

A man in a white shirt and red tie is holding a large red cable that loops around a globe. The globe is blue and green, representing Earth. The background is a textured yellow and blue. The title "Network & Network Devices Introduction" is written in large white letters across the center of the image.

Network & Network Devices Introduction



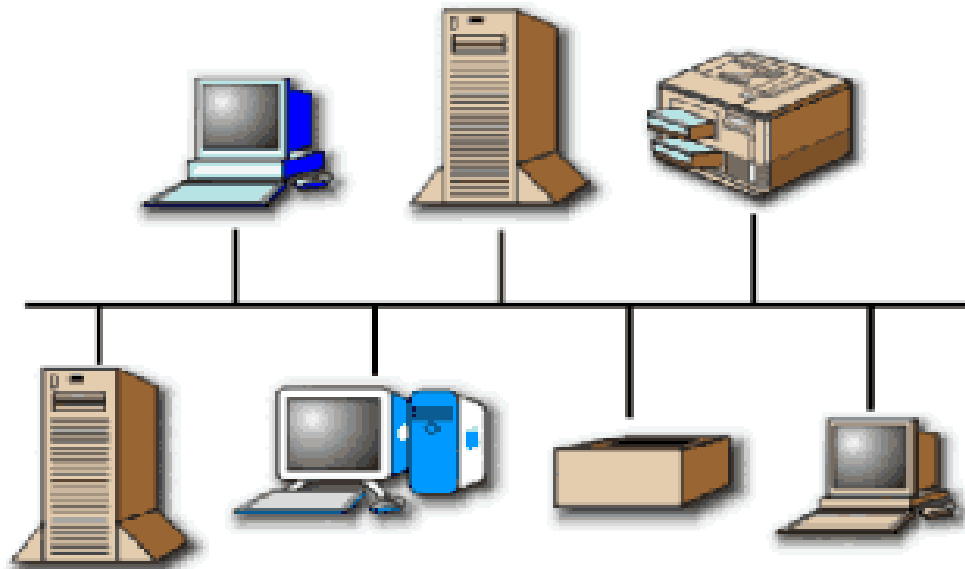
Objectives

Upon completion of this course, you will be able to perform the following tasks:

- **Describe network/ internetwork**
- **Types of network**
- **Key challenges in implementing a network**
- **Devices and media used in Lan /Wan**

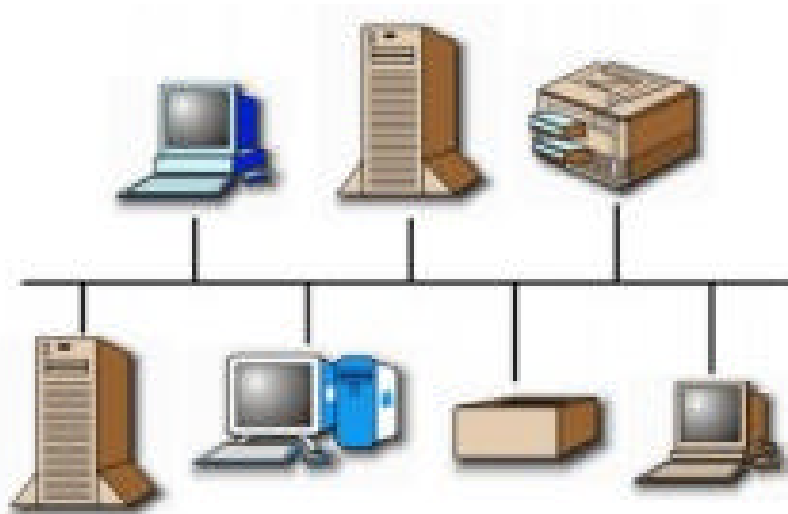
Network

Collection of computers, printers, routers, switches, and are able to communicate with each other over some transmission media



Types of Networks

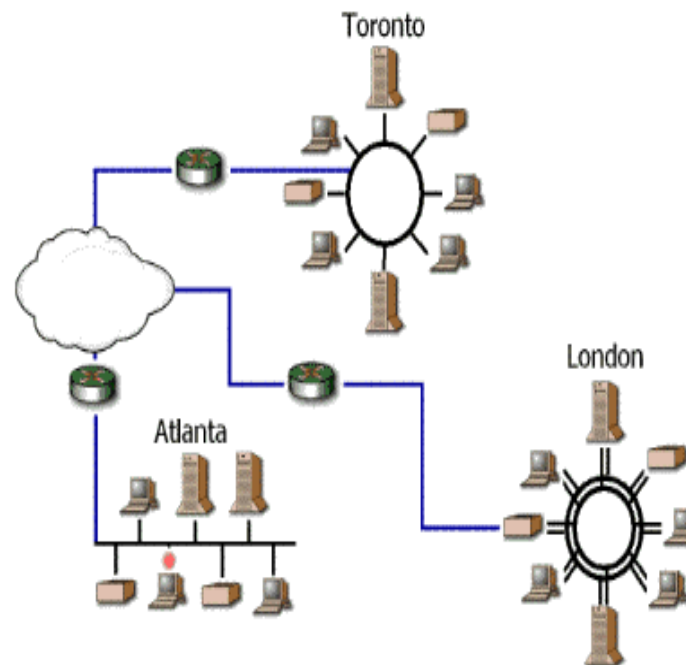
Two basic types of networks



Local Area Networks (LAN)

a group of computers and network communication devices within a limited geographic area, such as an office building .

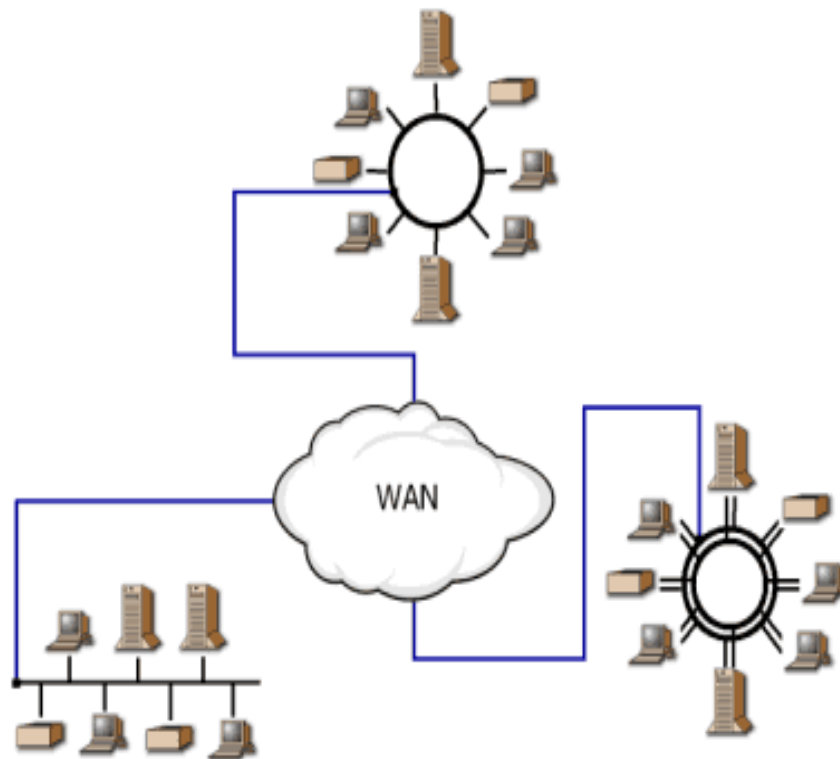
Types of Networks



Wide Area Networks (WAN)

Interconnects LANs. Not restricted to a geographical place

Internetwork



- **Internetwork is a collection of independent remote networks, LANs and WANs, and their connecting devices.**

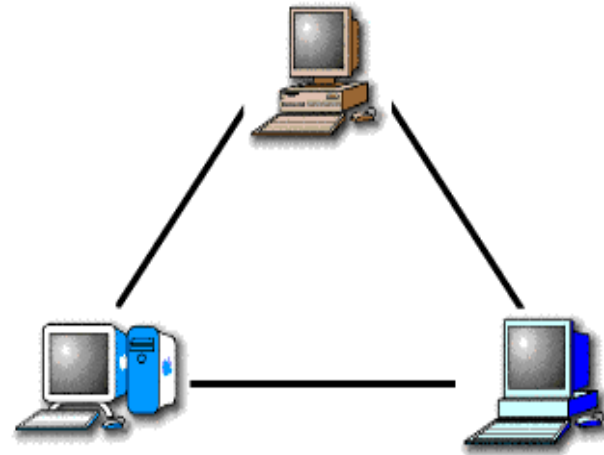
Internetworking Challenges

Challenges fall into 4 main areas

1. Connectivity
2. Reliability
3. Network management
4. Flexibility

Connectivity

Challenge in connecting systems between disparate technologies



Reliability

Individual users and entire organization depends on consistent , reliable access to network resources

Internetworking Challenges

Network Management

Management challenges include providing centralized support for the network users as well as configuration, security, performance, and troubleshooting

Flexibility

Designing and configuring a network with flexibility in mind is key for Issue of network expansion and adoption of new devices or services

LAN devices

Repeaters

regenerate and propagate signals. do not change & filter any information being transmitted.



Hubs

connect all computer LAN connections into one device. Nothing more than multiport repeaters.



Bridges

Intelligent repeaters. But unlike repeaters, determine destinations.

LAN devices



Switches

Same as hubs . Direct and filter information to and from.



Routers

Able to route, filter information . Intelligent routers can automatically detect problems.

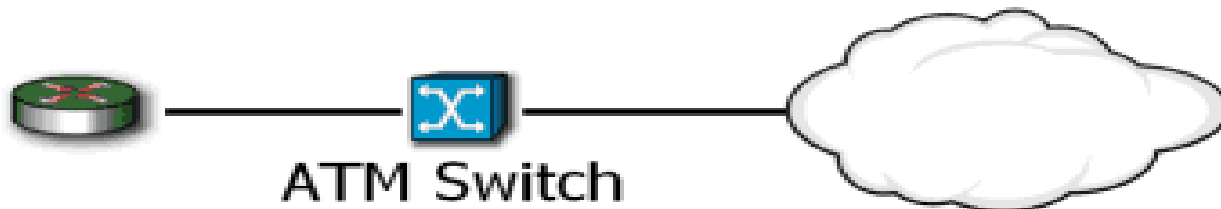
Wan devices

There are numerous devices associated with data information flow across a WAN. Together.



Router

Able to route, filter information . Intelligent routers can automatically detect problems

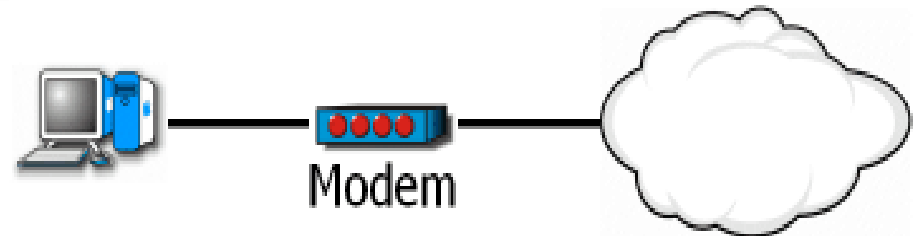


ATM Switch

ATM Switches provide high-speed transfer between both LANs and WANs.

This technology is not further covered in CCNA

Wan devices



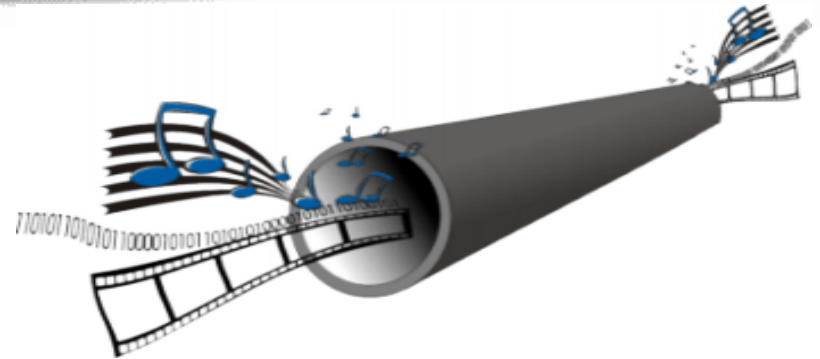
Modem (modulator / demodulator)

Source, modems convert digital signals to analog . Destination, modems convert the signal back to a digital format.

CSU/DSU (Channel Service Unit / Data Service Unit)

CSUs/DSUs similar to modems, send data in digital format across digital telephone loops. They may come in two separate units: CSUs or DSUs.

Wan devices



Multiplexer

Multiplexer combines multiple signals for transmission over a single circuit. This allows for the transfer of various data simultaneously, such as video, sound, text, etc.

This technology is not further covered in CCNA

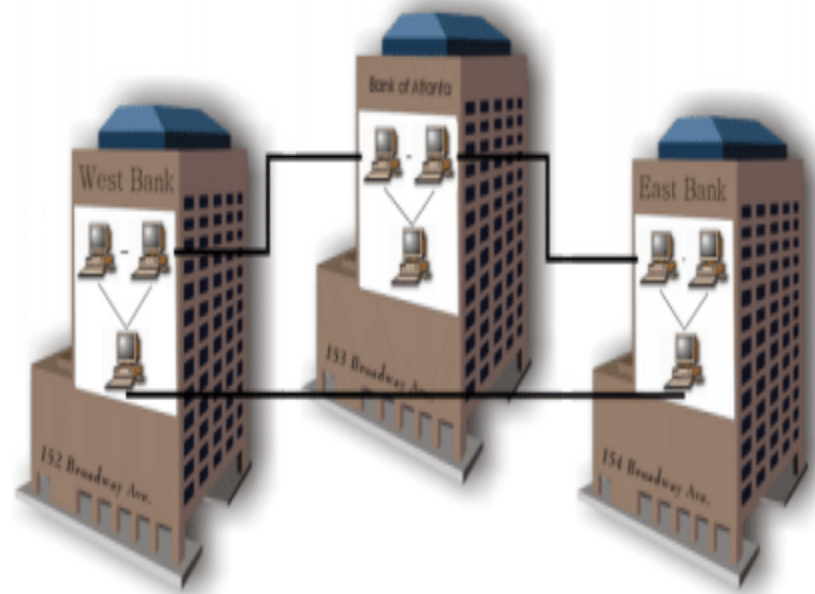
X.25/Frame Relay Switches

X.25 and Frame Relay Switches connect private data over public data circuits using digital signal. These units are very similar to ATM switches, but the transfer rate of data is not comparable.

Metropolitan Area Network

Metropolitan Area Networks (MANs) Overview

Hybrid between LANs and WANs. More closely resemble the features of the larger WAN. MANs



MAN vs. WAN

MAN	WAN
Generally high speeds	Generally low speeds
Short distances	Typically, long distances
Leased lines	Leased lines
Remote carrier	Point-to-Point link
Usually comparably inexpensive	Quite expensive in comparison
Great predicted expansion for the future	Continued growth for the future, depends on up rise of MANs