

REDEEMER'S UNIVERSITY, EDE

COLLEGE OF POSTGRADUATE STUDIES

COURSE CODE: CIT828

COURSE TITLE: Internet Technology

ASSIGNMENTS:

Difference between connectionless and connection in TCP/IP

Draw the layers on TCP/IP & OSI model

Compare and Contrast IPv4 & IPv6

Difference between packets, data and frame

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1. Differences between Connectionless and Connection-Oriented Communication in TCP/IP

Connection-Oriented Communication (e.g., TCP):

- A connection is established before any data is transferred.
- Ensures reliable transmission using acknowledgments, sequencing, and retransmission.
- Data arrives in order and without duplication.
- Examples: HTTP, FTP, SMTP over TCP.

Connectionless Communication (e.g., UDP):

- No prior connection is established.
- Data is sent without guarantee of delivery, order, or integrity.
- Faster but unreliable.
- Examples: DNS, VoIP, Streaming over UDP.

Feature	Connection-Oriented (TCP)	Connectionless (UDP)
Setup Required	Yes	No
Reliability	High (error checking & ACKs)	Low
Speed	Slower	Faster
Ordering of Packets	Guaranteed	Not guaranteed
Protocol Example	TCP	UDP

2. TCP/IP vs OSI Model Layers

TCP/IP Model: This consists of 4 layers which are:

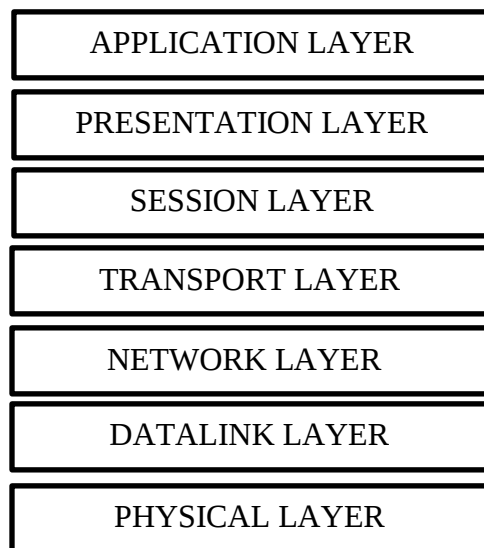
- Application Layer
- Transport Layer

- Internet Layer
- Network Access Layer

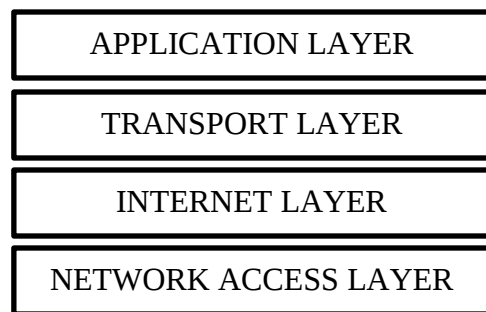
OSI Model: This consists of 7 layers which are:

- i. Application Layer
- ii. Presentation Layer
- iii. Session Layer
- iv. Transport Layer
- v. Network Layer
- vi. Data Link Layer
- vii. Physical Layer

OSI Model



TCP/IP Model



3. Comparison Between IPv4 and IPv6

Feature	IPv4	IPv6
Address Length	32 bits (4 bytes)	128 bits (16 bytes)
Address Format	Decimal (e.g., 192.168.1.1)	Hexadecimal (e.g., 2001:0db8::1)
Header Size	20 bytes	40 bytes
Number of Addresses	~4.3 billion	3.4×10^{38}
NAT Usage	Required	Not required
Security	Optional (via IPSec)	Mandatory (via IPSec)
Configuration	Manual or DHCP	Auto-configuration (Stateless)
Broadcast	Supported	Not Supported (uses multicast)

4. Differences Between Packets, Data, and Frames

Term	Description
Data	The raw payload generated by the application layer (e.g., a file, message).
Packet	A formatted unit of data at the network layer (includes IP header).
Frame	A packet encapsulated with data link layer headers and trailers.

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