



Basic Networking Protocols Guide with Visual Diagrams

FTP (Port 21)

Transfers files between client and server.

Client



FTP Server

Uploads and downloads occur through secure or standard FTP connections.

SSH (Port 22)

Provides secure encrypted remote access to servers.

Client



Remote Server

Used for secure login, file transfers (SCP/SFTP), and command execution.

DNS (Port 53)

Converts domain names into IP addresses for connectivity.

Client



DNS Server



Web Server

Resolves **www.example.com** to **192.168.1.1**.

HTTP (Port 80) / HTTPS (Port 443)

Loads and secures web pages between browsers and web servers.

Browser



Web Server

HTTPS uses **SSL/TLS encryption** for secure data transmission.

TCP vs UDP

Two transport layer protocols used for data transmission.

TCP

Reliable, connection-oriented
Used in HTTP, FTP, Email

UDP

Fast, connectionless
Used in Video Streaming, DNS

TCP ensures delivery, UDP favors speed.

Telnet (Port 23)

Allows remote access to servers using a command-line interface (unsecured).

Client



Telnet Server

Used for device configuration — replaced by **SSH** for security.

SMTP (Port 25)

Used to send outgoing emails between clients and mail servers.

Email Client



SMTP Server



Destination Mail Server

Works with **POP3** or **IMAP** to complete the email delivery process.

POP3 (Port 110)

Used by email clients to retrieve messages from a mail server.

Mail Server



Email Client

Once downloaded, emails are usually deleted from the server.

ARP (Address Resolution Protocol)

Finds a device's MAC address based on its IP address.

Host A (IP Request)



Host B (MAC Reply)

The ARP table maps IP addresses to physical MAC addresses on a network.

RARP (Reverse Address Resolution Protocol)

Used by diskless devices to get their IP address using their MAC address.

Device (MAC)



RARP Server (IP Response)

Now mostly replaced by **DHCP** for IP assignment.

MTP (Media Transfer Protocol)

Used to transfer media files between computers and portable devices.

Computer



Mobile / Camera

Commonly used when connecting Android phones via USB.

QOTD (Quote of the Day)

Displays a text-based quote when connected to a QOTD server.

Client



QOTD Server

A simple demonstration protocol often used for testing.

PPP (Point-to-Point Protocol)

Connects two network nodes directly for communication.

Device A



Device B

Used in dial-up and broadband connections for direct link communication.