# Computer Networks

## Network Models - Assignment 2

Present by :

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# Topics

- Introduction to Networks Models
- Introduction to ISO
- OSI Model
- TCP/IP Model
- Layers
- OSI vs TCP/IP
- Protocols and services
- Data Centers

# Introduction

**Network** Must be used Layers and Layered Models for Network Architecture.

Using a layered model for network architecture is not an unusual thing

# ISO

**ISO** is instead for the International Standards Organization , Founded in 1947.

It defines worldwide agreement on international standards

# ISO and OSI

**ISO** in 1970s introduced a standard for networks and networks communications.

**OSI** is "Open Systems Interconnected" network model , Have 7 Layers and used from 1970s to late 1980s (Around 1988) – Mid 1990s (Around 1995).

# ISO Another Example

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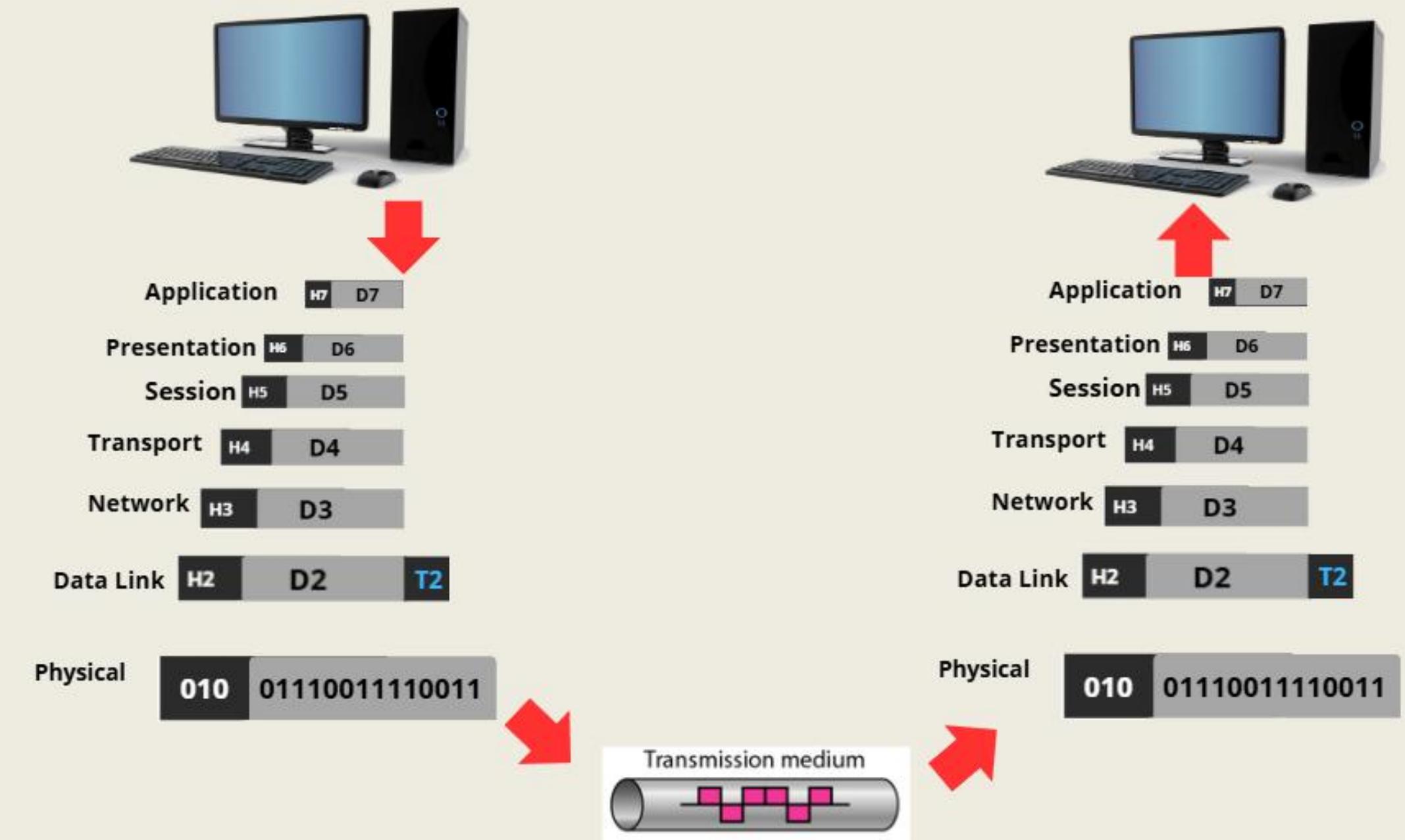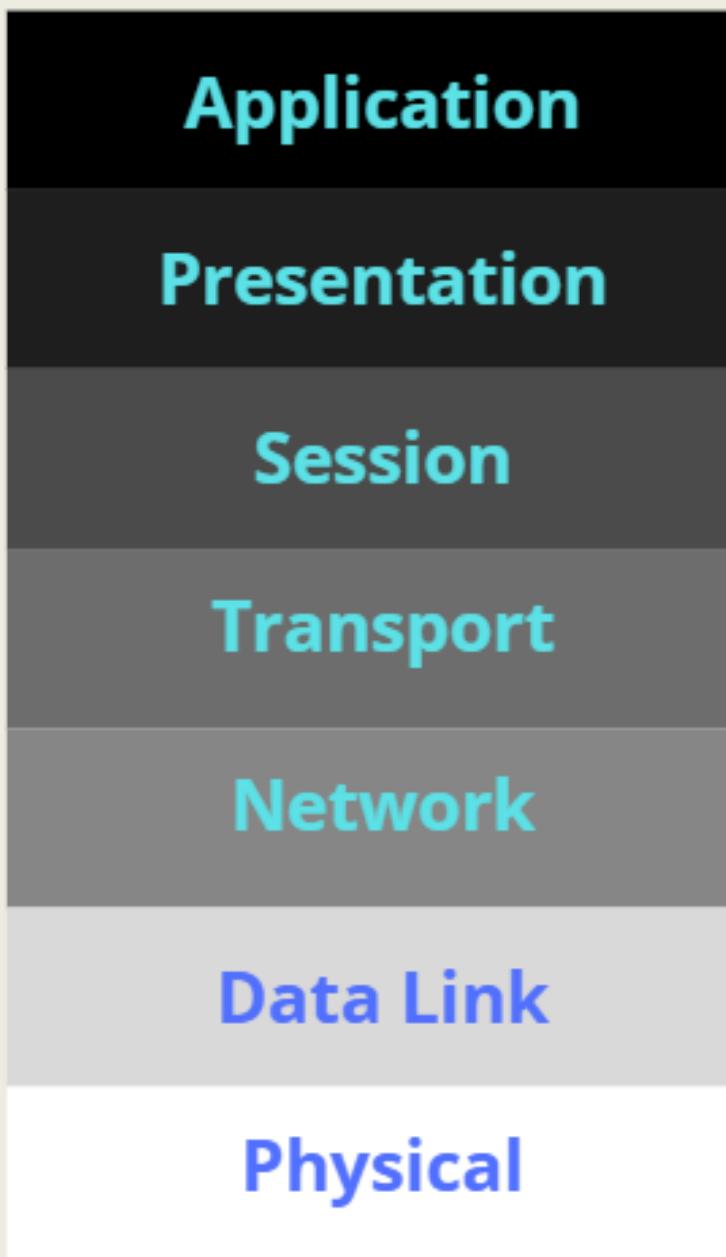
# OSI Layers

The OSI model was theoretical and complex in implementation and setup.

There are 7 Layers for OSI model , We will showing and discussing it.

# OSI Layers

# OSI vs TCP/IP
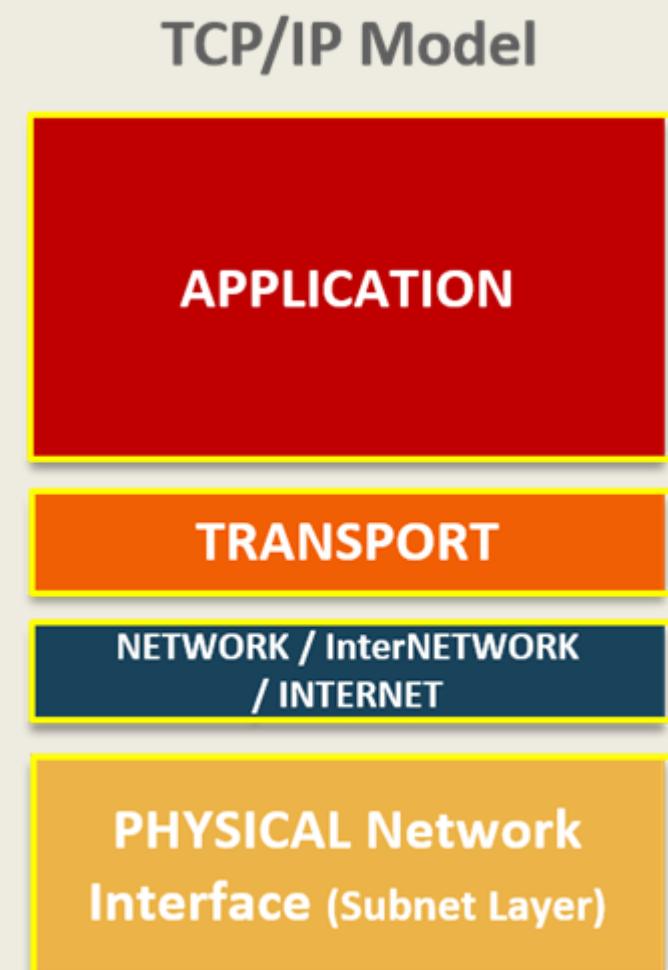
In our modern era, it is commonly used for teaching, explaining, analyzing, and troubleshooting.

This is due to the TCP/IP model, which is great option in currently time.

# TCP/IP Layers

The TCP/IP model summarizes the layers in the OSI model
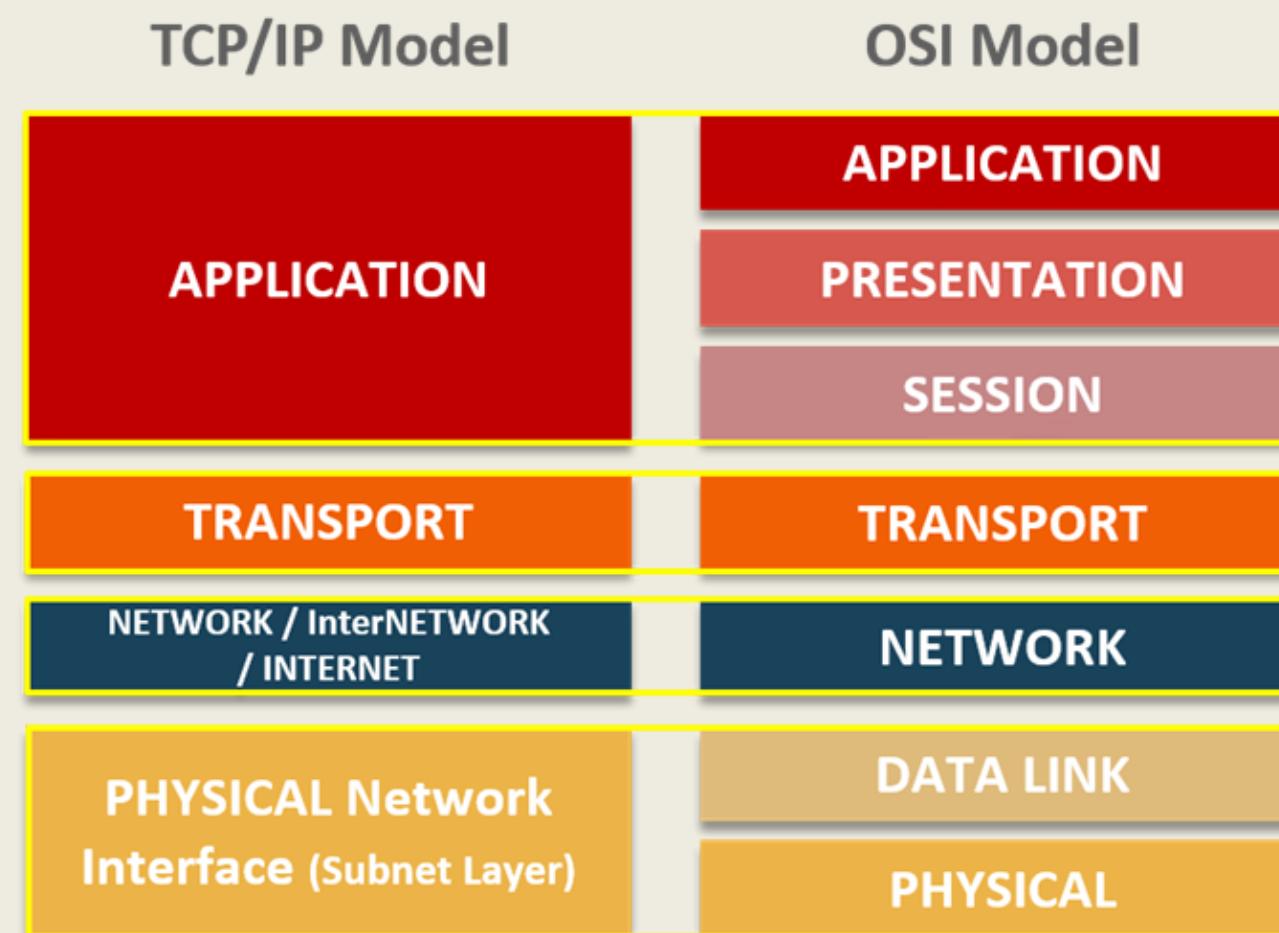
From seven layers to four layers, the four layers consist of five components.

### TCP/IP Model

**APPLICATION**

**TRANSPORT**

**NETWORK / InterNETWORK / INTERNET**

**PHYSICAL Network Interface (Subnet Layer)**
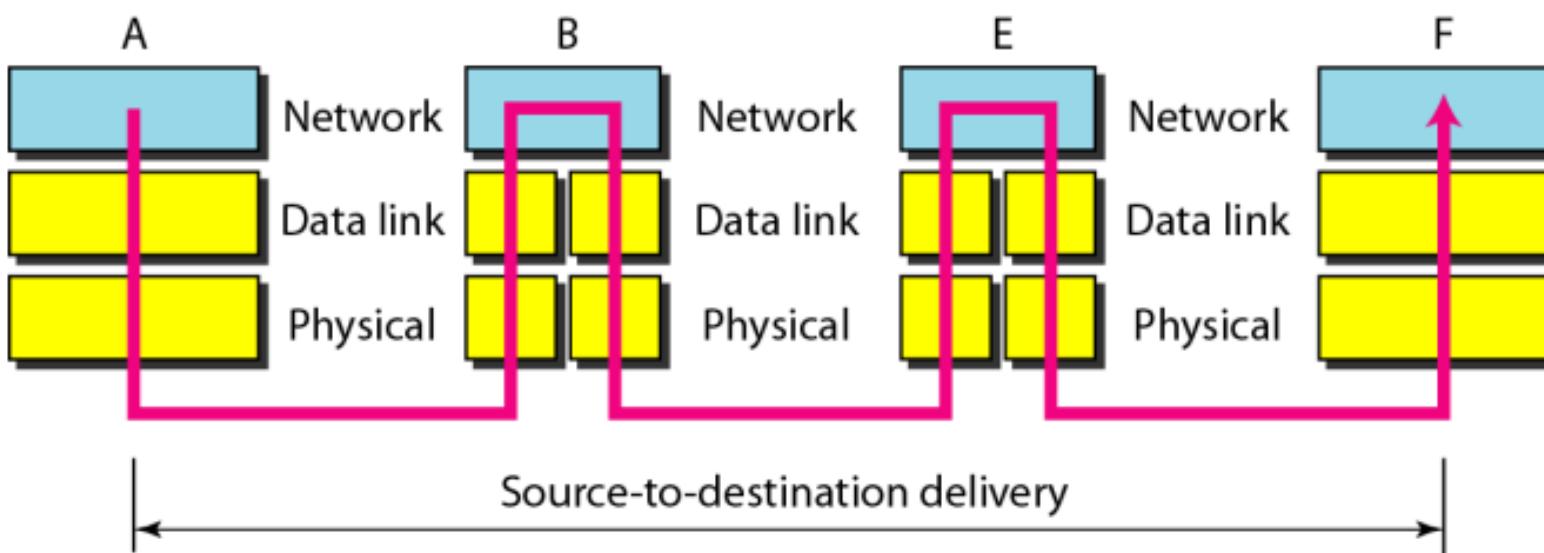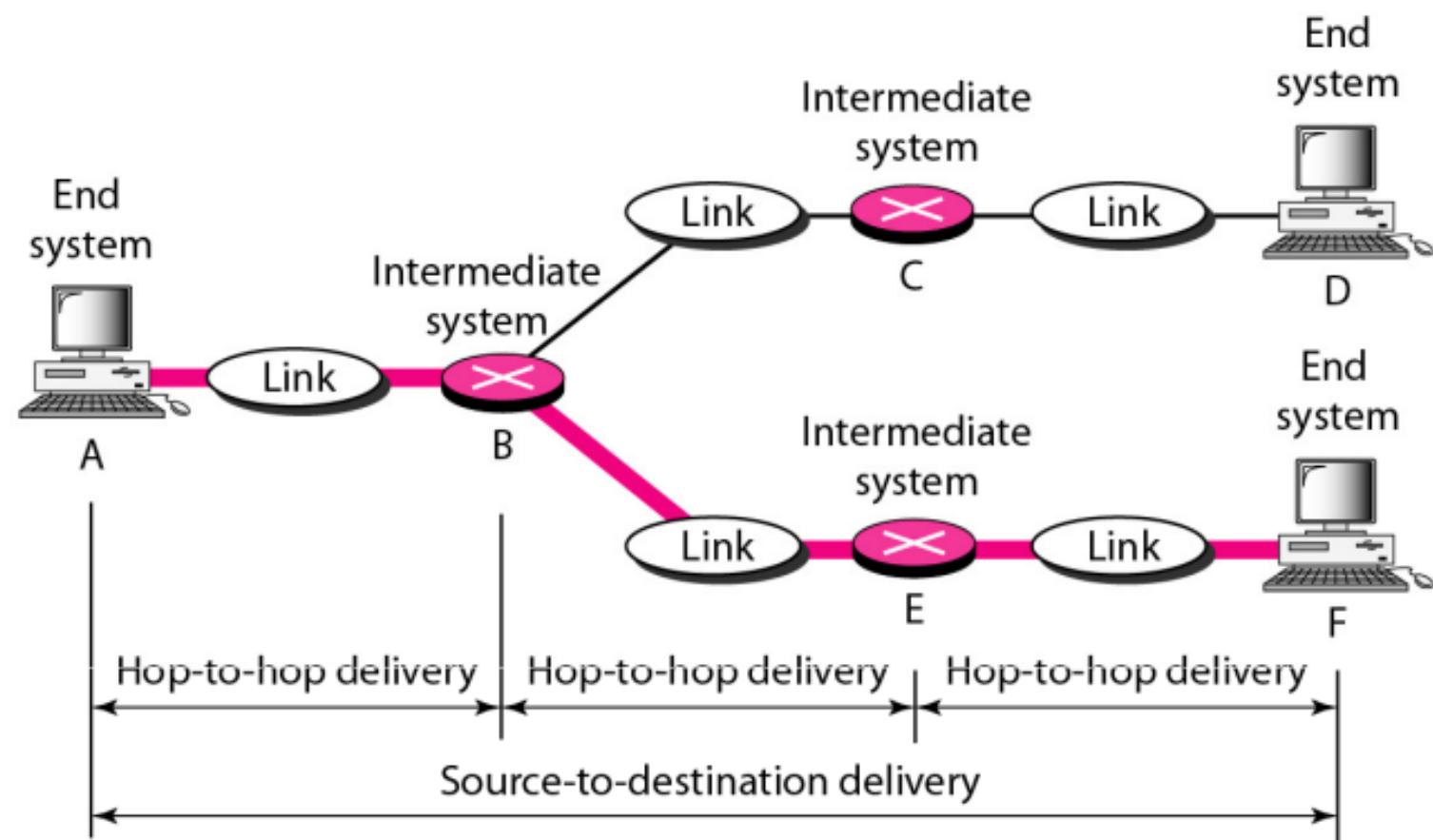
# TCP/IP vs OSI

The first three layers are grouped into the Applications layer

The network and transport layer remained the same, due to its importance, while the physical layer and the

data link layer combined into one layer for similar tasks.

| TCP/IP Model | OSI Model |
|---|---|
| | APPLICATION |
| APPLICATION | PRESENTATION |
| | SESSION |
| TRANSPORT | TRANSPORT |
| NETWORK / InterNETWORK / INTERNET | NETWORK |
| PHYSICAL Network Interface (Subnet Layer) | DATA LINK |
| | PHYSICAL |

# Delivery operation
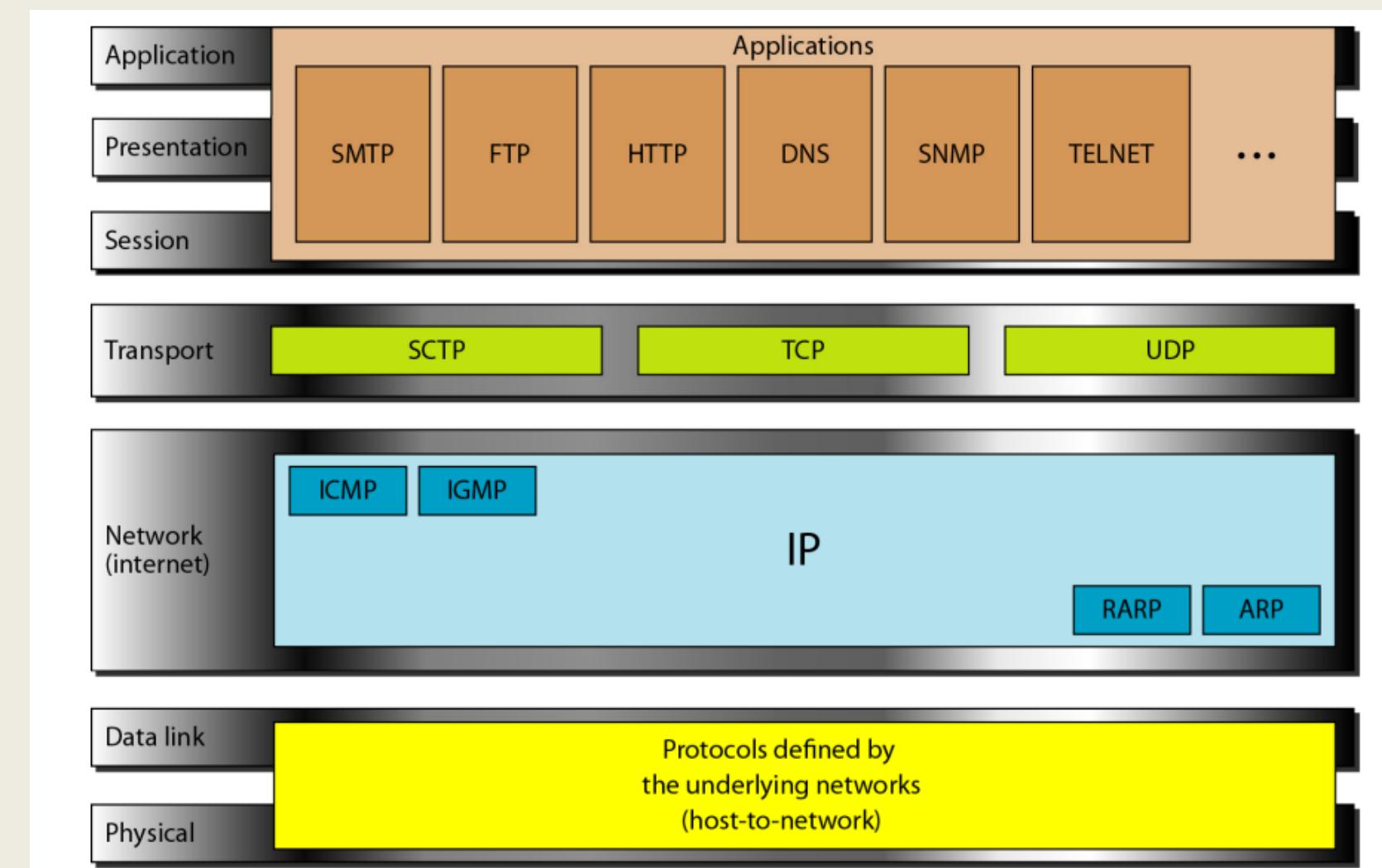


The data-link layer using Physical Address to communicate and directing to Network layer , And network using Logical Address.

# Protocols and Services

All Layers in OSI or TCP/IP Models , Using Protocols

Protocol : Set of rules or systems using to communicate or directs communication

Services : Is a protocol that has a function and feature used by the users, usually at the application layer (Example SMTP – HTTP – …).

# Example of Protocols and Abbreviations

MAC (Medium Access Control) : or Physical Address. It's 6 Byte globally unique ID assigned by the manufacturer

IP (Internet Protocol) : Used in network layer to access internet network.

DNS (Domain Name System) : Service translates domain names into IP addresses

NAT (Network Address Translation) : Service translates Private IP address to Public IP address .

SMTP (Simple Mail Transfer Protocol) : Used in Mailing
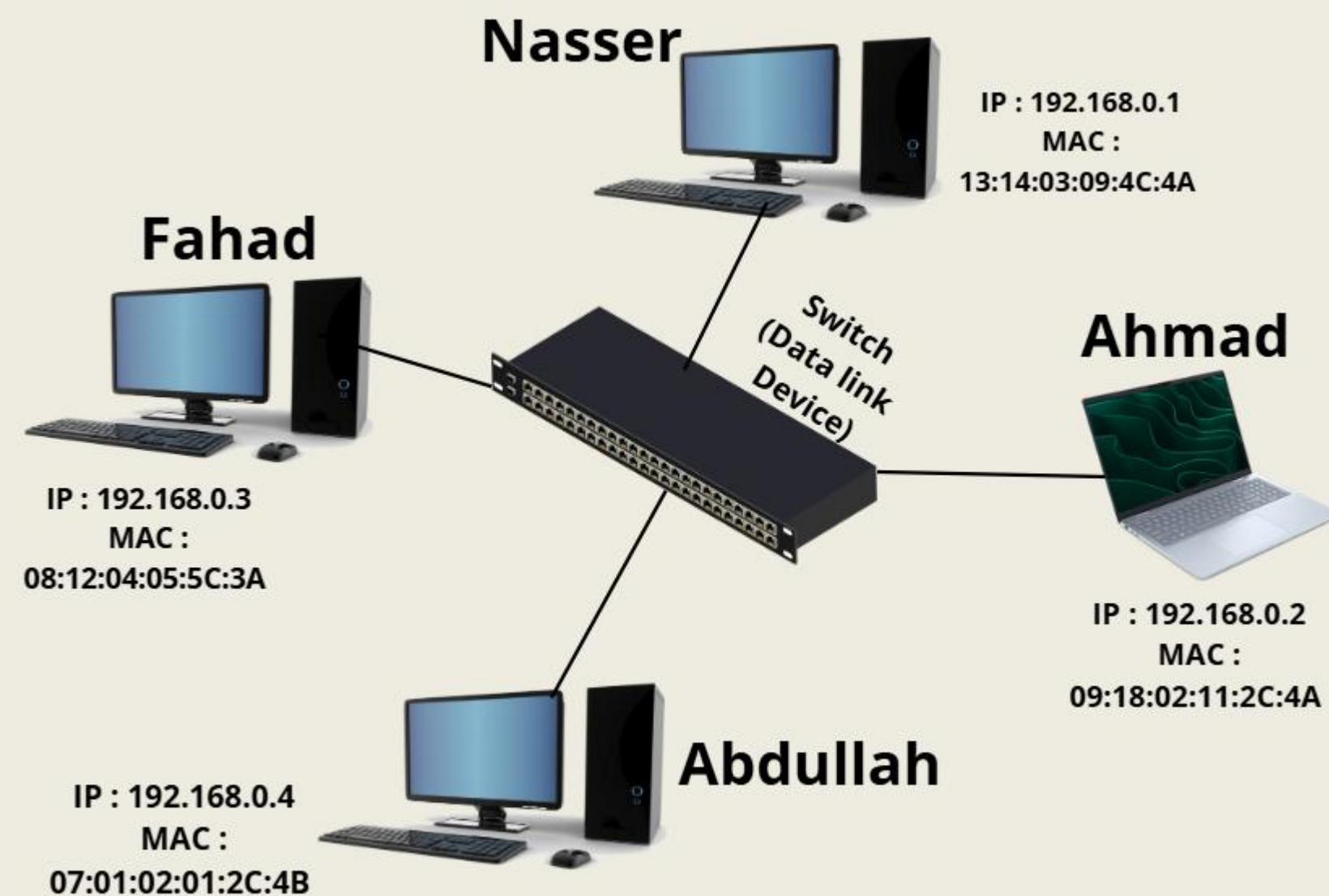
TCP (Transmission Control Protocol) : Protocol in transport layer , Used to Transport control.

FTP (File Transfer Protocol) : Used to transferring files.
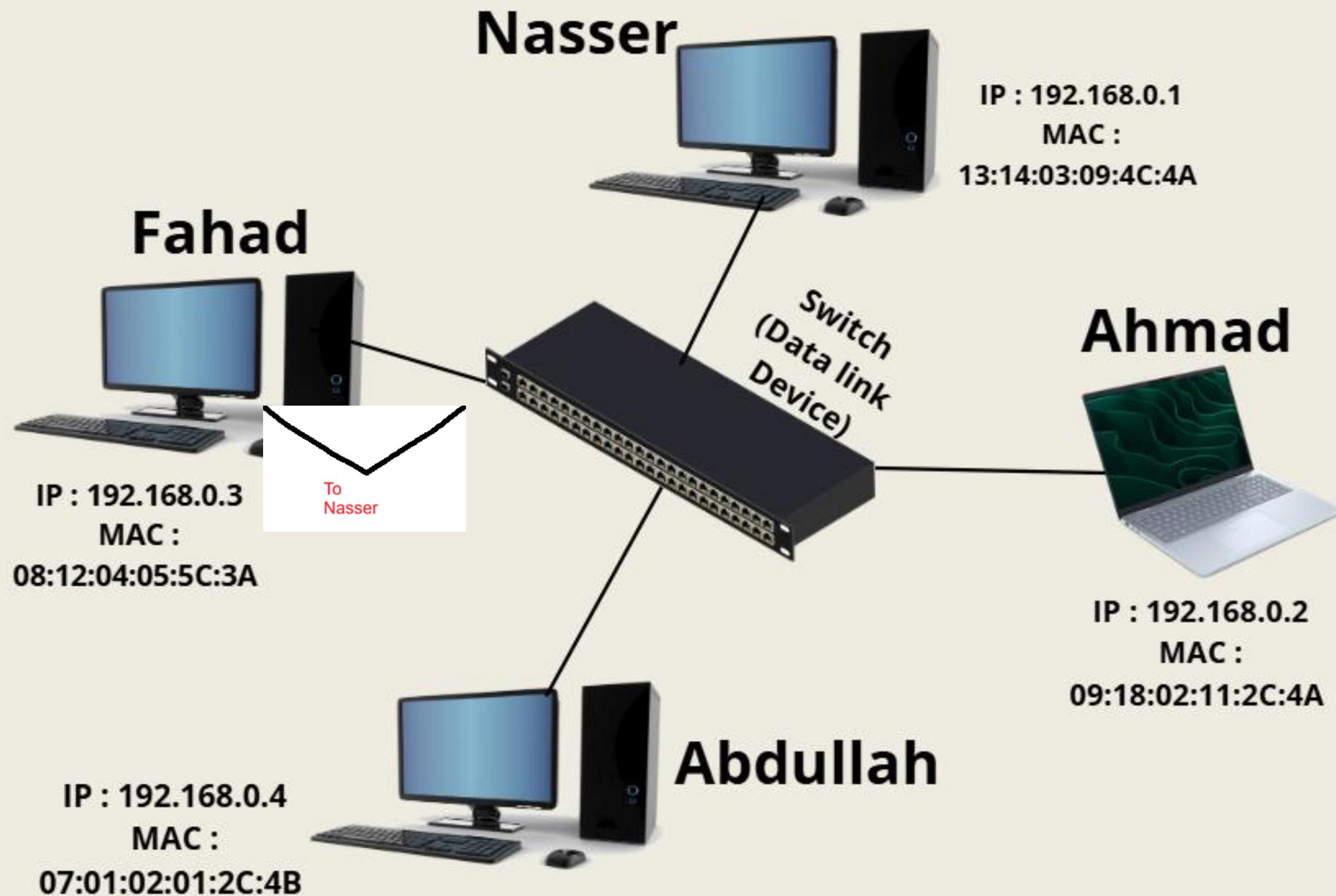
# Physical / Logical Addresses

MAC (Medium Access Control) : or Physical Address. It's 6 Byte globally unique ID assigned by the manufacturer
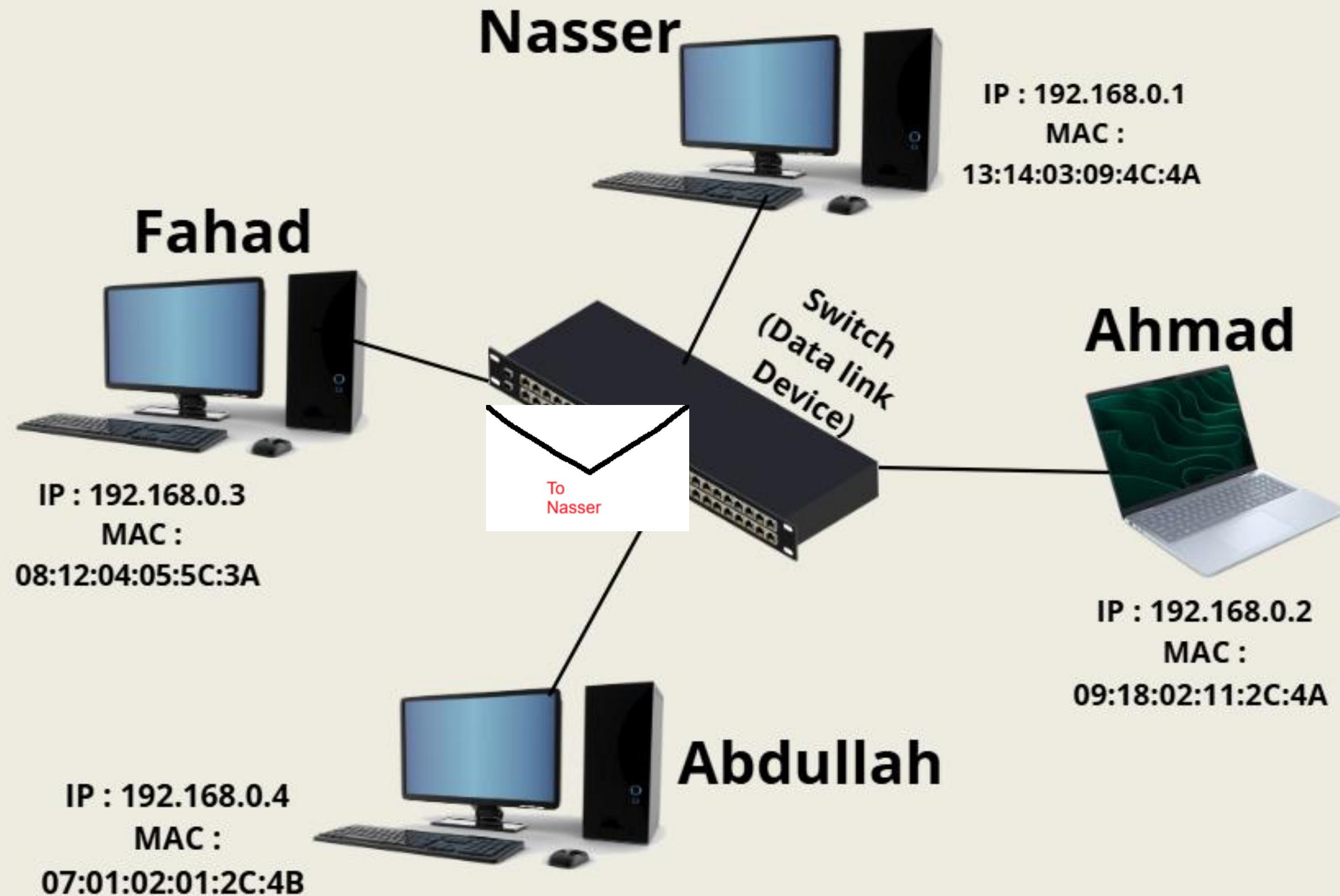
IP (Internet Protocol) : or Logical Address Used in network layer to access internet network.



**Nasser**
IP : 192.168.0.1
MAC :
13:14:03:09:4C:4A

**Fahad**
IP : 192.168.0.3
MAC :
08:12:04:05:5C:3A

**Switch**
**(Data link**
**Device)**

**Ahmad**
IP : 192.168.0.2
MAC :
09:18:02:11:2C:4A

**Abdullah**
IP : 192.168.0.4
MAC :
07:01:02:01:2C:4B

# Example

**Nasser**

IP : 192.168.0.1
MAC :
13:14:03:09:4C:4A

**Fahad**

IP : 192.168.0.3
MAC :
08:12:04:05:5C:3A

To Nasser

**Switch (Data link Device)**

**Ahmad**

IP : 192.168.0.2
MAC :
09:18:02:11:2C:4A

**Abdullah**

IP : 192.168.0.4
MAC :
07:01:02:01:2C:4B

# Example

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Switch
(Data link
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To
Nasser

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**Abdullah**

IP : 192.168.0.4
MAC :
07:01:02:01:2C:4B

# Example

**Fahad**



**192.168.0.3**

**MAC :**

**:04:05:5C:3A**

**Switch (Data link Device)**
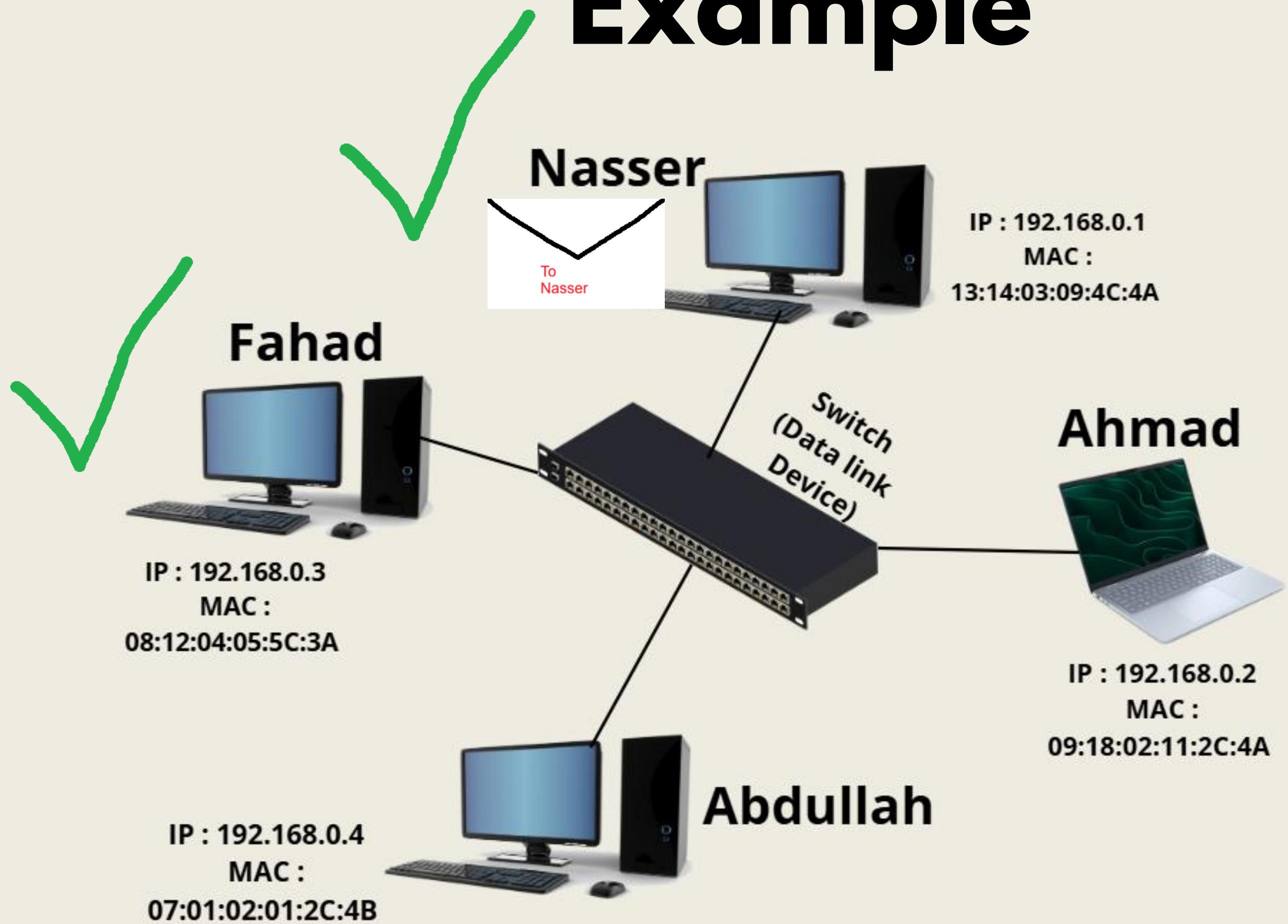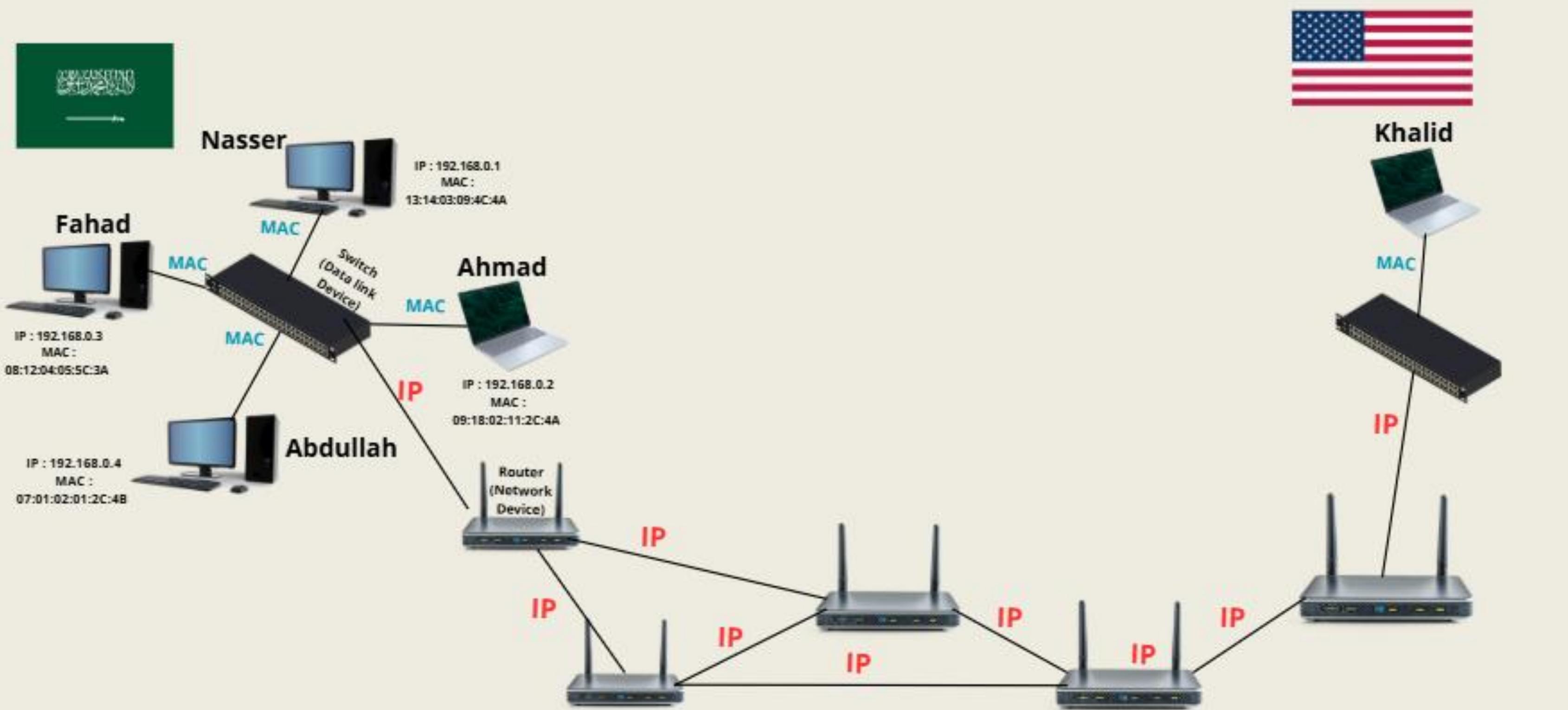
To Nasser

## MAC Address

From **08:12:04:05:5C:3A** Fahad

To **13:14:03:09:4C:4A** Nasser

# Example

**Nasser**

To Nasser

IP : 192.168.0.1
MAC :
13:14:03:09:4C:4A

**Fahad**

IP : 192.168.0.3
MAC :
08:12:04:05:5C:3A

Switch
(Data link
Device)

**Ahmad**

IP : 192.168.0.2
MAC :
09:18:02:11:2C:4A

**Abdullah**

IP : 192.168.0.4
MAC :
07:01:02:01:2C:4B

# From Switch to Router

# Data Centers

**Data center** is a pool of resources (Hardware, storage, network) interconnected using a communicati...

network

Used by large organizations for Super computing and Large-scale networks.

# Sources

- Taif University – Computer Networks ch.2

- Wikipedia – Data center network architectures

- Geeksforgeeks – Network Models

- Networking for Dummies Book

- Dev.to TCP/IP Model vs OSI Model

- VMWare – Data centers networking

# Thanks for listen