SAVEETHA SCHOOL OF ENGINEERING

Engineer to Excel

CAPSTONE PROJECT

Application Layer Protocol Analysis and Optimization for Web Services

NAME: V.P. Sneha

REGISTER NUMBER: 192324284

COURSE CODE: CSA0747

COURSE NAME: Computer Network for IOT

INTRODUCTION:

In this project, we are tasked with designing and implementing a network for an expanding e-commerce business. The company, with various branches across multiple locations, requires a reliable and efficient network infrastructure to connect its facilities. This includes building both Local Area Networks (LANs) and a Wide Area Network (WAN) to ensure smooth communication between different branches.

Objective:

Design LANs and WAN for the organization using routers, switches, PCs, and servers.
Calculate and assign subnets for eight LANs and one WAN link.
Manually configure IP addresses, subnet masks, gateways, and DNS for workstations and servers.
Configure routers and switches using basic IOS commands via CLI.
Verify end-to-end connectivity and test HTTP access via DNS.
Support network expansion for the company's e-commerce operations.

LITERATURE REVIEW

A well-designed network is essential for businesses, especially in sectors like e-commerce, where seamless connectivity is critical for operations. Implementing Local Area Networks (LANs) and Wide Area Networks (WANs) ensures that organizations can efficiently link multiple branches across different locations. LANs provide high-speed communication within a local area, while WANs connect these geographically dispersed networks, often utilizing routers and leased lines. Efficient subnetting is crucial for network management, as it divides an IP address space into smaller, more manageable sub-networks. .

Software:

- Cisco Packet Tracer

Network Design: The network consists of:

- 3 routers
- 5 switches
- 8 PCs
- 2 servers

The routers are interconnected, with Router1 and Router2 each connecting to two switches, while Router3 connects to a single switch. The first four switches each connect to two PCs, while the fifth switch connects to two servers.

IP Address Allocation:

- **Let us assume switch 1 consist of four PCs and 2 router then**

- Router0 IP address: 192.168.10.2
- PC0 IP address: 192.168.1.2
- PC1 IP address: 192.168.1.4
- Laptop0: 192.168.1.3
- Router1 IP address: 192.168.10.3
- PC2 IP address: 192.168.2.2
- PC3 IP address: 192.168.2.3

Protocol:

- HTTP is used as the communication protocol in this setup, particularly for web traffic between clients and servers.
- It defines how requests and responses are transmitted between web browsers (clients) and web servers.

- HTTP is a stateless protocol, meaning each request-response cycle

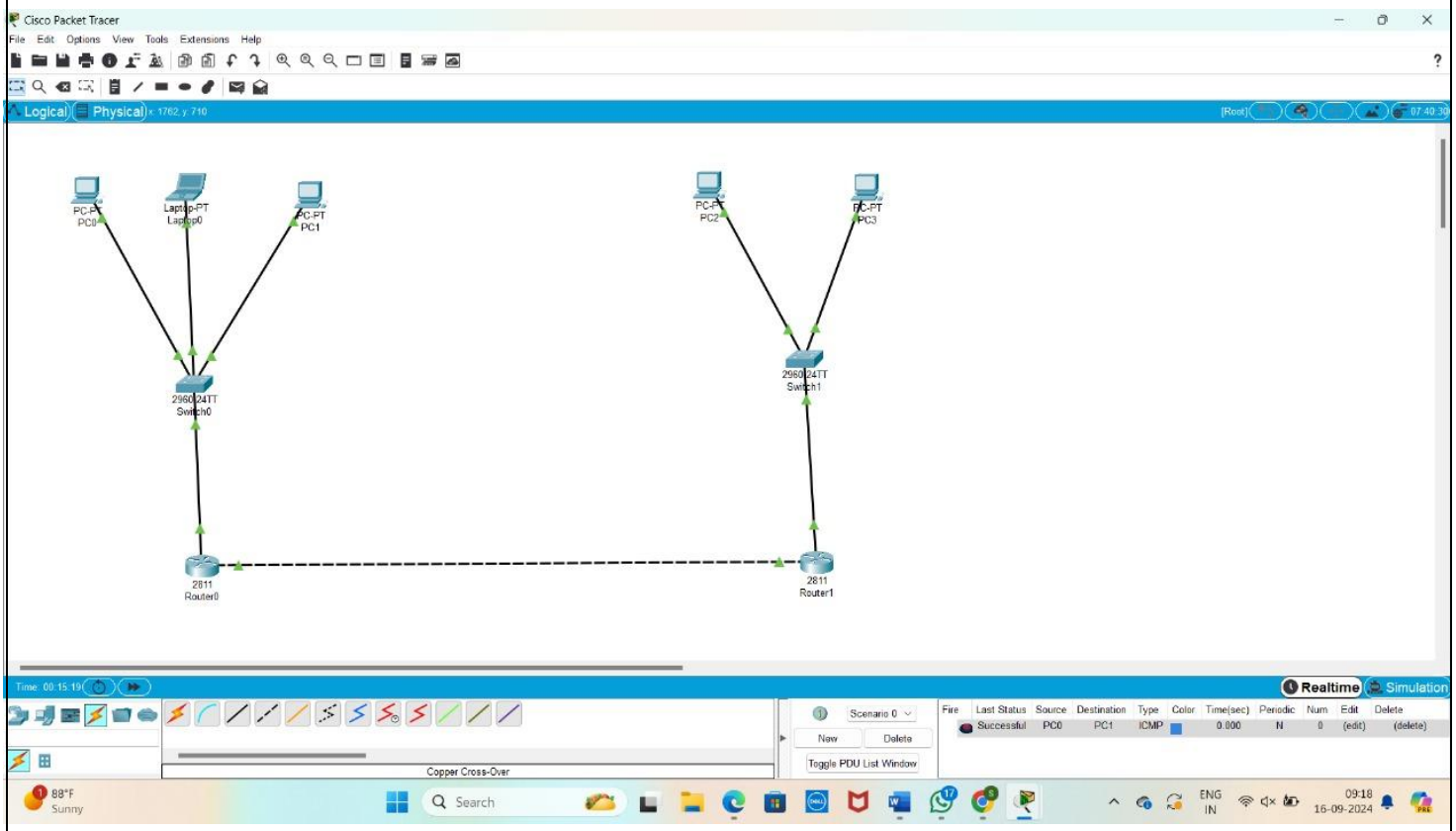
is independent, with no memory of previous interactions retained on the server.

❖ This structured methodology ensures the network is fully functional, allowing for communication across all devices and facilitating web access via HTTP.

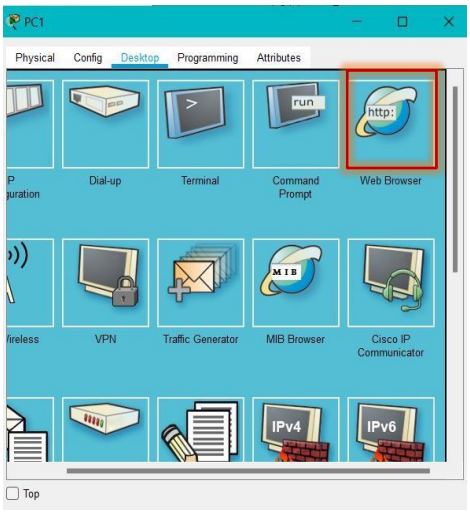
RESULT:

- All three routers were connected as per the design, with Router1, Router2, and Router3 successfully linked via their respective interfaces.
- The five switches were properly connected to the routers, and all devices, including PCs and servers, were assigned correct IP addresses based on the subnetting scheme.
- IP addresses, subnet masks, and default gateways were manually assigned to each device (PCs and servers), ensuring proper communication between them within their respective LANs.
- The routers were configured with IP addresses for both the LAN and WAN connections, and the routing tables were updated using RIP to facilitate data transmission between networks.

Network Design:



- open pc -> desktop -> web browser



CONCLUSION:

Cisco Packet Tracer is a network simulation tool designed to model and analyze network configurations rather than deploy actual online services. While it doesn't support the deployment of real web servers, it is highly effective for simulating and understanding web service interactions within a network environment.

Here's what you can achieve with Cisco Packet Tracer regarding web services:

- **Simulate Web Server Functionality:** You can set up devices in Packet Tracer to replicate basic web server operations. This simulation enables you to test and verify network configurations and observe the flow of web traffic as it would occur in a real-world scenario.
- **Explore Web Service Interactions:** By connecting client PCs to simulated web servers, you can emulate how web browsers interact with web services. This includes testing how HTTP requests are made and how web content is delivered, helping you understand the dynamics of web communication in a controlled environment.

- **Practice Network Design for Web Services:** Packet Tracer helps visualize how web servers, clients, and other network devices interact. This is useful for designing and troubleshooting real-world web service deployments.

Cisco Packet Tracer does not run real web server software, but it does provide a useful platform for learning and experimenting with online services in a virtual network. Real-world web service deployment requires dedicated web server software running on adequate hardware.