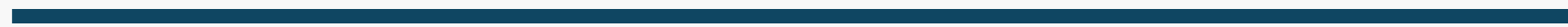# computer networks

project presentation on cisco packet tracer

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Series of content

The ICMP

ICMP stands for Internet Control Message Protocol. It is a network-layer protocol used for diagnostic and error-reporting purposes in Internet Protocol (IP) networks. ICMP is defined in the Internet Protocol Suite and is integral to ensuring network connectivity and troubleshooting.

ICMP messages allow network devices to exchange information about network conditions, such as unreachable hosts, network congestion, and packet loss.

Category	Type	Message
Error-Reporting Messages	3	Destination unreachable
	4	Source quench
	11	Time Exceeded
	12	Parameter Problem
	5	Redirection
Query Message	8 or 0	Echo request or reply
	13 or 14	Timestamp request or reply
	10 or 9	Router Solicitation or advertisement

The _key_ 'ping'

The Ping command sends ICMP echo requests to a destination host and waits for an echo reply.

The ping command is a widely used network diagnostic tool that utilizes ICMP (Internet Control Message Protocol) to test connectivity and measure the time it takes for a packet to travel from a source to a destination and back.

ICMP messages allow network devices to exchange information about network conditions, such as unreachable hosts, network congestion, and packet los.

DHCP

DHCP (Dynamic Host Configuration Protocol) is an essential protocol in computer networks that automatically configures the IP addresses of devices without manual intervention. This saves significant time and reduces the manpower required for assigning IP addresses, especially in large networks.

Advantages:

- DHCP eliminates errors such as duplicate IP address assignments.
- It supports centralized management of network configurations.
- DHCP can handle dynamic changes in the network, such as devices joining or leaving.
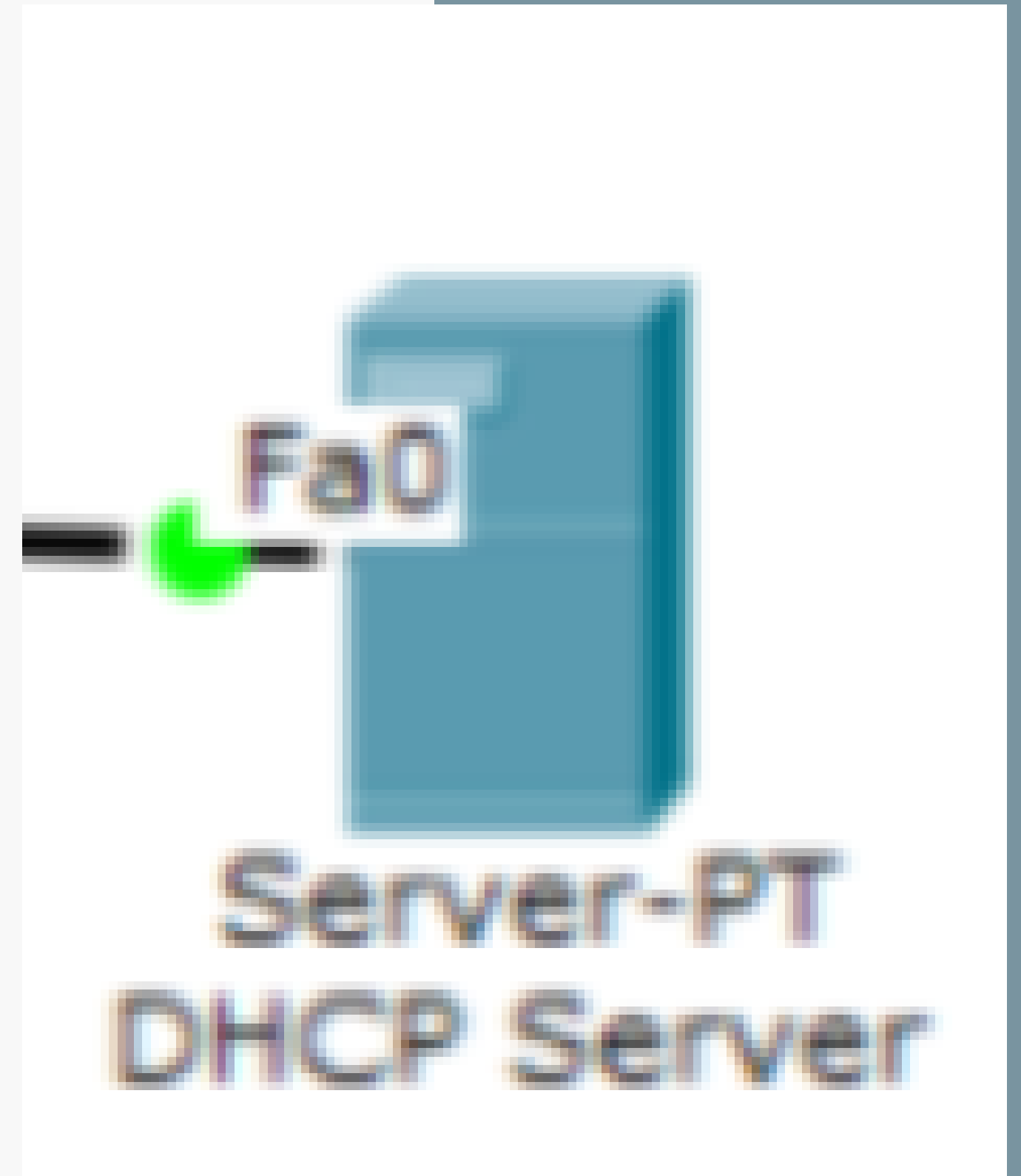
Mail Transferring services

mail services is one of the most important mode of communication in today's digital world . Email transferring include certain standard protocols in both the OSI/TCP models like SMTP, IMAP, pop3 etc
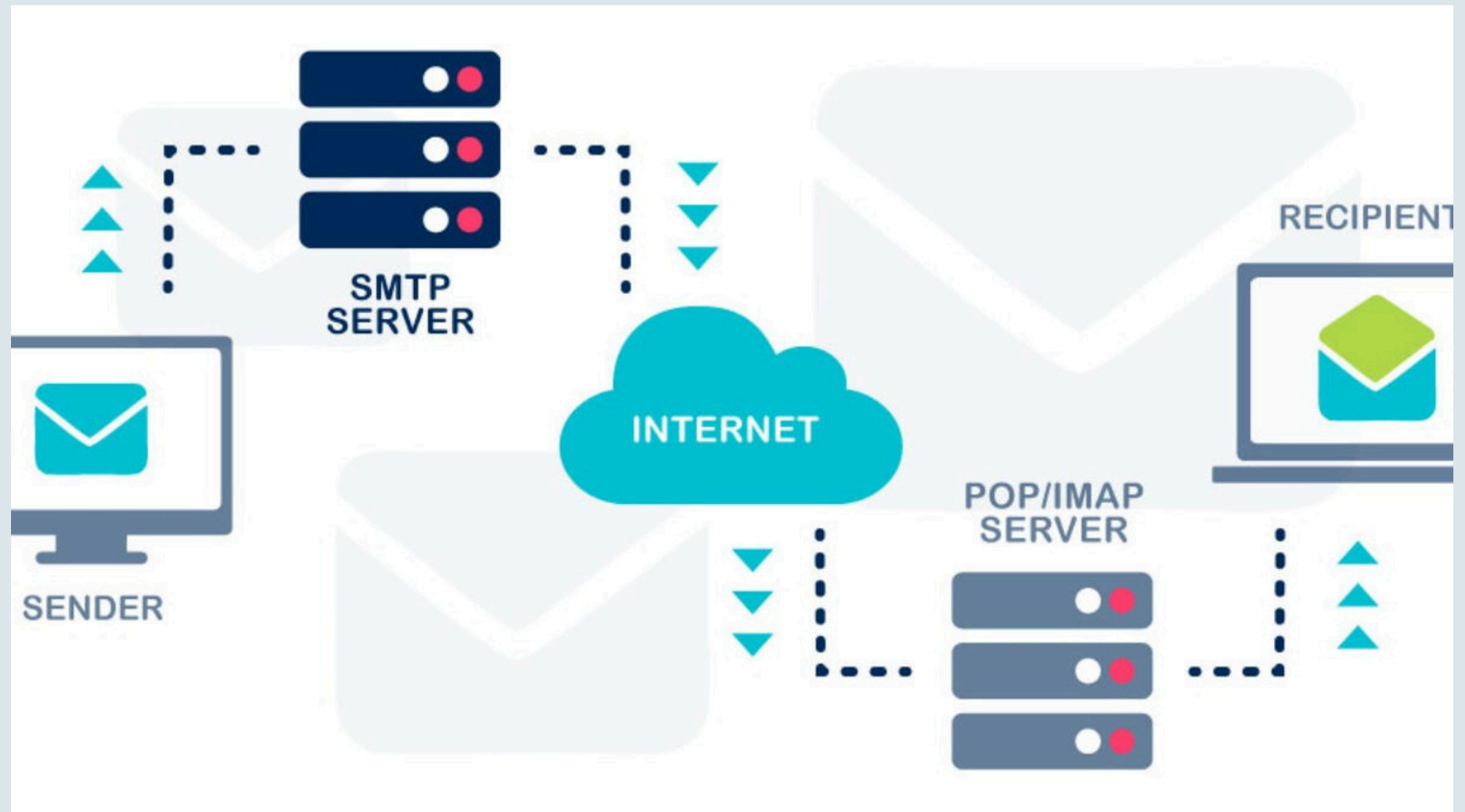
The 'SMTP'

SMTP is a standard mail sharing protocol between the devices through internet. it ensures succesful transfer of emails from one to the another

multi media files like images, videos, files can be sent through using SMTP protocol. the sender's mail is sent to the server first and then server to another server and from that server to the receiver

SMTP protocols use certain commands like QUIT, HELO etc. and they use certain number of special ports such as port 25, 587, 465
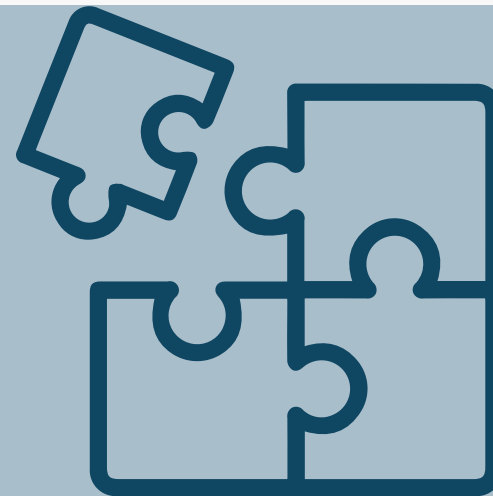
POP3

- **POP3** (Post Office Protocol version 3) is a standard protocol used to retrieve emails from a remote mail server to a local client. It operates at the application layer of the TCP/IP suite and is widely supported by email clients and servers.

- The client connects to the mail server using POP3, provides login credentials, retrieves emails (usually deleting them from the server unless configured otherwise), and closes the connection after the download.
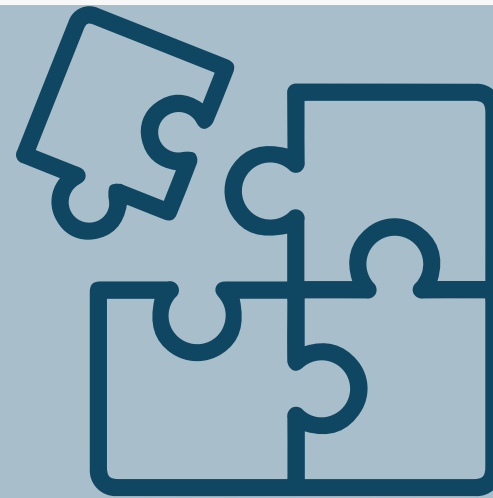
- Port 110: Default port for unencrypted communication.
- Port 995: Used for encrypted communication with SSL/TLS.

IMAP

- IMAP (Internet Message Access Protocol) is a standard protocol used to retrieve emails from a mail server. Unlike POP3, IMAP allows users to access and manage their emails directly on the server, enabling synchronization across multiple devices.

- Server-Based Email Storage: Emails remain on the server, allowing access from multiple devices.
- Synchronization: Actions like reading, deleting, or organizing emails are synced across all devices.

- Port 143: Default port for unencrypted communication.
- Port 993: Used for encrypted communication with SSL/TLS.

MX Record

10 mail1.example.com

20 mail2.example.com

10 → mail1.example.com: First mail server (highest priority).

20 → mail2.example.com: Backup mail server (lower priority).

MX (Mail Exchange) records are DNS (Domain Name System) records that specify the mail servers responsible for receiving email for a domain. MX records help direct emails to the appropriate mail server.

Improved Customer Engagement:

Determines the order of mail server preference (lower number = higher priority).

How MX Records Work:

1. Sender's Mail Server looks up the domain's MX record in the DNS to find the mail server.
2. Email is Routed: The email is routed to the mail server with the highest priority (lowest number).
3. Fallback Option: If the primary mail server is unavailable, a lower-priority mail server can handle the email.

WLAN

what is WLAN?

- WLAN (Wireless Local Area Network) is a type of local area network that allows devices to connect and communicate wirelessly within a limited area, such as a home, office, or campus. WLAN uses radio waves to transmit data, eliminating the need for physical cables.

key features

- Wireless Connectivity: Devices connect to the network without physical cables.
- Access Point (AP): Central devices like routers act as hubs for wireless communication.
- Range: Typically covers a range of up to 100 meters indoors and more in outdoor environments.
- Standards: Follows IEEE 802.11 standards (e.g., Wi-Fi).