



**A · P · U**  
ASIA PACIFIC UNIVERSITY  
OF TECHNOLOGY & INNOVATION

# Mobile and Wireless Technology

CT090-3-2-MWT Version VD01

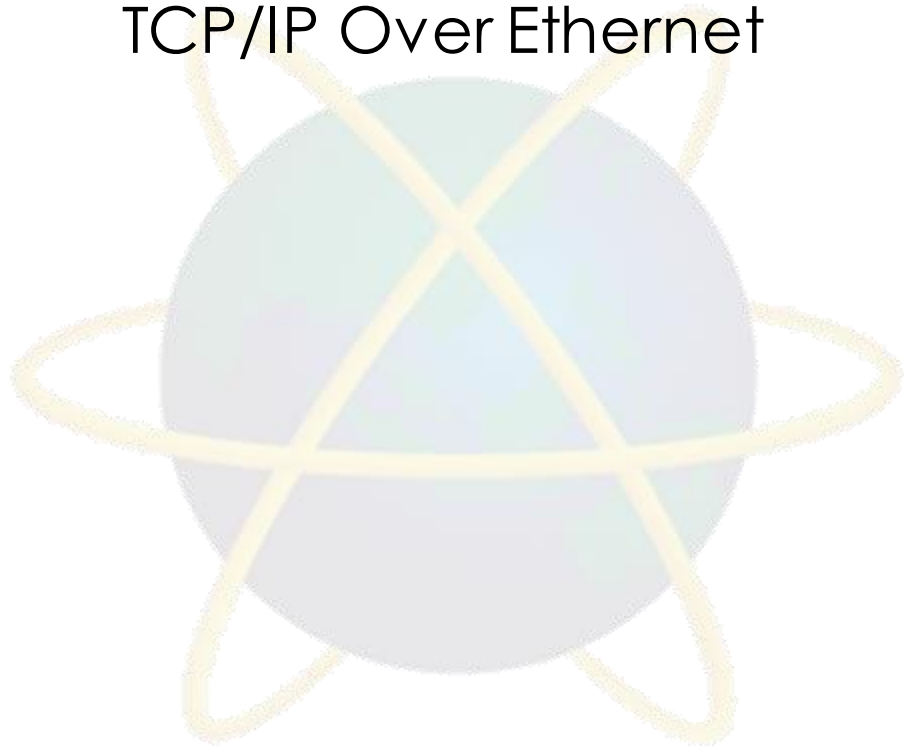
## Review of Core Concepts

# Topic & Structure of The Lesson

ISO/OSI Reference Model

Network Devices

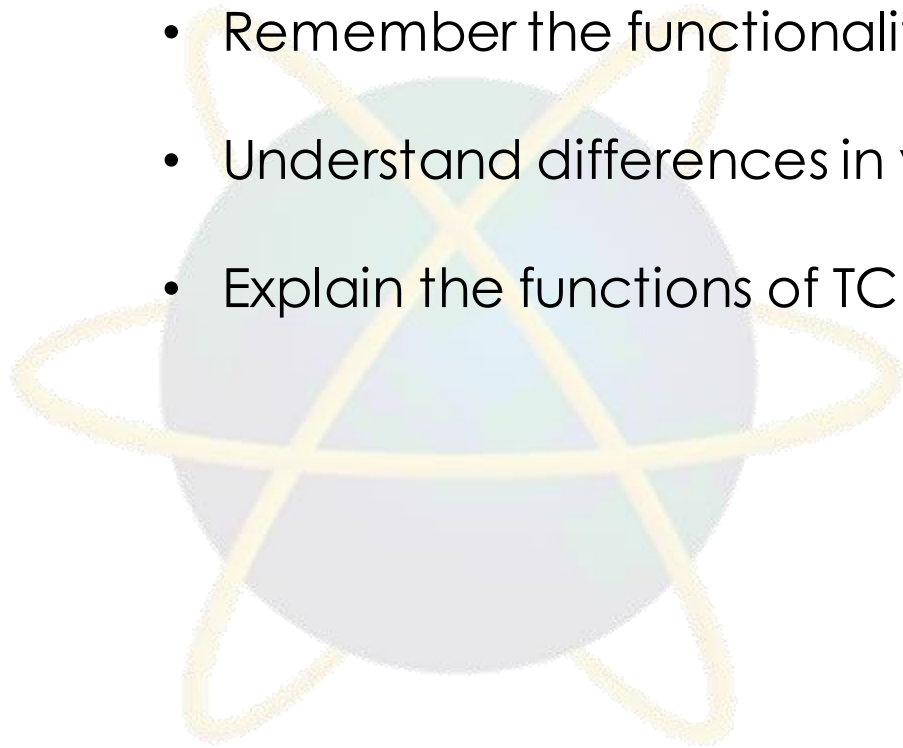
TCP/IP Over Ethernet



# Learning Outcomes

**At the end of this topic, You should be able to**

- Remember the functionalities of 7 layers in the OSI Model.
- Understand differences in various network devices.
- Explain the functions of TCP/IP over internet.



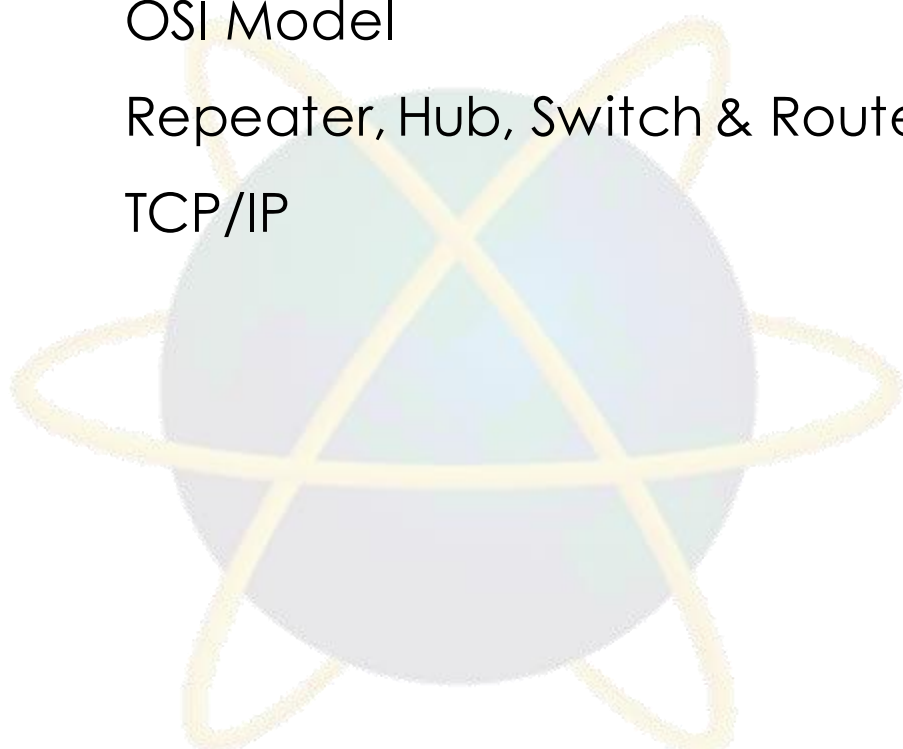
# Key Terms You Must Be Able To Use

If you have mastered this topic, **you should be able to use the following terms correctly in your assignments and exams:**

OSI Model

Repeater, Hub, Switch & Router

TCP/IP



# OSI Model

The **O**pen **S**ystem **I**nterconnection (OSI) model defines a networking framework to implement protocols in seven layers. They are:

- Physical
- Data Link Layer
- Network Layer
- Transport Layer
- Session Layer
- Presentation Layer
- Application Layer

# OSI Model

- **Physical Layer** - Physical layer transforms a sequence of bits into signals for transmission. The signal will be different for different communication media. E.g., dial-up phone, dial-up cellular phone, fiber optic LAN, Ethernet.
- The details of communicating over the available communication channel (link) are transparent to higher layers.
- **Data Link Layer** - Data Link Layer is responsible for orderly access to the communication link.
- The CSMA/CD protocol in the Ethernet is an example of a data link layer protocol.
- It provides the ability to transmit packets of bits from one host to the next.

# OSI Model

- **Network Layer** – Facilitates the exchange of packets between to remote hosts. For that purpose, it provides the ability to route packets.
- I.e., at each intermediate host (router) a decision is made on which link the packet should be forwarded.
- **Transport Layer** – Reassembles packets into a sequence of information bits. The transport layer must be able to cope with an unreliable network layer.
- Most importantly, packets may be lost or arrive out of sequence.

# OSI Model

- **Session Layer** - Its main aim is to establish, maintain and synchronize the interaction between communicating systems. Session layer manages and synchronizes the conversation between two different applications.
- **Presentation Layer** - It is used to present data to in an accurate, well-defined and standardized format.
- **Application layer** - protocol defines how an application processes (clients and servers) , running on different end systems, pass messages to each other.



# Network Devices

- **Repeater:** In digital communication systems, a repeater is a device that receives a digital signal on an electromagnetic or optical transmission medium and regenerates the signal along the next leg of the medium.
- **Hub:** Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.

# Network Devices

- **Switch:** In a telecommunications network, a switch is a device that channels incoming data from any of multiple input ports to the specific output port that will take the data toward its intended destination.
- **Router:** a router is a device or, in some cases, software in a computer, that determines the next network point to which a packet should be forwarded toward its destination.

# TCP/IP

- Short for **Transmission Control Protocol/Internet Protocol**, **TCP/IP** is a set of rules ([protocols](#)) governing communications among all computers on the Internet. More specifically, TCP/IP dictates how information should be packaged (turned into bundles of information called [packets](#)), sent, and received, as well as how to get to its destination.

# Segment, datagram, frame

- These terms are used to refer at which OSI layer we are referring to, the data remain same but the headers and trailers are getting added or removed.
- In Physical layer i.e. physical layer the actual data is in "bits" i.e. 0 and 1.
- When it reaches to data link layer or Layer 2 it becomes "frame" with source and destination MAC address getting added.
- When it reaches the third layer or the networking layer it becomes a "packet" with source and destination IP address attached to it.

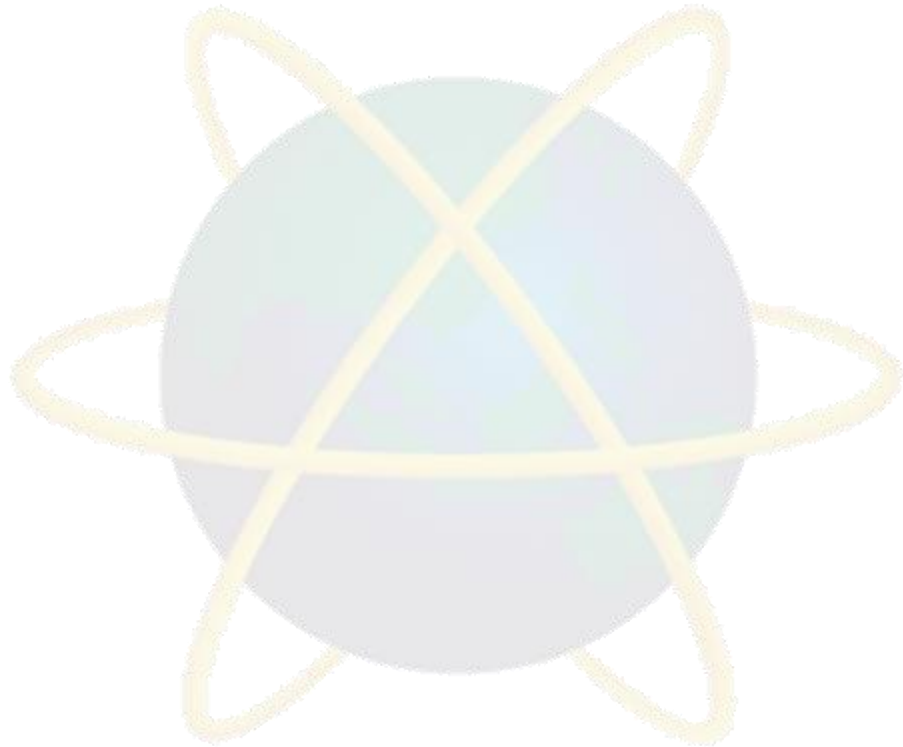
# Segment, datagram, frame

- Finally it become "segment" at Layer 4 or TCP/IP layer. Basically "segment" term is used for TCP connections and "datagrams" for UDP.



# Quick Review Question

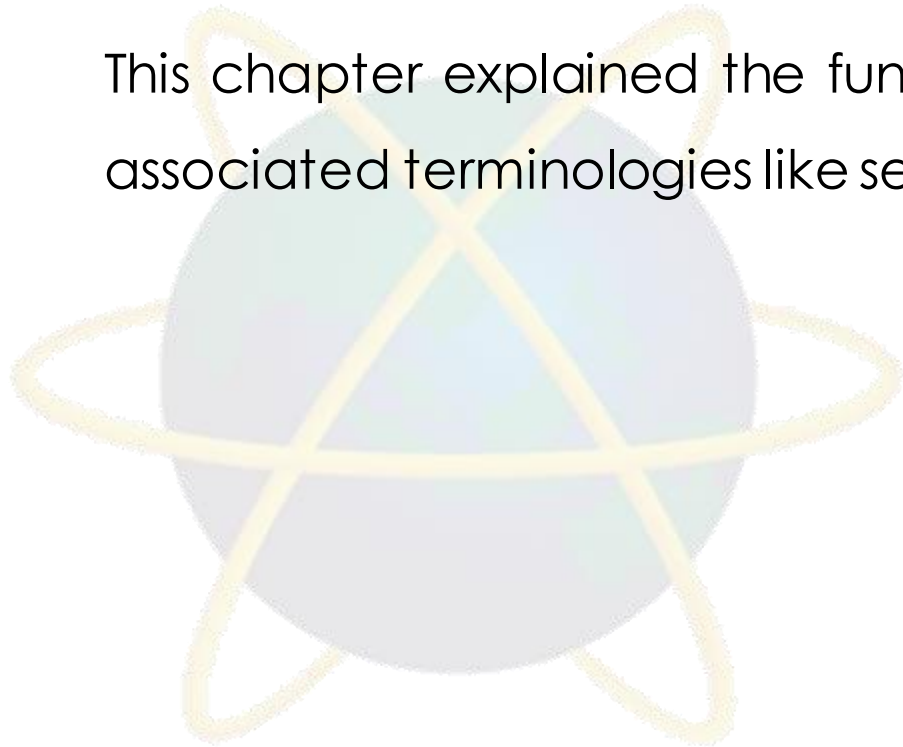
- Briefly explain OSI model.



# Summary of Main Teaching Points

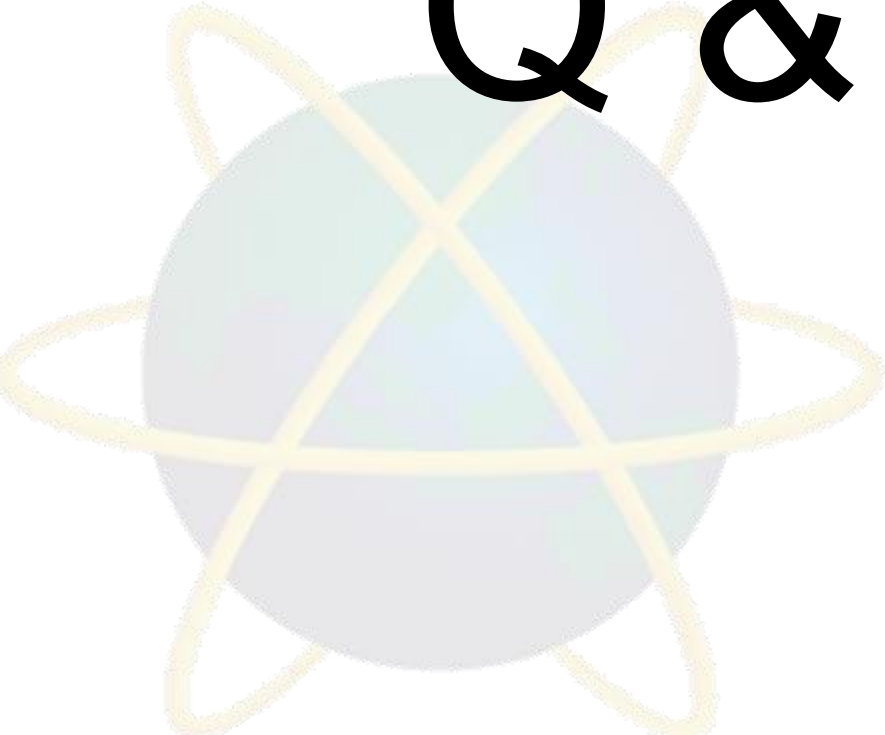
This chapter discussed the core concepts of networking and networking devices such as repeater, hub, switch and router.

This chapter explained the functions of TCP/IP protocol and its associated terminologies like segment, datagram, etc.



# Question and Answer Session

# Q & A





# What we will cover next

- Wireless LAN Infrastructure Devices
- Access Points (AP)
- Autonomous Access Points
- Lightweight Access Points
- Mesh Access Points
- Wireless LAN Routers
- Wireless Bridges
- Wireless Repeaters
- Wireless LAN Controller/Switch