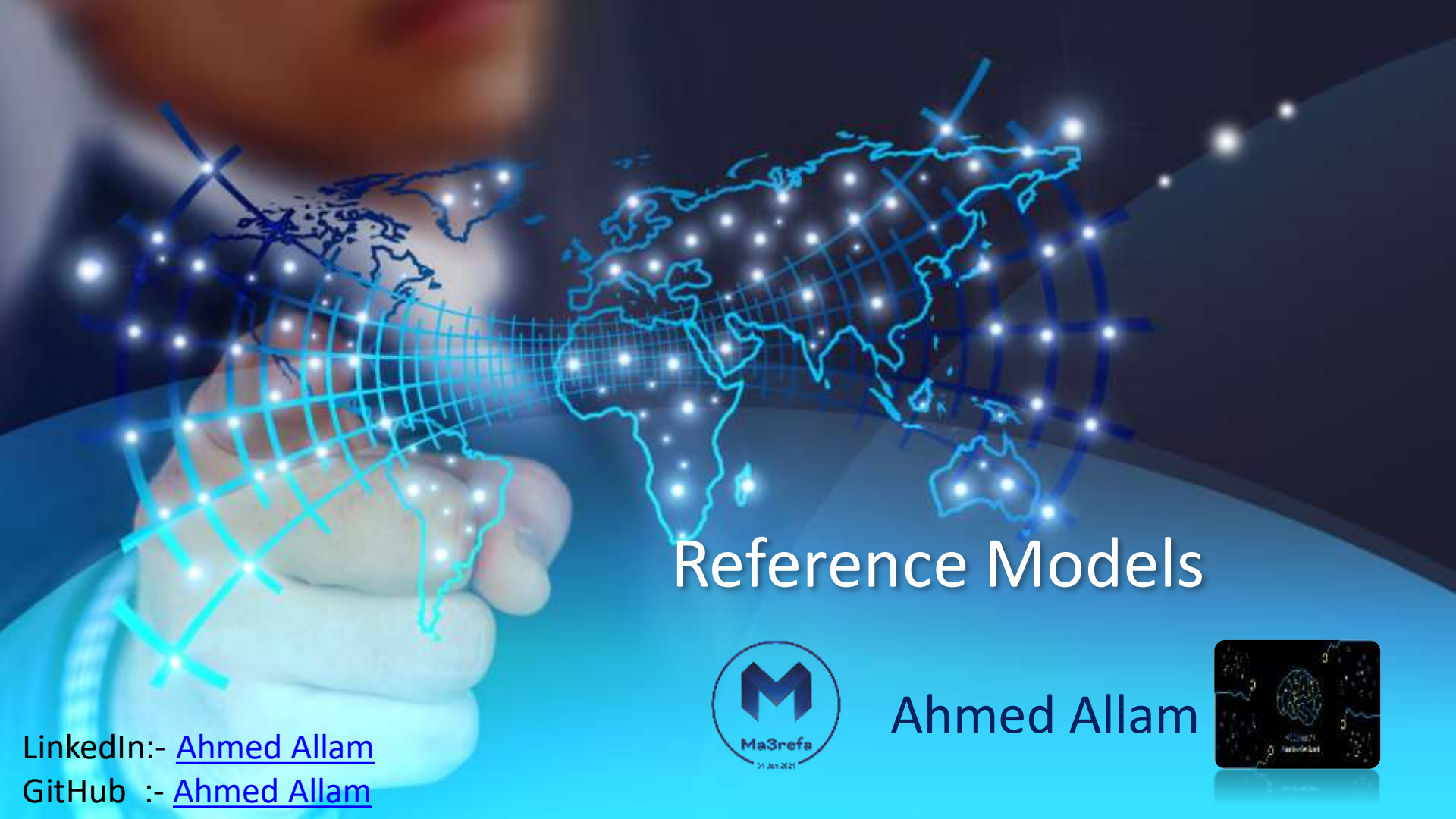


Reference Models

Ahmed Allam

LinkedIn:- Ahmed Allam
GitHub :- Ahmed Allam

Session 2

- What is Protocol ?
- What is OSI models ?
- What is TCP/IP models ?
- What is Legacy Classful Addressing ?

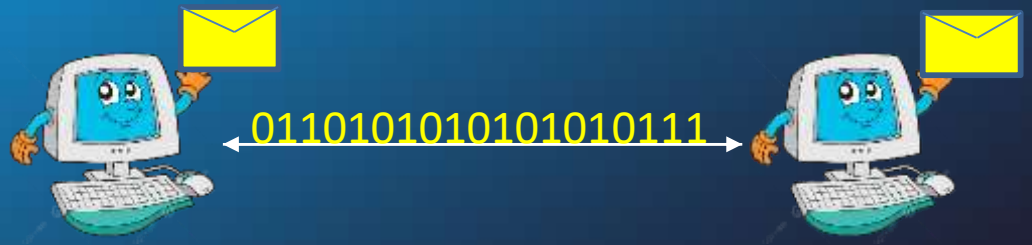
What is the reference model ?

- Describe how communication between devices.
- Defines which functions at each layer of the model.

Network Protocols

What is Protocol ?

- **A network protocol is a set of established rules that specify how to format, send and receive data so that computer network endpoints.**

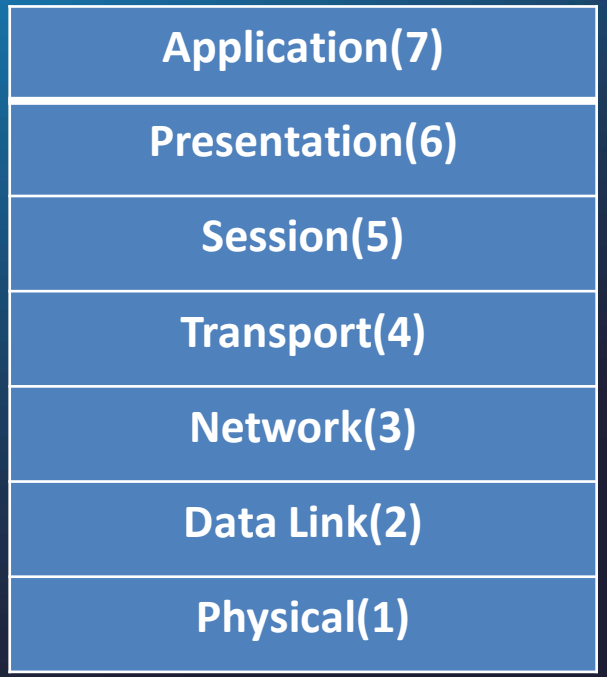


Introduction to the ISO

- **Abbreviation ISO (**International Standards Organization).
- **Divided into Two Layers Models Network Operation.**
  - **OSI Models (Open System Interconnection).**
  - **TCP/IP models.**

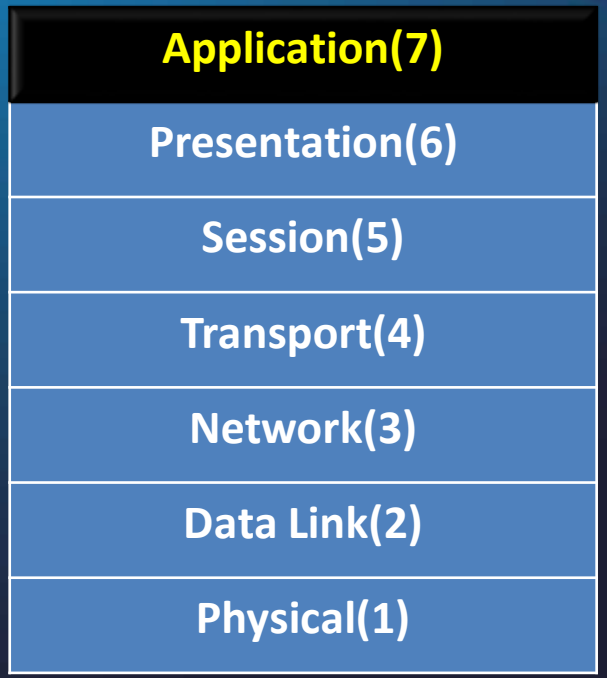
What is OSI model ?

- The OSI model is a reference framework that explains the process of transmitting data between computers.
- It is divided into seven layers that work together.



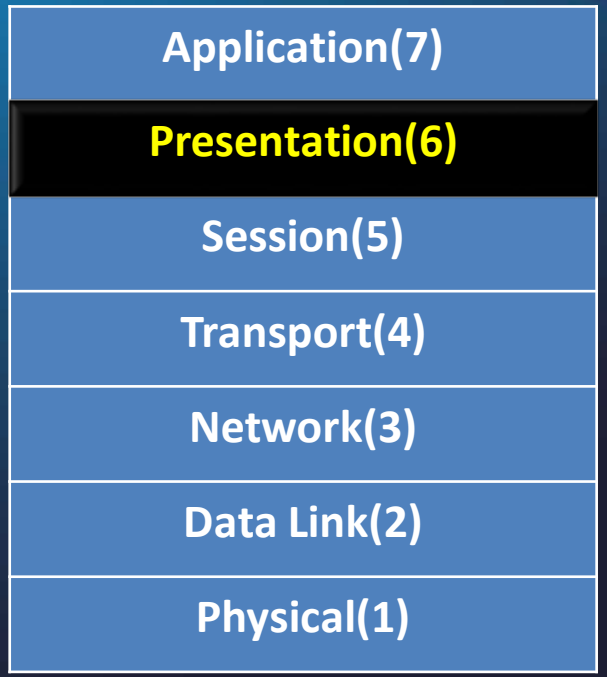
7-Application Layer

- provides the interface between the applications used to communicate, and the underlying network over which messages are transmitted.
- Some of the most widely known application layer protocols include HTTP, FTP, SMTP , DHCP and DNS.



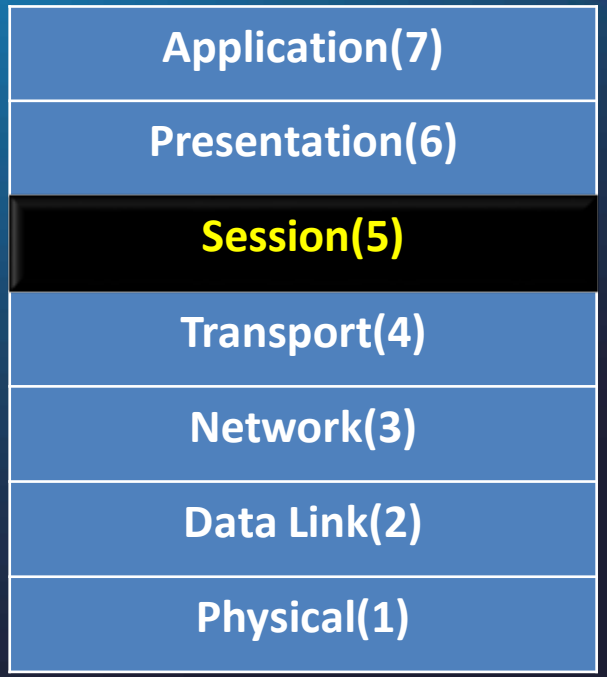
6-Presentation

- Formatting data.
- Compressing data and decompressing.
- Jpg , html , pdf , doc ,……..



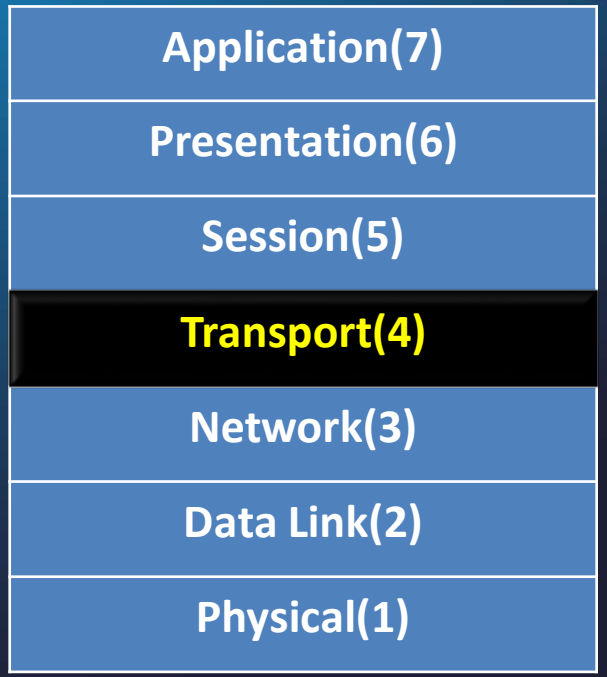
5-Session

- It creates and maintains dialogs between source and destination applications.
- It handles the exchange of information to initiate dialogs, keep them active, and to restart sessions that are disrupted or idle for a long period of time.
- Type Communication between hosts.
  - Single.
  - Half duplex.
  - Full duplex.



4-Transport

- responsible for logical communications between applications running on different hosts.
- The link between the application layer and the lower layers that are responsible for network transmission.
- includes the TCP and UDP protocols.
- Data is Segment. Segment



3-Network

- performs four basic operations.
  - Addressing end devices.
  - Encapsulation.
  - Routing.
  - De-encapsulation.
- IP version 4 (IPv4) and IP version 6 (IPv6) are the principles network layer communication protocols.
- Data is Packets

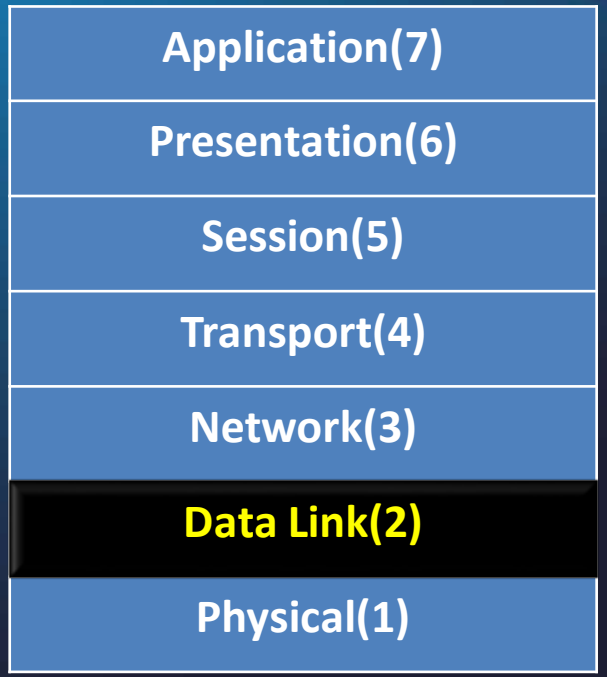
Packets

Application(7)
Presentation(6)
Session(5)
Transport(4)
Network(3)
Data Link(2)
Physical(1)

2-Data Link

- responsible for communications between end-device and network interface cards(NIC).
- It allows upper layer protocols to access the physical layer media.
- Ethernet
- error detection.
- Data is Frames .

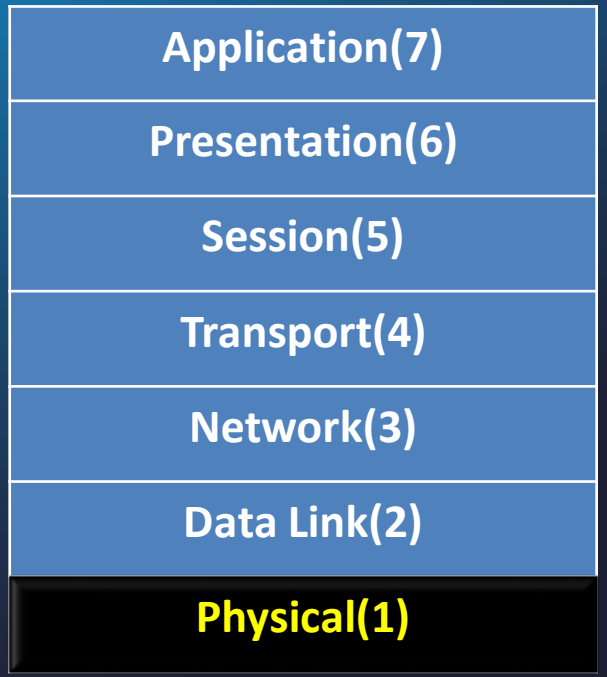
Frames

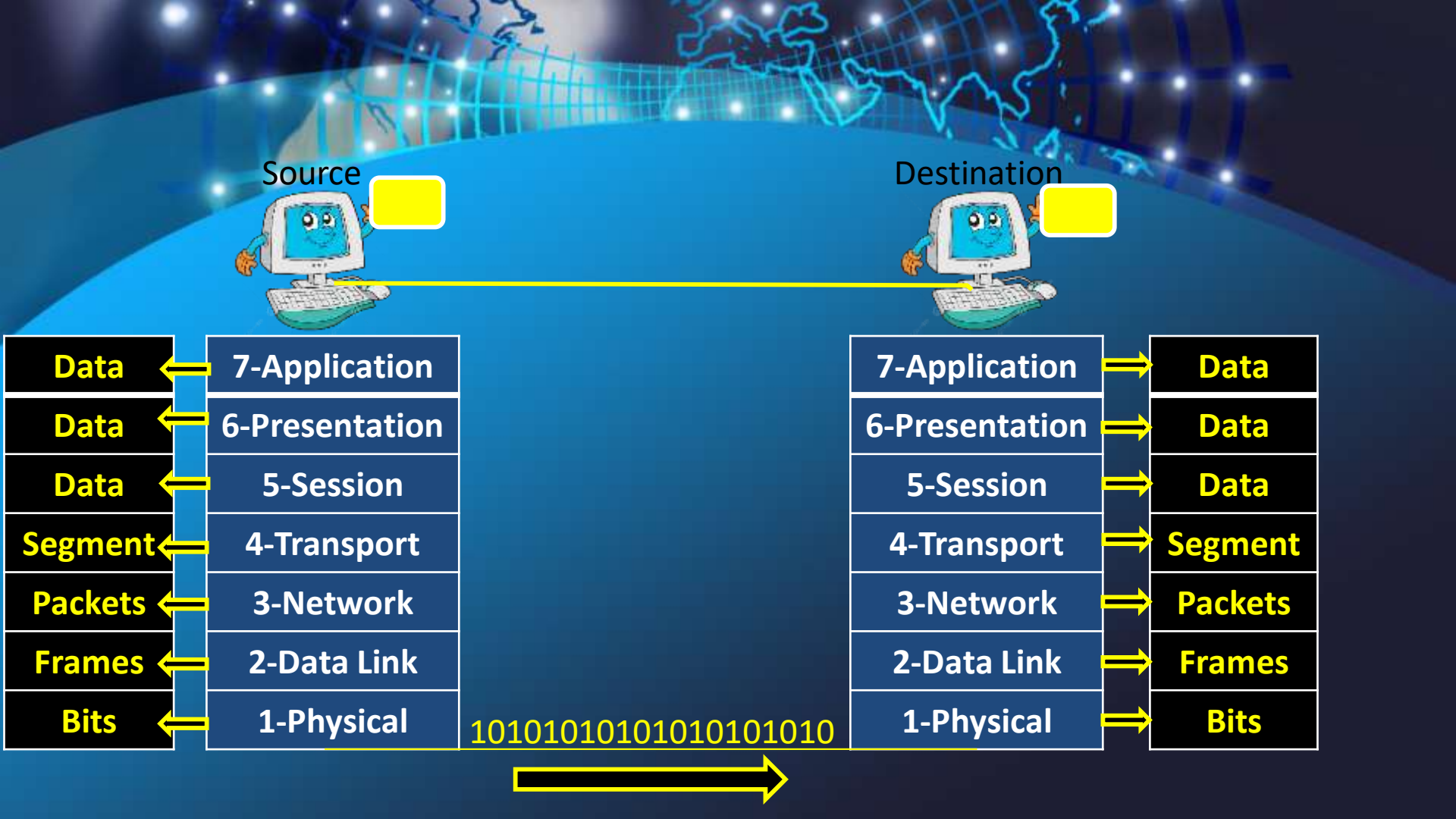


1-Physical

- Transports bits across the network media.
- This is the last step in the encapsulation process.
- The next device in the path to the destination receives the bits.
- Data is Bits

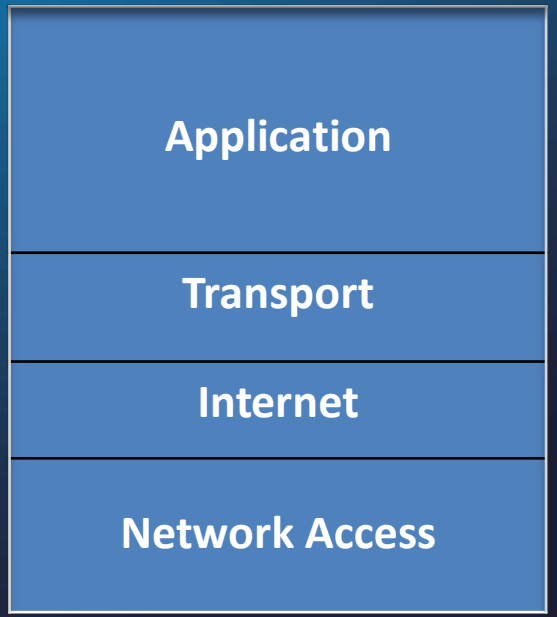
Bits

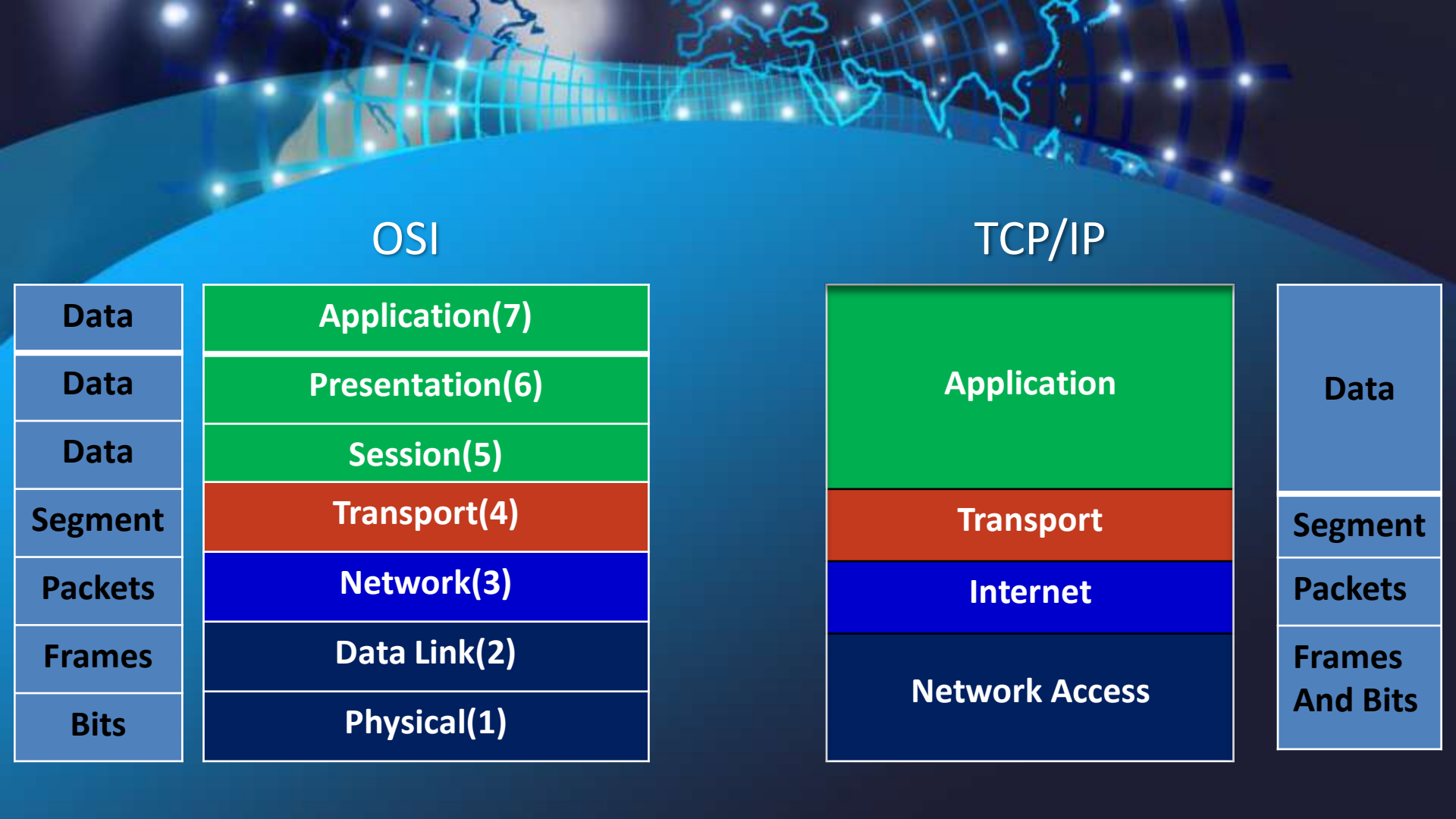



Source
Destination
Data
Data
Data
Segment
Packets
Frames
Bits
7-Application
6-Presentation
5-Session
4-Transport
3-Network
2-Data Link
1-Physical
7-Application
6-Presentation
5-Session
4-Transport
3-Network
2-Data Link
1-Physical
Data
Data
Data
Segment
Packets
Frames
Bits
10101010101010101010

What is TCP/IP ?

- Stands for Transmission Control Protocol/Internet Protocol.
- The TCP/IP model is a reference framework that explains the process of transmitting data between computers.
- It is divided into Four layers that work together.




OSI
TCP/IP
Data
Data
Data
Segment
Packets
Frames
Bits
Application(7)
Presentation(6)
Session(5)
Transport(4)
Network(3)
Data Link(2)
Physical(1)
Application
Transport
Internet
Network Access
Data
Segment
Packets
Frames And Bits

Legacy Classful Addressing

Ahmed Allam

Decimal and Binary

- كيفية التحويل من Binary الى Decimal .
- كيفية التحويل من Decimal الى Binary .

128	64	32	16	8	4	2	1

EX:-

- Convert 25 decimal to binary ?
- Convert 01110101 to decimal ?

What is IPV4 ?

- Abbreviation (Internet Protocol version4).
- Using in Layer 3 (Network Layer).
- 32bits means 4bytes or 4 Octets.

EX:- 192.168.1.1 Octet1.Octet2.Octet3.Octet4

11000000. 10101000.00000001.00000001

8bits + 8bits + 8bits + 8bits = 32bits

Classes

- Class A

  IP:1.0.0.0 to 126.255.255.255

  subnet mask:255.0.0.0 → N.H.H.H

  11111111.00000000.00000000.00000000

  Network ID | Host ID

  - اقصى عدد اجهزه (hosts) في هذا ال Class يساوي.....

Max number hosts = [2^(hosts) -2]=16,777,244 host

Classes

- Class B

  IP:128.0.0.0 to 191.255.255.255

  subnet mask:255.255.0.0 → N.N.H.H

  11111111. 11111111.00000000.00000000

  Network ID Host ID

- اقصى عدد اجهزه (hosts) في هذا ال Class يساوي.....

Max number hosts = [2^(hosts) -2]=65534 host

Classes

- Class C

  IP:191.0.0.0 to 223.255.255.255

  subnet mask:255.255.255.0 → N.N.N.H

  11111111. 11111111. 11111111.00000000

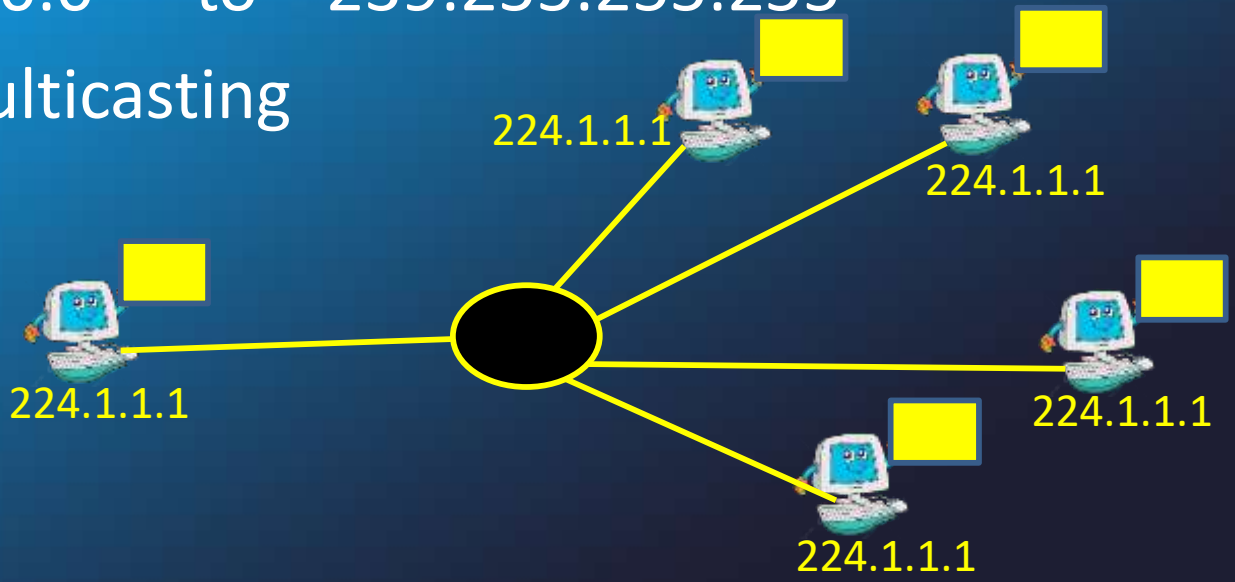
  Network ID Host ID

- اقصى عدد اجهزه (hosts) في هذا ال Class يساوي.....

Max number hosts = [2^(hosts) -2]=254 host

Classes

- Class D
  - IP:224.0.0.0 to 239.255.255.255
  - Using Multicasting



Classes

- Class E
  - IP:240.0.0.0 to 255.255.255.255
  - Using Research
  - This Class Using organization IANA.

LAPS

- Laps


Ip:10.0.0.1
Mask:255.0.0.0
SW
Ip:10.0.0.2
Mask:255.0.0.0
Ip:150.0.0.1
Mask:255.255.0.0
SW
Ip:150.0.0.2
Mask:255.255.0.0
Ip:192.168.1.2
Mask:255.255.255.0
SW
Ip:192.168.1.1
Mask:255.255.255.0

رمضان كريم

THANKS.....

Make Your Own