

Packet Tracer Lab 11 Solution Guide

IP Phone Deployment Failure

Incident ID: INC-1011

Objective

This lab focuses on identifying and resolving a Cisco CallManager Express (CME) configuration issue that prevents several Cisco IP phones from completing registration.

Although user workstations remain fully operational and some phones register successfully, additional Cisco IP phones are unable to complete deployment.

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

Root Cause

The Cisco CallManager Express (CME) configuration on R1 was incorrectly configured with:

`max-ephones 2`

This configuration limited Cisco CME to registering only two IP phones.

As a result:

- Only two Cisco IP phones successfully registered.
- Remaining phones continuously attempted registration.
- Voice service was unavailable for several departments.

Symptoms Observed

- User workstations operating normally.
- PCs successfully receiving DHCP addresses.
- Internal network connectivity operational.

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- Two Cisco IP phones successfully registered.
- Remaining phones stuck during registration.
- Continuous phone registration attempts displayed on R1.

Packet Tracer Note

During troubleshooting you may observe repeated:

```
%IPPHONE-6-REG_ALARM
```

messages while phones continue attempting to register.

If necessary, temporarily suppress console logging:

```
configure terminal  
no logging console  
end
```

This does not fix the issue.

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 normally.

Step 2 — Verify Network Connectivity

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Ping the default gateway.

Example:

```
ping 192.168.10.1
```

The ping should succeed.

Step 3 — Compare Working vs Non-Working Phones

Observe:

- HR phones successfully registered.
- Sales and IT phones failed to register.

Compare the functioning HR phones with the non-functioning Sales and IT phones. This comparison confirms the issue is isolated to only a portion of the voice environment rather than a complete voice outage.

Step 4 — Verify Phone Registration

On R1:

```
show ephone
```

Users should observe only two registered Cisco IP phones.

This is the primary indicator that Cisco CME is limiting phone registrations.

Step 5 — Review Cisco CME Configuration

On R1:

```
show running-config
```

Locate:

```
telephony-service
```

Users should identify:

```
max-ephones 2
```

This is the root cause.

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Commands Used

```
ipconfig  
ping  
show ephone  
show running-config  
configure terminal  
telephony-service  
write memory
```

Resolution

On R1:

```
configure terminal
```

```
telephony-service
```

```
max-ephones 10
```

```
end
```

```
write memory
```

Validation

Successful resolution should include:

- All Cisco IP phones successfully register.
- Extension numbers appear.
- No phones remain stuck during startup.
- Voice services restored across all departments.

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- Successful phone-to-phone calls.
- show ephone displays all six phones as **REGISTERED**.
- No additional %IPPHONE-6-REGISTER_ALARM messages continue appearing on the router console after all phones successfully register.

Key Takeaways

- Compare working and non-working devices before assuming a complete outage.
- Data services and voice services can fail independently.
- Cisco CME configuration directly impacts IP phone registration.
- Always validate registration after making configuration changes.
- Follow a structured troubleshooting methodology instead of making assumptions.