

Packet Tracer Lab 9 Solution Guide

VoIP Outage Investigation

Incident ID: INC-1009

Objective

This lab focuses on identifying and restoring voice services following scheduled maintenance.

Although user workstations remain fully operational, Cisco IP phones across the organization are unable to complete registration and voice communications have been disrupted.

The objective is to troubleshoot the issue using a structured methodology, identify the root cause, restore voice connectivity, and validate successful phone registration.

Root Cause

The Voice VLAN gateway interface (**FastEthernet0/0.150**) on **R1** was placed into an **administratively down** state during scheduled maintenance.

As a result:

- Cisco IP phones could not communicate with Cisco Call Manager Express (CME).
- Voice registration failed.
- Company-wide phone service became unavailable.

Symptoms Observed

- Workstations operating normally.
- DHCP functioning for user PCs.
- Internal network connectivity operational.
- Cisco IP phones powered on.
- Phones unable to complete startup.

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- Internal voice communication unavailable.

Troubleshooting Process

Step 1 — Verify Workstation Connectivity

From a workstation:

```
ipconfig
```

Verify:

- Valid IP address
- Valid subnet mask
- Valid default gateway

This confirms data networking is functioning.

Step 2 — Verify Network Connectivity

Ping the default gateway.

Example:

```
ping 192.168.10.1
```

This should succeed.

Step 3 — Compare Voice vs Data

Observe:

- PCs functioning normally.
- Phones unavailable.

This indicates the issue is isolated to voice services rather than the entire network.

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Step 4 — Verify Voice Gateway Connectivity

Example:

Attempt to verify connectivity to the Voice VLAN gateway.

Review the status of the Voice VLAN interface on R1.

Example command:

```
show ip interface brief
```

Users should identify that FastEthernet0/0.150 is administratively down.

This confirms the issue is isolated to the Voice VLAN gateway.

Step 5 — Verify Voice Gateway

Access R1.

Review interface status.

Example:

```
show ip interface brief
```

Identify:

FastEthernet0/0.150

Administratively Down

This is the primary indicator of the issue.

Commands Used

```
ipconfig
```

```
ping
```

```
show ip interface brief
```

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```
show running-config
```

```
configure terminal
```

```
interface FastEthernet0/0.150
```

```
no shutdown
```

```
write memory
```

Resolution

Restore the Voice VLAN gateway interface.

R1:

```
conf t
```

```
interface FastEthernet0/0.150
```

```
no shutdown
```

```
end
```

```
write memory
```

Validation

Successful resolution should include:

- Cisco IP phones successfully register.
- Extension numbers appear.

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- Phones successfully place calls.
- Workstations remain operational.
- Voice services restored across all departments.
- Successful phone-to-phone calls between departments.
- Voice gateway interface operational.

Key Takeaways

- Voice services rely on underlying network infrastructure.
- A data network can remain fully operational while voice services fail.
- Compare working and non-working services before making assumptions.
- Verify gateway availability during VoIP troubleshooting.
- Follow a structured troubleshooting methodology.
- Validate service restoration after completing repairs.