

# Computer Network Protocols Reference Model Lesson -2

كلية المستقبل الجامعة  
قسم هندسة تقنيات الحاسوب  
المرحلة الرابعة

By

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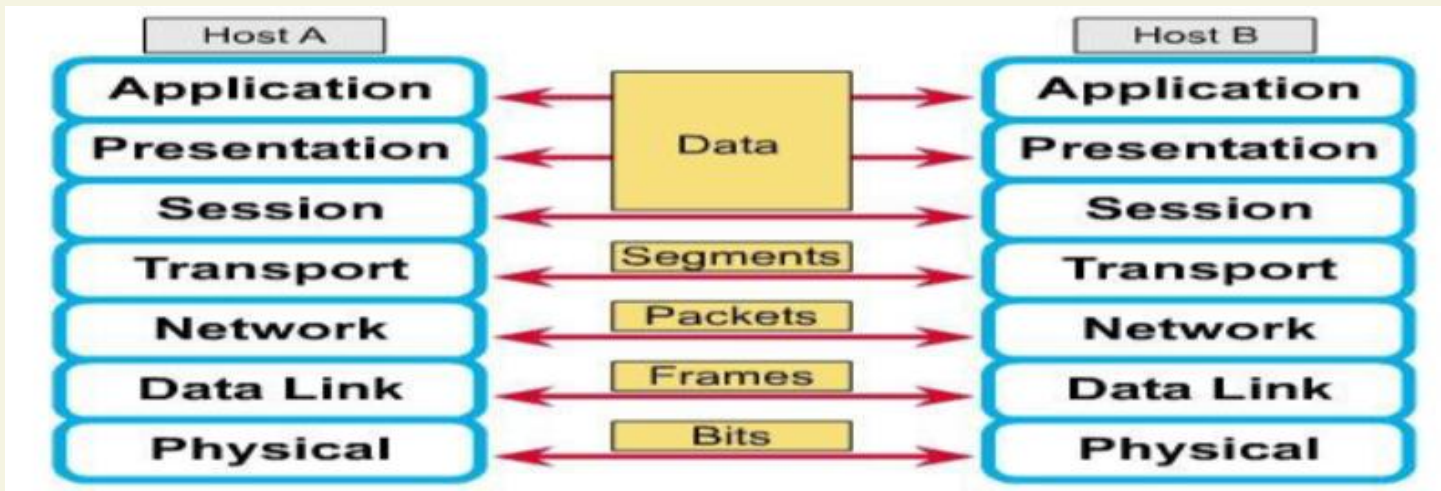
# ***Data Encapsulation***

*Each layer contains a Protocol Data Unit (PDU)*

- 1. PDU's are used for peer-to-peer contact between corresponding layers.*
- 2. Data is handled by the top three layers, then Segmented by the Transport layer.*
- 3. The Network layer places segment into packets and the Data Link frames the packets for transmission.*
- 4. Physical layer converts frame to bits and sends it out over the media.*
- 5. The receiving computer reverses the process using the information contained in the PDU (headers of each layer).*

# Data Encapsulation

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



# ***TCP/IP Model***

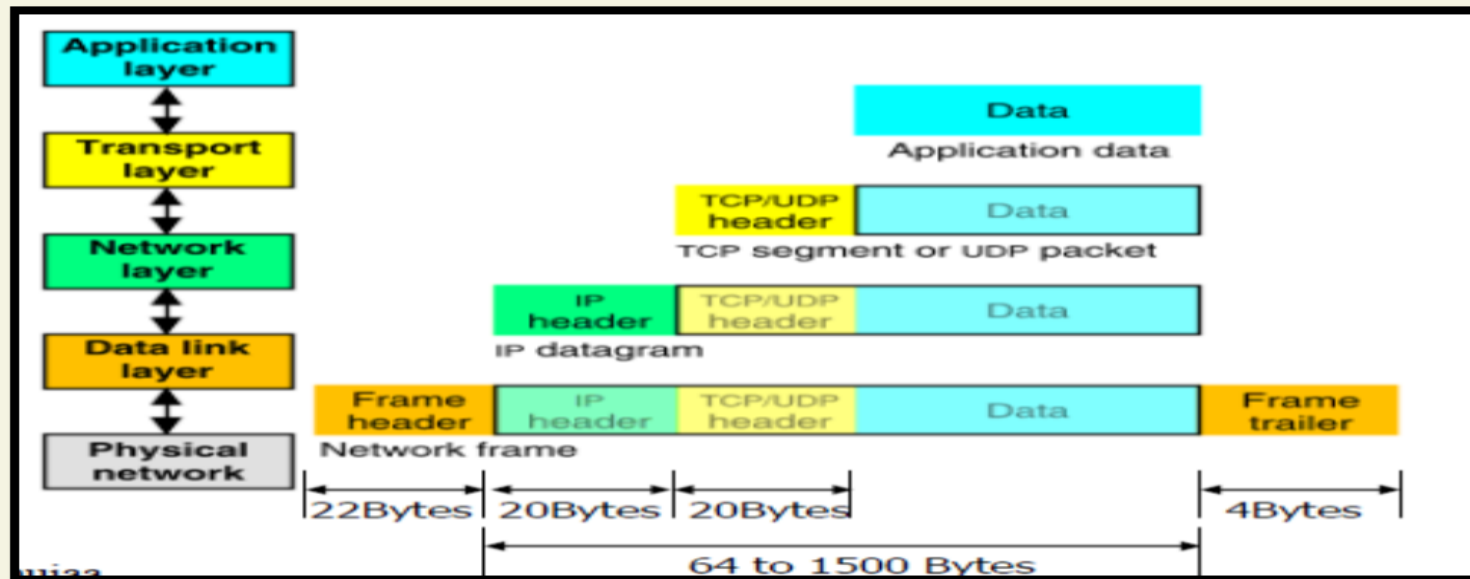
*It is important to note that some of the layers in the TCP/IP model have the same name as layers in the OSI model. Do not confuse the layers of the two models.*

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

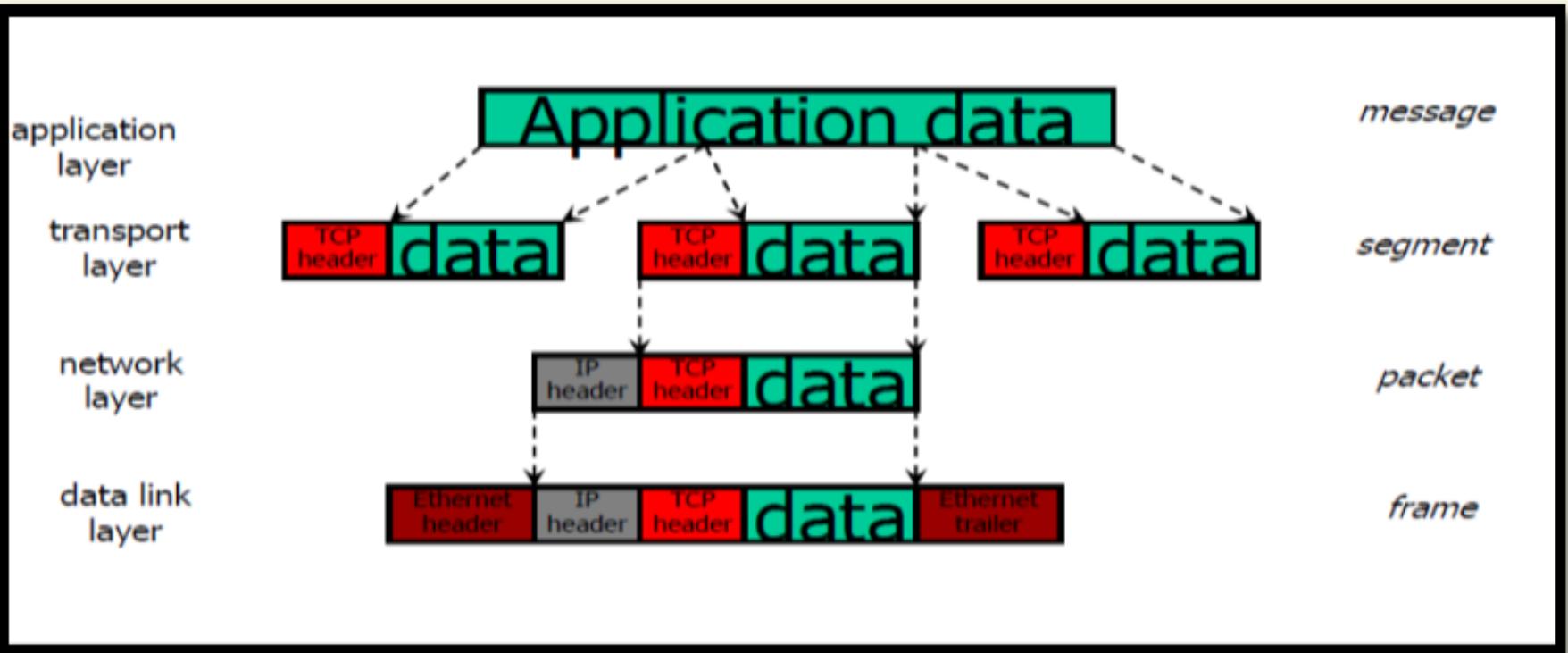


# Data Encapsulation In TCP/IP

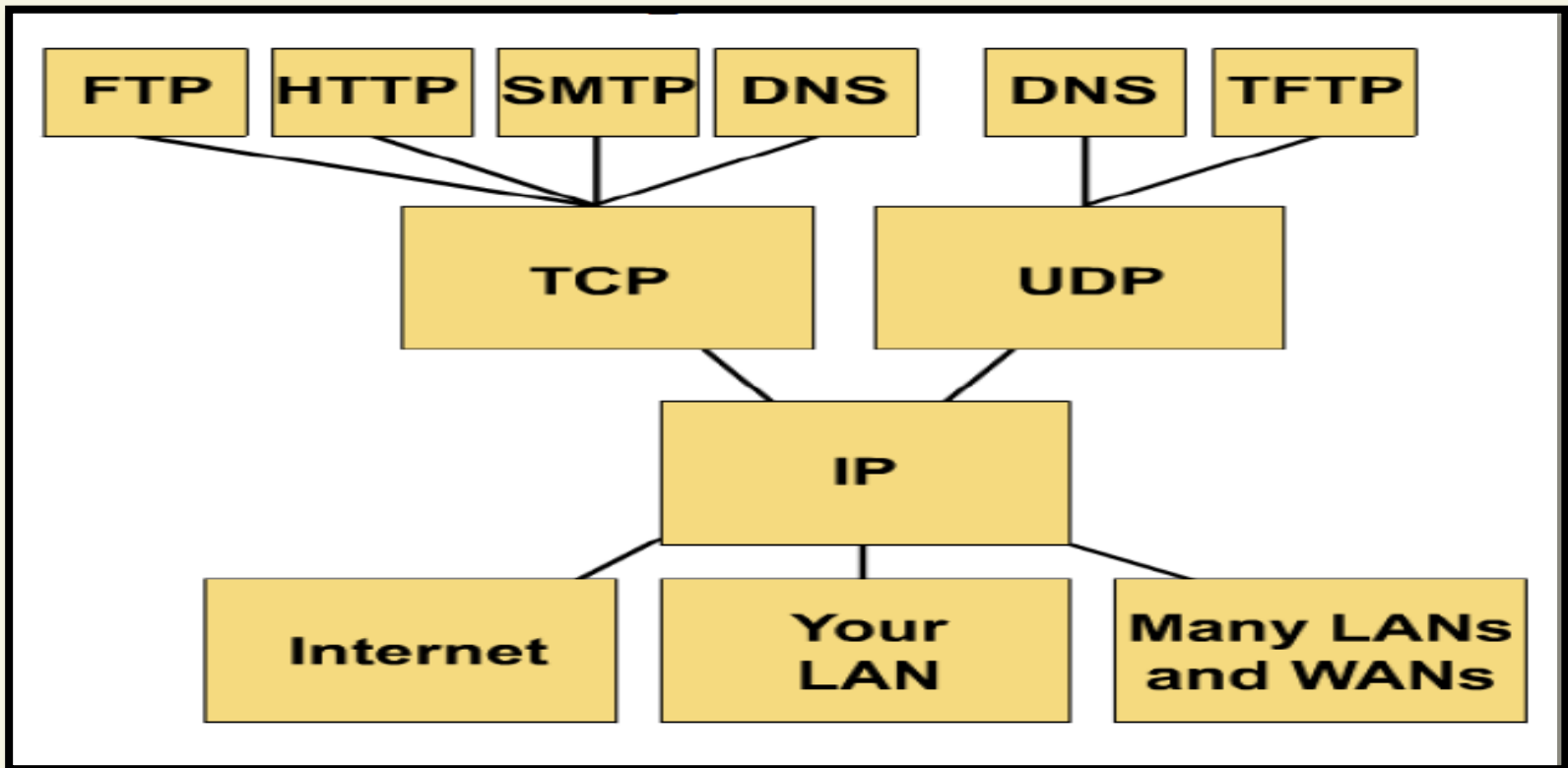
- Outgoing data is packaged and identified for delivery to the layer underneath
- PDU – Packet Data Unit – the “envelop” information attached to a packet at a particular TCP/IP protocol e.g. header and trailer
- Header (Identifies the protocol in use, the sender and intended recipient)
- Trailer (or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



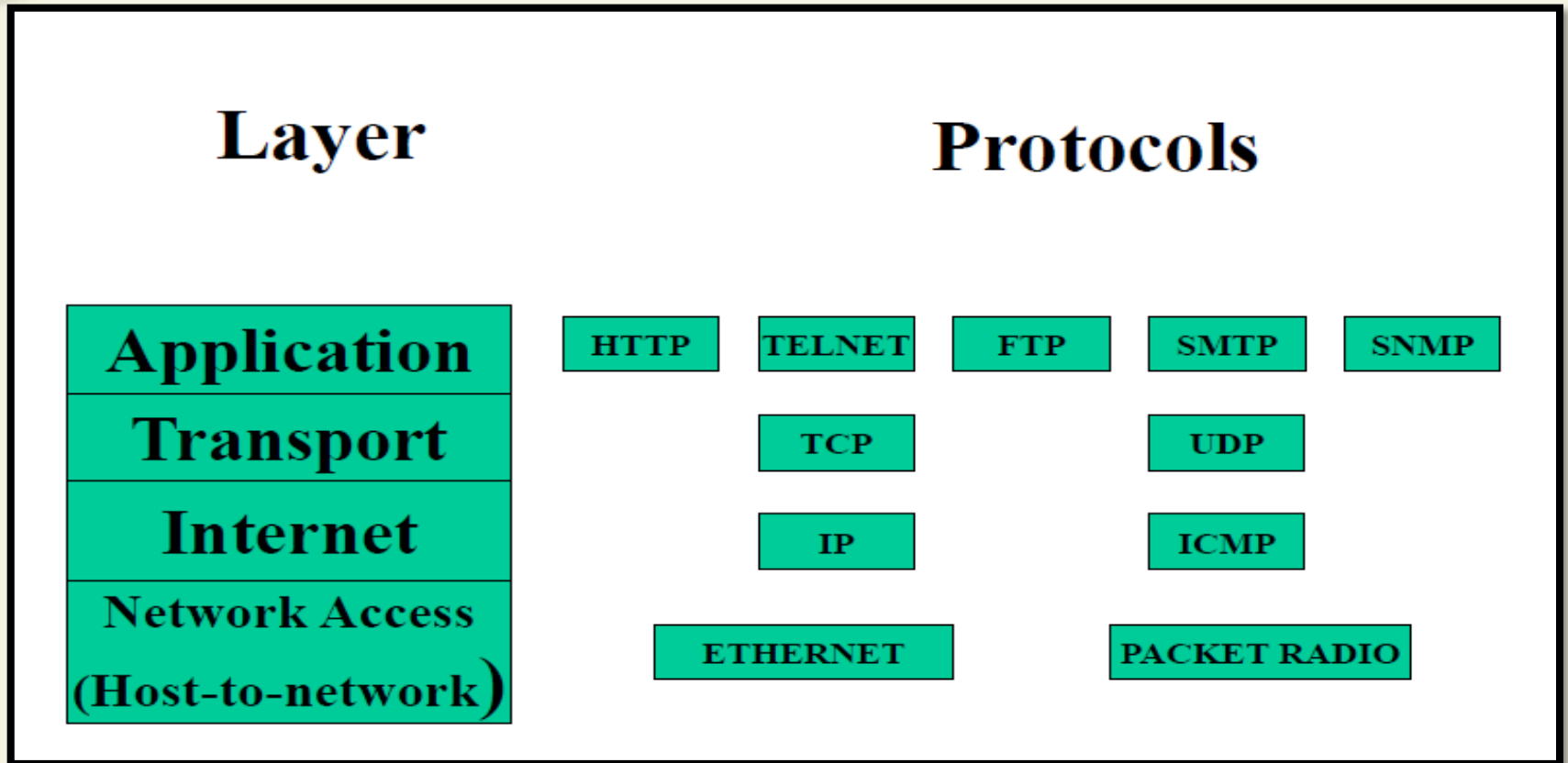
# Data Encapsulation In TCP/IP



# ***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)

# ***Differences Between OSI And TCP/IP Reference Models***

<b>OSI (Open System Interconnection)</b>	<b>TCP/IP (Transmission Control Protocol / Internet Protocol)</b>
1. OSI provides layer functioning and also defines functions of all the layers.	1. TCP/IP model is more based on protocols and protocols are not flexible with other layers.
2. OSI model has a separate presentation layer	2. TCP/IP does not have a separate presentation layer
3. OSI is a general model.	3. TCP/IP model cannot be used in any other application.
4. Network layer of OSI model provide both connection oriented and connectionless service.	4. The Network layer in TCP/IP model provides connectionless service.
5. OSI model has a problem of fitting the protocols in the model	5. TCP/IP model does not fit any protocol
6. Protocols are hidden in OSI model and are easily replaced as the technology changes.	6. In TCP/IP replacing protocol is not easy.
7. OSI model defines services, interfaces and protocols very clearly and makes clear distinction between them.	7. In TCP/IP it is not clearly separated its services, interfaces and protocols.
8. It has 7 layers	8. It has 4 layers

***End Of Lesson 2***

***Thanks For Listening***