The Islamia University of Bahawalpur Pakistan

Introduction to Computer

Computer System Architecture

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Networks and System Communication

Basic Protocols

Network and System Communication

Network and system communication refer to the processes, protocols, and technologies that enable devices, systems, and networks to exchange data and information effectively.

It involves the transmission, reception, and interpretation of signals or data between interconnected devices over physical or wireless media.

Key Components of Network and System Communication

1.Networks:

- A network is a collection of devices connected to share resources, exchange data, or perform collaborative tasks.
- Examples: Local Area Network (LAN), Wide Area Network (WAN), Wireless Networks (Wi-Fi, 5G).

2.Systems:

- Systems are individual or interconnected devices and software that perform specific tasks.
- Examples: Servers, databases, operating systems, IoT devices.

3.Communication Channels:

- The medium through which data is transmitted.
- Examples: Copper wires, fiber optics, radio waves, or satellite links.

How Communication Occurs

1.Source and Destination:

1. A source device (sender) sends data, and a destination device (receiver) receives and interprets it.

2.Data Encoding:

1. Data is converted into a suitable format for transmission (e.g., binary signals, analog signals).

3.Transmission:

1. Data is sent over a communication channel (e.g., Ethernet, Wi-Fi).

4.Protocols:

1. Predefined rules and formats ensure successful data transfer.
2. Examples: HTTP, TCP/IP, FTP.

5.Reception and Decoding:

1. The receiver decodes the transmitted data into usable information.

Technologies Enabling Network and System Communication

1.Internet Protocol (IP):

- Responsible for addressing and routing packets in a network.

2.Switches and Routers:

- Devices that manage data traffic and direct it to its destination.

3.Wireless Communication:

1. Technologies like Wi-Fi, Bluetooth, and 5G enable wireless data transmission.

4.IoT (Internet of Things):

- Connects devices to exchange data seamlessly.

5.Middleware:

- Software that enables communication between different systems or applications.

Network Protocol

In telecommunication, a communication protocol is a system of rules.

It is a set of rules that governs the communications between compute rs on a network.

Types of Protocols

The different types of network protocols are:

- HTTP/HTTPS
- FTP
- SMTP
- Ethernet
- TCP/IP

Hypertext Transfer Protocol (HTTP)

HTTP is used for transmitting and displaying information in the form of web pages on browsers.

This protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.

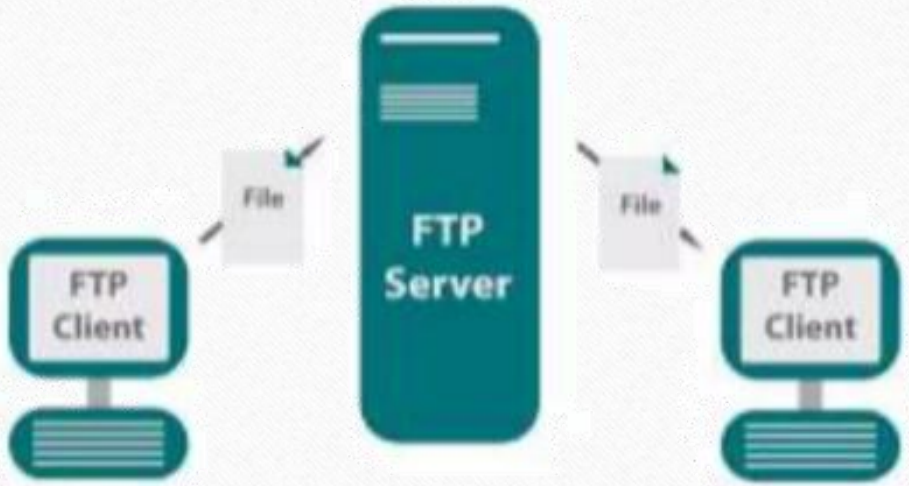
Hypertext Transfer Protocol Secure (HTTPS)

The problem with the regular HTTP protocol is that the information that flows from server to browser is not encrypted, which means it can be easily stolen.

- HTTPS is used for secure communication over a computer network, and is widely used on the Internet.
- In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS).

File Transfer Protocol

FTP used for file transfer (uploading and downloading) over the Internet.



Simple Mail Transfer Protocols (SMTP)

- Simple Mail Transfer Protocol is used in email.
- Ethernet is used for data transmission over a LAN.

TCP/IP

Transmission Control Protocol/IP, used for the reliable transmission of data over a network.

- It is the basic communication language or protocol of the Internet.
- It can also be used as a communication protocol in a private network (either an intranet or an extranet).


Thank
you