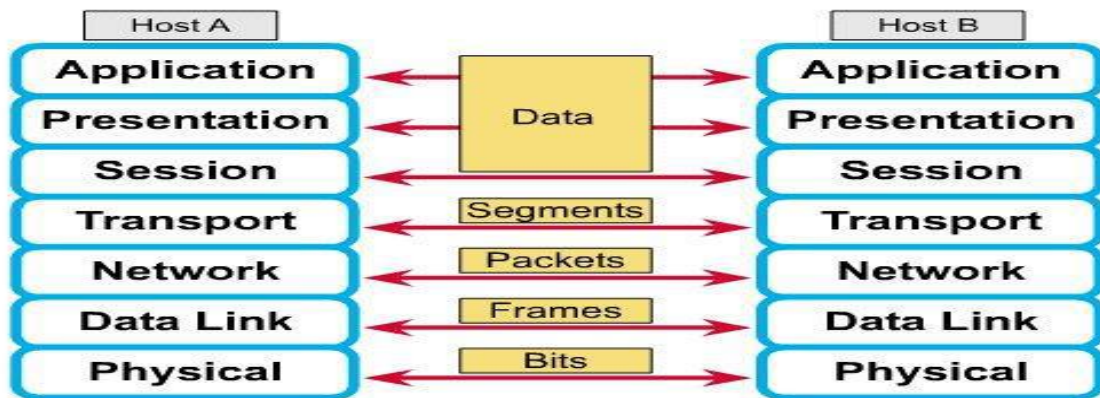


## Data Encapsulation

- Each layer contains a **Protocol Data Unit (PDU)**
- PDU's are used for **peer-to-peer contact** between corresponding layers.

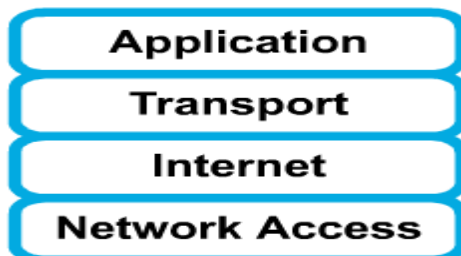
The Layer	Shape of data (PDU)
top three layers	Data
Transport layer	Segment
Network layer	packets
Data Link layer	frames
Physical layer	bits



### 4 layers of the TCP/IP model

- Layer 4: Application
- Layer 3: Transport
- Layer 2: Internet
- Layer 1: Network access

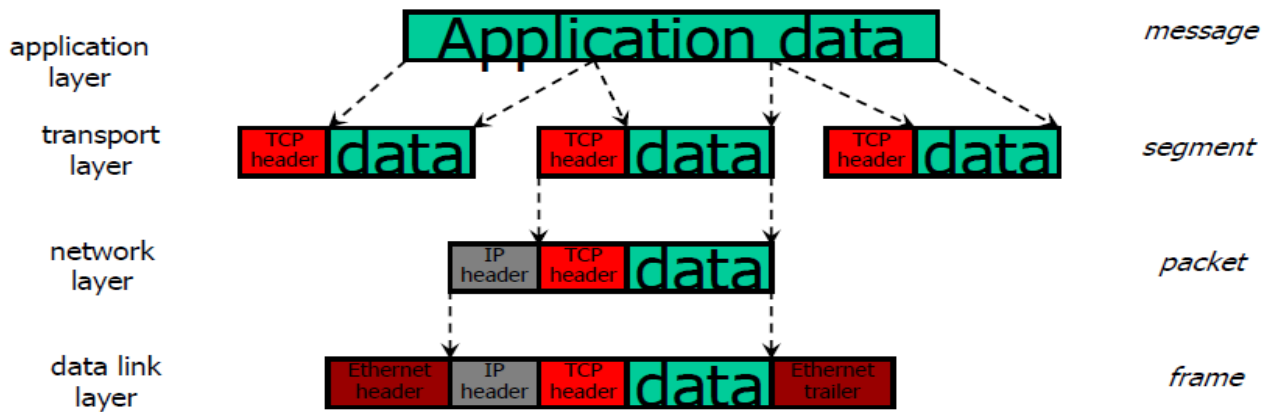
***It is important to note that some of the layers in the TCP/IP model have the same name as layers in the OSI model. Do not confuse the layers of the two models.***



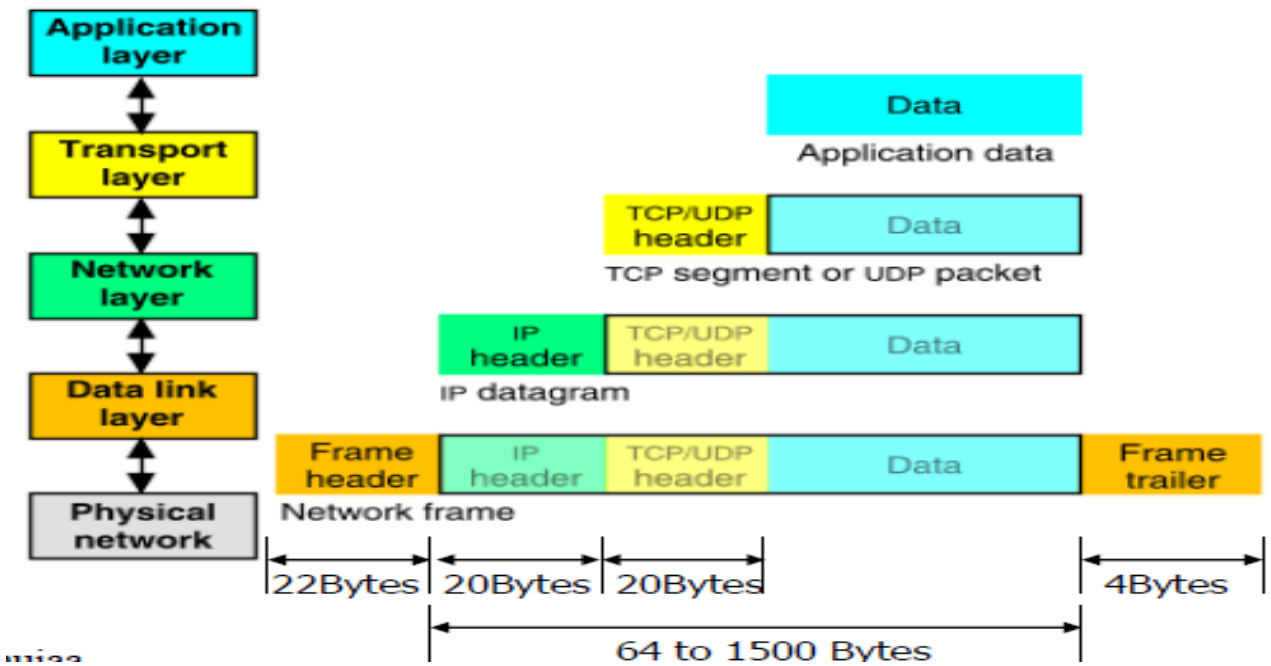
### Data Encapsulation In TCP/IP

- Outgoing data is packaged and identified for **delivery** to the layer underneath
- PDU – Packet Data Unit – the “envelop” information attached to a packet at a particular TCP/IP protocol e.g. header and trailer
- Header (Identifies the protocol in use, the sender and intended recipient)
- Trailer (or packet trailer) (Provides data integrity checks for the payload)

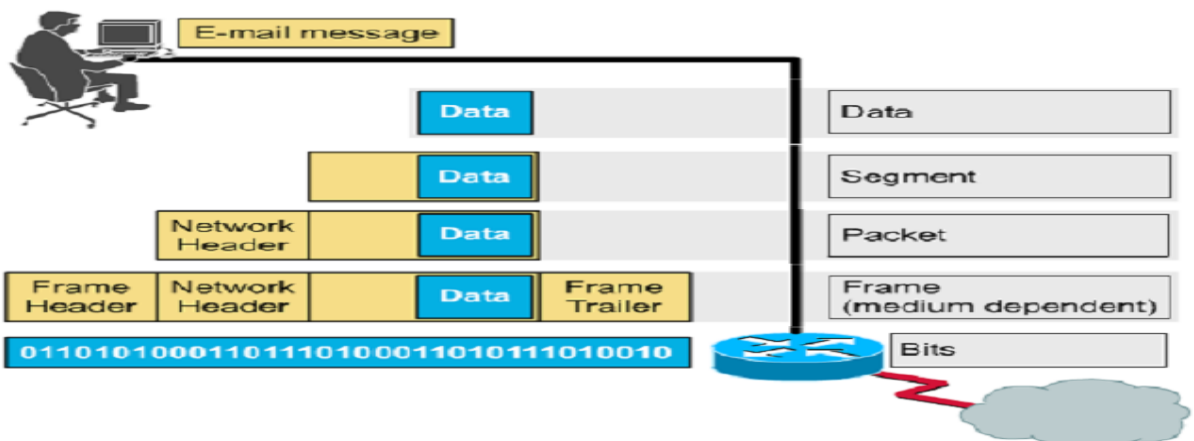
## Data Formats



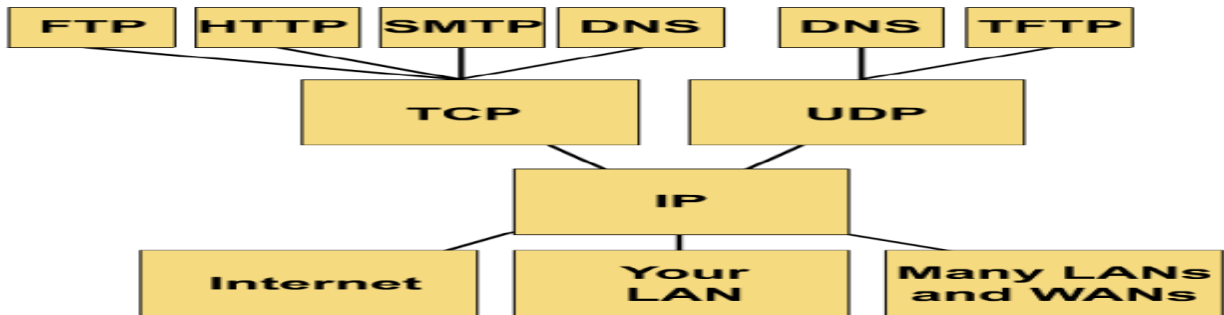
## Encapsulation (TCP/IP)



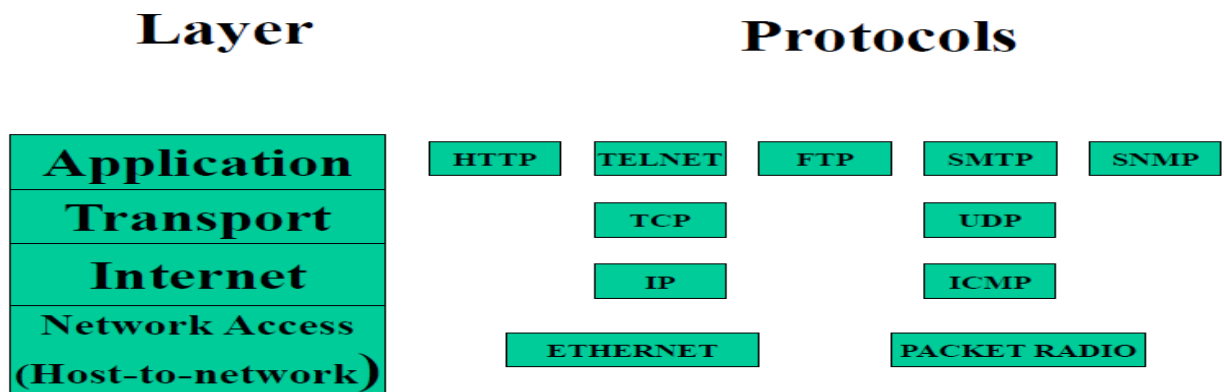
## Encapsulation example: E-mail



### TCP/IP protocol stack



### TCP/IP Reference Model



### What is a socket?

- An interface between application and network( each application create socket)
- Socket(Protocol family, type-of-communication, specific- protocol);
- The socket *type* dictates the style of communication

reliable vs. best effort

connection-oriented vs. connectionless

Q/Explain the delivery of data in Layered model?

Type of delivery	Layer	Shape of data	Type of addressing
End to End	Transport	Segment	Port (socket)
Source To Destination	Network	Packet	Logical (IP)
Node to Node	Data Link	Frame	Physical(MAC)