



CISCO

CCNA 200 - 301

المدرب عبد الرحمن العلوش



Cisco Systems, Inc

- **Cisco Systems, Inc.** is an American multinational company headquartered in San Jose, California.
- **Cisco** develops, manufactures and sells networking hardware, software, telecommunications equipment and other high-technology services and products.
- **Cisco** has many competitors such as Juniper, Huawei and HP ...



Cisco Products, Solutions, and Services



Networking

Switches

Routers

Wireless

Network management

Interfaces and modules

Optical networking

Software-defined networking

[See all Networking >](#)



Wireless and Mobility

Access points

Outdoor and industrial access points

Controllers

[See all Wireless and Mobility >](#)



Security

Firewalls and NGIPS

Endpoint Security

Cloud Security

Multi-factor Authentication

Email Security

Security Platform (SecureX)

[See all Security >](#)

Cisco Products, Solutions, and Services



Collaboration

Collaboration endpoints

Conferencing

Cisco Contact Center

Unified communications

[See all Collaboration >](#)



Data Center

Servers: Cisco Unified Computing System

Management and automation

Security

Switches

Hyperconverged infrastructure

Storage networking

Virtual networking

[See all Data Center >](#)



Analytics

Data center analytics and assurance

Network analytics (Cisco DNA Analytics and Assurance)

[Cisco Network Security Analytics](#)

Cisco Products, Solutions, and Services



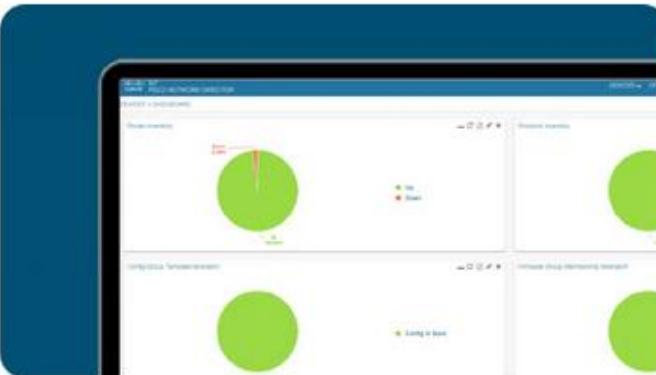
Video

Video endpoints

Video intelligence

Cisco Vision

[See all Video >](#)



Internet of Things

Networking

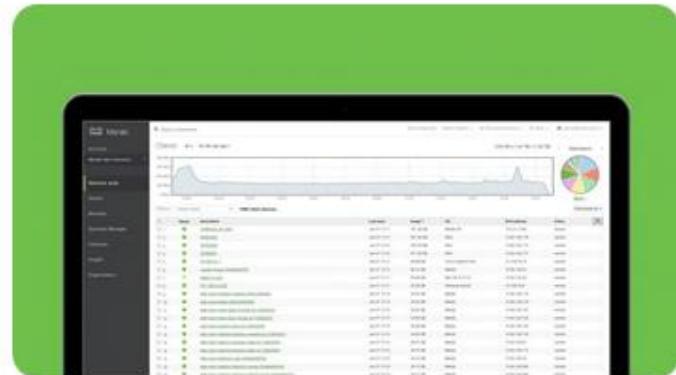
Extended Enterprise

Management

Cisco Kinetic

Security

[See all IoT >](#)



Software

IOS and NX-OS

Cisco ONE for Access

Cisco ONE for WAN

Cisco ONE for Data Center Networking

Cisco ONE for Data Center Compute and Cloud

[See all Software >](#)

Previous Cisco Career Certifications

مخطط شهادات سيسكو القديم

Expert

الخبرة

Professional

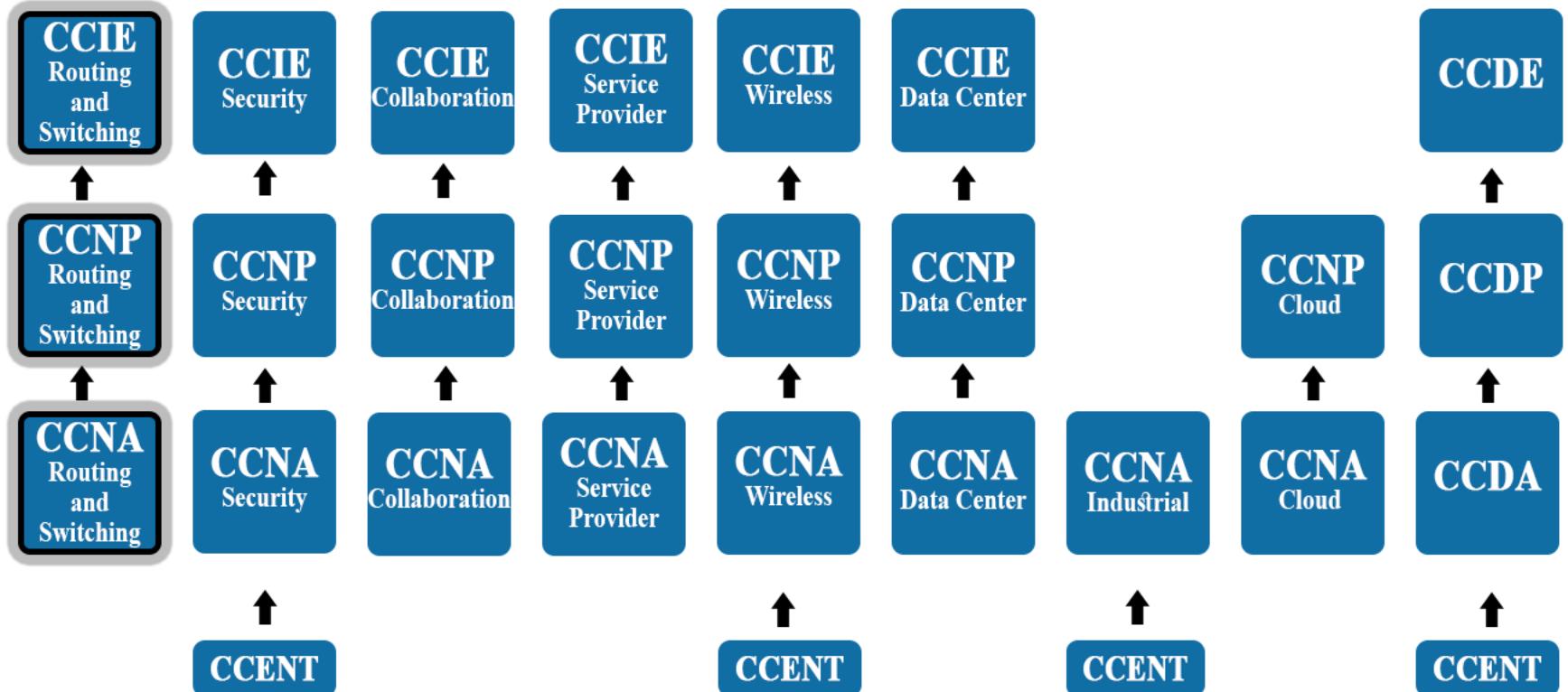
الاحتراف

Associate

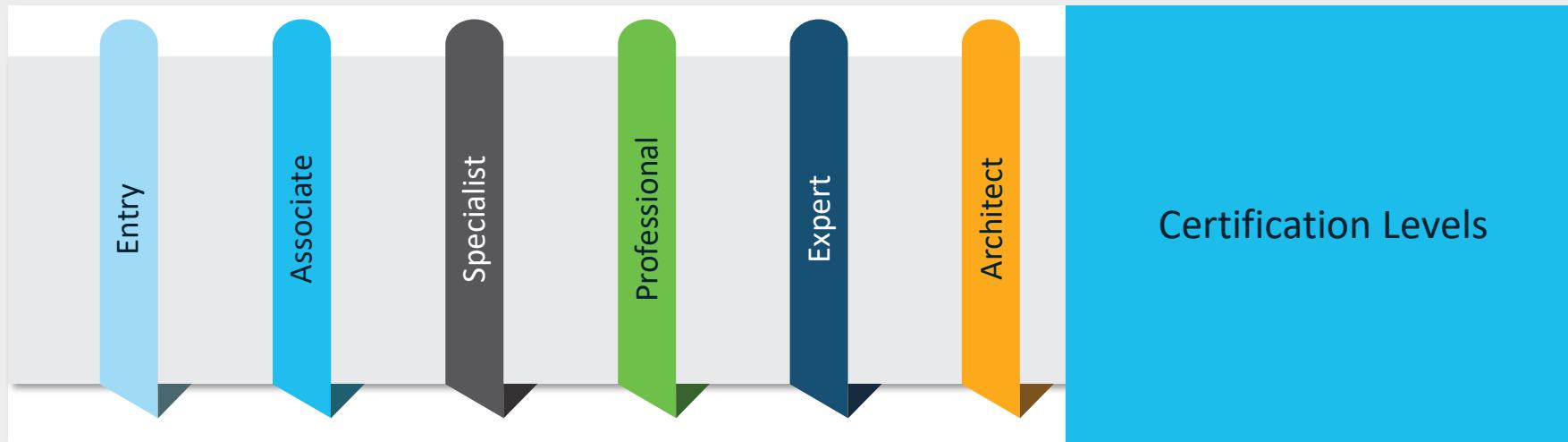
الارتباط

Entry

المدخل



New Cisco Certification Levels



Entry

Starting point for individuals interested in starting a career as a networking professional.

Associate

Master the essentials needed to launch a rewarding career and expand your job possibilities with the latest technologies.

Professional

Select core technology track and a focused concentration exam to customize your professional-level certification.

Expert

This certification is accepted worldwide as the most prestigious certification in the technology industry.

Architect

The highest level of accreditation achievable and recognizes the architectural expertise of network designers.

CCT

CCNA

CCNP Enterprise

CCIE Enterprise Infrastructure

CCAr

CyberOps Associate

CyberOps Professional

CCIE Enterprise Wireless

DevNet Associate

DevNet Professional

CCDE

CCNP Collaboration

CCIE Collaboration

CCNP Data Center

CCIE Data Center

CCNP Security

CCIE Security

CCNP Service Provider

CCIE Service Provider

Specialist Certifications

Collaboration	Cisco Unified Contact Center Enterprise Specialist		
Data Center	Cisco and NetApp FlexPod Design Specialist	Cisco and NetApp FlexPod Implementation and Administration Specialist	
Internet of Things	Cisco Industrial Networking Specialist		
Business Architecture Specialists	Cisco Business Architecture Analyst	Cisco Business Architecture Specialist	Cisco Business Architecture Practitioner
Customer Experience training and examinations	Cisco Customer Success Manager	Cisco Renewals Manager	
Meraki Solutions	Cisco Meraki Solutions Specialist		

CCNA 200-301



Cisco Certified Network Associate (CCNA) v1.0

CCNA

Exam Code : 200-301

Duration : 120 minutes

Questions Number : (60 - 70 questions)

Passing Score : 800-850 out of 1000

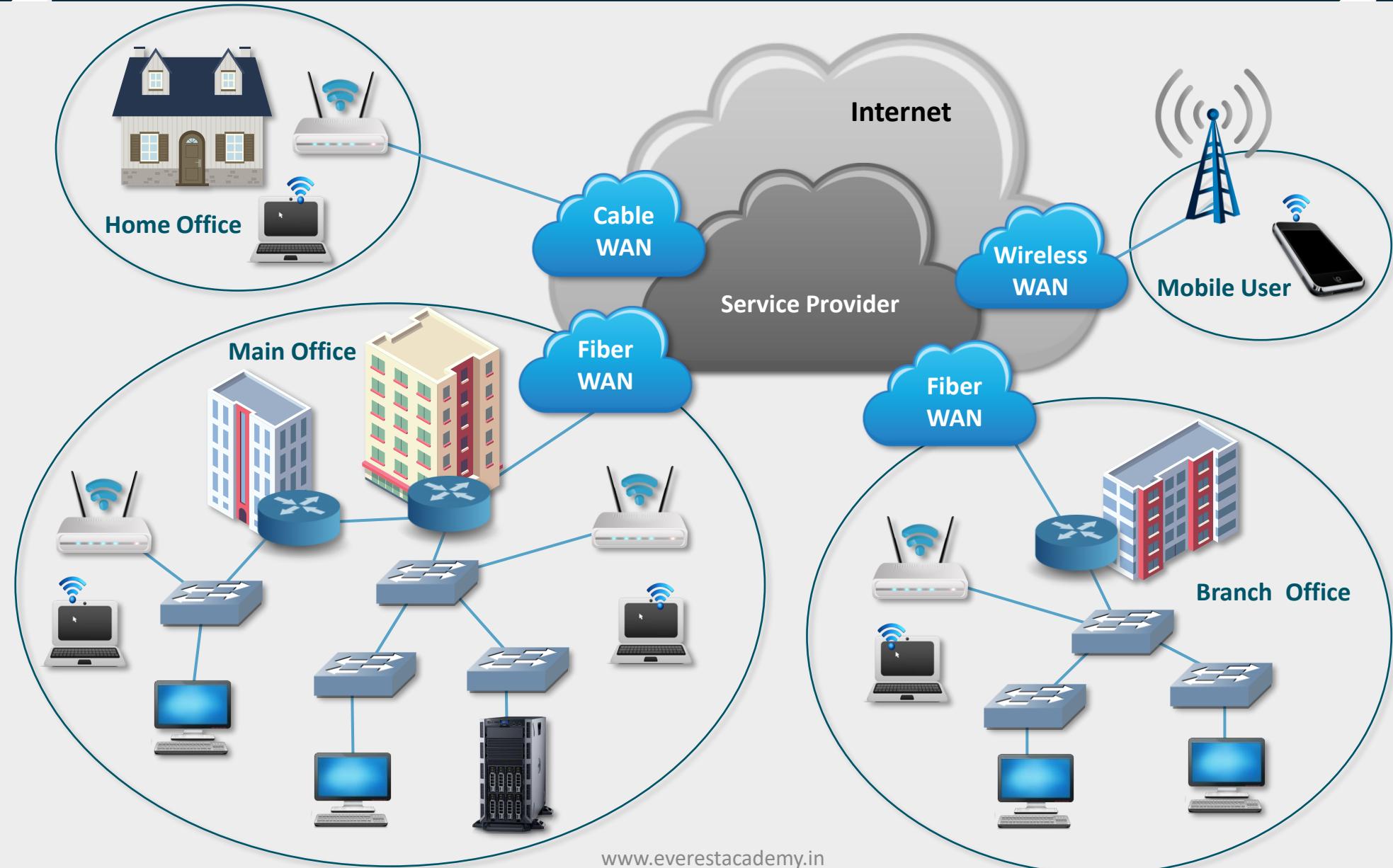
Available Languages: English, Japanese

Validity Period: 3 Years

Course Objectives

- ❖ After taking this course, you should be able to:
 - Identify the components of a computer network and explain their basic characteristics.
 - Describe the features and functions of the Cisco IOS Software.
 - Explain IPv4 and IPv6 addressing scheme.
 - Configuring network components such as switches, routers, and wireless LAN controllers.
 - Identify and resolve common switching and routing networking issues.
 - Describe network and device architectures and explain virtualization.
 - Describe the smart network management solutions like Cisco DNA Center, SD-Access and SD-WAN.
 - Outline threat defense technologies.

Enterprise Network



Target Audience

- Entry-level network engineer.
- Network administrator.
- Network support technician.
- Help desk technician.

Course Prerequisites

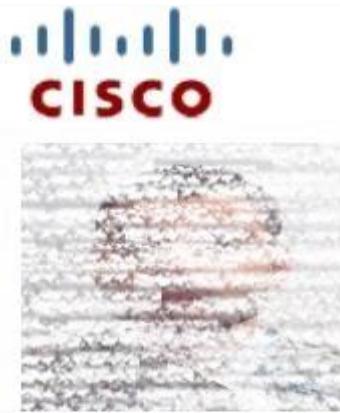
- ❖ Before taking this course, you should have:
 - Basic computer knowledge (CompTIA A+).
 - Basic PC operating system navigation skills (CompTIA A+).
 - Basic Internet usage skills (CompTIA Network +).
 - Basic IP address knowledge (CompTIA Network +).

CCNA Exam Topics

1.0 Network Fundamentals	20%	▼
2.0 Network Access	20%	▼
3.0 IP Connectivity	25%	▼
4.0 IP Services	10%	▼
5.0 Security Fundamentals	15%	▼
6.0 Automation and Programmability	10%	▼

Exam Topics

Examination Score Report



Preliminary Examination Score Report CCNA

Date Tested:

Candidate:

Candidate ID:

Cisco ID(CSCO):

Registration ID:

Validation ID:

Testing Site:

Exam Number:

Passing Score:

Your Score:

Grade:

Network Fundamentals

95%

Network Access

100%

IP Connectivity

96%

IP Services

90%

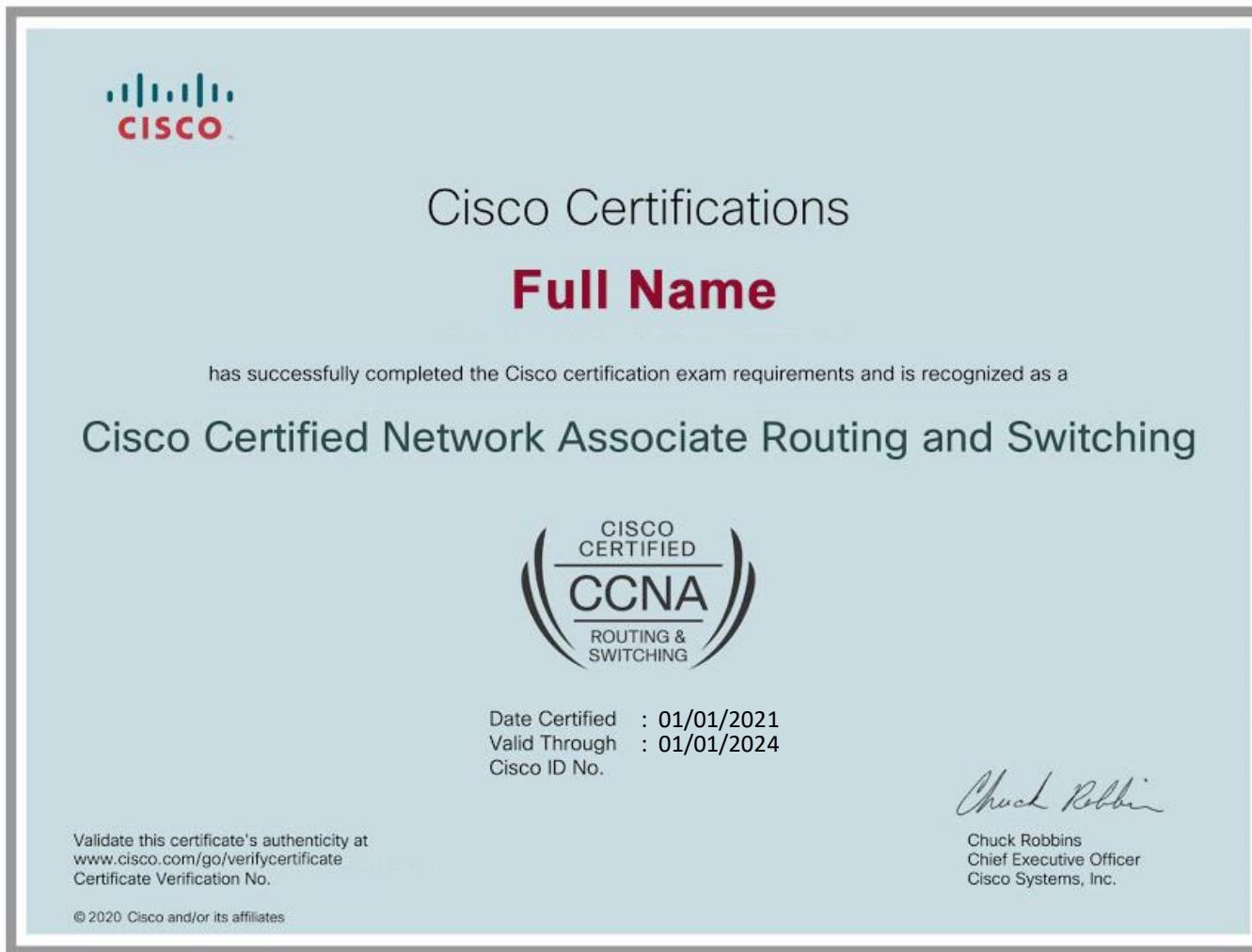
Security Fundamentals

100%

Automation and Programmability

100%

CCNA Certificate Sample



Questions

Multiple-Choice Single Answer

Which command is used to configure an IPv6 static default route?

- A. `ipv6 route ::/0 interface next-hop5`
- B. `ipv6 route default interface next-hop`
- C. `ipv6 route 0.0.0.0/0 interface next-hop`
- D. `ip route 0.0.0.0/0 interface next-hop`

Questions

Multiple-Choice Multiple Answer

When configuring IPv6 on an interface, which two IPv6 multicast groups are joined? (Choose two)

- A. 2000::/3
- B. 2002::5
- C. FC00::/7
- D. FF02::1
- E. FF02::2

Questions

Order of Operations

Order the DHCP message types as they would occur between a DHCP client and a DHCP server.

Select and Place:

DHCPACK

DHCPOFFER

DHCPDISCOVER

DHCPREQUEST

Questions

Drag and Drop

Drag and drop each broadcast IP address on the left to the Broadcast Address column on the right Not all options are used.

Select and Place:

10.1.255.254/24

10.63.255.255/10

172.16.255.39/29

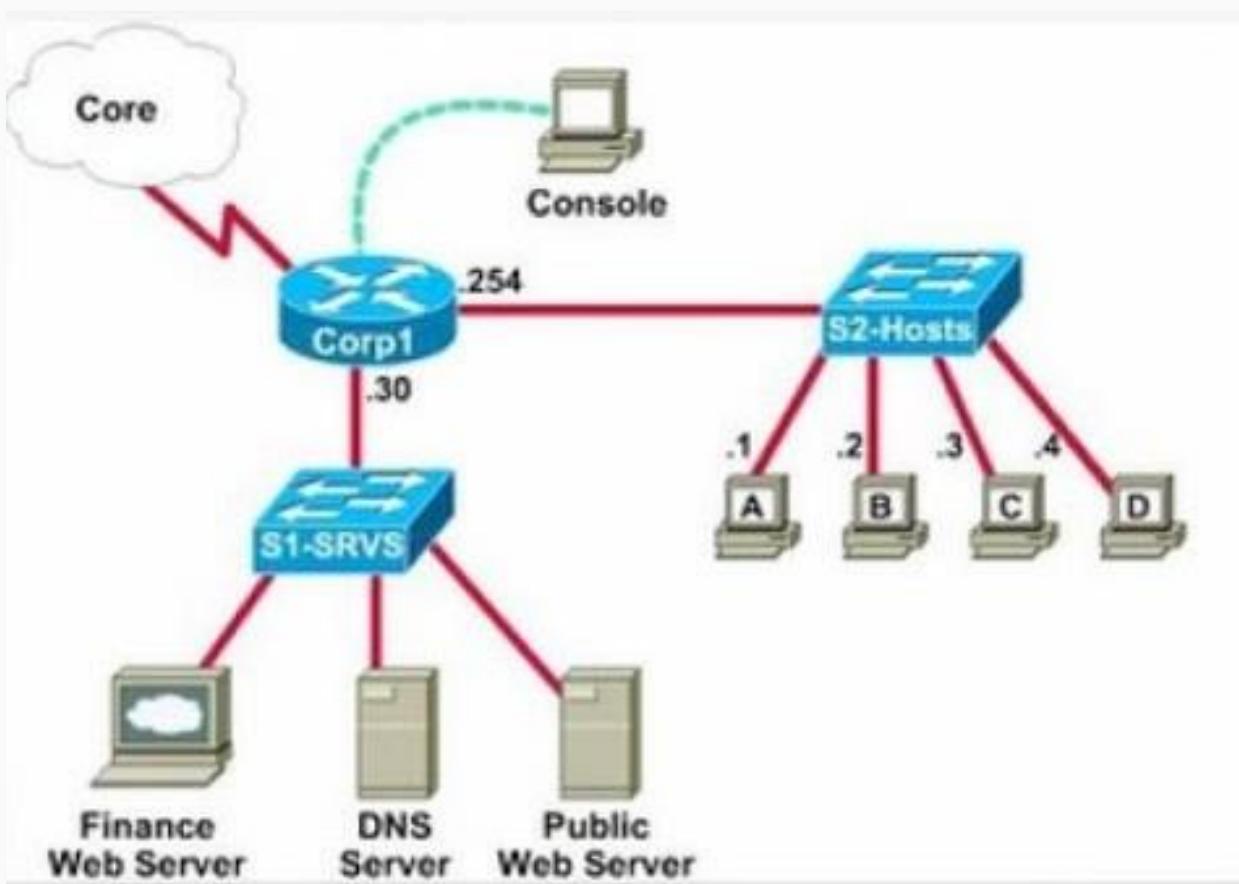
172.20.255.255/16

192.168.1.10/24

192.168.255.127/25

Questions

No More Simulation Question



Exam Price



Pearson
VUE



Duration: 120 minutes

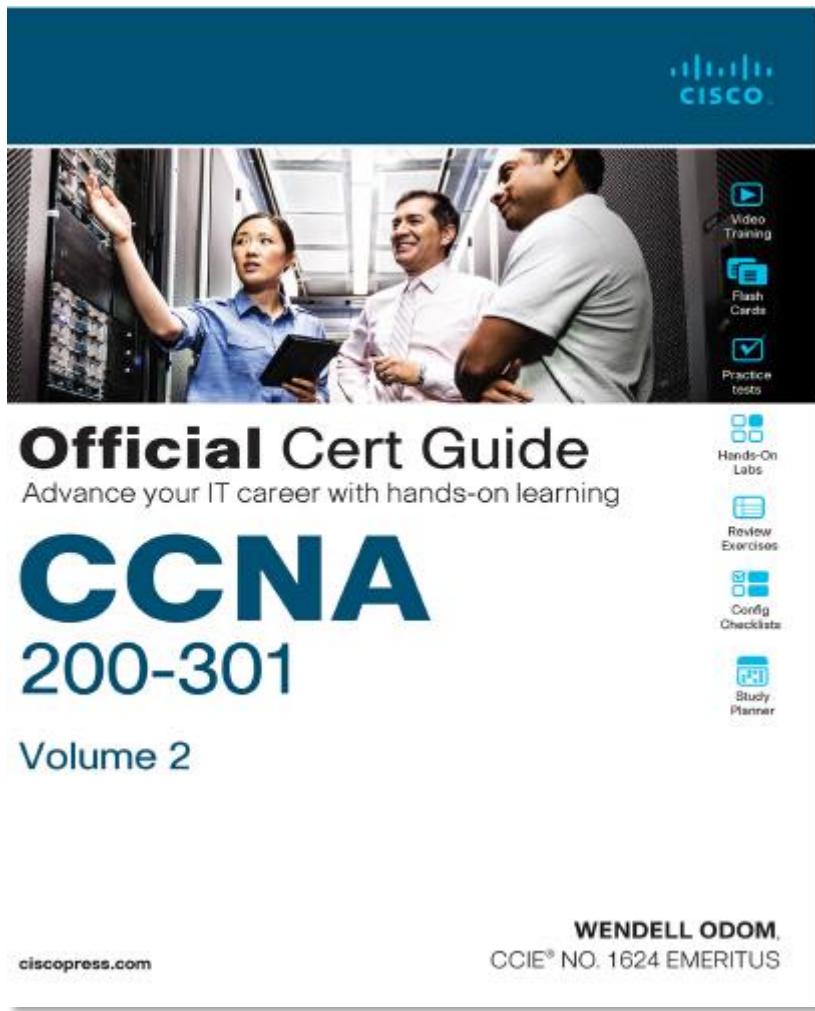
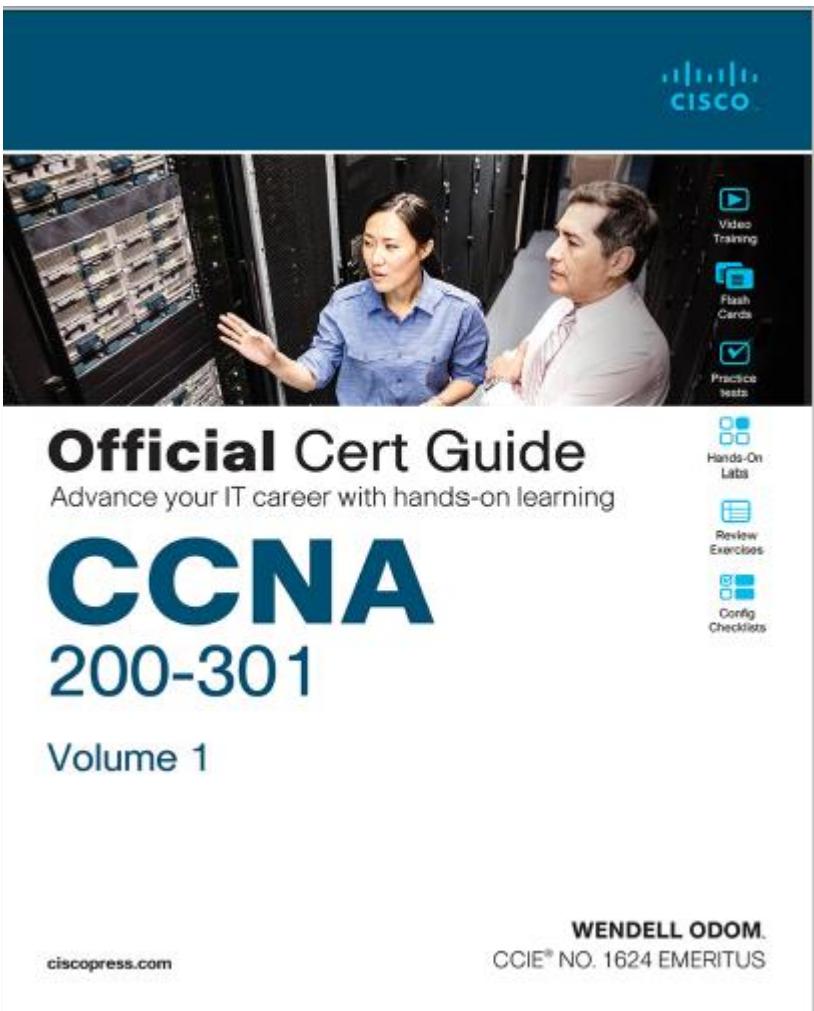
Languages: English and Japanese

Price: \$300 USD, plus tax or use [Cisco Learning Credits](#)

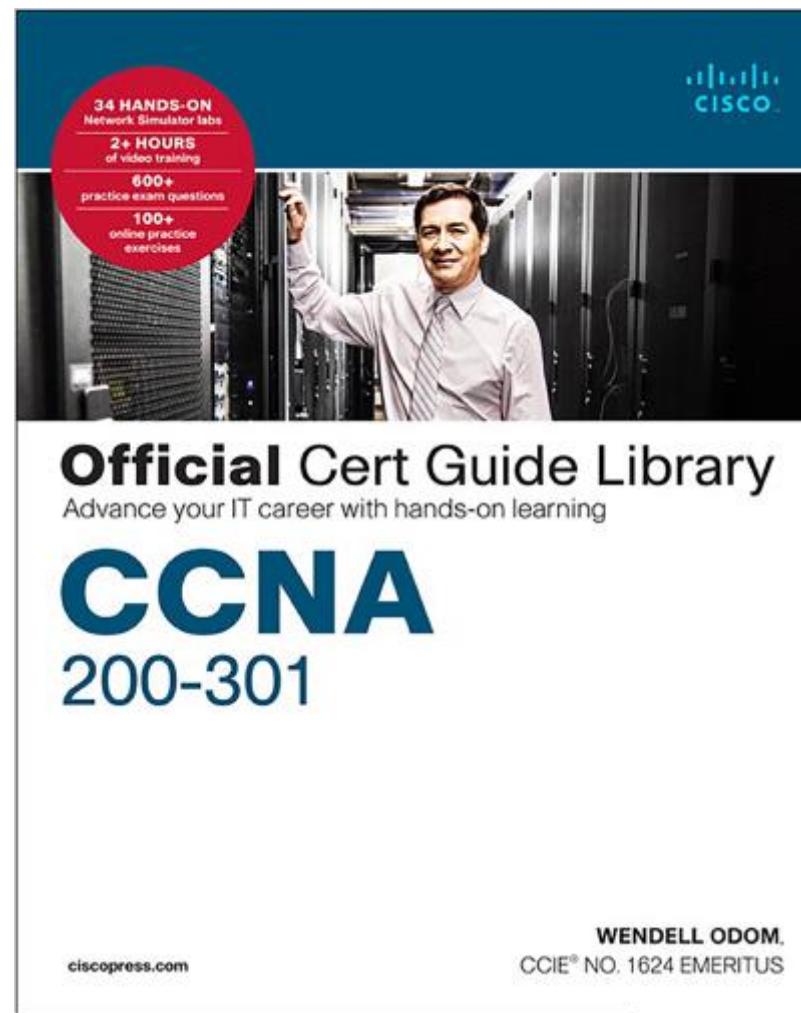
[Schedule an exam](#)

[Buy practice exam](#)

Books

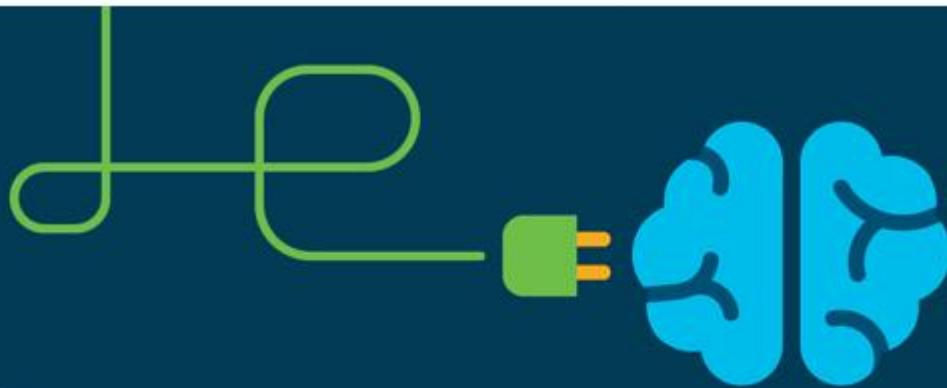


Books



Network Simulation Tool

Networking
CISCO. Academy



Cisco Packet Tracer

An innovative and powerful networking simulation tool used for practice, discovery and troubleshooting



Courses in
20+ Languages

Hands-On

Flexible Delivery

Supports Personalized
Instruction

Simulations

Hackathons

Integral to the Skills-to-Jobs Learning Experience

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Version: 7.3.1.0362



Network Simulation Tool

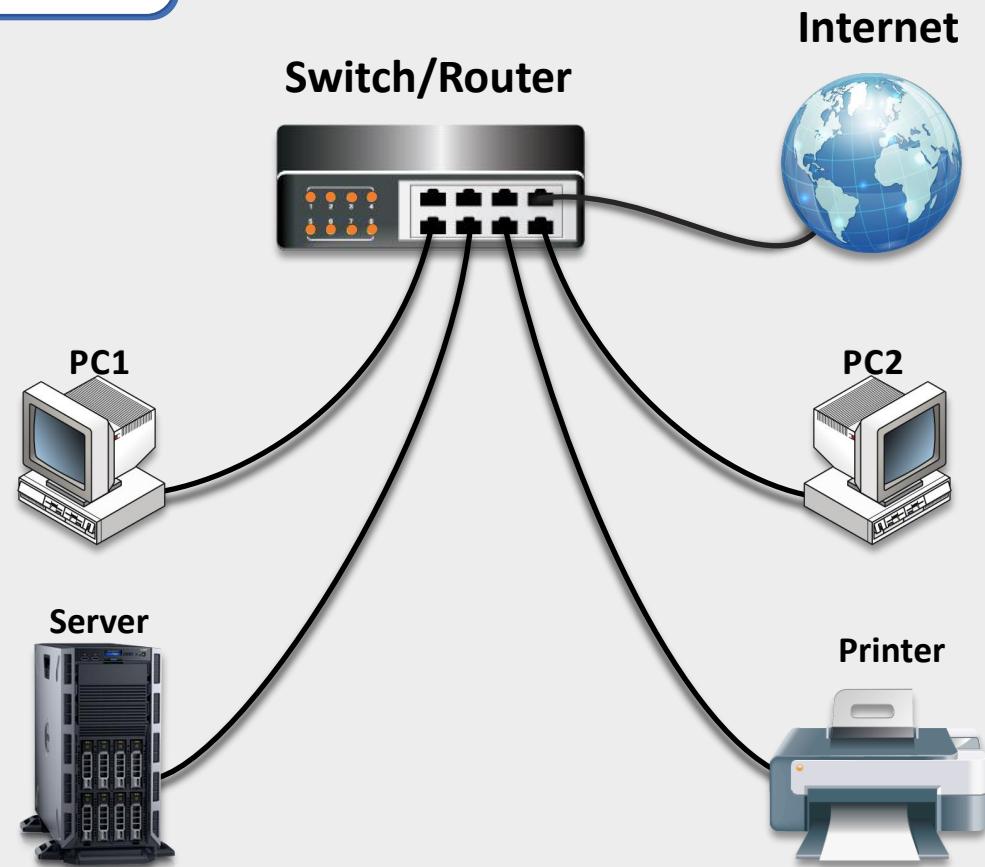


Computer Network

- ❖ A **computer network** is a set of computers connected together for the purpose of sharing resources such as internet connection, a printer, a file server and others.

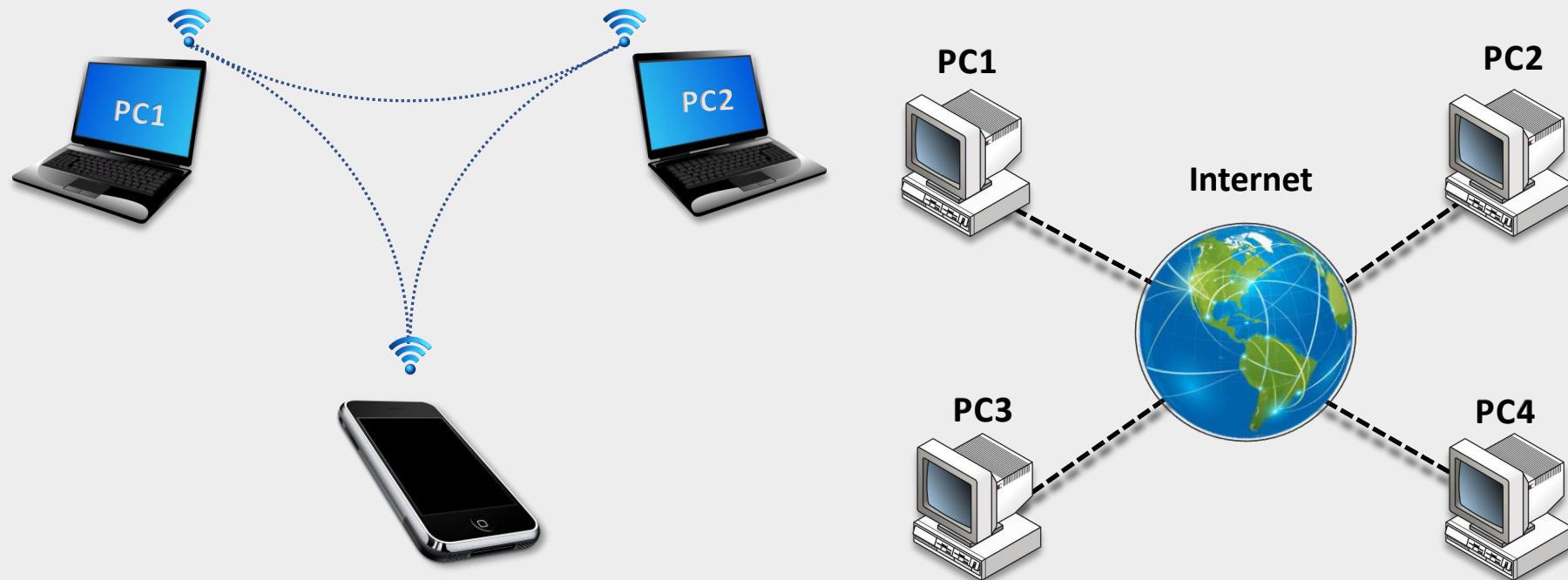
➤ Applications of Computer Networks:

- File Transfer.
- Web/Internet.
- Email.
- Video Conferencing.
- Remote Access.
- Network Printer.
- Network Server.



Smallest and Largest Computer Network

- ❖ **The Smallest Computer Network** is made up by two computers or a computer and a mobile.
- ❖ **The Largest Computer Network** is the internet.



Wired network

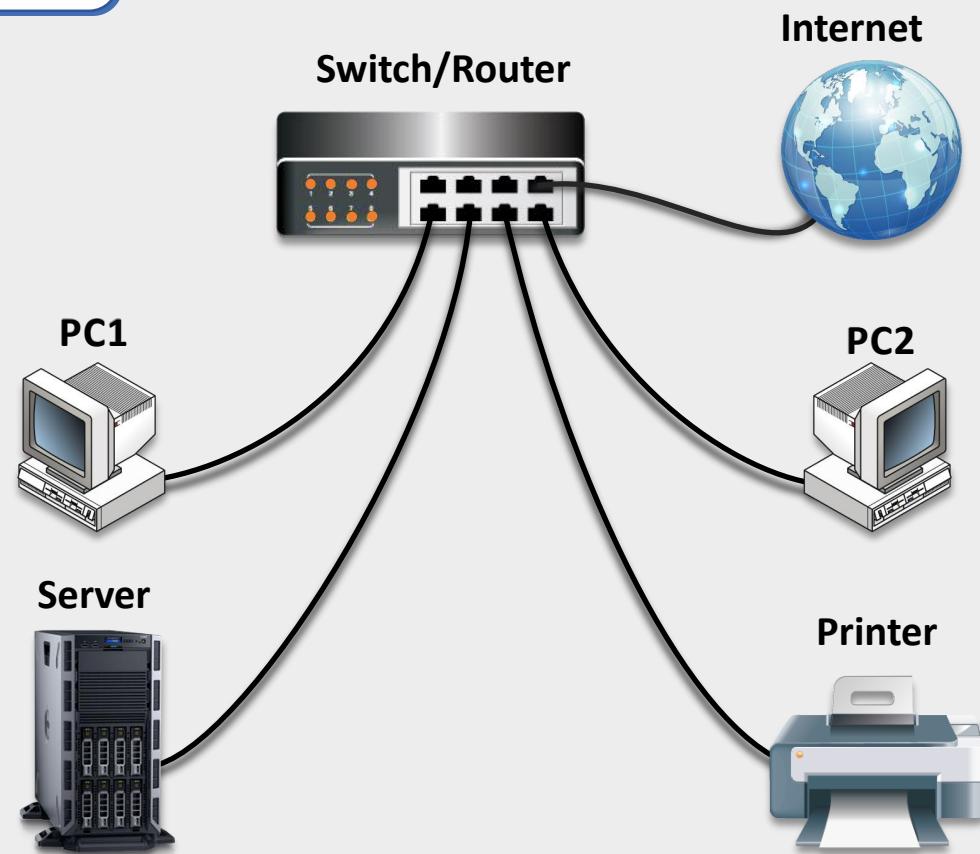
- ❖ A **Wired network** is a computer network that uses cables to transfer data between connected devices.



▪ Copper cable

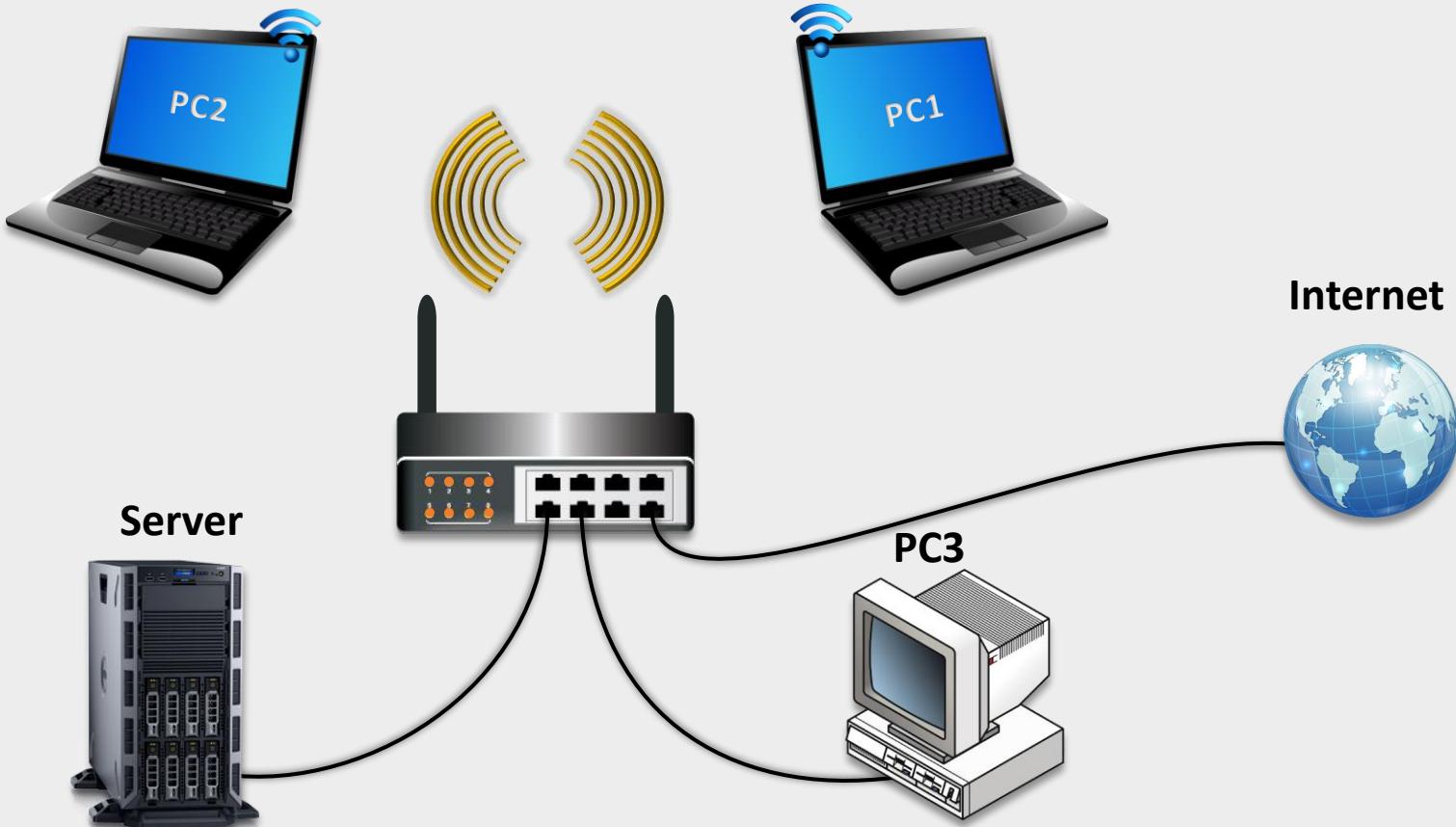


▪ Fiber optic cable



Wireless Network

- ❖ **Wireless network** uses radio signal frequency to transfer data between connected devices



Network Topologies

❖ A **Network Topology** is the arrangement with which computer systems or network devices are connected to each other.

➤ Partial Mesh Topology

➤ Full Mesh Topology

➤ Point to Multipoint Topology

➤ Point to Point Topology

➤ Star Topology

➤ Ring Topology

➤ Bus Topology

Bus Topology

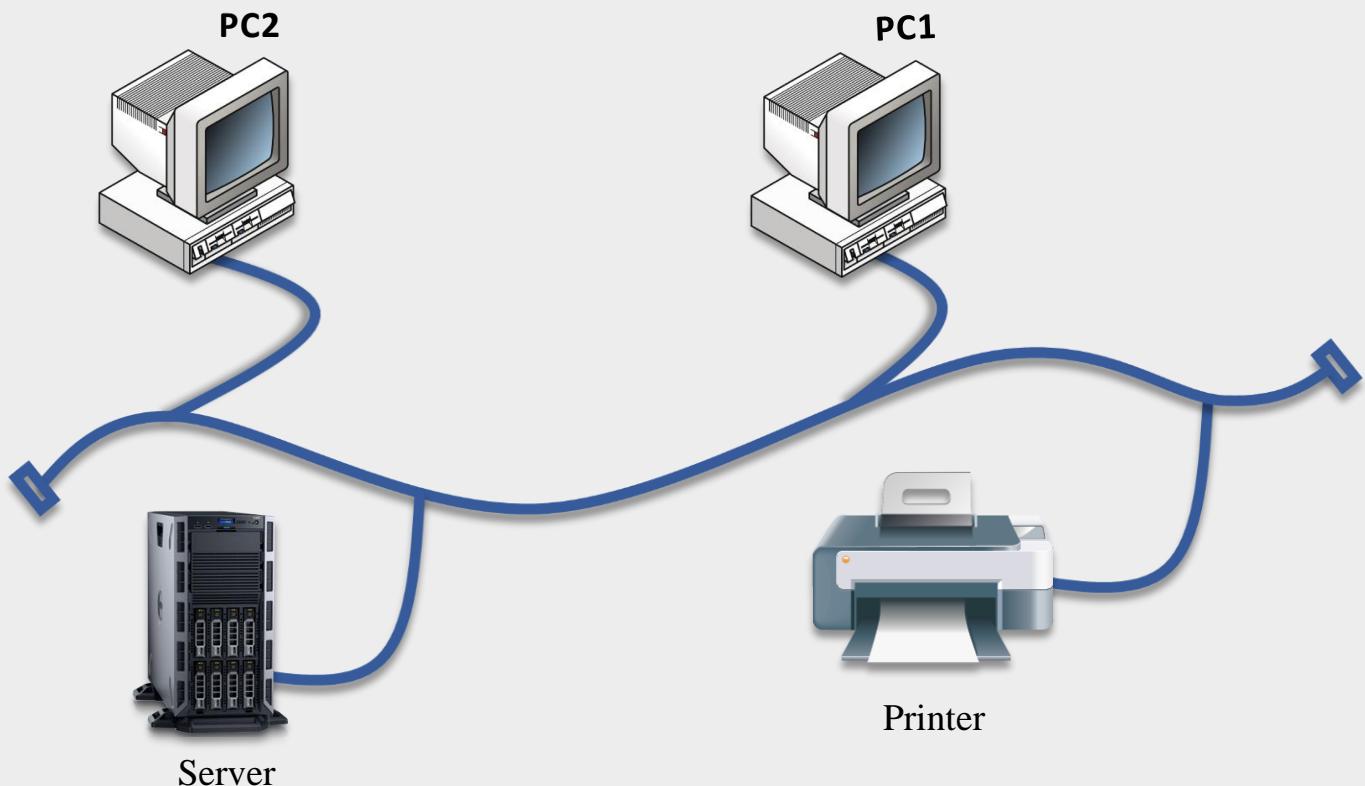
❖ All the nodes are connected to a single cable.

➤ Advantages

- Very easy to connect a computer.
- It works well for small networks.
- If one node fails, it does not affect the whole network.
- It is easy to extend by joining cable with connector or repeater.

➤ Disadvantages

- The entire network shuts down if there is a break in the main cable.
- Collisions occur in the network resulting in packet loss.
- It is difficult to isolate faults in the network.



Ring Topology

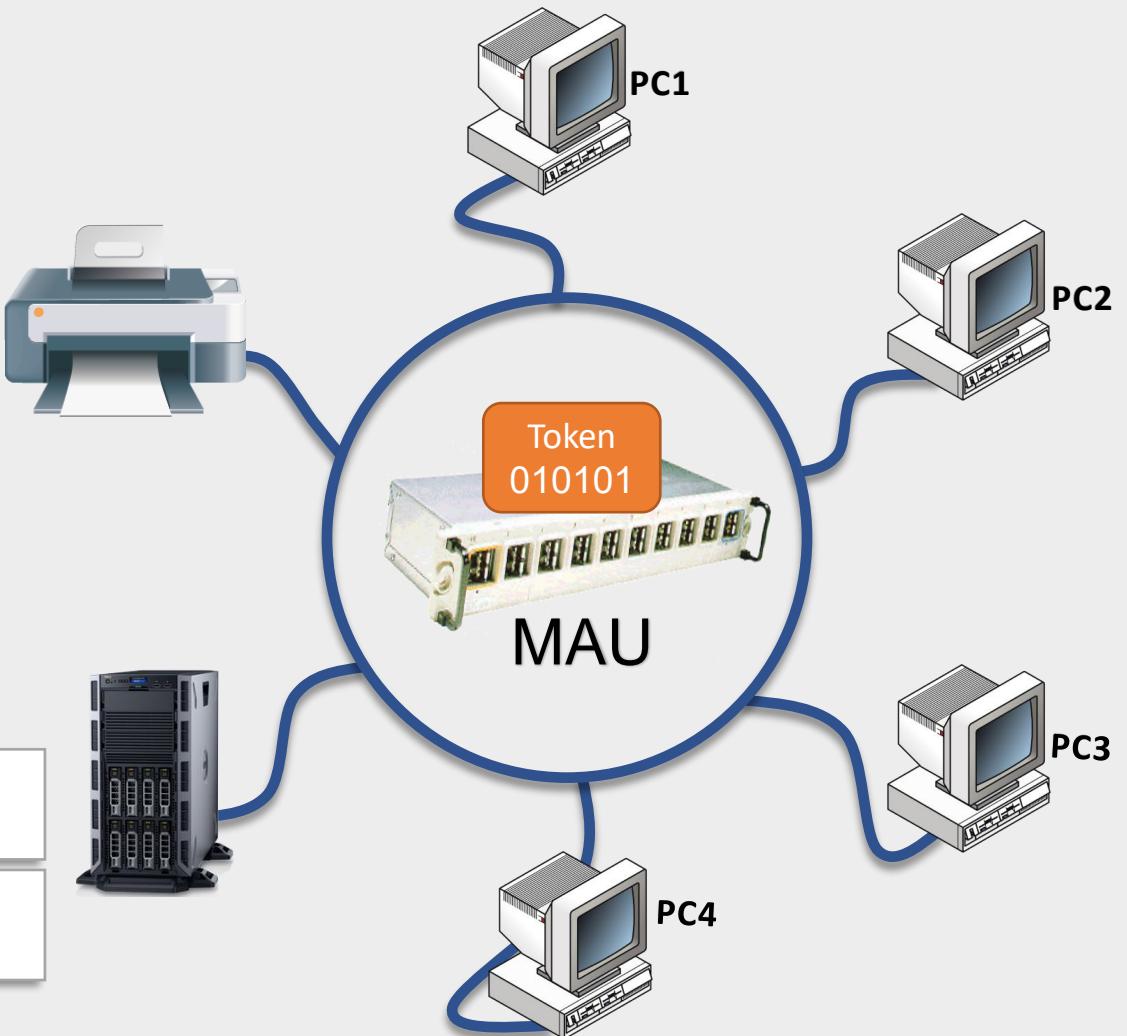
- ❖ All the nodes are connected together as a ring using Media Access Unit (MAU) device.

➤ Advantages

- All data flows in one direction, reducing the chance of packet collisions.
- Data can transfer between workstations at high speeds.
- Additional workstations can be added without impacting performance

➤ Disadvantages

- All data being transferred over the network must pass through each workstation on the network.
- The entire network will be impacted if one workstation shuts down.



Star Topology

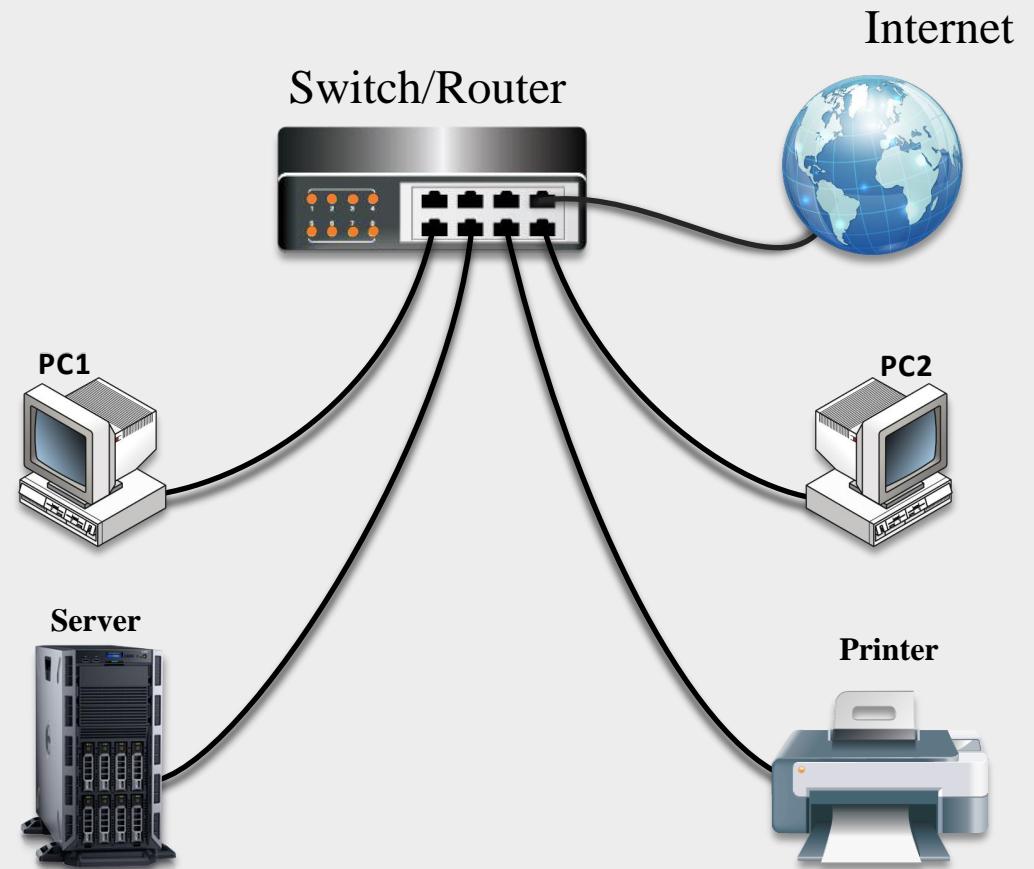
- ❖ All nodes are individually connected to a central device, like a Hub or a Switch.

➤ Advantages

- Centralized management of the network, through the use of the central hub or switch.
- Easy to add another computer to the network.
- If one computer on the network fails, the rest of the network continues to function normally.

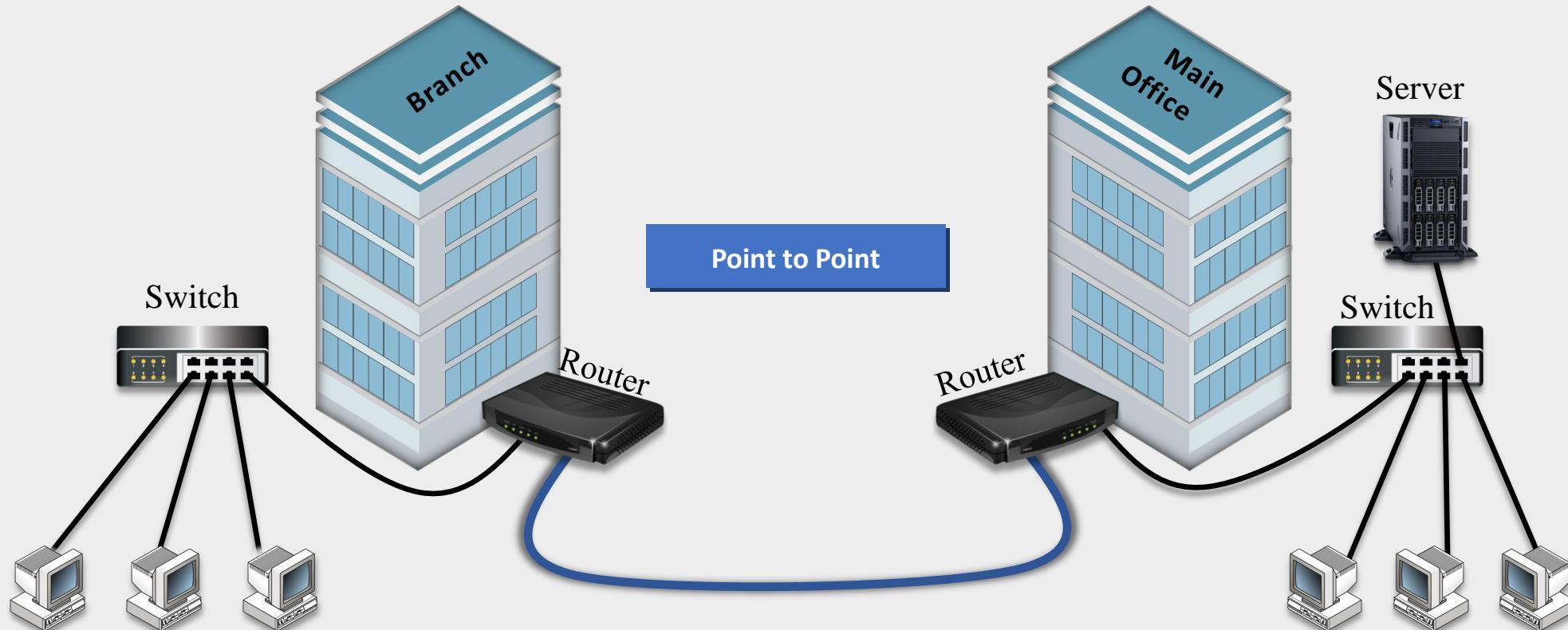
➤ Disadvantages

- The central network device determines the performance and number of nodes the network can handle.
- If the central device fails, the entire network goes down and all computers are disconnected from the network.

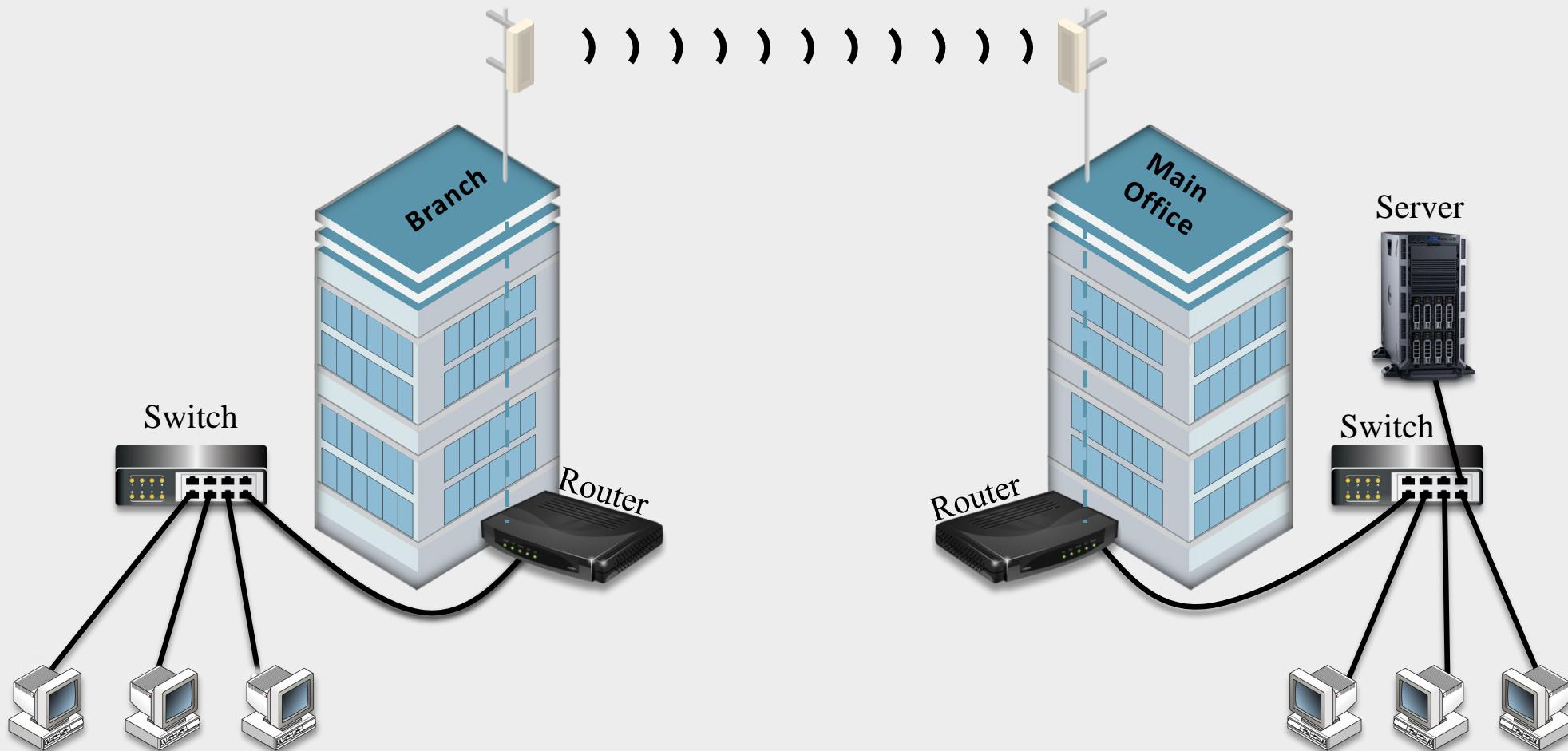


Point to Point Topology

- ❖ **Point to Point Topology** is a simplest topology that connects two nodes directly together with a common link.

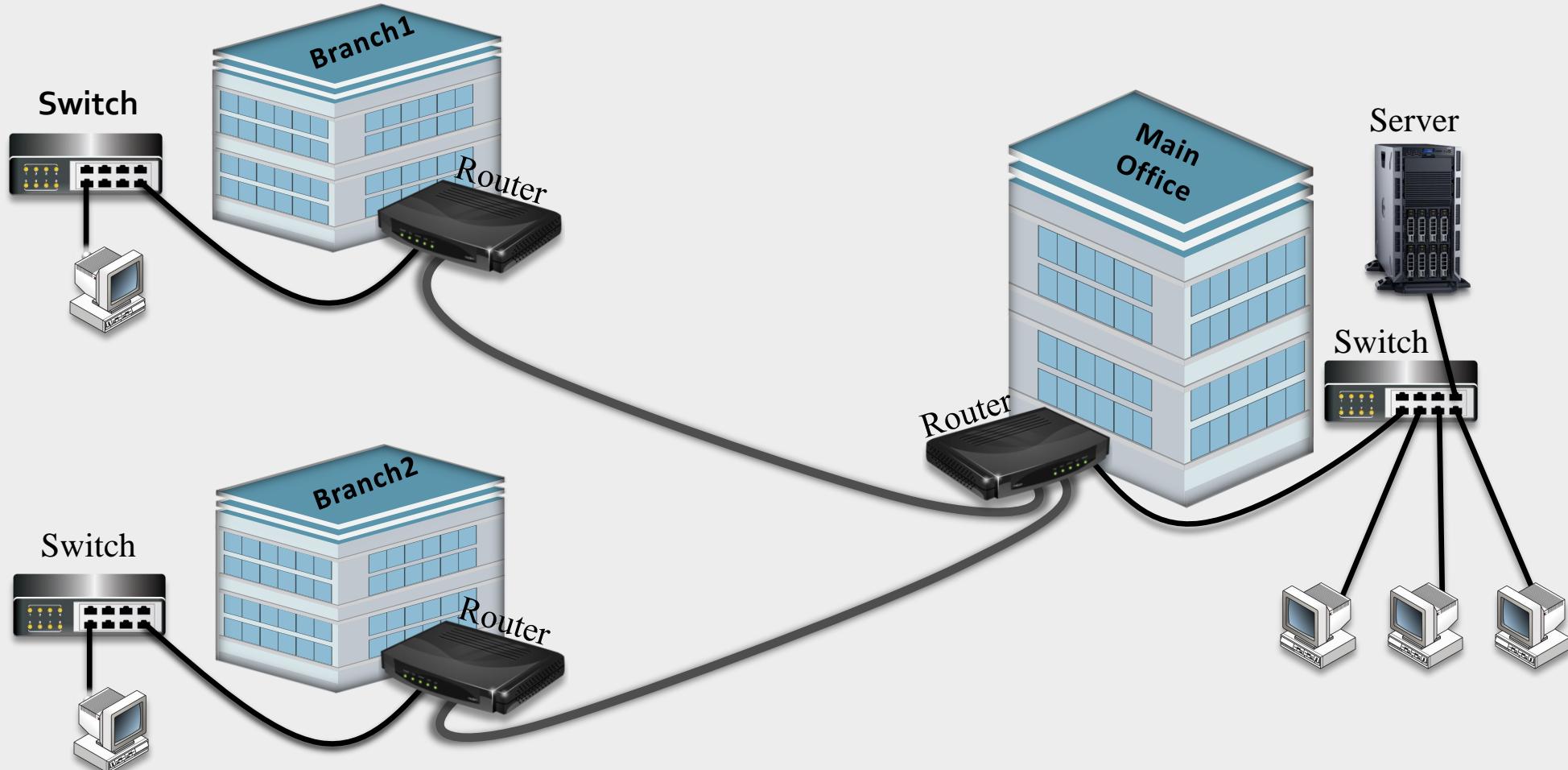


Point to Point Topology (Using wireless connection)



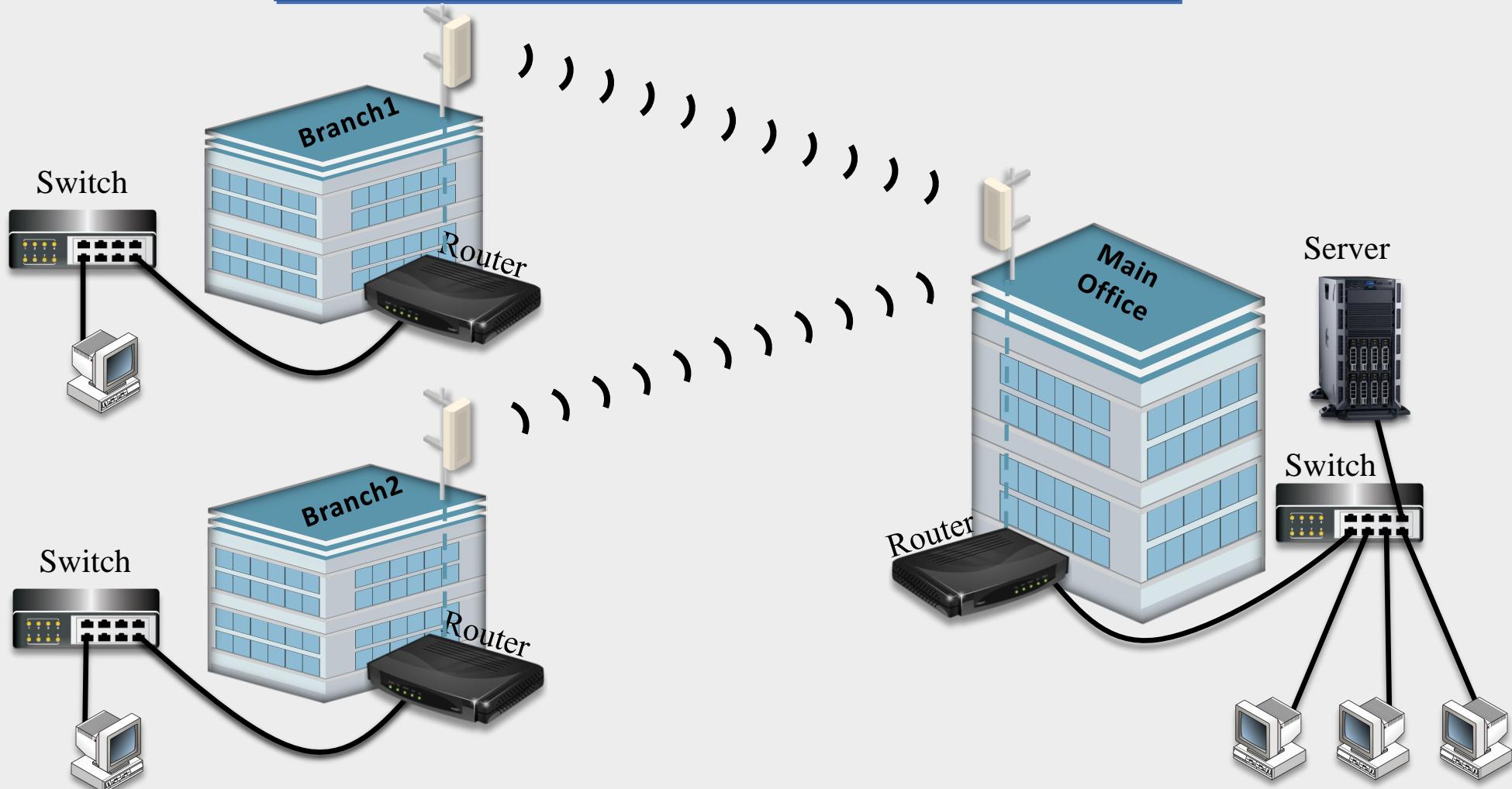
Point to Multipoint Topology

- ❖ Point to Multipoint Topology is a topology that connects a node to many nodes.



Point to Multipoint Topology

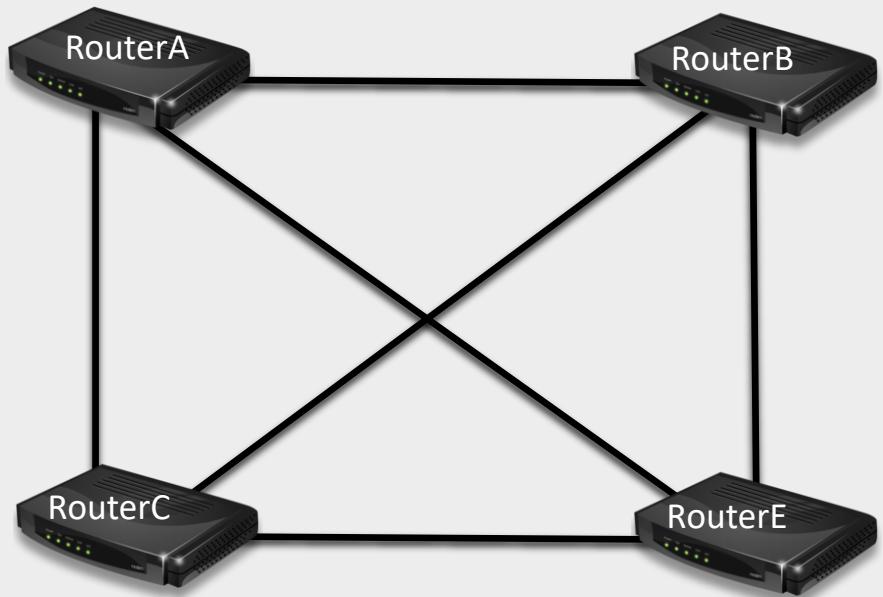
❖ Point to Multipoint Topology uses wireless connection.



Full and Partial Mesh Topology

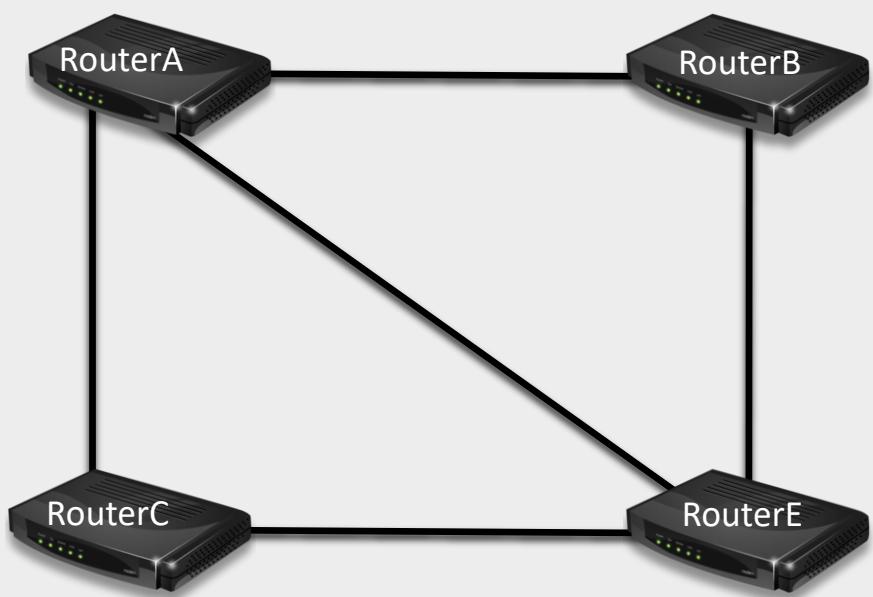
Full Mesh

- Every node has a direct connection to every other node in a network.



Partial Mesh

- Some nodes doesn't have a direct connection to every other node in a network.



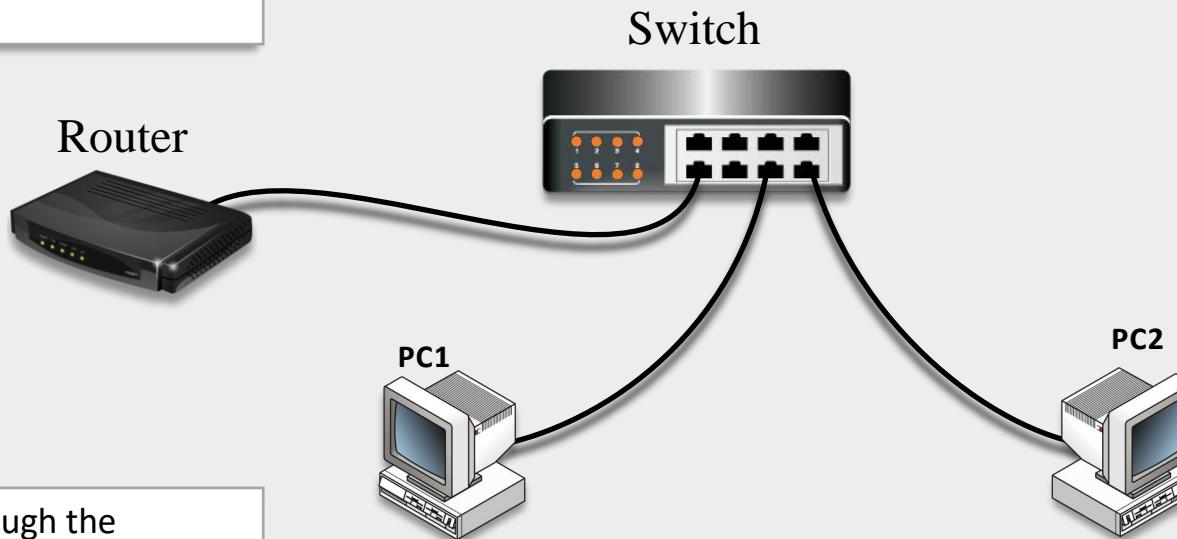
$$\text{Number of cables} = N*(N-1) / 2$$

N is the number of nodes

Logical vs Physical Topology

❖ Physical Topology

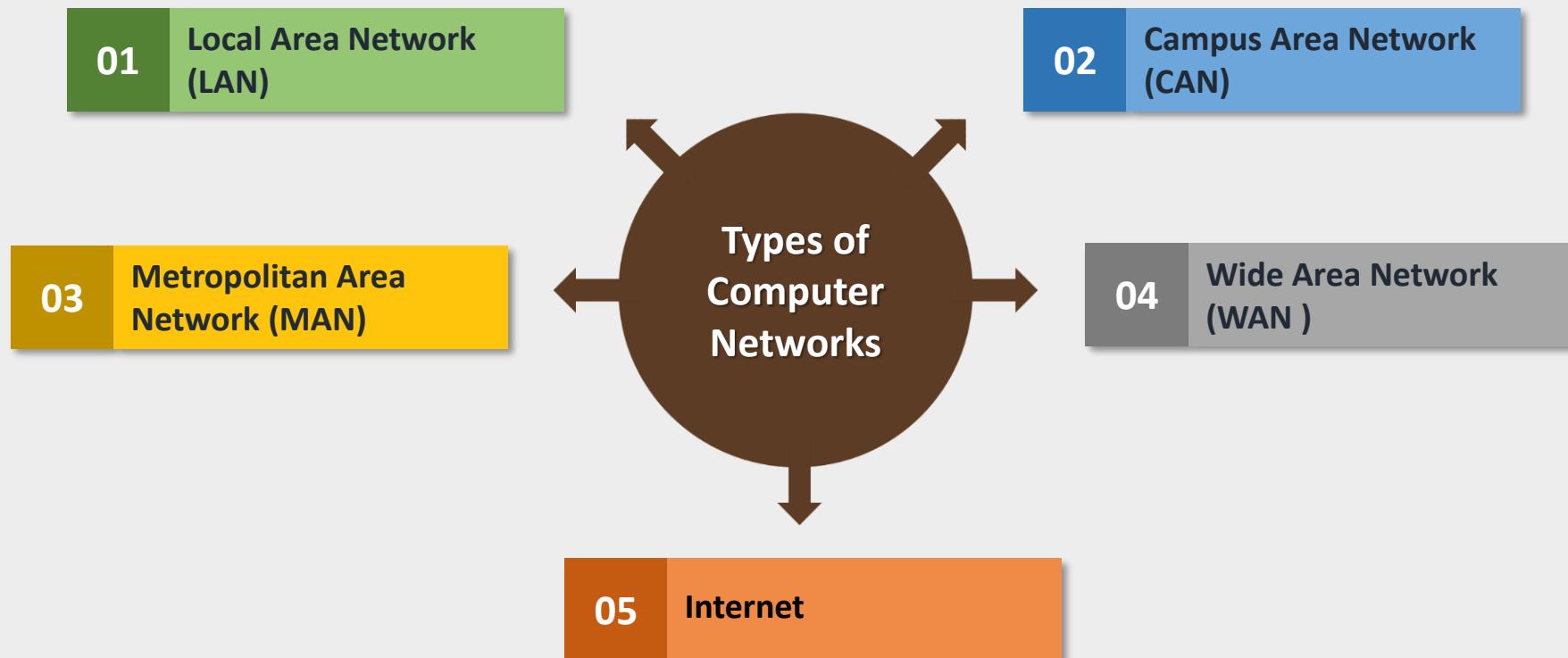
- Refers to the physical layout of the wires in a network.



❖ Logical Topology

- Refers to how data moves through the network.

Types of Computer Networks



Local Area Network (LAN)

- ❖ **Local Area Network (LAN)** is a computer network that interconnects computers within a limited area such as **home, school, and office**.

❖ LAN's Benefits

- Sharing files and folders.
- Sharing printers.
- Connecting to servers.
- Using a single internet connection.

❖ LAN's Cables

- Copper cables (UTP and STP cable).
- Optical fiber cables (MMF cable).

❖ LAN's Devices

- Computers, Printers ,Servers, Switches, Routers, Access pointes and Firewalls.

❖ LAN's Ownership

- Owned, controlled, and managed by a single person or organization.

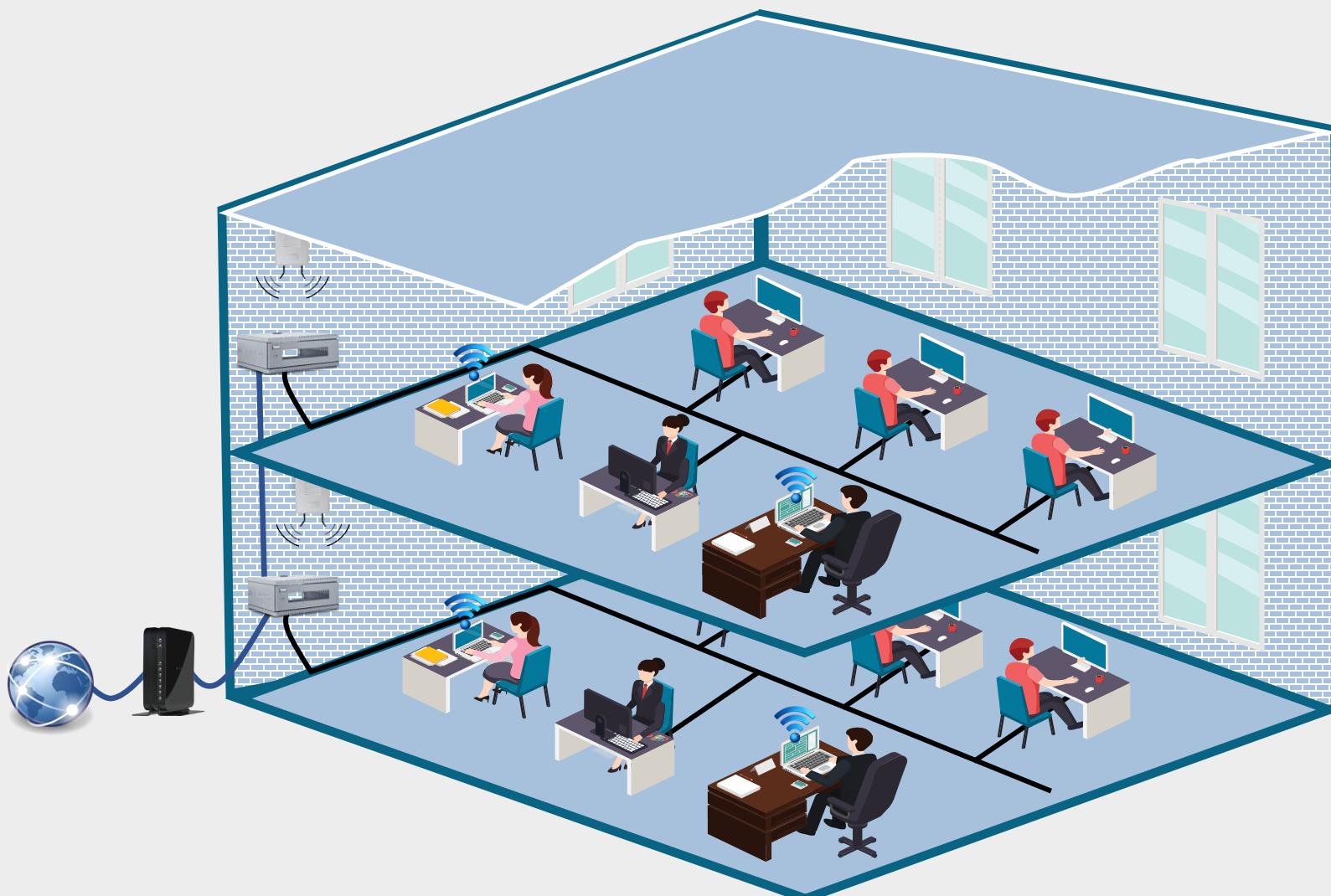
❖ LAN's Technology

- Ethernet and Wireless LAN (WLAN).

❖ LAN's Bandwidth

- High bandwidth is available for transmission.

Local Area Network (LAN)



Campus Area Network (CAN)

- ❖ A **Campus Area Network** is a network of multiple interconnected local area networks (LAN) within a limited area such as an university, an enterprise and a corporate buildings.

❖ CAN's Benefits

- Connecting multiple LANs together within a limited area.

❖ CAN's Bandwidth

- High bandwidth is available for transmission.

❖ CAN's Devices

- Computers, Printers ,Servers, Switches, Routers, Access pointes and Firewalls.

❖ CANs Technology

- Ethernet and Wireless LAN (WLAN).

❖ CAN's Cables

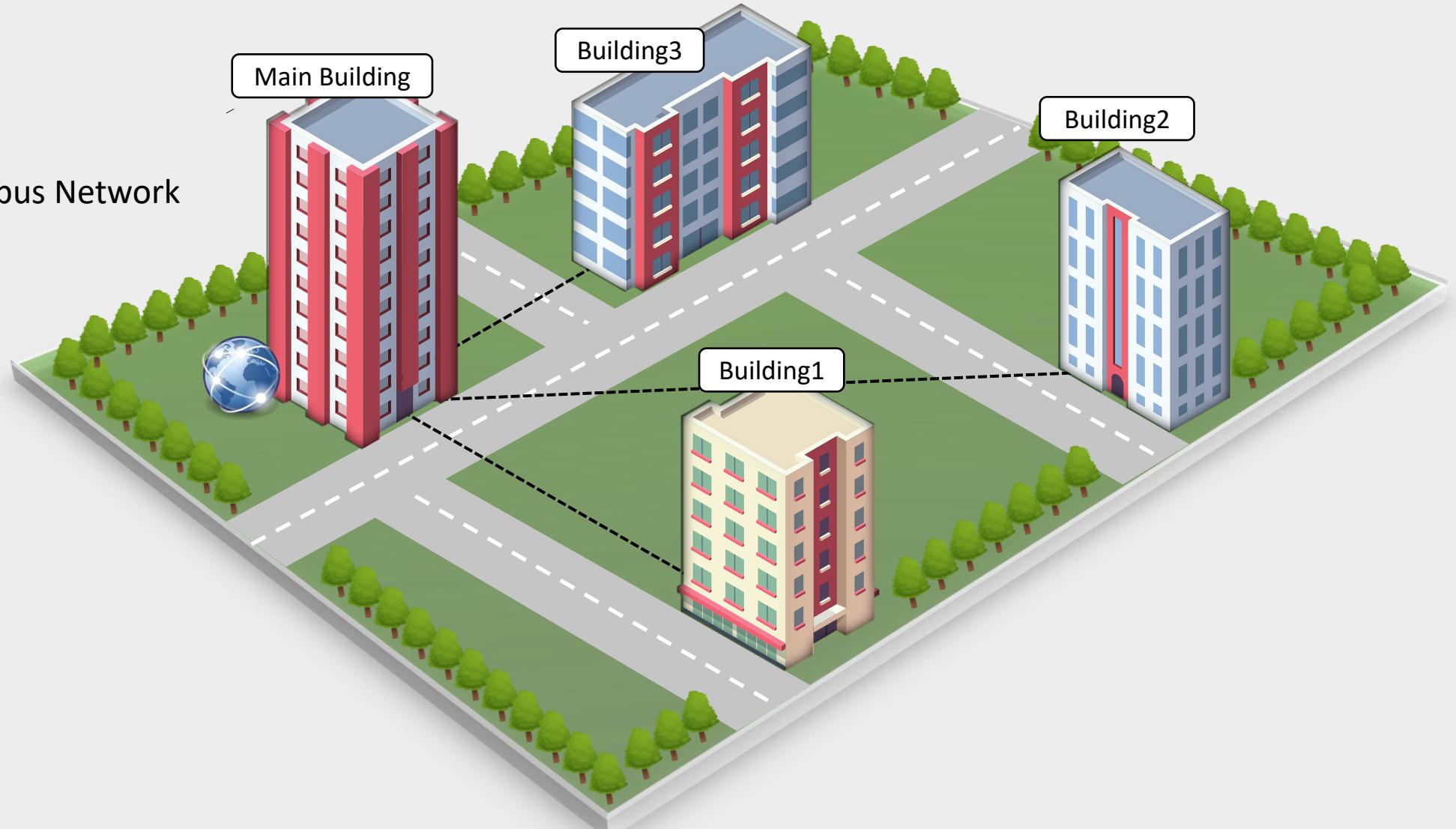
- Copper cables (UTP and STP cable).
- Fiber-Optic cable (MMF cable).

❖ CAN's Ownership

- Owned, controlled, and managed by an organization.

Campus Area Network (CAN)

❖ Campus Network



Metropolitan Area Network (MAN)

- ❖ A Metropolitan Area Network is a network that interconnects LANs in a geographic region of the size of a metropolitan area.

❖ MAN's Benefits

- Connecting multiple LANs together within a limited area.

❖ MAN's Bandwidth

- High bandwidth (10 Gbps).

❖ MAN's Devices

- Multilayer switches and routers.

❖ MANs Technology

- Metro Ethernet, FDDI, ATM and SMDS

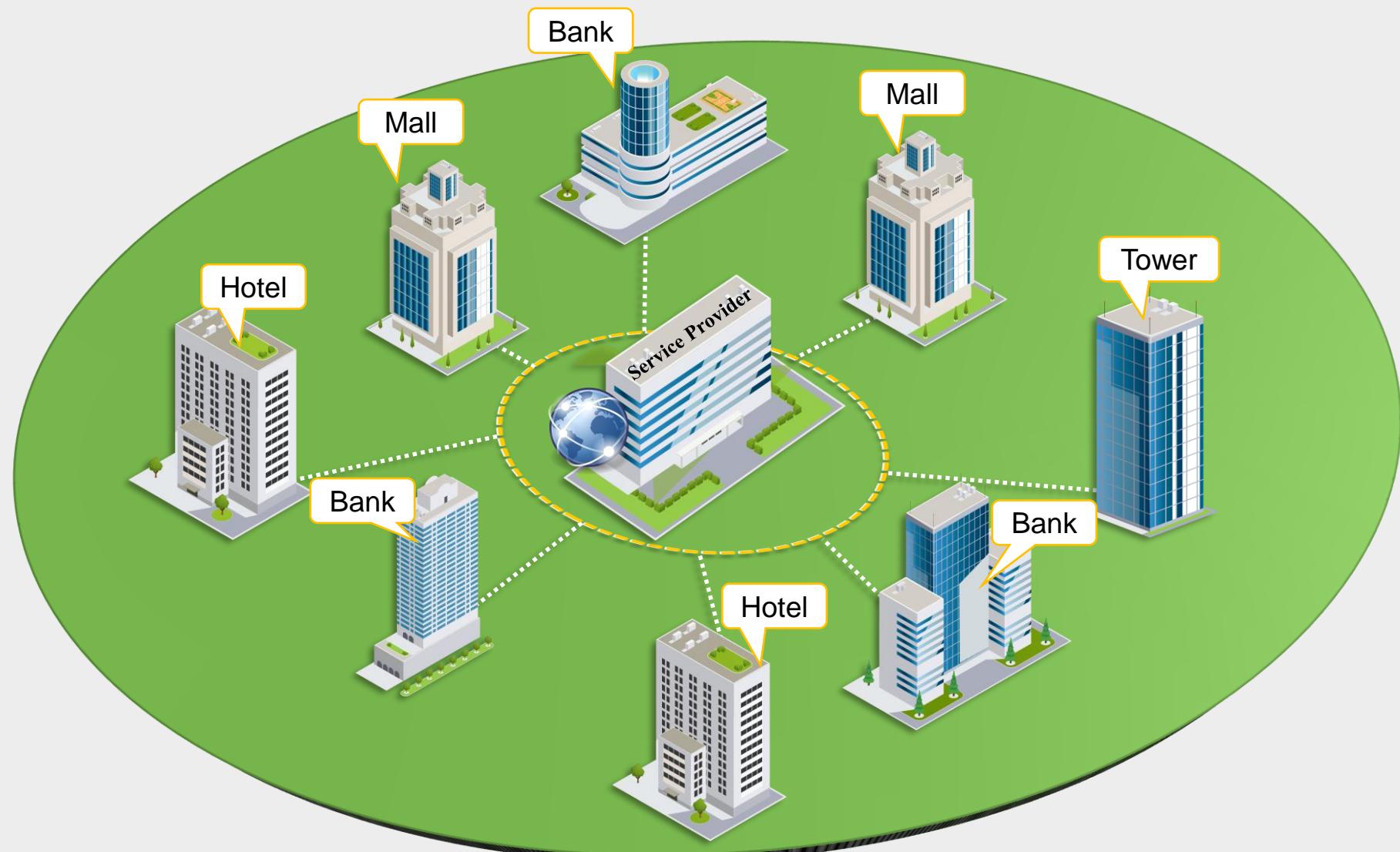
❖ MAN's Cables

- Fiber-Optic cable (SMF cable).

❖ MAN's Ownership

- Service Provider.

Metropolitan Area Network (MAN)



Wide Area Network (WAN)

- ❖ A Wide Area Network (WAN) is a form of telecommunication networks that exists over a large-scale geographical area such as a network of bank cash dispensers and network of a company with several branch offices geographically distant.

❖ WAN Benefits

- Connecting multiple LANs and MANs together.

❖ WAN's Bandwidth

- High bandwidth (100 Gbps).

❖ WAN's Devices

- Routers

❖ WANs Technology

- SD-WAN, Leased line and MPLS.

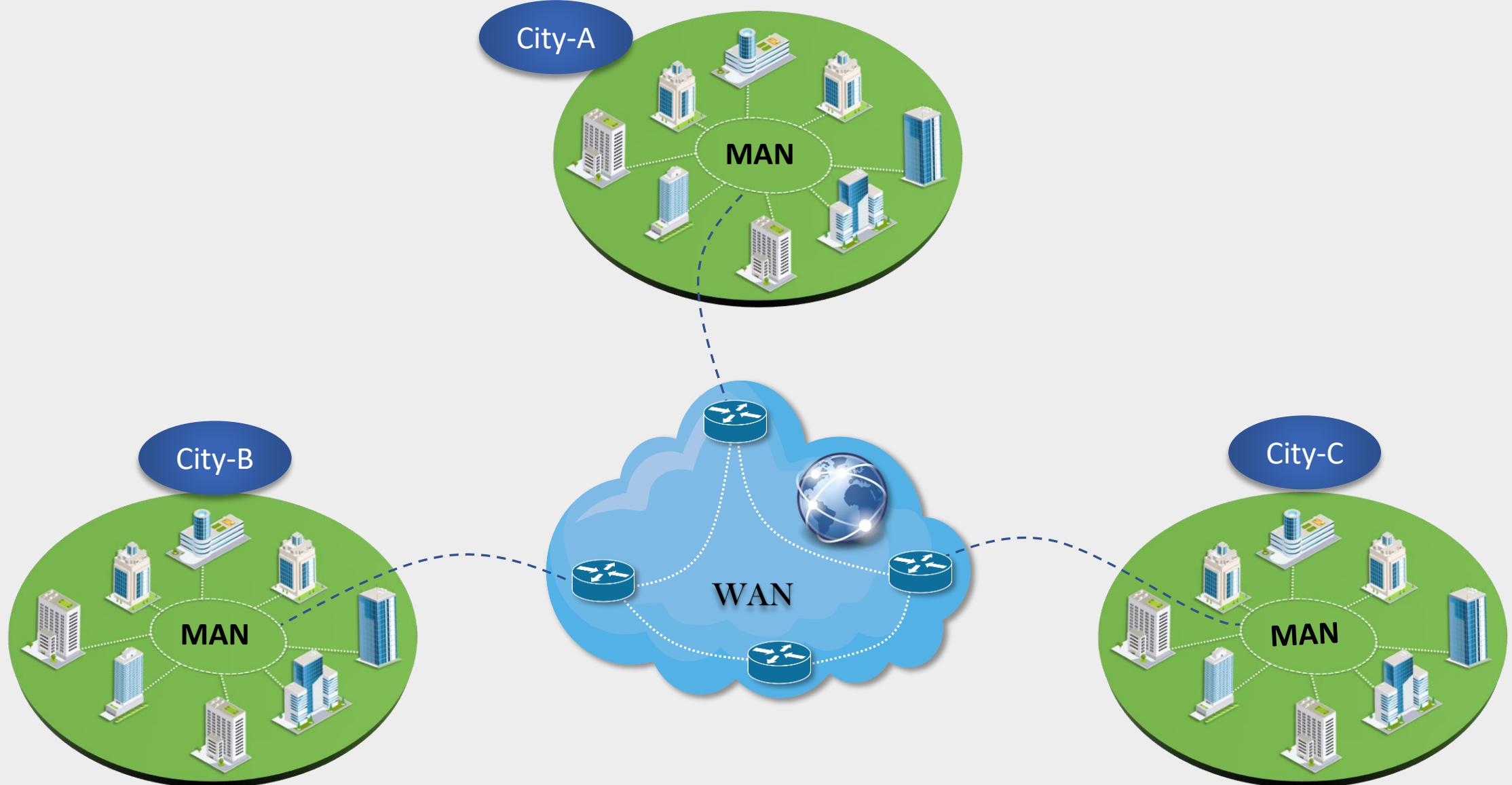
❖ WAN's Cables

- Fiber-Optic cables (SMF cable).

❖ WAN's Ownership

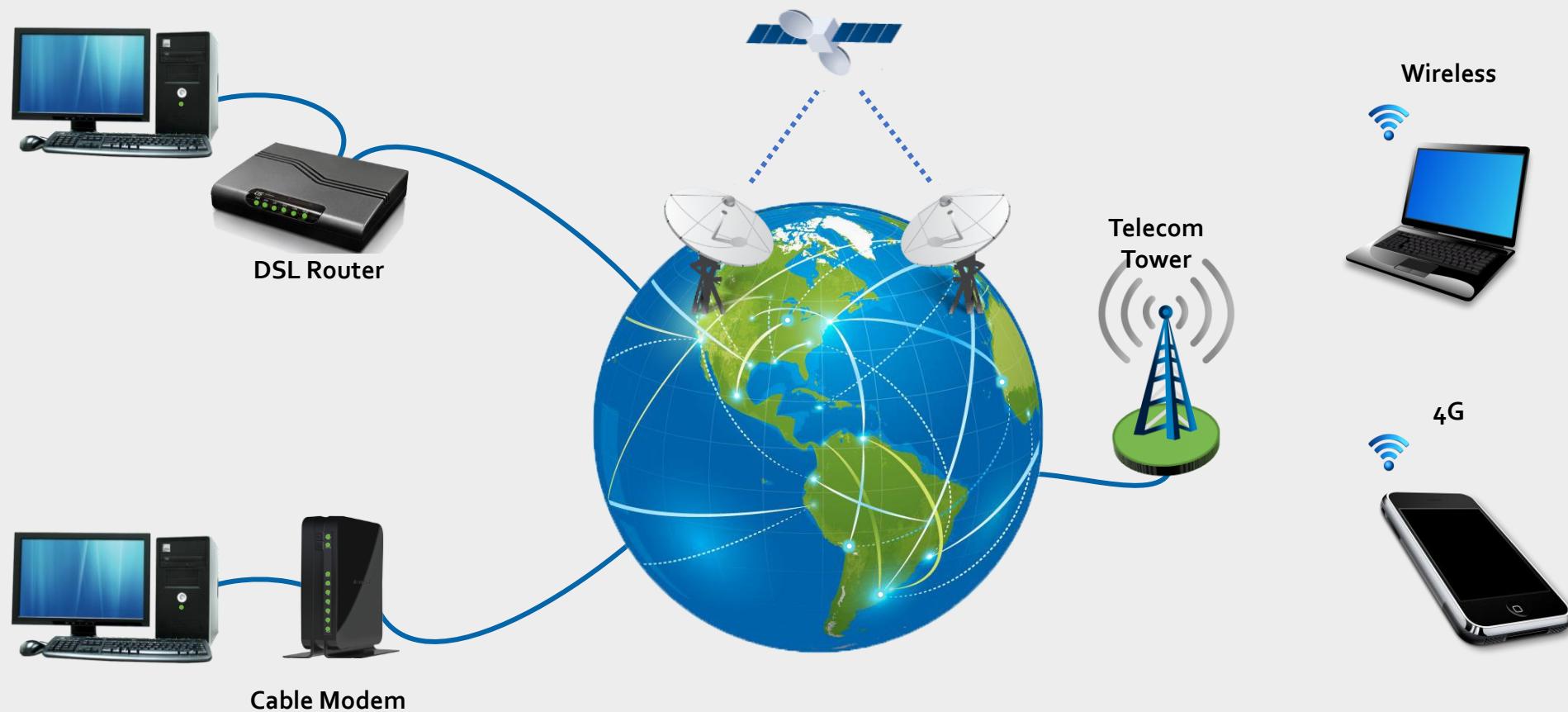
- Service Provider and Telecommunication Companies.

Wide Area Network (WAN)



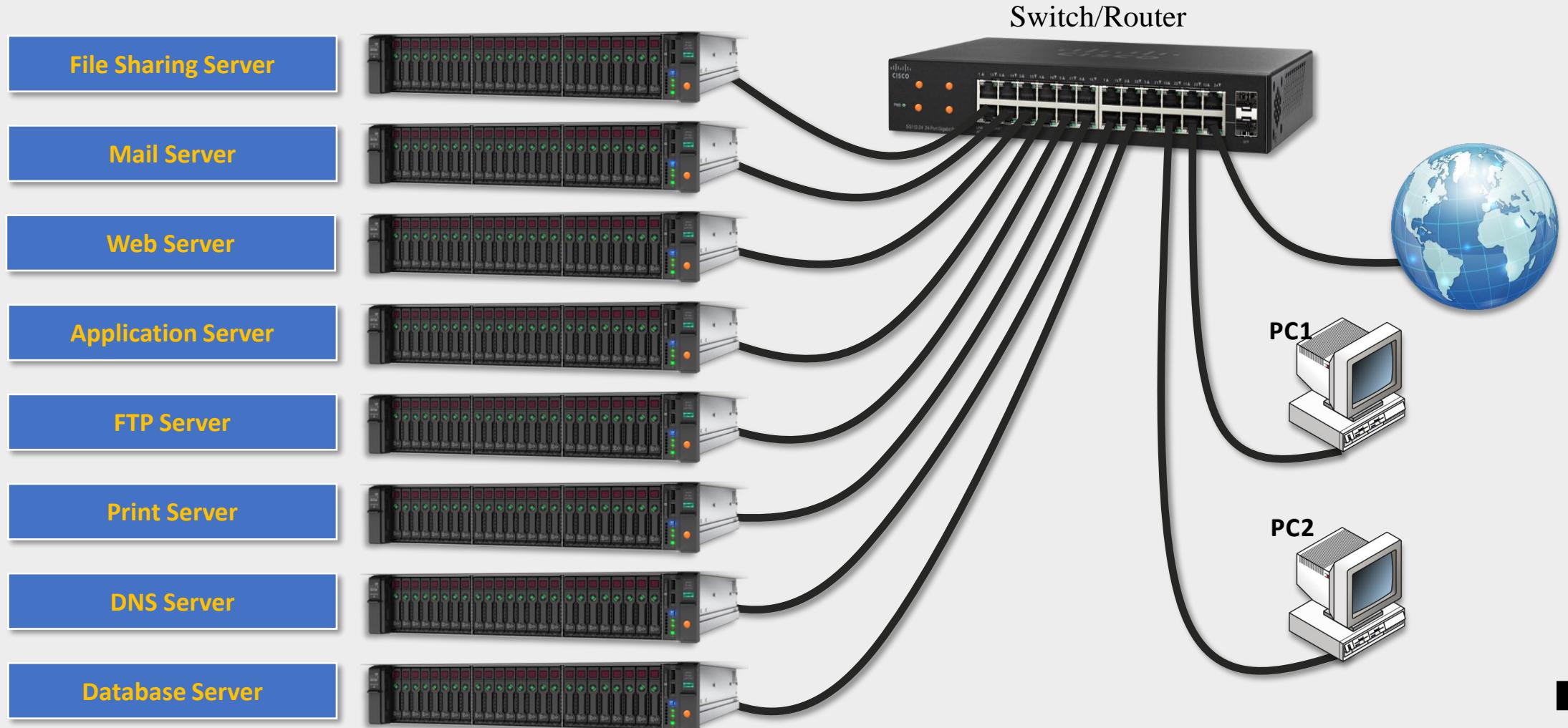
Internet

- ❖ **Internet** is the network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies.



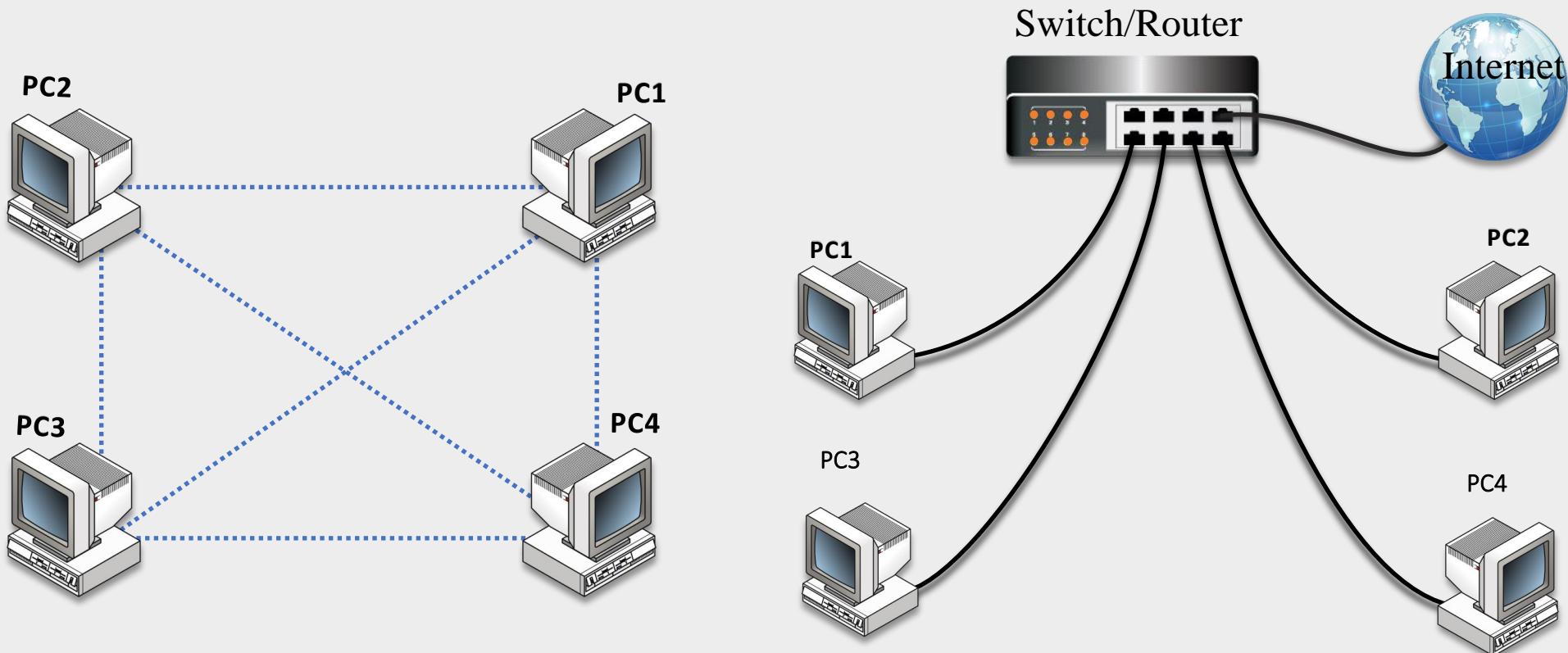
Client/Server Network

- ❖ In Client/Server Network servers provide network services to the other computers (Clients).



Peer-to-Peer (P2P) Network

- ❖ A Peer-to-Peer (P2P) Network has decentralized resources and doesn't have a dedicated server. every computer can serve as both a server and a client. One computer might assume the role of server for one transaction while acting as a client for another transaction.



Peer-to-Peer (P2P) Network

BitTorrent Applications

