Application Layer

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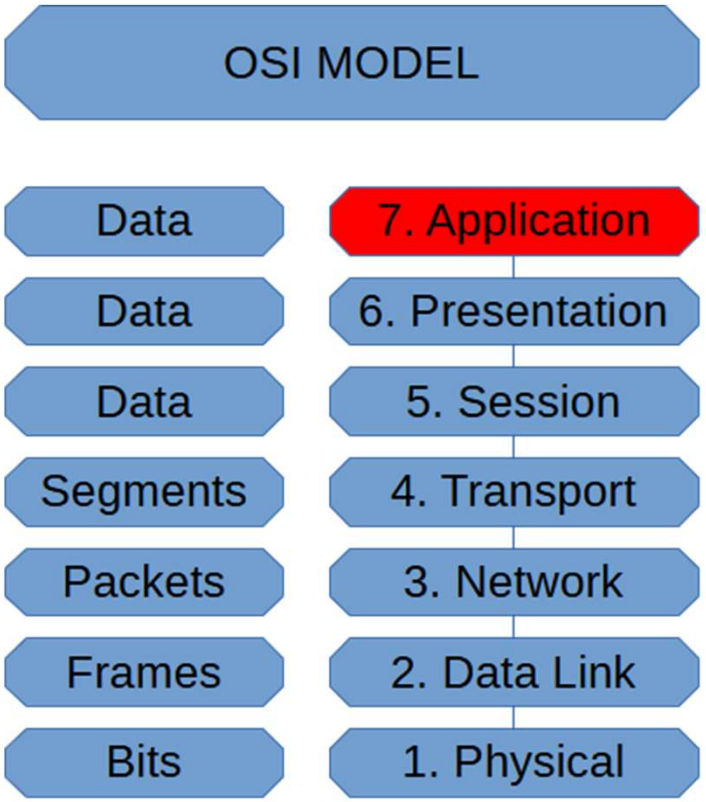
Agenda

1. What is Application Layer in OSI Model?
2. Functions of Application Layer
3. Working of Application Layer in OSI Model
4. Application Layer Protocols

Introduction

- The Application Layer is the topmost layer (Layer 7) in the OSI (Open Systems Interconnection) model.
- It serves as the interface between end-users and the network, facilitating access to network services.



Key Functions of the Application Layer

Network Virtual Terminal

File Transfer, Access, and Management (FTAM)

Mail Services

Directory Services

Network Virtual Terminal (NVT)

It standardize communication during remote logins.

It allows users to interact with remote systems as though they are directly accessing them, regardless of differences in hardware or operating systems.

Example Protocols:

- **Telnet:** Provides remote login functionality in a text-based interface. However, it is not secure as data is sent in plaintext.
- **SSH (Secure Shell):** Adds encryption to secure the communication, making it the preferred option for remote logins today.

File Transfer, Access, and Management (FTAM)

FTAM refers to the set of services that allow users to access, transfer, and manage files stored on remote systems.

File Transfer: Moving files between a client and a remote server.

- **File Access:** Opening and retrieving files stored on a remote system.
- **File Management:** Performing actions like renaming, deleting, or copying files on the server.

Example Protocols:

- **FTP (File Transfer Protocol):** Provides a reliable method for transferring large files but lacks encryption.
- **TFTP (Trivial File Transfer Protocol):** A lightweight protocol used for simple file transfers, often in system boot processes.

Mail Services

Mail services refer to the functionalities that enable email communication, including composing, sending, receiving, and storing emails.

Components of Mail Services:

- **Message Composition:** Users create and format email messages.
- **Message Transport:** Ensures the email is transmitted from the sender to the recipient.
- **Message Storage:** Stores emails on a mail server for future retrieval.

Example Protocols:

- **SMTP (Simple Mail Transfer Protocol):** Used for sending emails.
- **IMAP (Internet Message Access Protocol):** Allows users to access and manage their emails directly on the server.
- **POP3 (Post Office Protocol 3):** Downloads emails from the server to the user's device.

Directory Services

Directory services provide a structured way to store, organize, and retrieve information about resources, such as user accounts, devices, and network services.

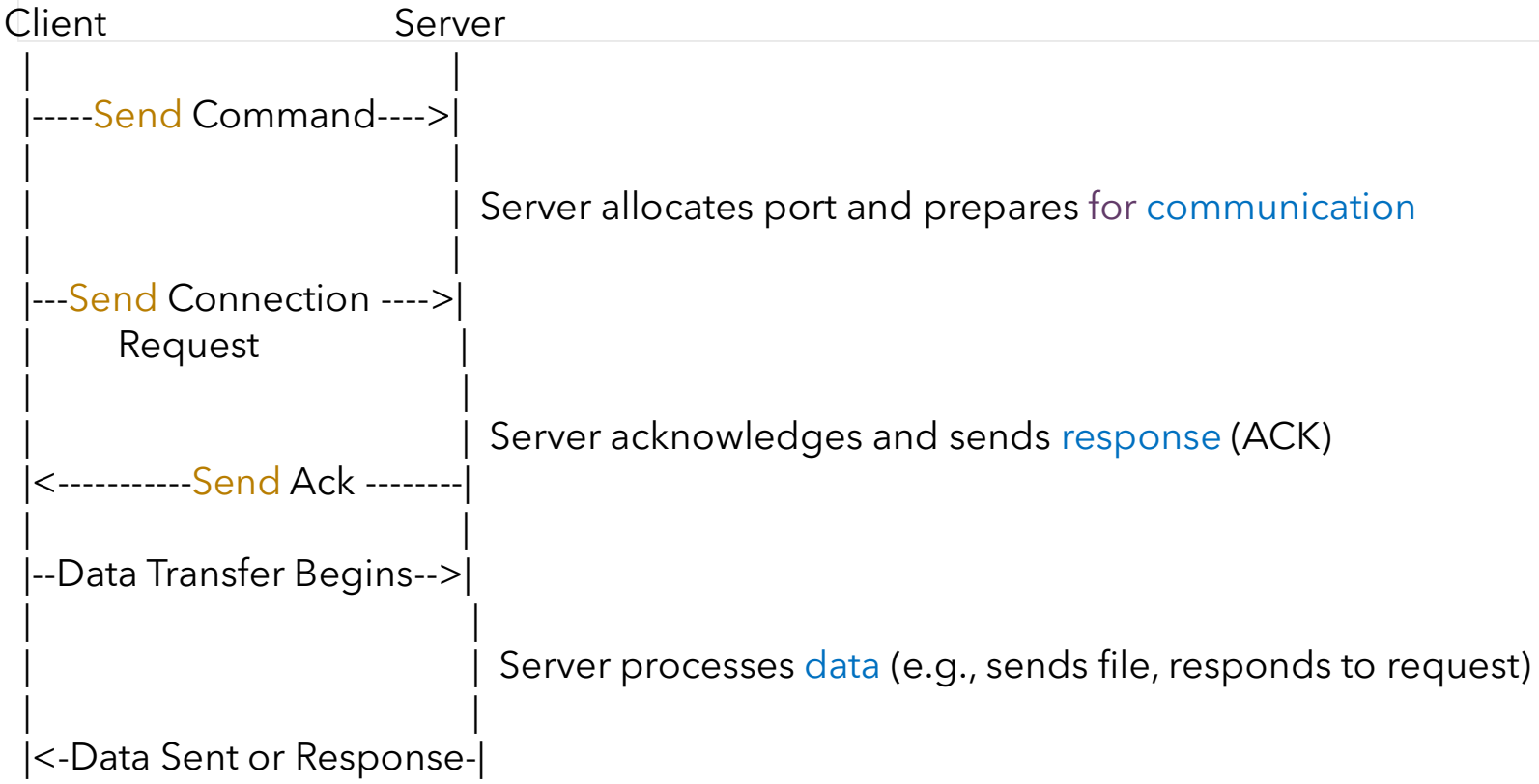
Key Features:

- **Hierarchical Structure:** Information is organized in a tree-like structure for efficient navigation.
- **Resource Discovery:** Helps users locate and utilize network resources, such as printers or file servers.

Example Protocols:

- **LDAP (Lightweight Directory Access Protocol):** Used for accessing and managing directory information.
- **DNS (Domain Name System):** Resolves human-readable domain names (e.g., google.com) into IP addresses needed for routing.

Working of Application Layer in OSI Model



Application Layer Protocols

Protocol Name	Port No.	Transport Protocol
ECHO	7	TCP\UDP
FTP File Transfer Protocol	20/21	TCP
Secure Shell (SSH)	22	TCP
Telnet	23	TCP
SMTP Simple Mail Transfer Protocol	25	TCP
DNS Domain Name System	53	UDP
DHCP Dynamic Host Configuration Protocol	67/68	UDP
TFTP Trivial File Transfer Protocol	69	UDP
HTTP HyperText Transfer Protocol	80	TCP
POP Post Office Protocol	110	TCP
NTP Network Time Protocol	123	UDP
HTTPS HyperText Transfer Protocol Secure	443	TCP