

# 01\_Introduction-to-Networks\_EUAD04

EUAD04\_Intro-to-Networks

Training Clarusway

Pear Deck - August 18, 2020 at 5:34PM

## Part 1 - Summary

Use this space to summarize your thoughts on the lesson

## Part 2 - Responses

Slide 1

Introduction to  
Networks

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Use this space to take notes:

## Slide 2

### Table of Contents



- ▶ What's a Network?
- ▶ Local Area Network (LAN)
- ▶ Common Network Components
- ▶ Wide Area Network (WAN)

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## Slide 3

### Table of Contents



- ▶ Network Topology
- ▶ Physical Network Topologies
  - Bus Topology
  - Star Topology
  - Ring Topology
  - Mesh Topology
  - Tree Topology
  - Hybrid Topology

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## What's a Network?

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#### ► What's a Network?



A **network** is two or more computer systems linked together by some form of the transmission medium that enables them to share information



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## ► What's a Network?



Provides services like:

- Access to shared files/folders
- Access to printers/scanners
- Email applications
- Database applications
- Web applications
- Voice over IP (VoIP)
- Multimedia conferencing



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## ► What's a Network?



### Features of Computer Network

- **Performance** → Response time
- **Data Sharing**
- **Backup**
- **Reliability** → No failures!
- **Security** → Keep data safe!
- **Scalability** → New systems can be added
- **Software and hardware compatibility**

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## Local Area Network (LAN)

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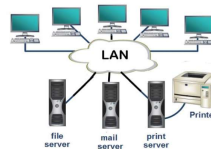
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#### ► Local Area Network (LAN)



A LAN is a **local** network



- Could be as small as two computers or large, with thousands of devices connected
- Usually restricted to spanning a particular geographic location

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### Your Response

You Chose

- **True**

Other Choices

<p>A company in a single building is considered as LAN</p> <div><div>True</div><div>False</div></div> <p>Students choose an option</p>	<ul style="list-style-type: none"><li>False</li></ul>
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Slide 11	Your Response
<p>A company consists of multiple buildings in the same area is considered as LAN</p> <div><div>True</div><div>False</div></div> <p>Students choose an option</p>	

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## ► Local Area Network (LAN)

LAN's size and the distance a LAN can span is not restricted

But it's best to split a big LAN into smaller logical zones known as **workgroups** to make administration easier

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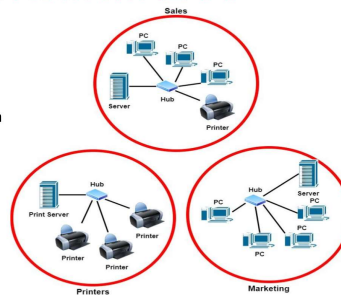
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## ► Local Area Network (LAN)

3 LANs, each has its own workgroup

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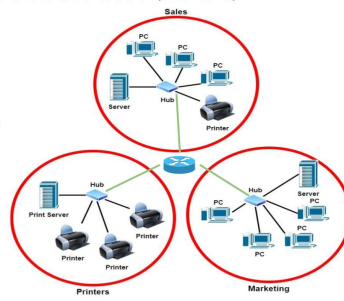
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## Local Area Network (LAN)

A LAN with 3 workgroups

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### 3 Common Network Components

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## ► Common Network Components ►

- **Node** →
  - A point or joint where a connection takes place
  - Can be a computer or device
- **Station** → A node on a wireless network

- PC	- Printer
- Laptop	- Router
- Server	- Switch
- Smartphone	- etc.

*Some examples of Node*

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## ► Common Network Components ►

- **Host** →
  - Requires IP Address
  - Can be a client or server
- **Workstation** →
  - Powerful computer designed for technical or scientific applications
  - Used by one person at a time

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## ► Common Network Components ►

- **Server** → A powerful computer used to store files and run programs centrally
- **Client** → A device that makes request from a server

- |                |                      |
|----------------|----------------------|
| - Web Server   | - Application Server |
| - Proxy Server | - DNS Server         |
| - Mail Server  | - File Server        |
| - Print Server | - Telephony Server   |

*Common types of servers*

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## ► Common Network Components ►

- **Segment** →
  - Refers to a specific physical region of a network
  - Typical usage is to describe the link between a computer and a switch
  - Another usage is to refer to a region of the network where all the nodes use the same type of transmission media
- **Backbone** → A fast link between other segments of a network

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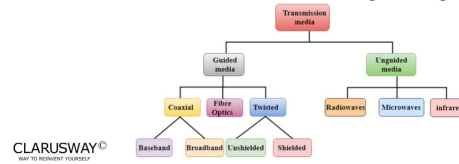


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## ► Common Network Components ►

- **Transmission Media** → - A communication channel between **nodes** that carries the information from the sender to the receiver
  - Data is transmitted through the electromagnetic signals



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## 4 ► Wide Area Network (WAN)

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## ► Wide Area Network (WAN) »

A **WAN** is a collection of computers and devices connected by a communications network over a wide geographic area

**WANs** are commonly connected either through the Internet or special arrangements made with phone companies or other service providers

The **Internet** is considered the **largest WAN** in the world

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## 5 ► Network Topology

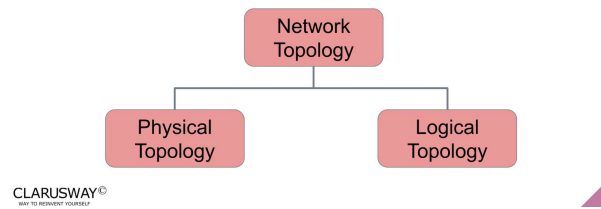
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## ► Network Topology

**Network topology** is the description of the arrangement of **nodes** and **connections** in a network



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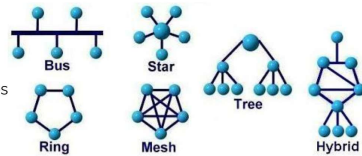
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## ► Network Topology

A **physical topology** details how devices are physically connected

Depends on:

- Office layout
- Troubleshooting techniques
- Cost of installation
- Type of cable used



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## ► Network Topology



**Logical topology** describes the way in which a network transmits information from network/computer to another

It's not the way the network looks or how it is laid out

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## Physical Network Topologies

Bus Topology  
Ring Topology  
Tree Topology

Star Topology  
Mesh Topology  
Hybrid Topology

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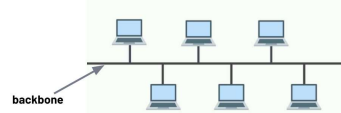
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## ► Physical Network Topologies

### Bus Topology:

Every node is connected in series along a linear path



✓ Keeps the layout simple

✓ Cost effective

✗ If backbone fails entire network goes down

✗ Decreased network performance

✗ Not scalable

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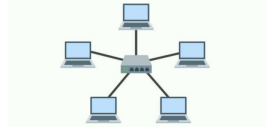
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## ► Physical Network Topologies

### Star Topology:

Every node in the network is connected to one central switch



✓ Easy to manage

✓ Requires fewer cables

✗ If central switch fails entire network goes down

✗ Performance is up to central switch

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## ► Physical Network Topologies

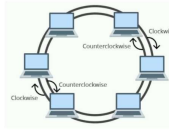
### Ring Topology:

Every node is connected to each other in a circular format.



- ✓ Low risk of packet collision
- ✓ Easy to install

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- ✗ Vulnerable to failure
- ✗ The more devices added the more communication delay
- ✗ To make changes the network should be shut down

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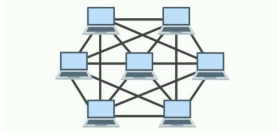
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## ► Physical Network Topologies

### Mesh Topology:

A point-to-point connection where nodes are interconnected



- ✓ Reliable

- ✗ Configuration is complex
- ✗ Expensive

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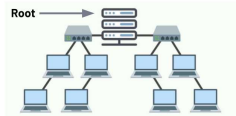
## Slide 32



## ► Physical Network Topologies

### Tree (Hierarchy) Topology:

A network structure that is shaped like a tree with its many branches



✓ Scalable

✓ Manageable

✗ Hard to maintain

✗ If root fails entire network goes down

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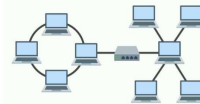
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## ► Physical Network Topologies

### Hybrid Topology:

A combination of two or more types of physical or logical network topologies working together within the same network



✓ Flexibility

✗ Quite complex

✗ Can be quite costly

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# THANKS!

## Any questions?

You can find me at:

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- ▶ david@clarusway.com

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