

Packet Tracer Lab 10 Solution Guide

Cisco IP Phone Registration Failure

Incident ID: INC-1010

Objective

This lab focuses on identifying and restoring Cisco IP phone registration after an incorrect DHCP Option 150 configuration was introduced during scheduled maintenance.

Although user workstations remain fully operational, Cisco IP phones cannot locate the Cisco Call Manager Express (CME) server and therefore fail to register.

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

Root Cause

The Voice DHCP pool on R1 was configured with an incorrect DHCP Option 150 address.

Instead of providing the Cisco Call Manager Express (CME) server address:

192.168.150.1

The DHCP server was configured to provide:

192.168.150.99

As a result:

- Cisco IP phones could not locate the Cisco Call Manager Express (CME) server.
- Phone registration failed.
- Company-wide voice communications became unavailable.

Symptoms Observed

- Workstations operating normally.

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- DHCP functioning for user PCs.
- Internal network connectivity operational.
- Cisco IP phones powered on.
- Phones display **Configuring CM List**.
- show ephone reports all phones as UNREGISTERED.
- 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 the data network is functioning properly.

Step 2 — Verify Network Connectivity

Ping the default gateway.

Example:

```
ping 192.168.10.1
```

This should succeed.

Step 3 — Compare Data vs Voice Services

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Observe:

- PCs functioning normally.
- Cisco IP phones unable to register.

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

Step 4 — Verify Phone Registration

Access R1.

Run:

```
show ephone
```

Users should observe:

- All Cisco IP phones are UNREGISTERED.
- All phones display an IP address of 0.0.0.0.
- Phone status is DOWN.

This confirms the phones are unable to complete registration with Cisco Call Manager Express (CME).

Step 5 — Review the Voice DHCP Configuration

Review the DHCP configuration.

Example:

```
show running-config
```

or

```
show ip dhcp pool
```

Users should identify:

```
option 150 ip 192.168.150.99
```

This is the primary indicator of the issue.

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Commands Used

ipconfig

ping

show ephone

show running-config

show ip dhcp pool

configure terminal

show run | section dhcp

write memory

Resolution

Access the Voice DHCP pool configuration.

Correct the DHCP Option 150 address:

conf t

ip dhcp pool VOICE

option 150 ip 192.168.150.1

end

write memory

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Packet Tracer Note

After correcting the DHCP Option 150 configuration, Cisco IP phones may not immediately re-register.

If phones continue displaying **Configuring CM List**, save the Packet Tracer file, close Packet Tracer, and reopen the lab. This forces the Cisco IP phones to reboot and request updated DHCP information. Once the phones restart and obtain the updated DHCP information, they should successfully register with Cisco Call Manager Express (CME).

Validation

Successful resolution should include:

- Cisco IP phones successfully register.
- Extension numbers appear.
- Successful phone-to-phone calls.
- show ephone reports all phones as REGISTERED.
- Voice communications restored across all departments.
- Cisco IP phones display extension numbers.

Key Takeaways

- Cisco IP phones rely on DHCP Option 150 to locate the Cisco Call Manager Express (CME) server.
- A fully functional data network does not guarantee operational voice services.
- Compare working and non-working services before making assumptions.
- Follow a structured troubleshooting methodology.
- Validate service restoration after configuration changes.
- Cisco IP phone registration depends on proper DHCP configuration in addition to general network connectivity.

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