SNS COLLEGE OF TECHNOLOGY

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An Autonomous Institution

COURSE CODE & NAME : 23CSB302 & COMPUTER NETWORKS

Topic: Building a network, Requirements

Ms. JACQUELIN ANUSHYA P

Assistant Professor

Department of Computer Science and Engineering

23CSB302 & COMPUTER NETWORKS/ CSE/SNSCT

Computer network

Networking, or computer networking,

is the process of connecting two or more

computing devices, such as desktop computers,

 mobile devices, routers or applications, to

enable the transmission and exchange

of information and resources.
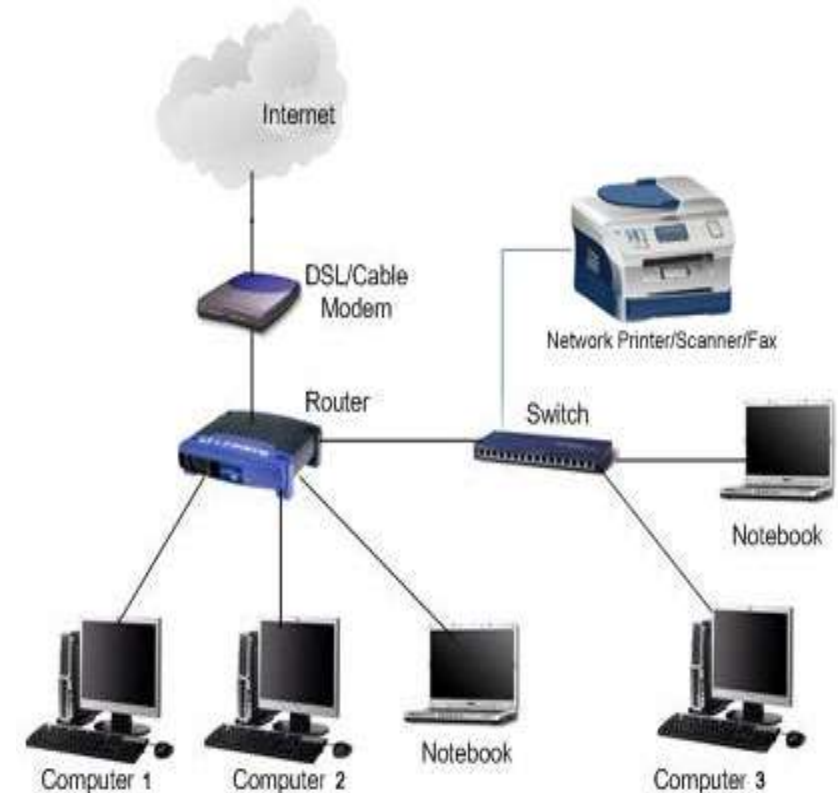
Building a network

- **Do you need a server?**

- **Wired or wireless?**

- **What internet connection do you need?**

- **How will you keep your network secure?**

- **Do you need extra software?**

Do you need a server?

- A network server is a powerful computer at the heart of your network, installed on-site.

- It provides strong control and enables you to run centralized software such as customer relationship management systems.

- However, it also increases the cost and complexity of your network, and cloud services are now the default for most companies.

Wired or wireless?

- Wired networks are fast and reliable, but require cables to be run throughout your premises.

- Wireless is versatile, but sometimes less reliable.

- Many companies use a mix; cables to static computers at desks and wireless for smartphones, tablets and ad-hoc access in meeting rooms.

What internet connection do you need?

- A standard fibre broadband connection is usually suitable for smaller companies with up to 30 employees.

- Larger companies may need a faster, more expensive connection such as a leased line.

- Don't skimp on your internet connection, particularly if you intend to use cloud computing services or VoIP services.

How will you keep your network secure?

- It's very important you take <u>key security precautions</u> to protect your network from hackers, viruses and other online threats.

Do you need extra software?

- A network is more than the equipment that links your computers together.

- In addition to any on-site server operating system, you may also need network security software and a device management solution.

Typical networks

Cloud-hosted network:

- suitable for a small and medium sized business which uses a combination of Software as a Service apps, remote file storage and hosted email.

- only hardware required on-site would be user devices and a router capable

Basic network:

- suitable for a small company with five devices, might simply link the five devices wirelessly, without a central server.

- This would enable everyone to use the internet and share files.

- You could set up a network like this for £100 or less.

Cont…

Intermediate network :

- might consist of 15 devices, connected by cables.

- An entry level server would create shared file storage and allow important files to be safely backed up.

- The company could also run a basic, centralized customer database.

- A network like this could cost around £2,000.

Advanced network :

- might include 30 devices and a powerful server, connected by cables.

- The server would enable the company to run its own intranet, customer relationship management system and collaboration software.

- A number of shared printers could also be installed, and wireless access offered in common areas and meeting rooms.

- A network like this could cost £5,000 or more.

Building a network Requirements

Requirements differ according to the perspective:

- Application programmer

- Network designer

- Network provider

Requirements:

- **Connectivity**

- **Cost-Effective Resource Sharing**

- **Support for Common Services**

- **NETWORK CRITERIA**

Connectivity:

- Links and Nodes
- Types of Links or Connections

  (**Multipoint-**multiple devices share channel capacity and network links **, Point-to-point-**direct node-to-node**, Broadcast-** several parties can receive one-way transmissions from a single sending device. EX:Television)

- Direction of Data Flow (**Simplex:**unidirectional EX:Keyboards and traditional monitors, **Half-Duplex:** both transmit and receive, but not at the same time , **Full-Duplex: B**oth stations can transmit and receive simultaneously)

- Unicast, Broadcast and Multicast

Cost-Effective Resource Sharing

- Multiplexing is a way that a system resource is shared among multiple users.

- Two or more simultaneous transmissions on a single circuit. Transparent to end user. Multiplexing cost less.

- Multiple telephone channels may share a transmission link by means of multiplexing – this sharing is static

- FDM (Frequency Division Multiplexing) is used in analogue systems (a telephone analogue channel has a nominal bandwidth of 4 kHz)

- –STDM (Synchronous Time Division Multiplexing) is used in digital systems (the basic telephone digital channel has a capacity of 64 kbit/s)

Support for Common Services

- A computer network provides more than packet delivery between nodes.

- We don't want application developers to rewrite for each application higher layer networking services.

- The channel is a pipe connecting two applications.

- How to fill the gap between the underlying network capability and applications requirements? a set of common services– Delivery guarantees, security, delay.

NETWORK CRITERIA

- Performance, Reliability, and Security

CATEGORIES OF NETWORK:

Local area network (LAN)- short distance, such as those within an office building, school or hospital

Wide area network (WAN) - across large geographical areas, such as regions and continents.

Metropolitan area network (MAN)- MANs are larger than LANs but smaller than WANs. Cities and government entities

Personal area network (PAN) - A PAN serves one person like E MAIL