Computer Network Protocols Reference Model Lesson -2

جامعة المستقبل
كلية الهندسة والتقنيات الهندسية
قسم هندسة تقنيات الحاسوب
المرحلة الرابعة

By

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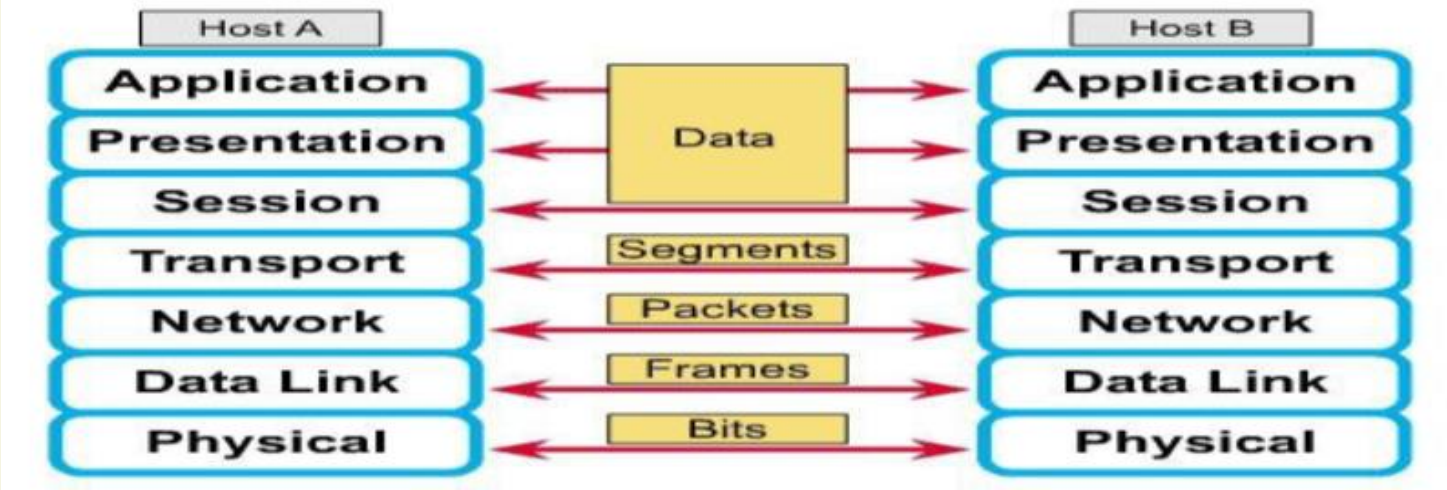
Data Encapsulation

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

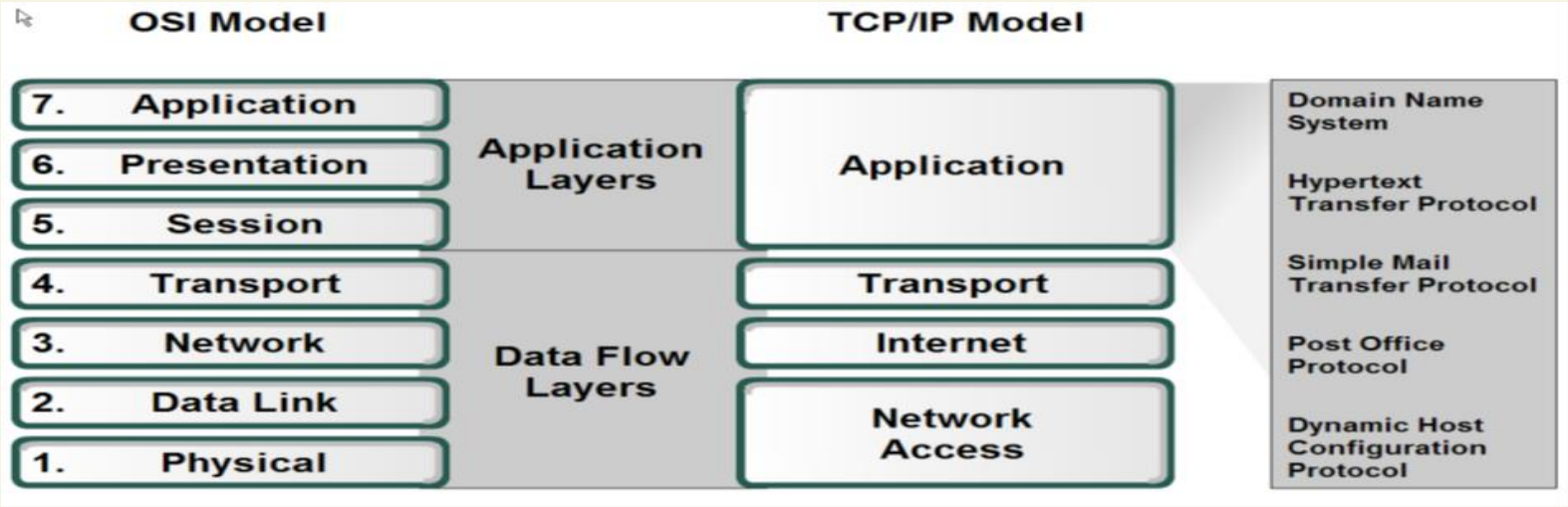
The Layer	Shape of data (PDU)
Top three layers	Data
Transport layer	Segment
Network layer	packets
Data Link layer	frames
Physical layer	bits



TCP/IP Model

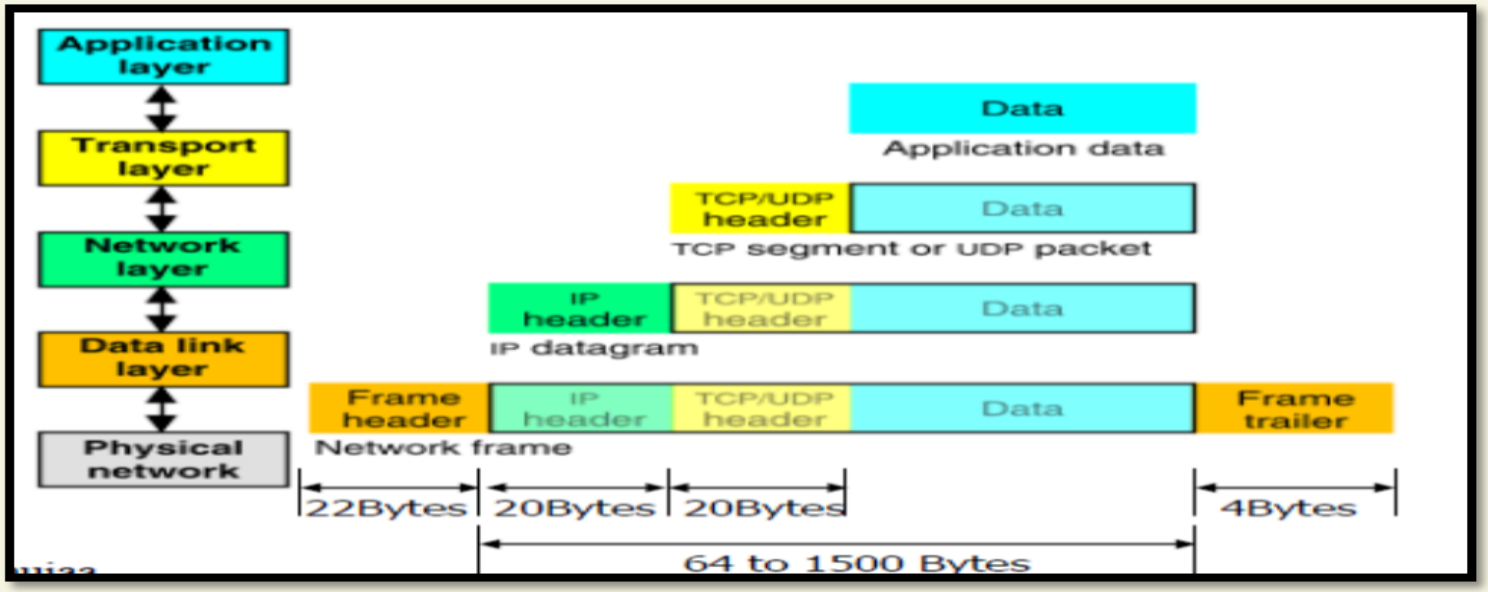
It is important to note that some of the layers in the TCP/IP model have the same name as layers in the OSI model. Do not confuse the layers of the two models.

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

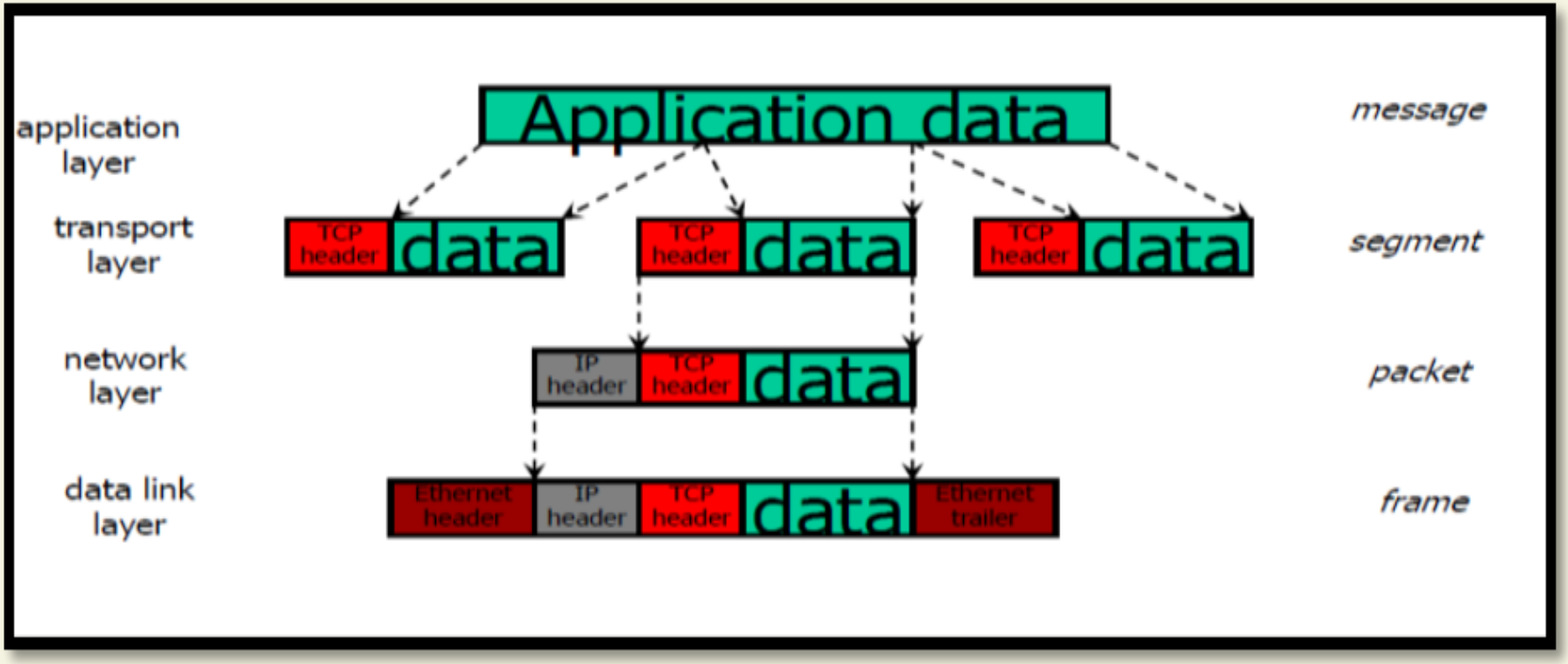


Data Encapsulation In TCP/IP

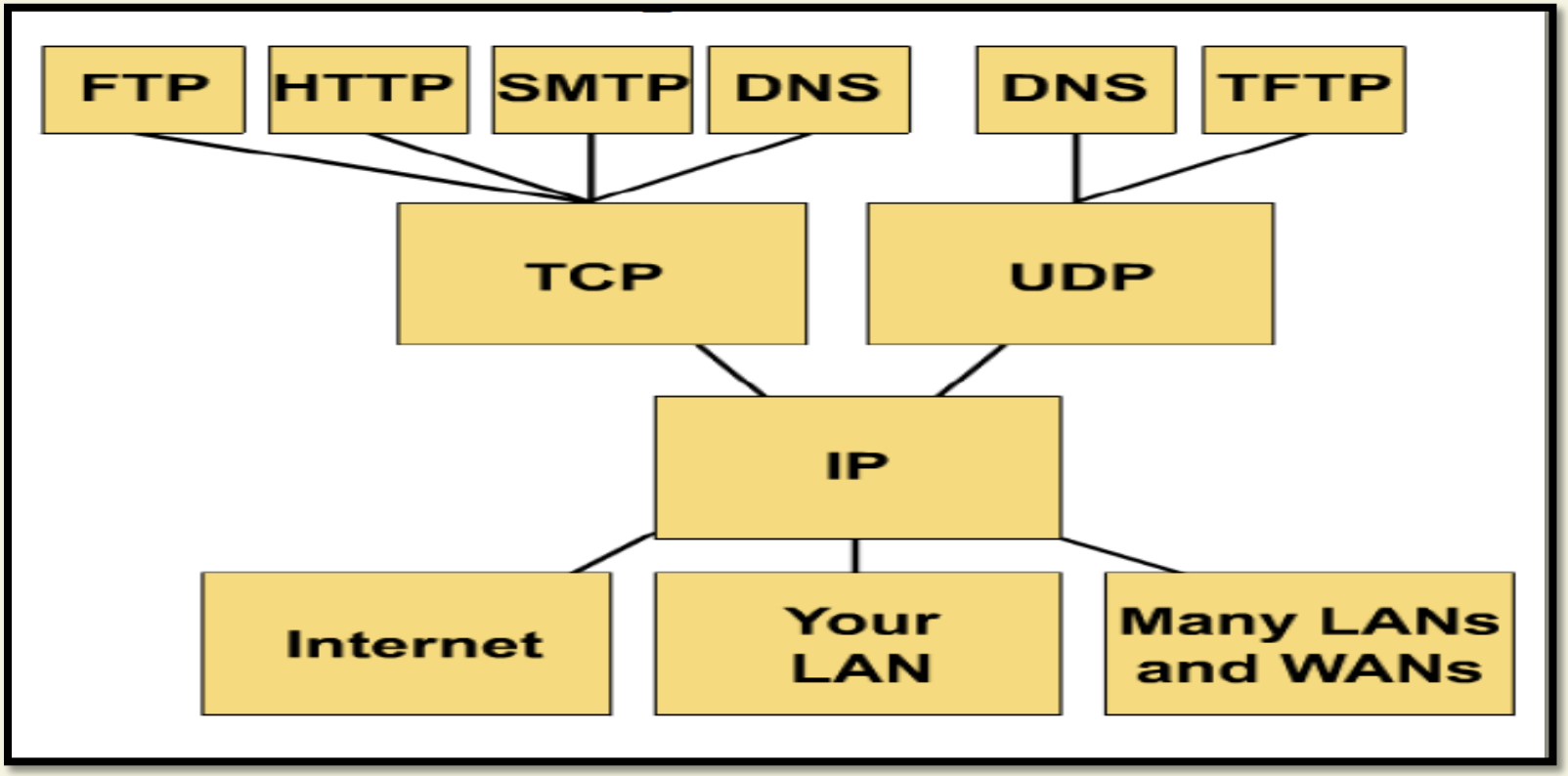
- *Outgoing data is packaged and identified for delivery to the layer underneath*
- *PDU – Packet Data Unit – the "envelop" information attached to a packet at a particular TCP/IP protocol e.g. header and trailer*
- *Header (Identifies the protocol in use, the sender and intended recipient)*
- *Trailer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



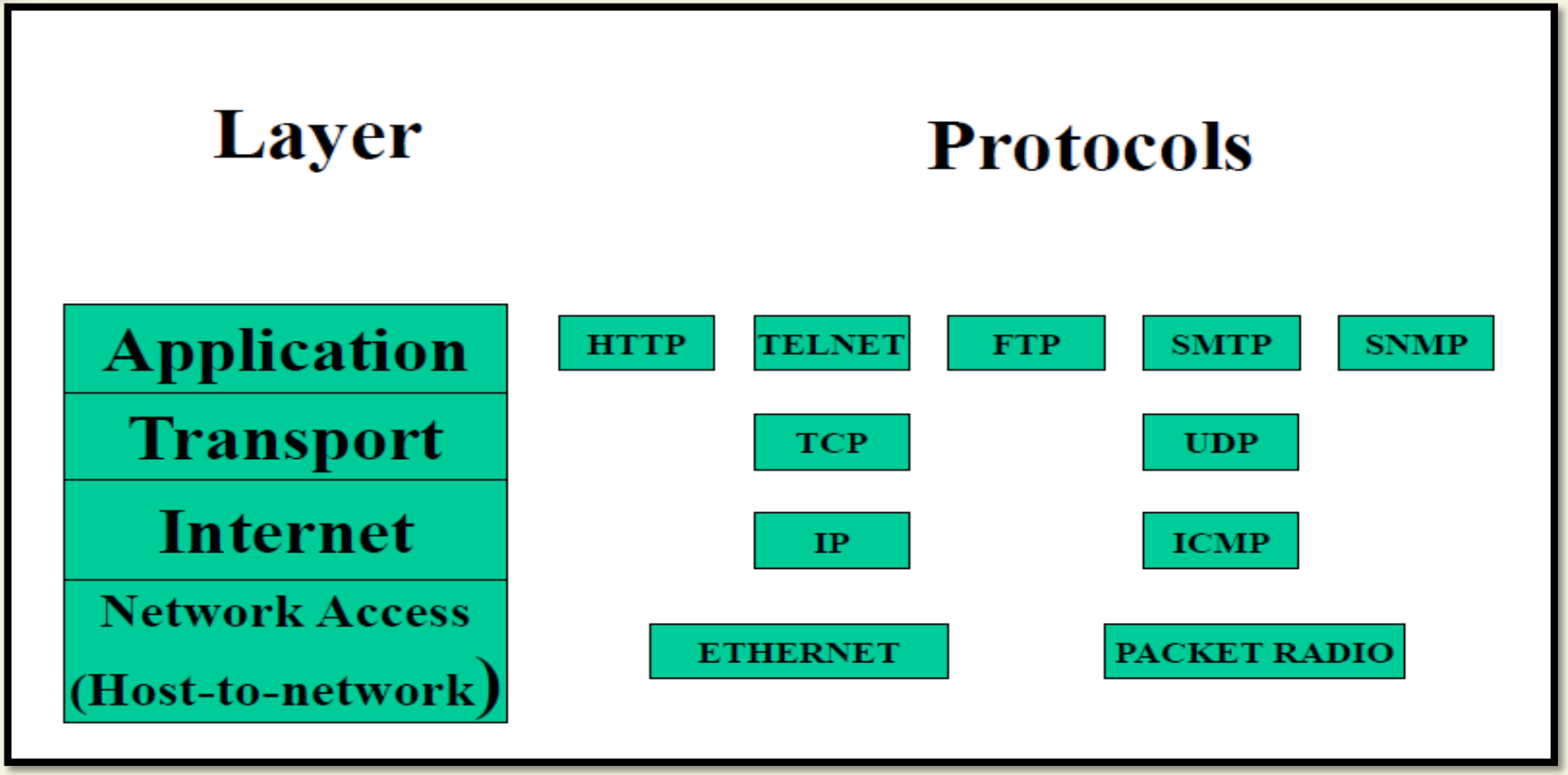
Data Encapsulation In TCP/IP



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

OSI (Open System Interconnection)	TCP/IP (Transmission Control Protocol / Internet Protocol)
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