NETLABS HUB

How to Troubleshoot DHCP,EMAIL ,FTP in a Complex Network

It is designed for network engineers, CCNA/CCNP learners, and technical content creators.

1. LAB OBJECTIVE

The goal of this lab is to demonstrate real-world DHCP troubleshooting skills in a complex network environment.
Instead of simply configuring DHCP, the lab focuses on identifying, isolating, and fixing common DHCP failures.

2. NETWORK TOPOLOGY OVERVIEW

The lab should include:
• Multiple VLANs (e.g. VLAN 10 – Users, VLAN 20 – Servers, VLAN 30 – Wireless)
• Layer 2 switch with access and trunk ports
• Router or multilayer switch for inter-VLAN routing
• Centralized DHCP server or router-based DHCP
• Multiple client PCs

Intentionally misconfigure parts of the network to simulate real problems.

3. COMMON DHCP ISSUES TO SIMULATE

Create faults such as:
• Missing or incorrect ip helper-address
• VLAN mismatch between access ports and SVIs
• DHCP pool with wrong network or subnet mask
• Excluded address range covering all IPs
• Interface shutdown or wrong gateway configuration

4. STEP-BY-STEP TROUBLESHOOTING METHODOLOGY

Step 1: Physical & Interface Checks

• show ip interface brief
• Ensure interfaces are up
• Confirm correct VLAN assignment

Step 2: VLAN & Trunking Verification

• show vlan brief
• show interfaces trunk
• Verify access vs trunk configuration

Step 3: DHCP Service Verification

• show running-config | section dhcp

• show ip dhcp pool
• show ip dhcp binding

Step 4: DHCP Relay (ip helper-address)
• Confirm helper is configured on the correct interface/SVI
• Verify DHCP server IP reachability

Step 5: Routing Verification
• show ip route
• Ping tests between VLANs and DHCP server

Step 6: Validation
• Renew IP on client
• Confirm correct IP, gateway, and DNS

EMAIL

Proper protocols not configured

Wrong domain name,

Lack of Ip address

FTP

Limited permissions

Credentials not created on server or forgotten

Latency