follow a structured troubleshooting process instead of making configuration changes immediately.