Mini Project Report

Subject: Computer Networks
Problem statement: Design and Simulation of a Company Network Using Cisco Packet Tracer
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1. Introduction

This mini project presents the design and simulation of a company-wide computer network using Cisco Packet Tracer. The network is designed for a company with three floors, each hosting different departments. It includes features like VLANs for separation, servers for communication, firewalls for security, and remote access for outside users.

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2. Objectives

1. To divide the company network department-wise using VLANs
2. To allow devices in different departments to communicate safely
3. To set up web, FTP, and email servers for company use
4. To protect internal data using firewalls
5. To provide limited public access through a DMZ
6. To allow remote access from different countries (like USA and China)

To simulate and test the working of the entire network

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3. Tools & Technologies Used

- Programming Language: HTML
- Tools: CPT
- Protocols
    a. **HTTP (HyperText Transfer Protocol)**: Used for web communication.
    b. **FTP (File Transfer Protocol)**: Used for file transfers.
    c. **TCP/IP (Transmission Control Protocol/Internet Protocol)**: Basic protocol suite for internet communication.
    d. **DNS (Domain Name System)**: Resolves domain names to IP addresses.

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4. System Design

The company has **three floors** with different departments:

- **1st Floor** – Sales & Marketing, HR & Logistics

- **2nd Floor** – Finance & Admin
- **3rd Floor** – Technical (CT Department), Wireless Area

There is also a **DMZ area** where servers are kept, like:

- Web Server
- FTP Server
- Email Server
- DNS Server
- DHCP Server

Two firewalls are placed to protect the company network.
There is also a setup for **remote users** (USA and China) to access services like email and web.

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5. Implementation

🔷 VLAN Configuration:
Each department has its own VLAN with separate IP range
VLANs ensure security and reduce unnecessary traffic
Inter-VLAN communication is enabled through a Layer 3 switch

🔷 Server Setup in DMZ:
Web Server: Hosts the company website (created using HTML)
FTP Server: For file sharing within the company
Email Server: Allows users to send and receive mail
DNS Server: Converts website names to IP addresses
DHCP Server: Gives automatic IP addresses to all devices

🔷 Security with Firewalls:
Two ASA Firewalls are used
They allow only required traffic (like web or email)
Protect the internal network from the internet

🔷 Internet and Remote Access:
Internet is connected through a simulated ISP router
Users from countries like the USA and China can access services safely
Remote users can use the web server and email

🔷 Wireless Configuration:
Wireless Access Point connected on 3rd floor
Wireless devices like laptops can join the company network

IP Addressing Scheme

Network Area	IP Address/Subnet
Internal Company LAN	192.168.10.0/24
DMZ Servers	10.11.11.0/27
Remote Users	8.0.0.0/8
ISP/Firewall Links	20.0.0.0/30 and others
VLAN Interfaces	172.16.x.x/16 (per VLAN)

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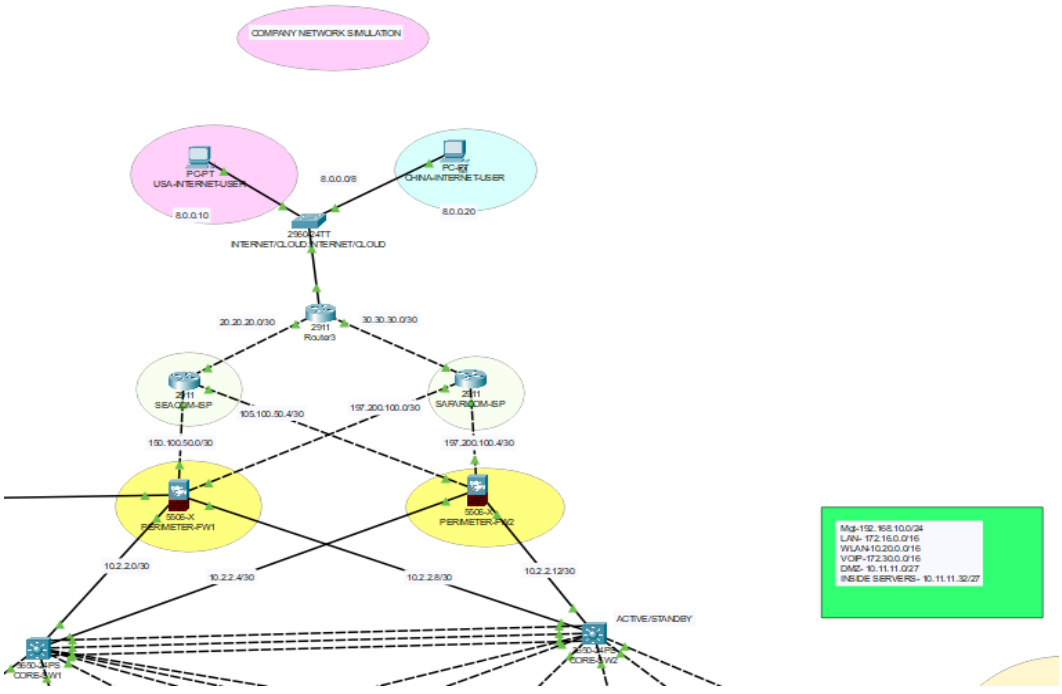
6. Results & Screenshots

What was tested and confirmed:
- All departments can connect to each other through VLAN routing
- Servers (Web, FTP, Email) respond correctly
- Remote users can access the website and email
- Wireless devices connected successfully
- Firewall rules block unwanted traffic and allow only safe access

Screenshots showing the full topology, server setup, VLANs, and successful ping tests are included.

TOPOLOGY:



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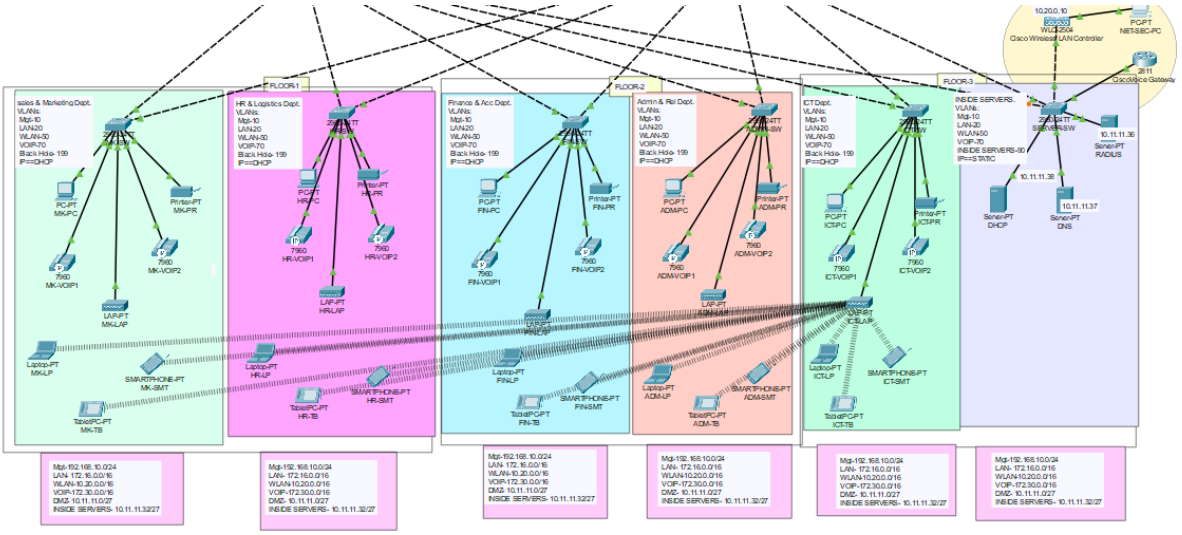
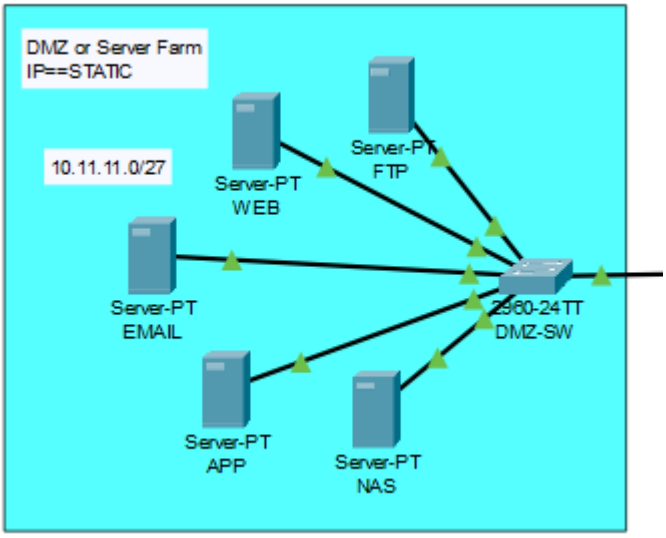
TOPOLOGY:



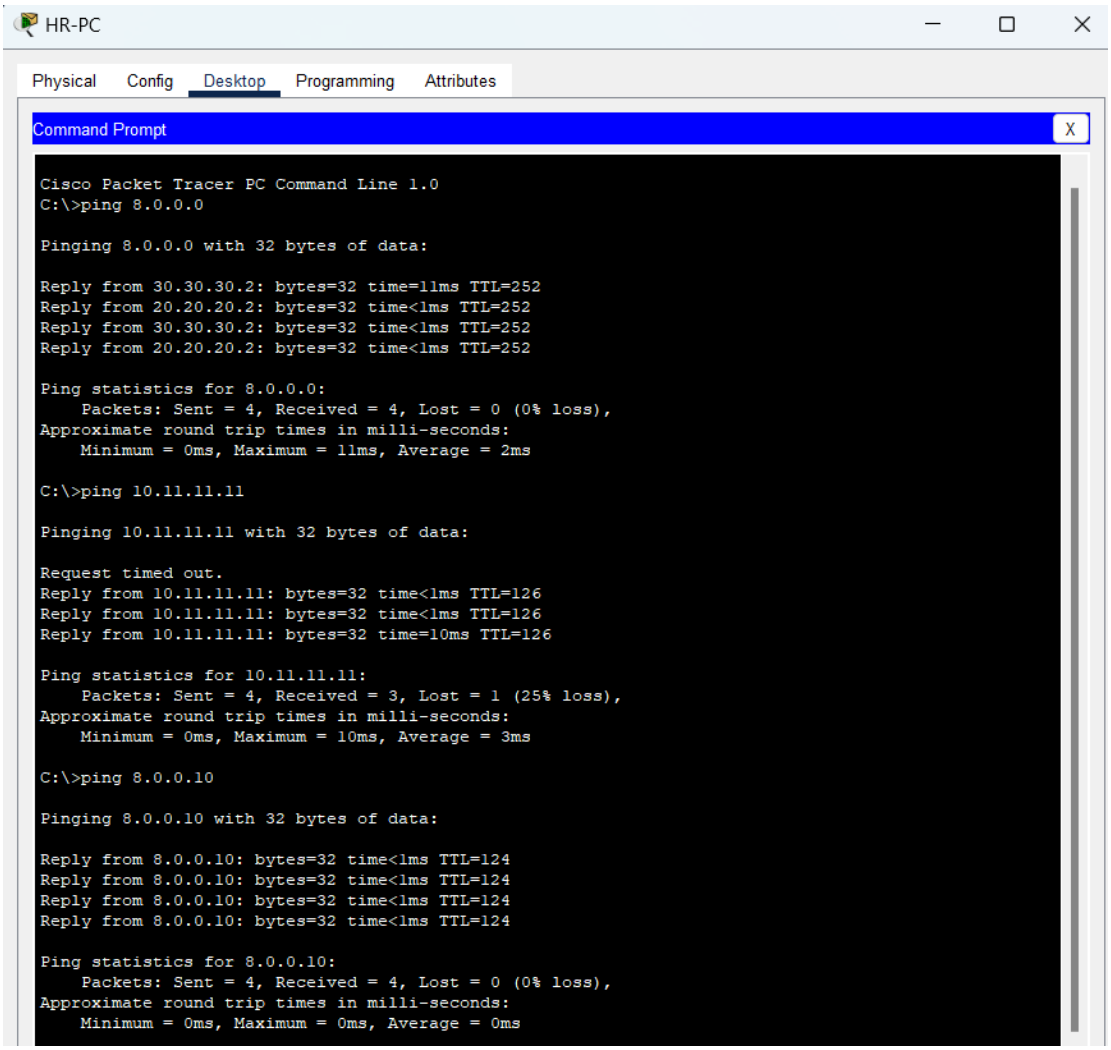
TOPOLOGY:



CONNECTION STATUS:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	HR-PC	ICT-PC	ICMP		0.000	N	2	(edit)	(delete)
	Successful	USA-I...	HR-PC	ICMP		0.000	N	3	(edit)	(delete)
	Successful	CHIN...	ADM-PC	ICMP		0.132	N	4	(edit)	(delete)

SUCCESSFUL PING TESTS



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7. Conclusion

This mini project shows how a company network can be planned and built using Cisco Packet Tracer. It includes all major features like VLANs, servers, firewalls, and remote access. The project also includes a basic website using HTML. All parts were tested and are working properly. This setup is useful for learning how real-world companies organize and protect their computer networks.

8.References

- Cisco Packet Tracer Documentation

- Cisco Networking Academy Resources

- Official Cisco VLAN Configuration Guides