

Packet Tracer Lab 16

External Service Connectivity Investigation

Incident ID: INC-1016

Difficulty

Intermediate

Estimated Time

20–40 Minutes

Skills Covered

- NAT/PAT Troubleshooting
- External Connectivity Testing
- DNS Validation
- Router Edge Troubleshooting
- Static Route Verification
- NAT Translation Table Analysis
- Structured Troubleshooting Methodology
- Operational Validation

Scenario

Following scheduled maintenance performed earlier in the day, users at the corporate office have reported that external services are unavailable.

Employees are still able to access internal resources, including internal DNS and application services. However, attempts to reach the company's public website are failing.

Initial reports indicate that internal systems remain operational, but communication to external/public resources is not functioning as expected.

You have been assigned to investigate the issue, identify the cause of the external connectivity problem, restore service, and validate that users can reach external resources again.

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Customer Report

Reported By: Corporate Operations Team

Users Affected: Corporate office users

Business Impact: Users cannot access external/public web services. Internal resources remain available.

Issue Started: Shortly after scheduled network maintenance.

Priority: High

Goal

- Identify the cause of the external connectivity issue.
- Restore access to public/external services.
- Validate internal resources remain accessible.
- Confirm DNS resolution and external connectivity.
- Document your findings.

Environment

The lab environment includes:

- Corporate User VLAN
- Internal Server VLAN
- Core Switch
- Main Router
- Edge Router
- ISP Router
- Public Web Server
- Internal DNS/Application Server
- Corporate Workstations

Known Variables

- Corporate users should be able to access internal resources.
- Internal DNS should remain reachable.
- The public website should resolve to a public IP address.
- The issue affects external/public connectivity.
- Internal routing should be validated before making changes.
- Follow a structured troubleshooting methodology before making configuration changes.

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Troubleshooting Mindset

During troubleshooting, think through the following questions:

- Are users receiving valid IP configuration?
- Can users reach their default gateway?
- Can users reach internal servers?
- Is DNS resolution working?
- Can users reach the public web server by IP address?
- Where does traffic stop?
- Is the edge router correctly translating internal traffic?
- Has a recent infrastructure change impacted outbound traffic?

Expected Outcome

By the end of this lab, users should successfully regain access to external/public services.

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

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 update describing:

- Users reporting external service access issues
- Internal resources remaining available
- Investigation underway

2. Save Timeline Updates

Provide 2–3 operational updates describing:

- Investigation progress
- Validation performed
- What has been ruled out
- Progress toward resolution

Add updates to your Command Center timeline.

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3. Create a Final Resolution Statement

Summarize:

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

Real-World Relevance

This issue simulates realistic troubleshooting commonly encountered in:

- Network Operations Centers (NOC)
- Enterprise IT
- MSP Support
- Junior Network Engineer Roles
- Security Operations
- Edge Network Support

The purpose of this lab is to develop:

- NAT troubleshooting skills
- Layer 3 validation
- External connectivity troubleshooting
- Structured operational thinking
- Infrastructure validation
- Operational communication

Deliverables

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

- Explain the issue.
- Describe the troubleshooting methodology.
- Restore external service connectivity.
- Validate internal and external communication.
- Demonstrate successful access to public resources.
- Communicate findings clearly.

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Hints

If you become stuck during troubleshooting, consider the following:

- Verify internal connectivity before assuming a full network outage.
- Test both DNS name resolution and direct IP connectivity.
- Compare internal resource access with external resource access.
- Verify the edge router configuration.
- Review NAT translations and NAT statistics.
- Confirm traffic is being translated before leaving the internal network.
- Follow a structured troubleshooting methodology instead of guessing.