

## **ASSIGNMENT**

<b>COURSE</b>	Networking Fundamental	<b>ASSIGNMENT NO</b>	2
<b>MODULE</b>	1	<b>ASSIGNMENT DATE</b>	20/08/2024
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**Q1. Write the important functions of all 7 layers of OSI Layers.**

Ans:

OSI Model is a structure to define the system of networking. It allows the transfer of data from one device to another over a network

### **1.Physical Layer:**

This layer is responsible for the physical connection between devices. It transmits raw bits (0s and 1s) over a communication channel. It deals with the physical aspects of network communication, such as cables, switches, and electrical signals.

#### **Protocols:**

Not applicable in the traditional sense, but standards like Ethernet , DSL, and various types of cables fall under this layer.

#### **Devices:**

Network Interface Cards (NICs)

Hubs

Cabling and Connectors

## **2. Data Link Layer**

### **Function:**

Frame Transmission and Error Detection: This layer is responsible for node-to-node data transfer and handles error detection and correction that occurs at the frame level. It frames data packets, handles MAC addressing, and controls access to the physical medium.

### **Protocols:**

- Ethernet (IEEE 802.3)
- PPP (Point-to-Point Protocol)
- HDLC (High-Level Data Link Control)

### **Devices:**

- Switches
- Bridges

## **3. Network Layer**

### **Function:**

Routing and Logical Addressing: This layer is responsible for routing packets across networks and managing logical addressing. It determines the best path for data to travel from the source to the destination.

### **Protocols:**

-IP (Internet Protocol): Provides logical addressing and routing of packets.

-ICMP (Internet Control Message Protocol): Used for error messages and operational information (e.g., ping).

-IGMP (Internet Group Management Protocol): Manages multicast group memberships.

### **Devices:**

Routers: Forward packets based on IP addresses and route them between different networks.

Layer 3 Switches: Perform routing functions in addition to switching.

## **4. Transport Layer**

### **Function:**

End-to-End Communication and Error Recovery: This layer ensures reliable data transfer between end systems. It provides end-to-end communication services for applications, manages data flow, and ensures error recovery and retransmission.

### **Protocols:**

TCP (Transmission Control Protocol): Provides reliable, connection-oriented communication with error checking and recovery.

UDP (User Datagram Protocol): Provides connectionless communication with minimal error recovery.

### **Devices:**

No specific devices at this layer; it's primarily concerned with software functions.

## **5. Session Layer**

### **Function:**

Session Management: This layer manages and controls the sessions between applications. It establishes, maintains, and terminates sessions between applications on different devices.

**Protocols:**

NetBIOS (Network Basic Input/Output System): Allows applications to communicate over a network.

RPC (Remote Procedure Call): Allows programs to execute procedures on remote systems.

**Devices:**

No specific devices; this layer operates at the software level within applications.

## **6. Presentation Layer (Layer 6)**

**Function:**

Data Translation and Encryption: This layer translates, encrypts, and compresses data. It ensures that data is in a format that the application layer can understand. It also handles data encryption and decryption.

**Protocols:**

SSL/TLS (Secure Sockets Layer/Transport Layer Security): Provides encryption for secure communication.

JPEG, GIF, MPEG: Data formats for images and multimedia.

**Devices:**

No specific devices; it deals with data formatting and encryption within software.

## **7. Application Layer**

**Function:**

End-User Services and Application Interfaces: This layer provides network services directly to end-user applications. It supports application services and ensures that data is usable by applications.

**Protocols:**

- HTTP/HTTPS : Used for web communication.
- FTP : For transferring files.
- SMTP : For email transmission.
- DNS : Translates domain names to IP addresses.

**Devices:**

No specific devices

**Q2. Connect two PC to a server using a switch. Assign IP address to each and show the connection between all three.**

Ans

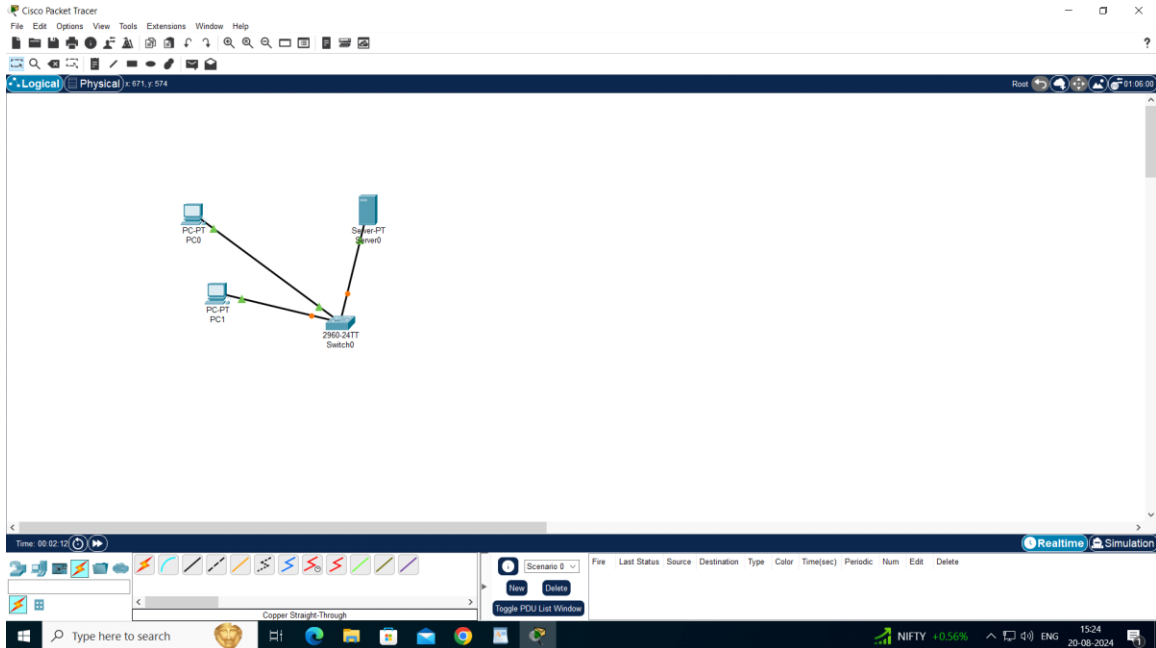
- **Select the PC's and server in Packet tracer**
- **Using switch and connect all three end devices with cable**
- **Topology Diagram**

Select the PC: choose two PCs (PC0 and PC1) .

Insert a Switch: From the "Switches" section, select

Connect the Devices: Use copper straight-through cables to connect:

- PC1 to Switch (FastEthernet0/1)
- PC2 to Switch (FastEthernet0/2)
- Server to Switch (FastEthernet0/3)



- **Assign IP's to all End devices**

PC0:

Click on PC1 → Desktop → IP Configuration.

Assign IP Address: 192.168.1.2

Subnet Mask: 255.255.255.0

- PC2:

Click on PC2 → Desktop → IP Configuration.

Assign IP Address: 192.168.1.3

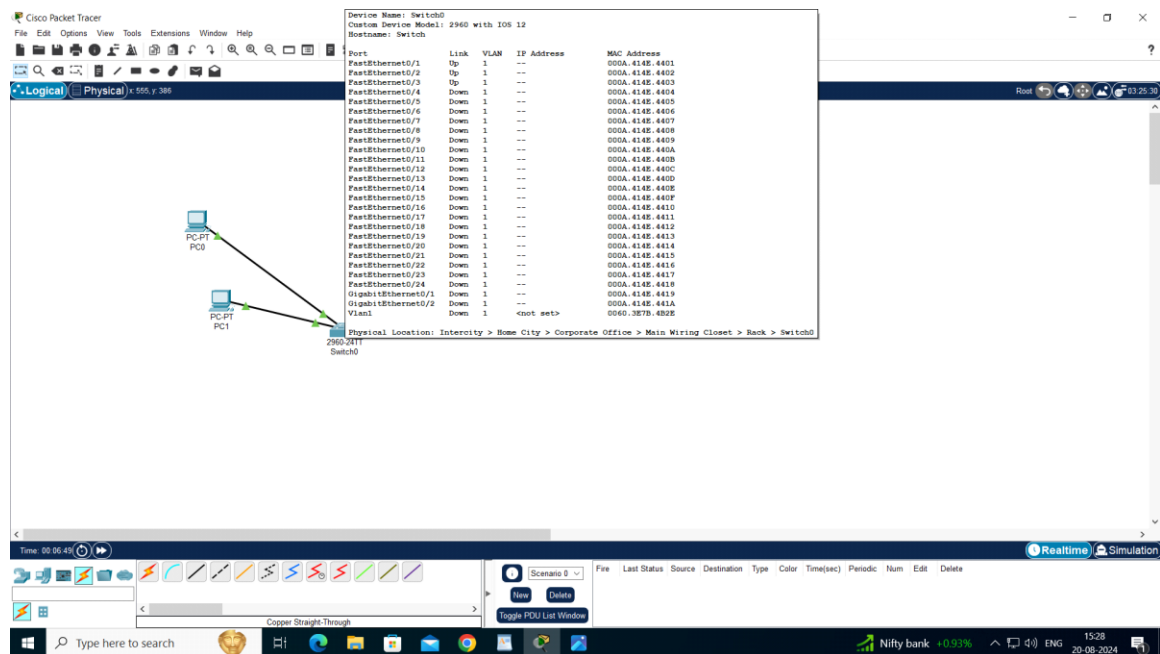
Subnet Mask: 255.255.255.0

- Server:

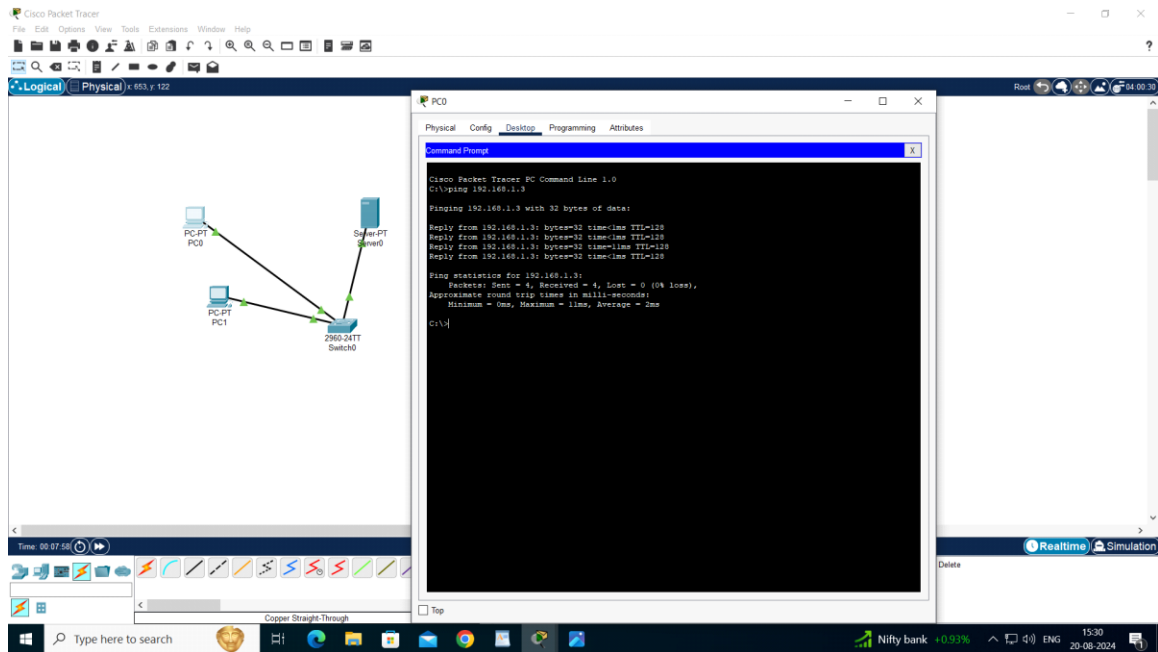
Click on the Server → Desktop → IP Configuration.

Assign IP Address: 192.168.1.4

Subnet Mask: 255.255.255.0

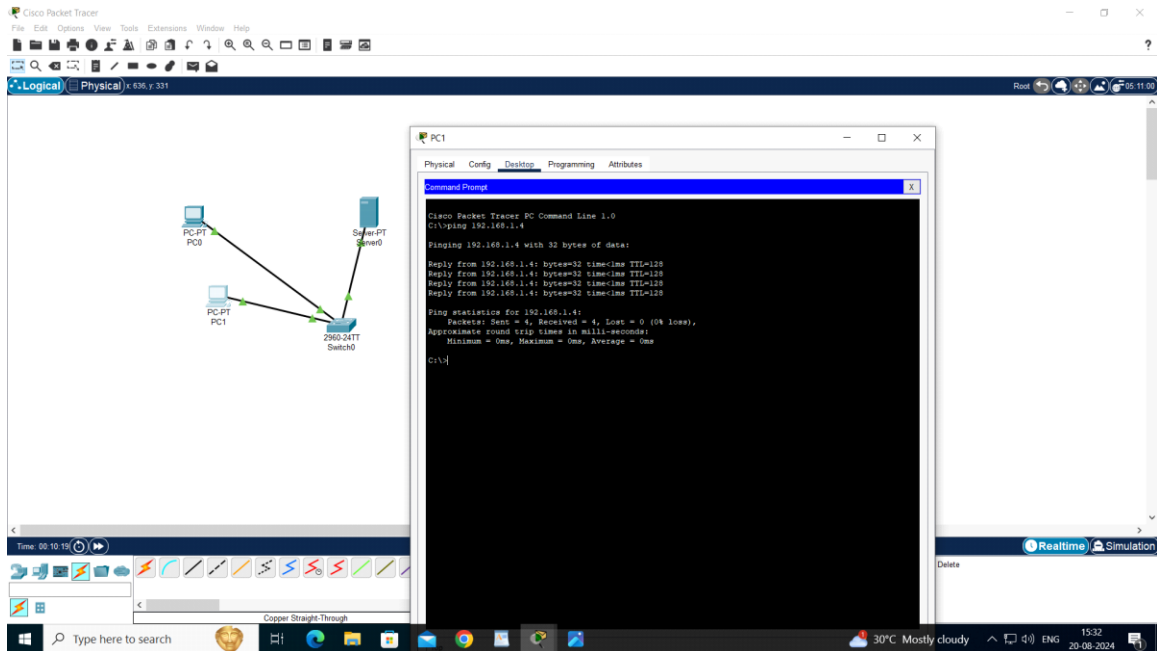


- **Ping PC1 to PC2**



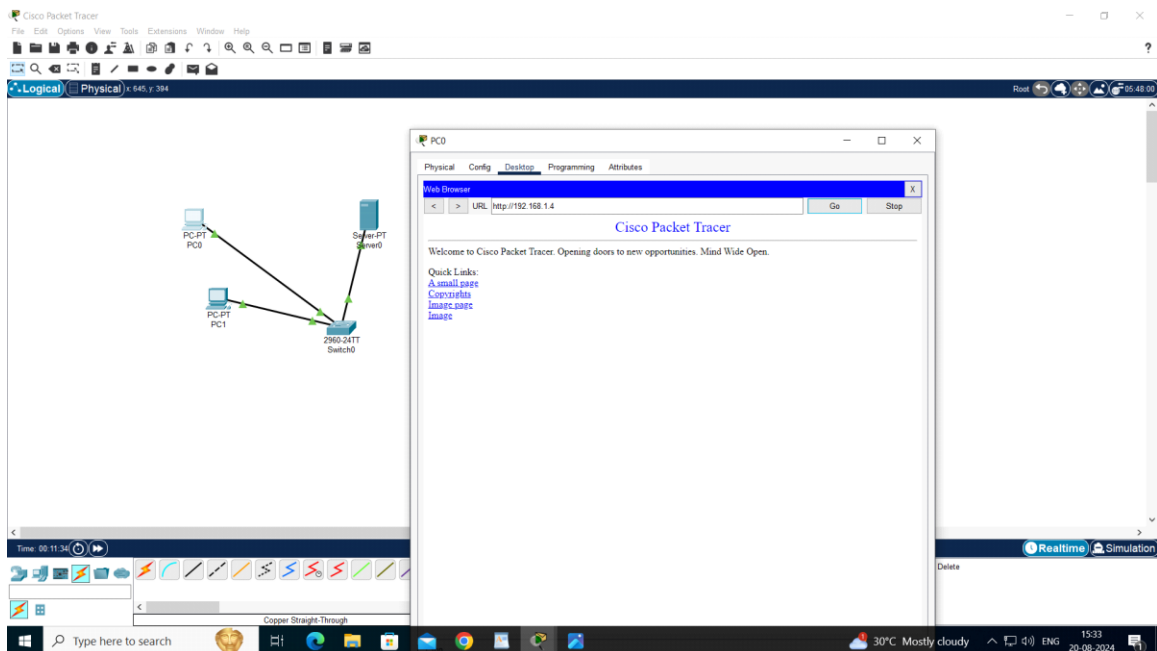
- **Ping PC1 to Server & PC2 to Server**





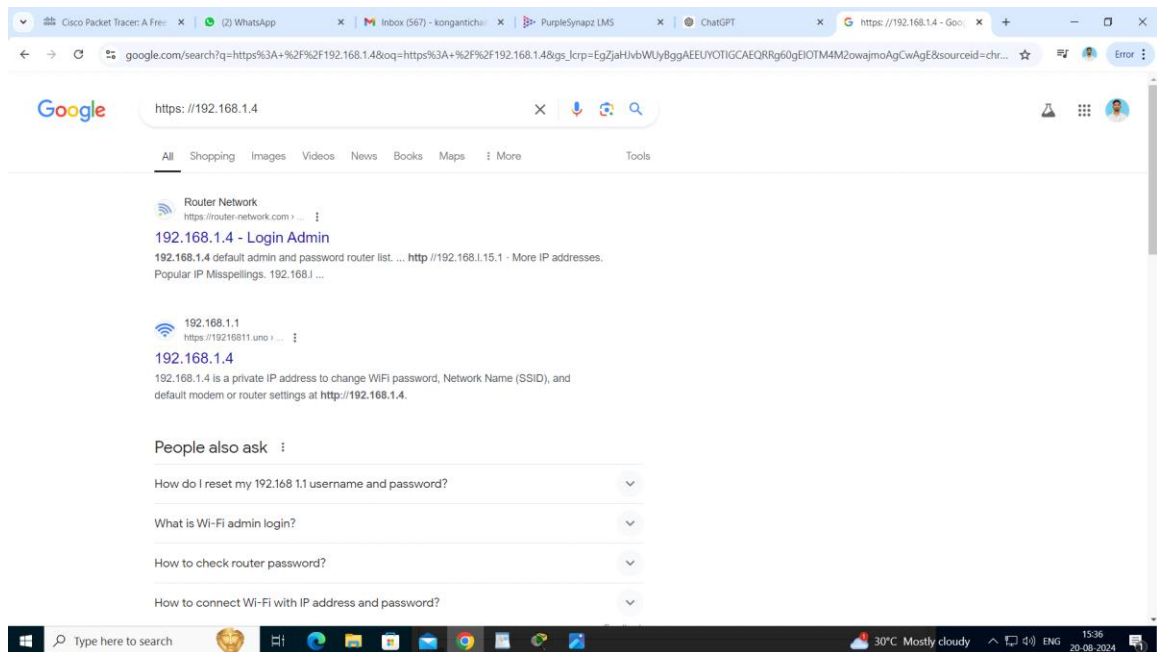
- **Access the server using port 80 and 443 respectively and pen down your observations**

- **Port 80**



**Observations:** The webpage loads over HTTP, which is an unsecured protocol. Information sent over the connection is not encrypted.

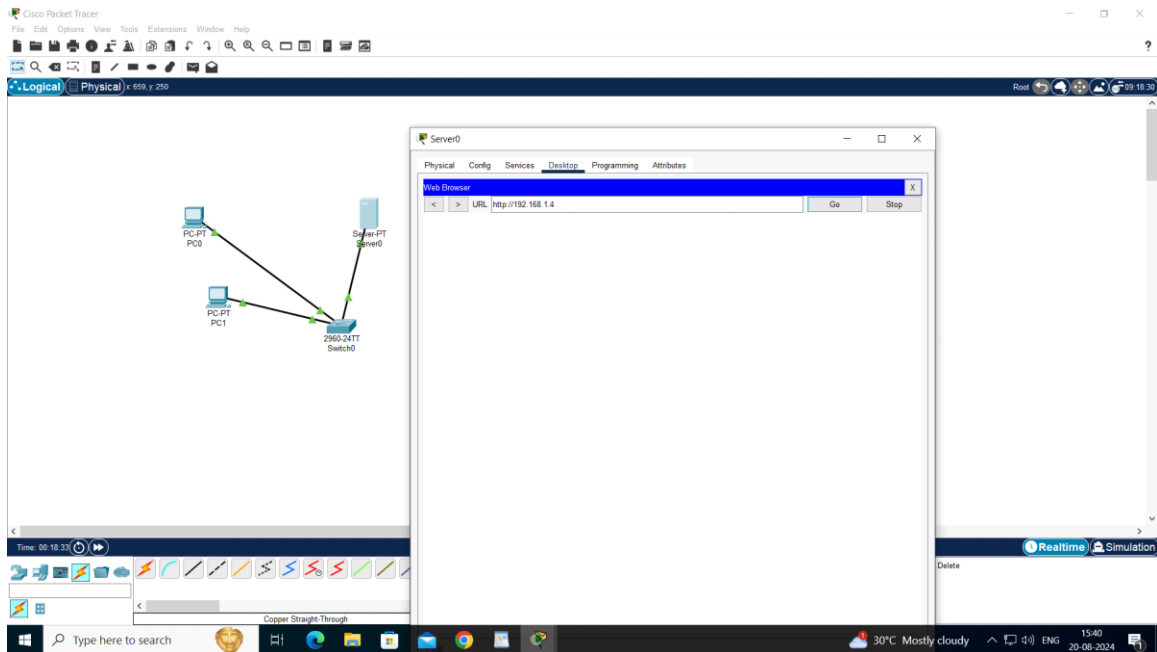
- **Port 443**



**Observations:** The webpage loads over HTTPS, ensuring the communication is encrypted and secure.

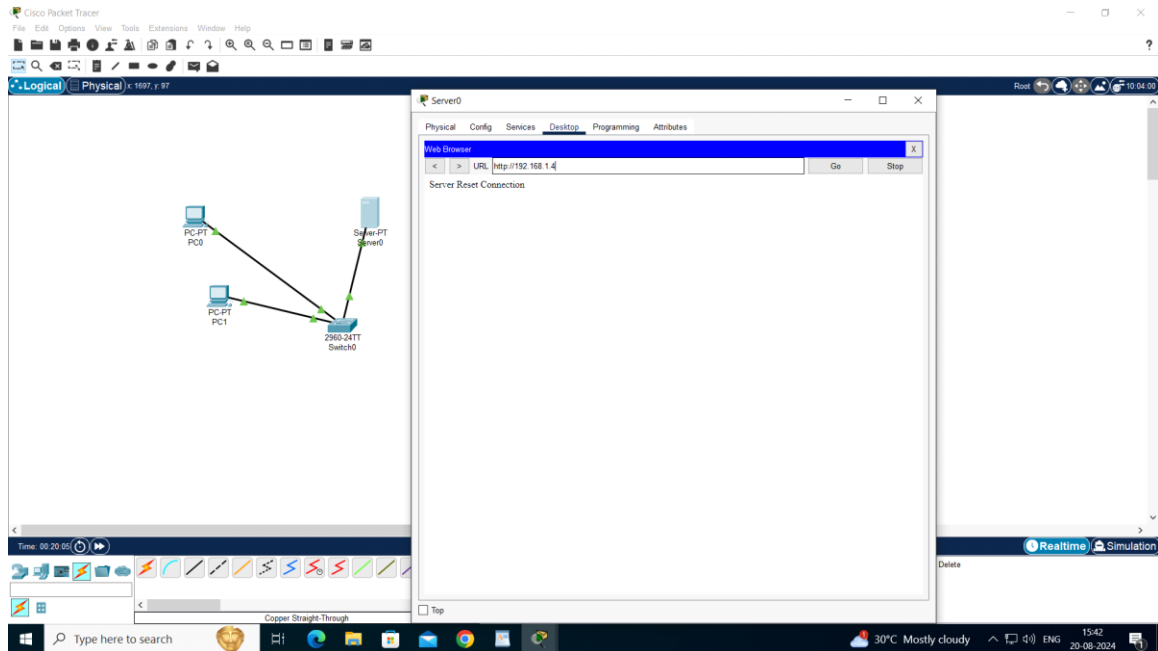
- **Switch OFF port 80 and access the server and vice-versa, write your observations**

- **Port 80 OFF**



**Observations:** The server is no longer accessible using HTTP when Port 80 is off.

- **Port 443 OFF**



**Observations:** The server is no longer accessible using HTTPS when Port 443 is off.