

Packet Tracer Lab 10

Cisco IP Phone Registration Failure Investigation

Incident ID: INC-1010

Difficulty

Intermediate

Estimated Time

20–40 Minutes

Skills Covered

- DHCP Troubleshooting
- DHCP Option 150 Validation
- Cisco IP Phone Registration
- Cisco Call Manager Express (CME)
- Voice Infrastructure Troubleshooting
- Structured Troubleshooting Methodology
- Operational Validation
- TFTP Discovery

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Scenario

Following scheduled maintenance performed on the company's voice infrastructure, employees throughout the organization have reported that all Cisco IP phones are unavailable.

Users report that workstations continue functioning normally and network resources remain accessible. However, Cisco IP phones are unable to successfully register with the Cisco Call Manager Express (CME) system, preventing employees from placing or receiving internal phone calls.

You have been assigned to investigate the issue, restore phone registration, and validate that voice communications have been fully restored.

Customer Report

Reported By: Operations Department

Users Affected: All Cisco IP Phone users

Business Impact: Employees are unable to place or receive internal phone calls because Cisco IP phones are not registering with the voice system.

Issue Started: Shortly after scheduled maintenance to the voice infrastructure.

Priority: High

Goal

- Identify why Cisco IP phones are failing to register.
- Restore successful Cisco IP phone registration.
- Validate successful phone-to-phone communication.
- Document your findings.

Environment

The lab environment includes:

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- Cisco 2811 Router (CME)
- Core Switch
- Three Access Switches
- HR Department
- Sales Department
- IT Department
- Cisco IP Phones
- Department Workstations
- Voice VLAN
- DHCP Services
- Voice DHCP Pool

Known Variables

- User workstations continue functioning normally.
- PCs should successfully obtain DHCP addresses.
- Users can still access internal network resources.
- The issue affects Cisco IP phone registration only.
- Cisco IP phones remain powered on.
- Cisco Call Manager Express (CME) is operational.
- Follow a structured troubleshooting methodology before making configuration changes.

Troubleshooting Mindset

During troubleshooting, think through the following questions:

- Are workstations functioning normally?
- Are Cisco IP phones receiving power?

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- Are phones receiving network connectivity?
- How do Cisco IP phones locate the Cisco Call Manager Express (CME) server?
- Has a recent DHCP configuration change affected voice services?
- Compare working data services with failed voice services.

Focus on identifying where phone registration stops instead of immediately assuming the root cause.

Expected Outcome

By the end of this lab, users should successfully restore Cisco IP phone registration and validate that voice communications have been fully restored.

Users should also be able to explain how DHCP Option 150 is used during Cisco IP phone registration.

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:

- Company-wide phone registration failure
 - Voice services unavailable
 - Investigation underway
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2. Save Timeline Updates

Provide 2–3 operational updates describing:

- Investigation progress
- Validation performed

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- Findings

Add updates to your Command Center timeline.

3. Create a Final Resolution Statement

Summarize:

- Root cause
- Corrective actions
- Current voice environment status
- Validation completed

Real-World Relevance

This issue simulates realistic troubleshooting commonly encountered in:

- Network Operations Centers (NOC)
- Voice Infrastructure Support
- Enterprise IT
- Unified Communications Support
- Network Engineering

The purpose of this lab is to develop:

- Voice troubleshooting skills
- DHCP troubleshooting
- Cisco IP phone registration knowledge
- Structured operational thinking
- Infrastructure validation
- Operational communication

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Deliverables

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

- Explain the issue.
- Describe the troubleshooting methodology.
- Restore Cisco IP phone registration.
- Validate successful phone registration.
- Demonstrate successful phone-to-phone calls.
- Communicate findings clearly.

Hints

If you become stuck during troubleshooting, consider the following:

- Verify workstation connectivity before assuming a complete network outage.
- Compare workstation functionality with Cisco IP phone functionality.
- Verify phones are receiving network connectivity.
- Compare the Voice DHCP configuration with the expected Cisco Call Manager Express (CME) server address.
- Consider how Cisco IP phones locate the Cisco Call Manager Express (CME) server.
- Use:

`show ephone`

`show running-config`

`show ip dhcp pool`

- Follow a structured troubleshooting methodology instead of guessing.