



# INTRODUCTION TO COMPUTER NETWORK AND DATA COMMUNICATION

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## References :

- Computer Networks - A Tanenbaum - 5th edition (2011)
- Data Communications and Networking - Behrouz A.Forouzan - 4th edition (2007)
- Cisco System Inc - 2011 - Cisco Configuration Profesional User Guide.

## Chapter 1: Objectives

After completing this chapter, students will be able to:

- Explain how multiple networks are used in everyday life.
- Explain the topologies and devices used in a small- to medium-sized business network.
- Explain the basic characteristics of a network that supports communication in a small- to medium-sized business.
- Explain trends in networking that will affect the use of networks in small to medium-sized businesses.

## Chapter 1:

- 1.1 Globally Connected
- 1.2 LANs, WANs, and the Internet
- 1.3 The Network as a Platform
- 1.4 The Changing Network Environment

## 1.1 Globally Connected

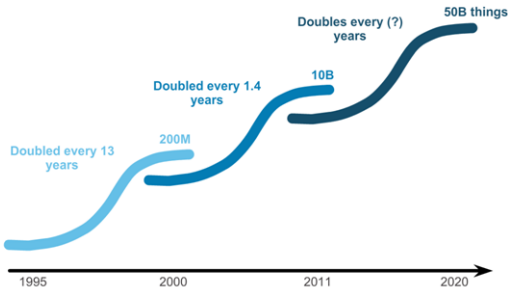
## Networks in Our Past and Daily Lives

"Fixed" Computing  
(You go to the  
device)

Mobility/BYOD  
(The device goes  
with you)

Internet of Things  
(Age of Devices)

Internet of  
Everything  
(People, Process,  
Data, Things)



## Internet of Things

- The Internet of things (stylised Internet of Things or IoT) is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other itemseembedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.[1][2][3]

## Internet of Things

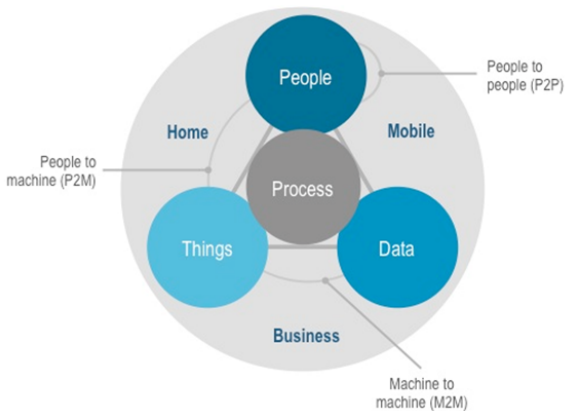




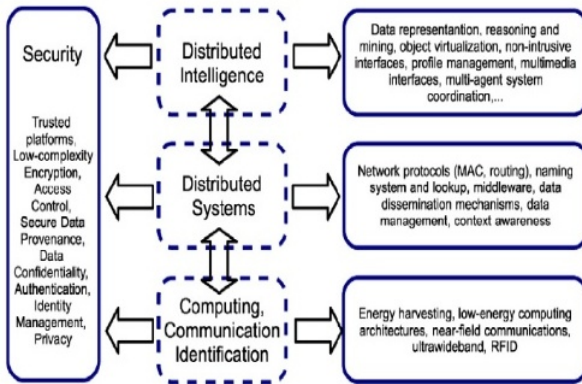
## Internet of Everything

- The Internet of Everything (IoE) brings together people, process, data, and things to make networked connections more relevant and valuable than ever before—turning information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity for businesses, individuals, and countries.

## Internet of Everything



## Taxonomy of Research Area to IOT



## Networking Impacts in Our Daily Lives

- Networks support the way we learn.
- Networks support the way we communicate.
- Networks support the way we work.
- Networks support the way we play.

## The Global Community



## Networks of Many Sizes



Small Home Networks



Small Office/Home Office  
Networks

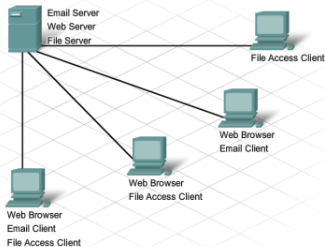
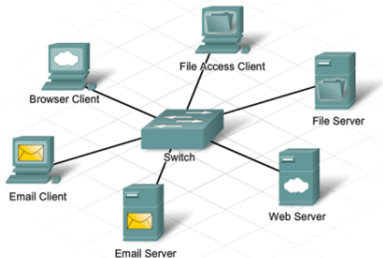


Medium to Large Networks



World Wide Networks

## Providing Resources in a Network Clients and Servers



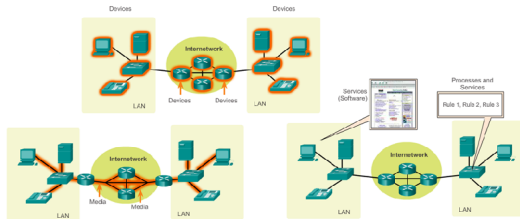
## 1.2 LANs, WANs, and the Internet



## Components of a Network

There are three categories of network components:

- Devices
- Media
- Services



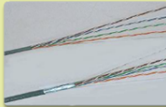
## Network Infrastructure Devices

Examples of intermediary network devices are:

- Network Access Devices (switches, and wireless access points)
- Internetworking Devices (routers)
- Security Devices (firewalls)

## Network Media

Copper



Fiber Optic



Wireless

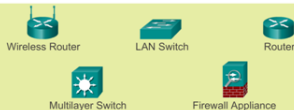


## Network Representations

### End Devices



### Intermediary Devices

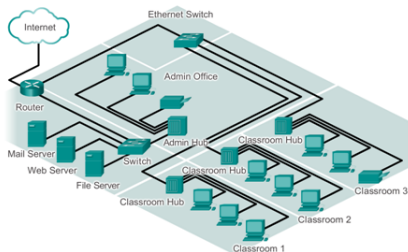


### Network Media

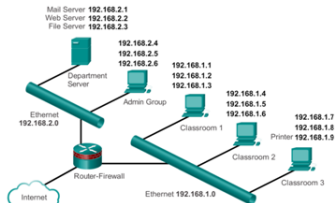


## Topology Diagrams

Physical Topology



Logical Topology



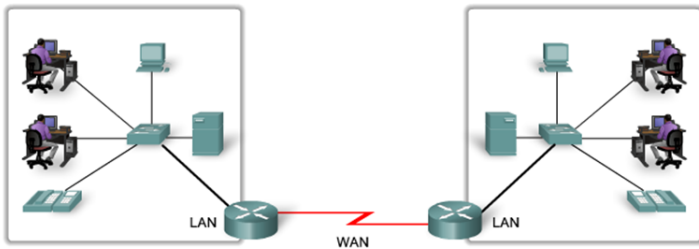
## Types of Networks

The two most common types of network infrastructures are:

- Local Area Network (LAN)
- Wide Area Network (WAN)
- Metropolitan Area Network (MAN)
- Wireless LAN (WLAN)
- Storage Area Network (SAN)

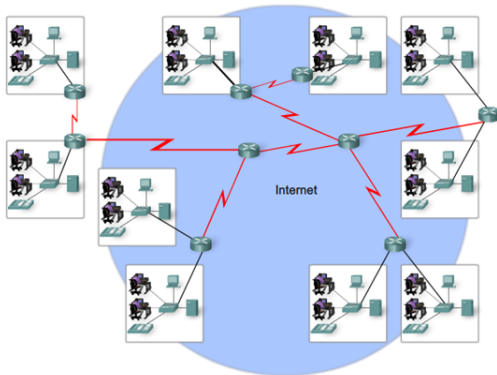
## LANs and WANs

LANs separated by geographic distance are connected by a network known as a Wide Area Network (WAN).



## The Internet

LANs and WANs may be connected into internetworks.

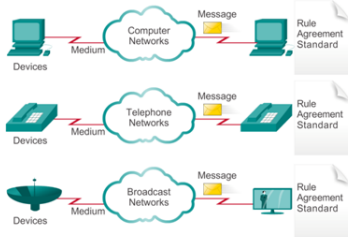




## 1.3 The Network as a Platform

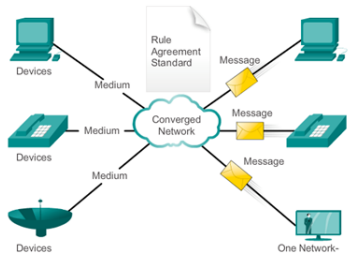
## The Converging Network

**Multiple Networks**



Multiple services are running on multiple networks.

**Converged Networks**



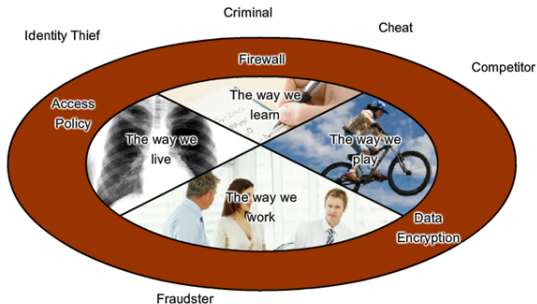
Converged data networks carry multiple services on one network.

## Supporting Network Architecture

As networks evolve, we are discovering that there are four basic characteristics that the underlying architectures need to address in order to meet user expectations:

- Fault Tolerance
- Scalability
- Quality of Service (QoS)
- Security

## Providing Network Security



The communication and information that we would like to be private is protected from those who would make unauthorized use of it.

## 1.4 The Changing Network Environment

## Network Trends

Some of the top trends include:

- Bring Your Own Device (BYOD)
- Online collaboration
- Video
- Cloud computing

## References

- 1 Brown, Eric (13 September 2016). "Who Needs the Internet of Things?". Linux.com. Retrieved 23 October 2016.
- 2 Brown, Eric (20 September 2016). "21 Open Source Projects for IoT". Linux.com. Retrieved 23 October 2016.
- 3 "Internet of Things Global Standards Initiative". ITU. Retrieved 26 June 2015.

**Terima  
kasih!**