Network Setup and Troubleshooting

This project takes a hands-on approach to network configuration and troubleshooting with Build and troubleshoot a basic network to enhance our networking

Our project

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maintain an excellent network

1. Introduction to Network Setup
2. Design Network Layout
3. Configuring Network
4. Testing Network
5. Common Troubleshooting
6. maintain an excellent network

Introduction our Network Setup

1

Begin by connecting devices like routers, switches, Server and computers using and printer with Ethernet cables. Ensure proper physical connections are in place.

Hardware Setup

2

Network Configuration

Assign DHCP IP addresses to each device. Use a subnet mask to define the network range and create a logical network structure.

3

Verify network connectivity by pinging devices across the network. Confirm that communication is successful between all connected devices

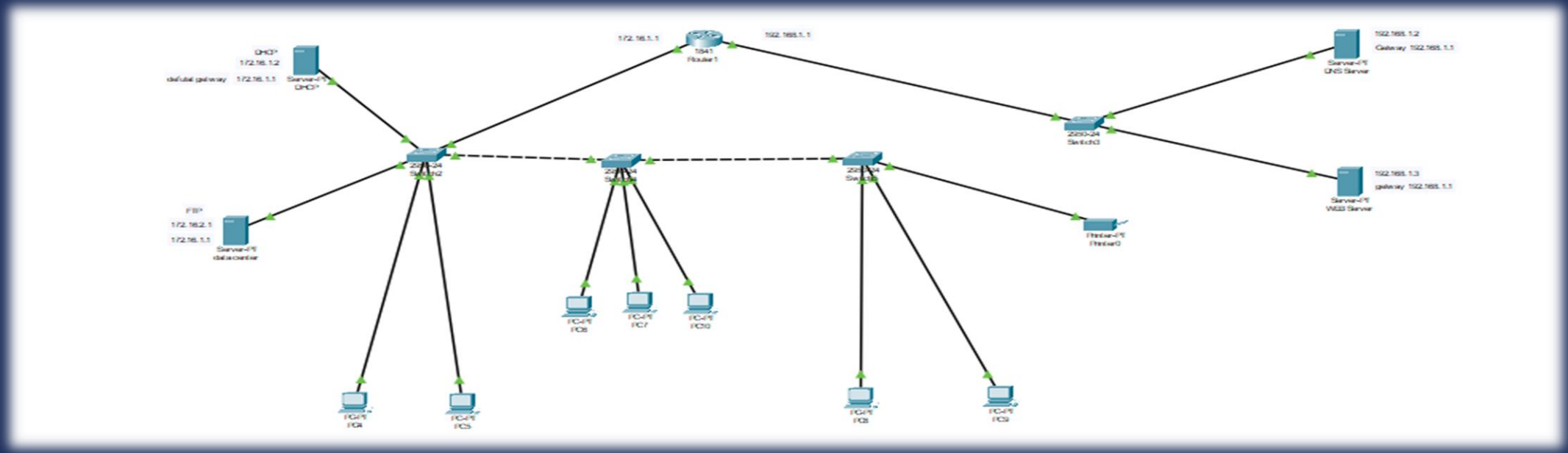
Testing

4

Documenting Network

•Compile documentation to reflect network design, setup, and troubleshooting.

Design Network Layout



Router
Central device providing interconnection between different Device of the network and servers

Web Server
Hosts a website accessible to devices on the network, providing content and services.

DNS Server
Resolves domain names to IP addresses, ensuring that devices can find each other within the network.

Switch
Distribute connections between the laptops and servers

DHCP Server
Automatically assigns IP addresses to connected devices to simplify IP management.

FTP Serve
Provides file-sharing capabilities for users

Hardware Setup

Network Devices: Routers, Switches, server , End Devices

Router

Connects multiple networks and directs traffic based on IP addresses. It performs network address translation (NAT) and acts as a gateway between networks.

We use :

1 Router

Switch

Connects devices within a single network. It learns MAC addresses of connected devices and forwards

traffic efficiently.

We use :

4 switches – use for groups

End devices

are the devices at the edge of a network that directly interact with users or other devices. They are the "endpoints" of the network.

We use :

7 PC and printer

server

server is a computer that manages and shares resources within a network. It handles tasks like file sharing, printing, and providing access to internet and other network services.

We use :

DNS - FTP – DHCP -WEB

Network Configuration

Router

•**IP Address** Switch 1 f0/1 172.16.1.1 - switch 2 f0/0 192.168.1.1

•**Function**: Connects the internal network to the external network.

•**Switches**

(Switch 1 & Switch 2):**Function**: Distributes connections between servers, PCs, and the router.

•Pc and printer : **Automatically assigns IP addresses from DHCP server**

Server

- **DHCP Server :** Automatically assigns IP addresses to the devices
- **IP 172.16.1.2 subnet mask 255.255.0.0 Default Gateway 172.16.1.1**
- **Make IP start from 172.16.0.5 Maximum number of user 50**
- **DNS 192.168.1.2**

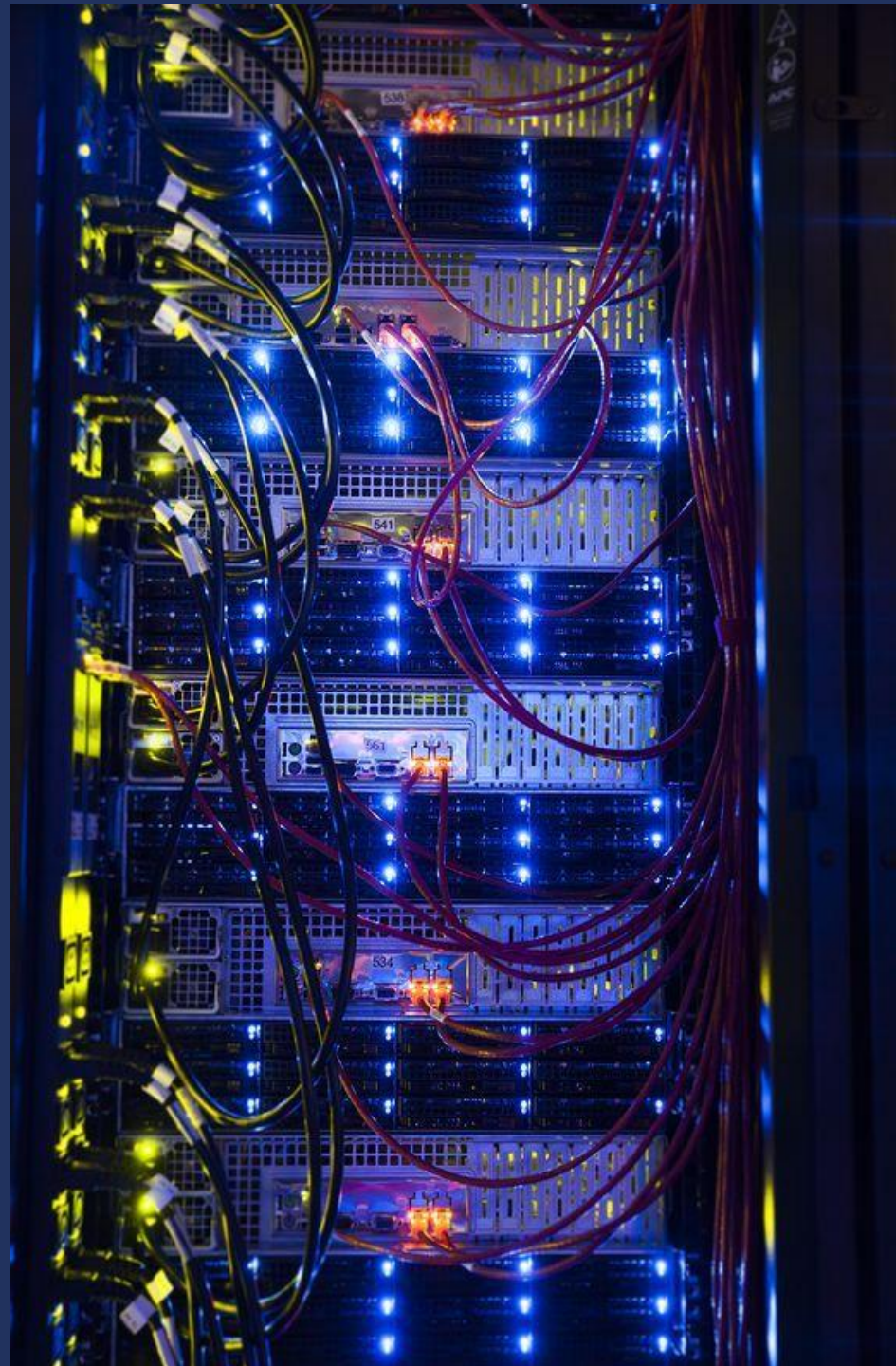
- **Web Server :** Hosts the website accessible within the network

IP 192.168.1.3 subnet mask 255.255.255.0 Default Gateway 192.168.1.1
We make HTTP Server on

- **DNS Server :** Resolves domain names to IP addresses.

IP 192.168.1.2 subnet mask 255.255.255.0 Default Gateway 192.168.1.1
Name of DNS itsuppotfaster.com IP web server 192.168.1.3

- **FTP Server** : Provides file transfer services.
- **IP 172.16.2.1 subnet mask 255.255.0.0 Default Gateway 172.16.1.1**
- **Share file with policy (writ – read – list) with user and password**



Testing

```
C:\>
C:\>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data:

Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255
Reply from 172.16.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=18ms TTL=127
Reply from 192.168.1.2: bytes=32 time<1ms TTL=127
Reply from 192.168.1.2: bytes=32 time=1ms TTL=127
Reply from 192.168.1.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 18ms, Average = 5ms

C:\>ftp 172.16.2.1
Trying to connect...172.16.2.1
Connected to 172.16.2.1
220- Welcome to PT Ftp server
Username:ourdata
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
%Error opening ftp://172.16.2.1/ (Timed out)
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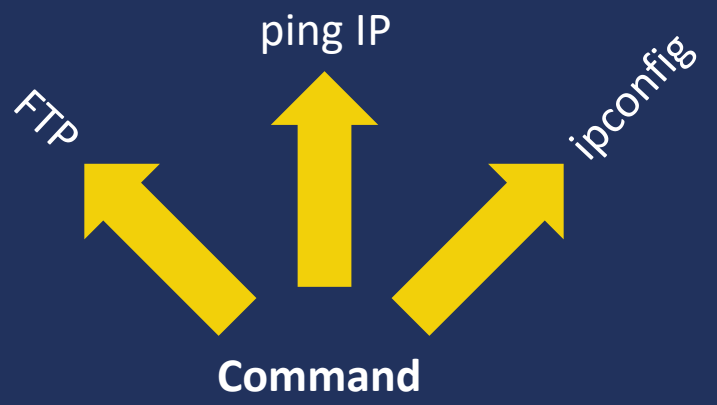


Troubleshooting & Case Study

Issue	Symptom	Solution
Slow Network Performance	Slow file transfers, lag online	Check for network congestion, optimize bandwidth usage, troubleshoot Wi-Fi interference.
Unable to Connect to the Network	Unable to access websites	Check physical connections Check IP configuration Verify network adapter status
Device Not Found	Unable to ping a specific device on the network	Verify IP address assignment, check for firewall restrictions, troubleshoot cable connections.
unable to access a specific file shared from a server	You receive error messages or cannot find the file when trying to access it.	Check file permissions Verify FTP server configuration
Unable to Access DNS Server	Unable to Access to specific website	Verify DNS Server Settings Adjust Firewall or Security Settings Check network connectivity
Unable to Access Network Printer	unable to connect to or print to a network printer	Check Printer Power and Connectivity Verify Network Settings Update Printer Driver

maintain an excellent network

1-Update Firmware and Software

Keep network devices and software up-to-date to fix vulnerabilities and enhance performance.

2.-Monitor Performance

Use monitoring tools to track bandwidth, latency, and downtime for proactive issue resolution.

3-Test Regularly

Conduct periodic network tests to identify and address performance bottlenecks.

4-Regular Backups:

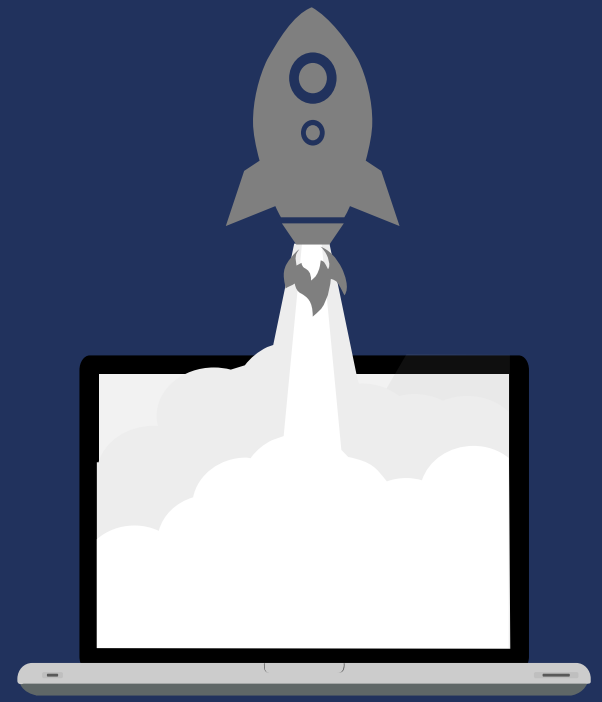
Back up your network configuration, data, and software regularly to protect against data loss

5-Security Best Practices

Use strong passwords and enable two-factor authentication (2FA) for user accounts.

6-Security Awareness Training

Provide regular security awareness training to educate users about common threats and best practices for protecting their accounts and devices.



Thanking Your Viewers

Eng. MUSTAFA SALAH

we are truly grateful for your guidance, support, and dedication in educating us and helping us successfully complete this project