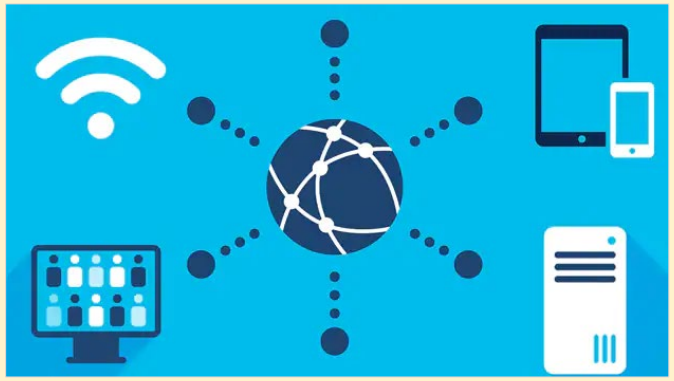
Lecture 4- Network and IT Infrastructure



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Assignment

Assessment Elements

Element	Type of assessment	Word or time limit	% of Total Mark	Submission method	Final Submission Date
010	Face to Face delivery: GROUP PRESENTATION HAND-IN AS A VIDEO Group Presentation focused on IT structure of one of the following: 1) network and security; 2) database design and relationships; 3) querying the database; or 4) database user interface.	6-8 minutes video	25%	Group Leader: Submit Video to Canvas Submit Slides to TurnitinUK	NO LATER THAN 2PM ON: 29 Mar 2022
011	ASSIGNMENT: 2000 WORDS	2,000 words	75%	Submit to TurnitinUK	NO LATER THAN 2PM ON: 01 May 2022

Assessment Case Study- EPS

Assessment Case Study: Elite Print Services[1]

Background

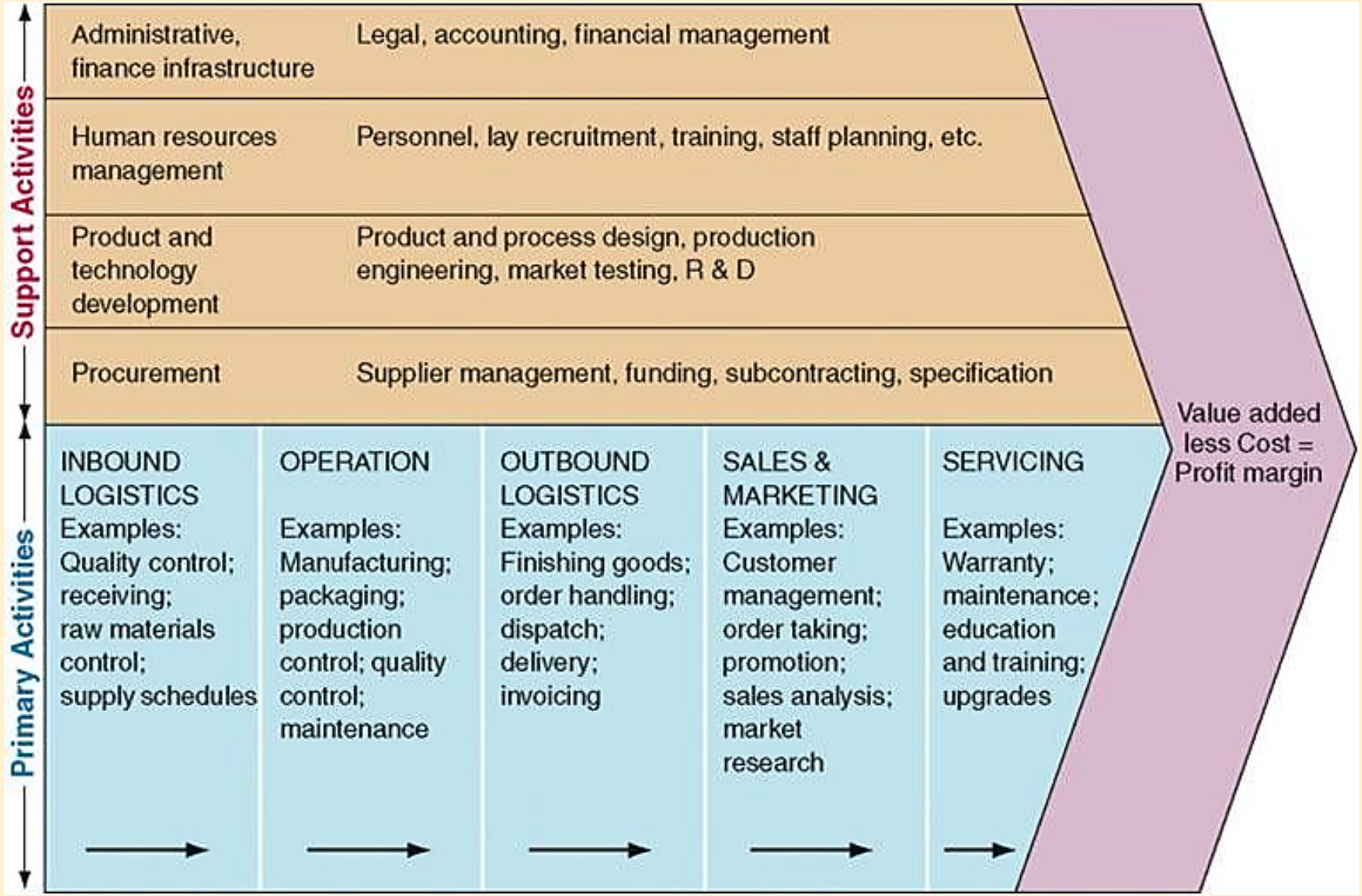
Elite Print Services (EPS) is a member of The Elite Group, a company in the pre-press and print technology market, with a mission:

'to become a world-class company providing complete production service for corporations, enhancing the perceived values of their products and services by improving the quality and efficiency of the communication process.'

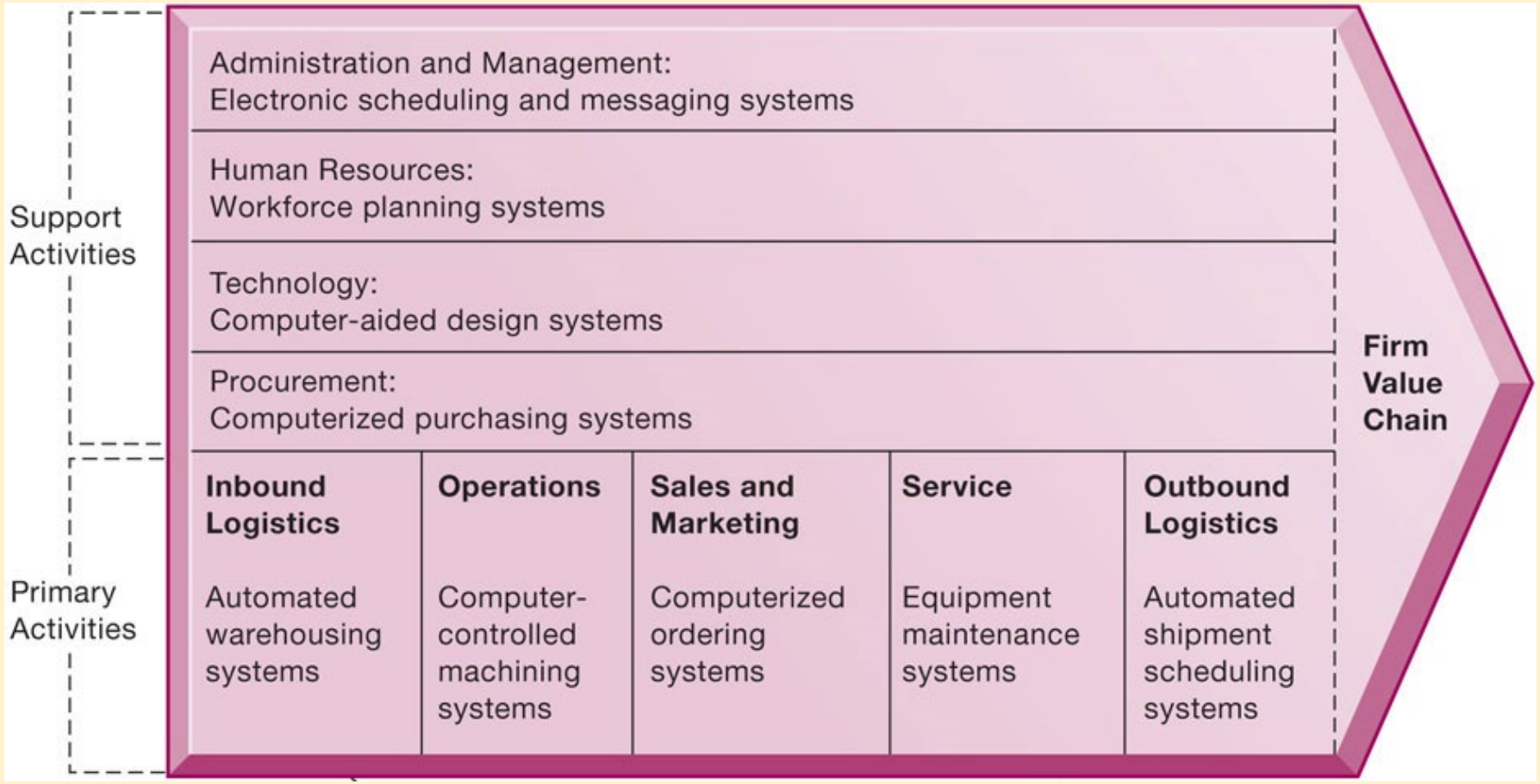
The Elite Group operates in a wide range of communication-related sectors including imaging networks, advertising, promotional print, corporate literature, academic journals, rigid and flexible packaging, and labels. EPS, a business employing around 250 people, specialises in the colour printing of greeting cards, gift wrap, posters, calendars, book jackets and folders. Their customers are mainly creative publishers, supplying retailers.

Recap-Porter’s Value Chain Analysis

Value Chain Model



Example-Information Systems in Value Chain Activities



Laudon and Laudon (2013)

Steps to Value Chain Analysis for a Firm

- Step 1 – Identify sub-activities for each primary activity
- Step 2 – Identify sub-activities for each support activity
- Step 3 – Identify links between all value activities identified
- Step 4 – Look for problems to resolve and opportunities to increase value
- Step 5 – Identify Information Systems that can be used to increase value

- Self Study- Apply the Value Chain to Hotel Plaza Nouveau
  - Analyze Hotel Plaza Nouveau using the value chain, show any problems and how they can improve processes and use of information systems
  - Download the Value Chain Template and identify:
    - What processes take place at Plaza Nouveau?
    - Indicate any problems/issues within their value chain
    - Indicate how they might improve their value chain?
    - Consider processes and information systems
    - You need to consider the different parts of the Hotel – reception; restaurant; etc.
  - It is best to start with the primary activities first
  - Follow the steps to Value Chain Analysis

Value Chain to Hotel Plaza – Support Activities

Firm Infrastructure
Managed as a boutique hotel with 120 rooms, accounting and finance and legal aspects. Need to improve integration across departments.
Human Resource Management
Recruiting and training different staff: receptionists; waiters; chefs; bar staff; porters; house-keeping. Staff need training on the processes. Staff training if new reservations and CRM system is implemented
Technology Development
Interior design for the new room layouts. Could invest in supporting information systems.
Procurement
Purchasing of all items to support the business, including: food; drink; office items; linens; equipment etc. Could use purchasing software.

Value Chain to Hotel Plaza – Primary Activities

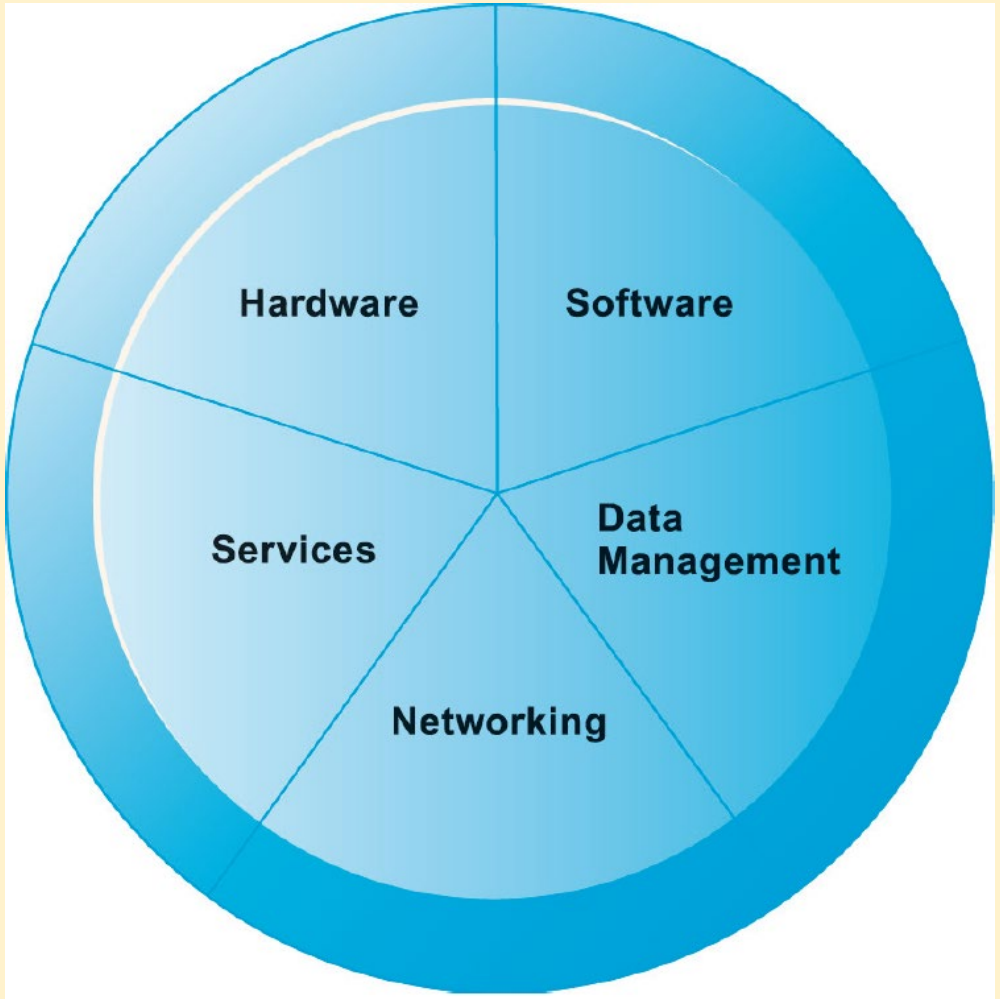
Inbound Logistics	Operations	Outbound Logistics	Marketing and Sales	After Sales Service
Hotel: Receiving and storing office items and other sundries. **Restaurant:** Receives food and drinks for the restaurant. **Housekeeping:** Receiving and storing of bed linens and cleaning items. Could use purchasing software here.	**Hotel:** Taking reservations; assigning rooms (currently problematic) Serving customers at the reception Need to redesign their processes to manage reservations between Need a supporting hotel reservations information system and small-scale CRM system. **Restaurant:** Taking table reservations; taking orders for room service and in restaurant; preparing food; etc. (cause for concern – balancing room service and restaurant) Develop a streamlined process for room service Collect data to manage busy and quiet times more effectively. **Housekeeping**: maintaining cleanliness standards; currently inefficient as often performing a full service clean on a room that does not need it Schedule housekeeping using the hotel reservations system.	**Hotel:** Check-out process **Restaurant:** Serving food and drinks to customers; delivering room service	**Mainly word-of-mouth advertising and repeat business** Small-scale CRM system with loyalty rewards for the customers. Use hotel booking websites for advertising.	**Responding to customer complaints** Manage these within the CRM system

Networks and IT Infrastructure

Infrastructure Components

- ITinfrastructure
  - Platform for supporting all information systems in the business
- Computer hardware
- Computer software
- Data management technology
- Networking and telecommunications technology
- Technology services

IT Infrastructure Components



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Types of Computers

- Personal computers and mobile devices
- Workstations
- Servers
- Mainframes
- Supercomputers
- Grid computing

Storage, Input, and Output Technology

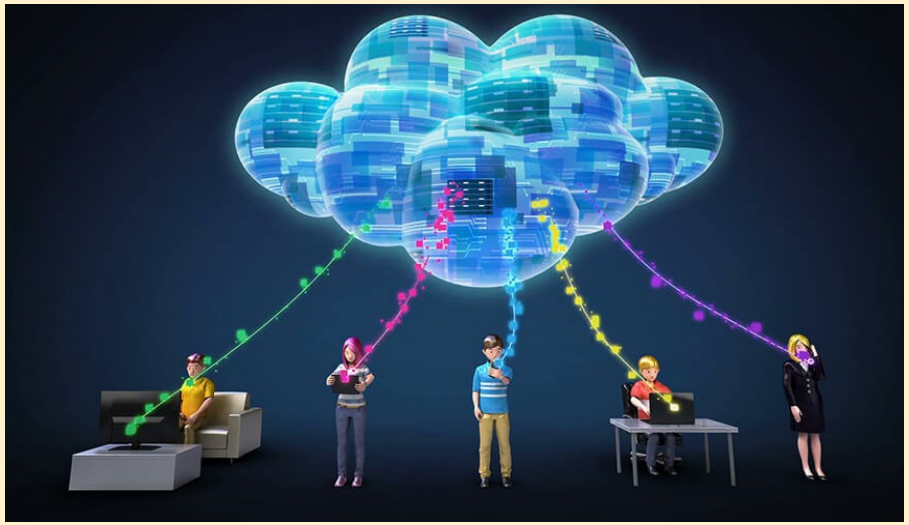
- Primary secondary storage technologies
  - Magnetic disk
    - SSDs
  - Storage networking: SANs
- Input devices
  - E.g. keyboard
- Output devices
  - E.g. monitor

Contemporary Hardware Trends

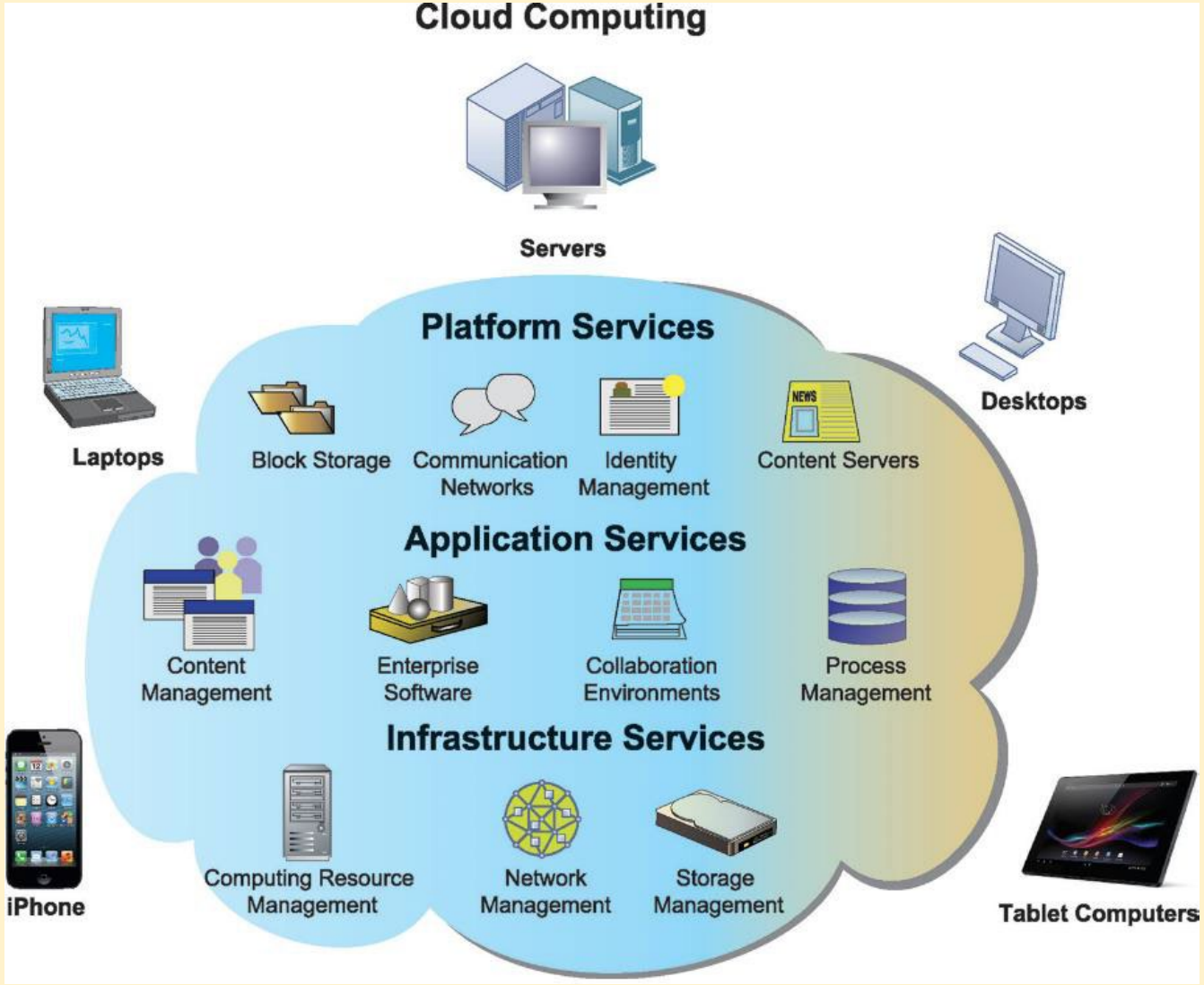
- The mobile digital platform
  - Tablet computers
  - Netbooks
- Consumerization of IT and BYOD
- Nanotechnology and quantum computing
- Virtualization
  - Software-defined storage (SDS)

Contemporary Hardware Trends

- Cloud computing:
  - Computing resources obtained over the Internet
    - Infrastructure as a service (Iaa S)
    - Software as a service (SaaS)
    - Platform as a service (PaaS)
  - Public vs. private clouds
  - Data storage security is in hands of provider



Cloud Computing Platform



Laudon and Laudon (2013)

Major Amazon Web Services

Laudon and Laudon (2013)

Contemporary Hardware Trends

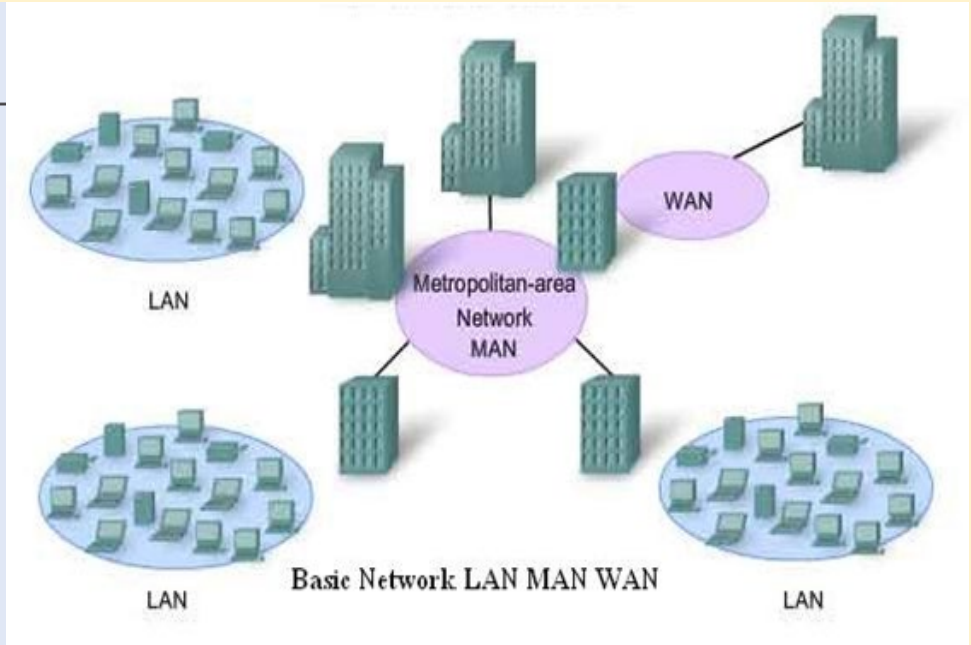
- Green computing
  - Green IT
  - Practices and technologies for minimizing impact on environment
- High-performance and power-saving processors
  - Multicore processors
  - Reduced power consumption

Computer Networks

Computer Networks

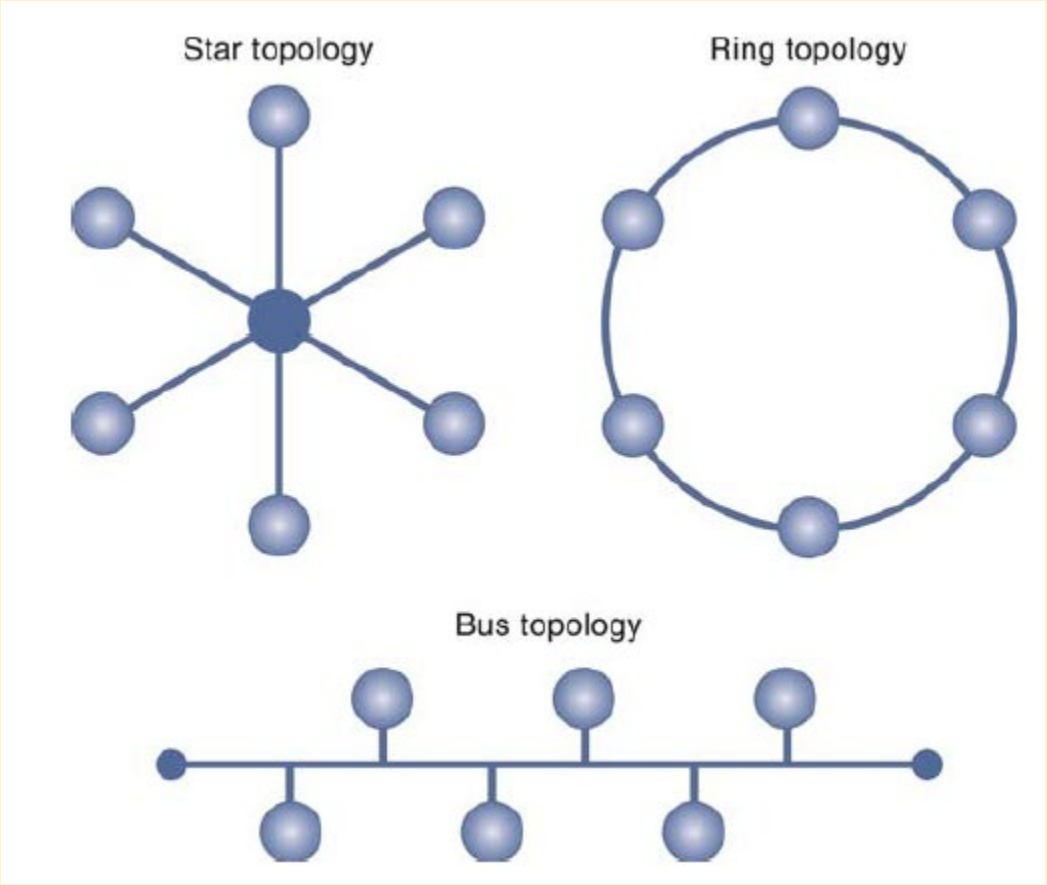
- Two or more connected computers
- Types of Networks:

Type	Area
Local area network (LAN)	Up to 500 meters (half a mile); an office or floor of a building
Campus area network (CAN)	Up to 1,000 meters (a mile); a college campus or corporate facility
Metropolitan area network (MAN)	A city or metropolitan area
Wide area network (WAN)	A transcontinental or global area



Network Topologies

- **Star topology-** all devices on the network connect to a single hub.
- **Bus topology-** one station transmits signals, which travel in both directions along a single transmission segment
- **Ring topology-** connects network components in a closed loop. Messages pass from computer to computer in only one direction around the loop, and only one station at a time may transmit



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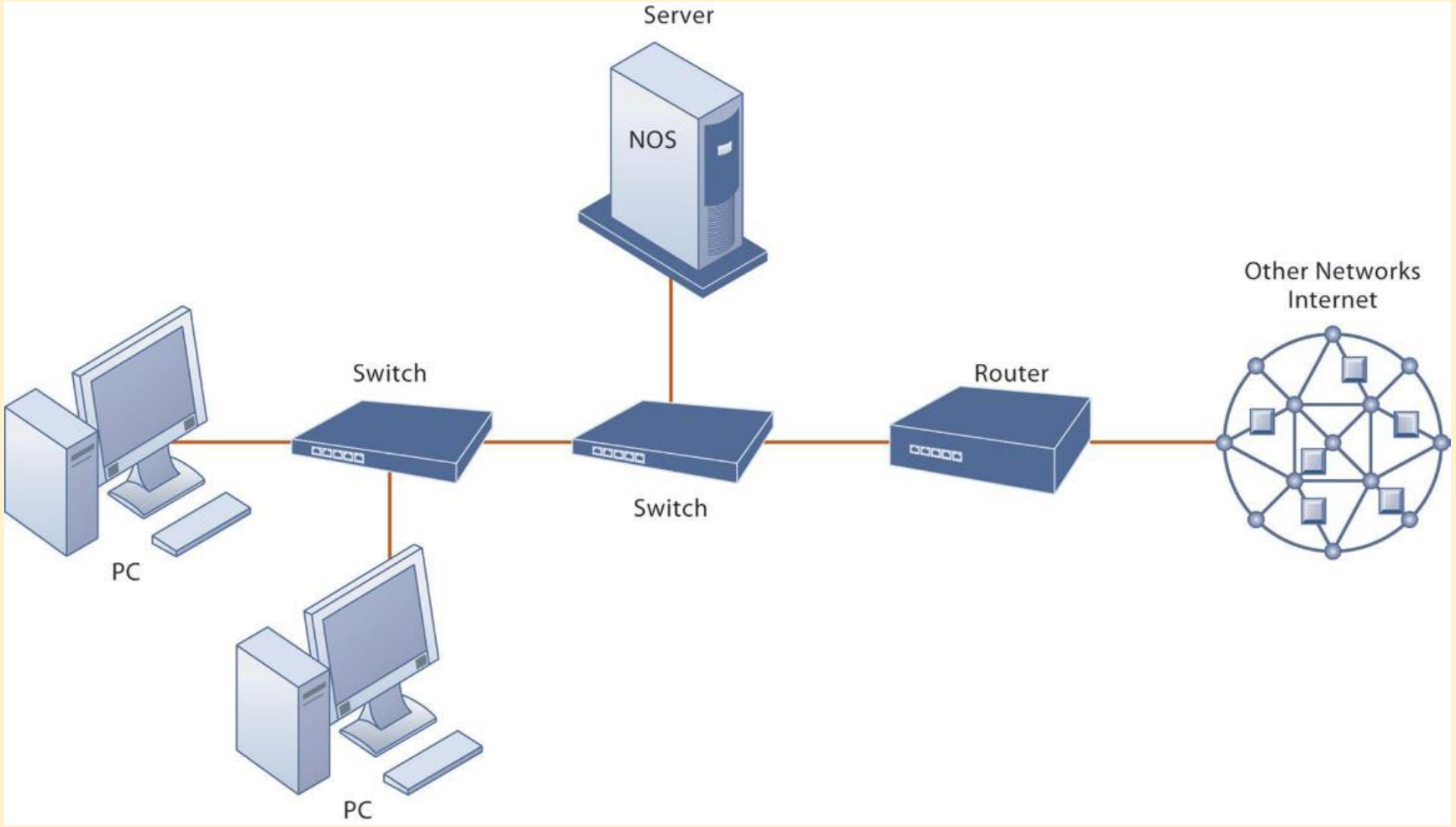
Major components in simple network

- Client and server computers
- Network interfaces (N I C s)
- Connection medium- network cables
- Hubs
- Switches
- Routers
- Network Operating System (NOS)

Components of a Simple Computer Network-LAN



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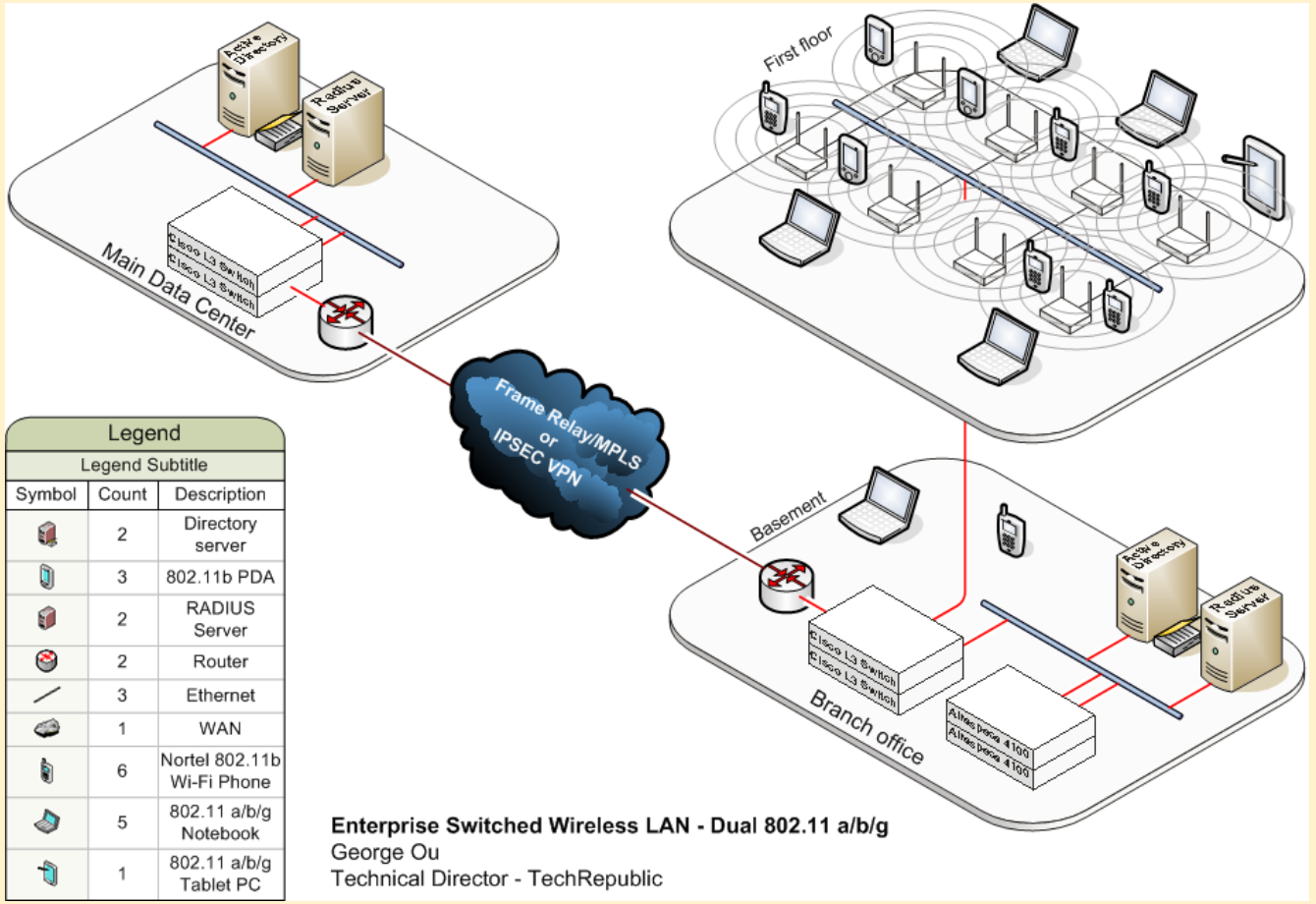
Example of Wireless LAN



Large LAN's

- Larger LANs have many clients and multiple servers, with separate servers for specific services, such as:
  - storing and managing files and databases (file servers or database servers),
  - managing printers (print servers),
  - storing and managing e-mail (mail servers), or
  - storing and managing Web pages (Web servers).

Types of LANs

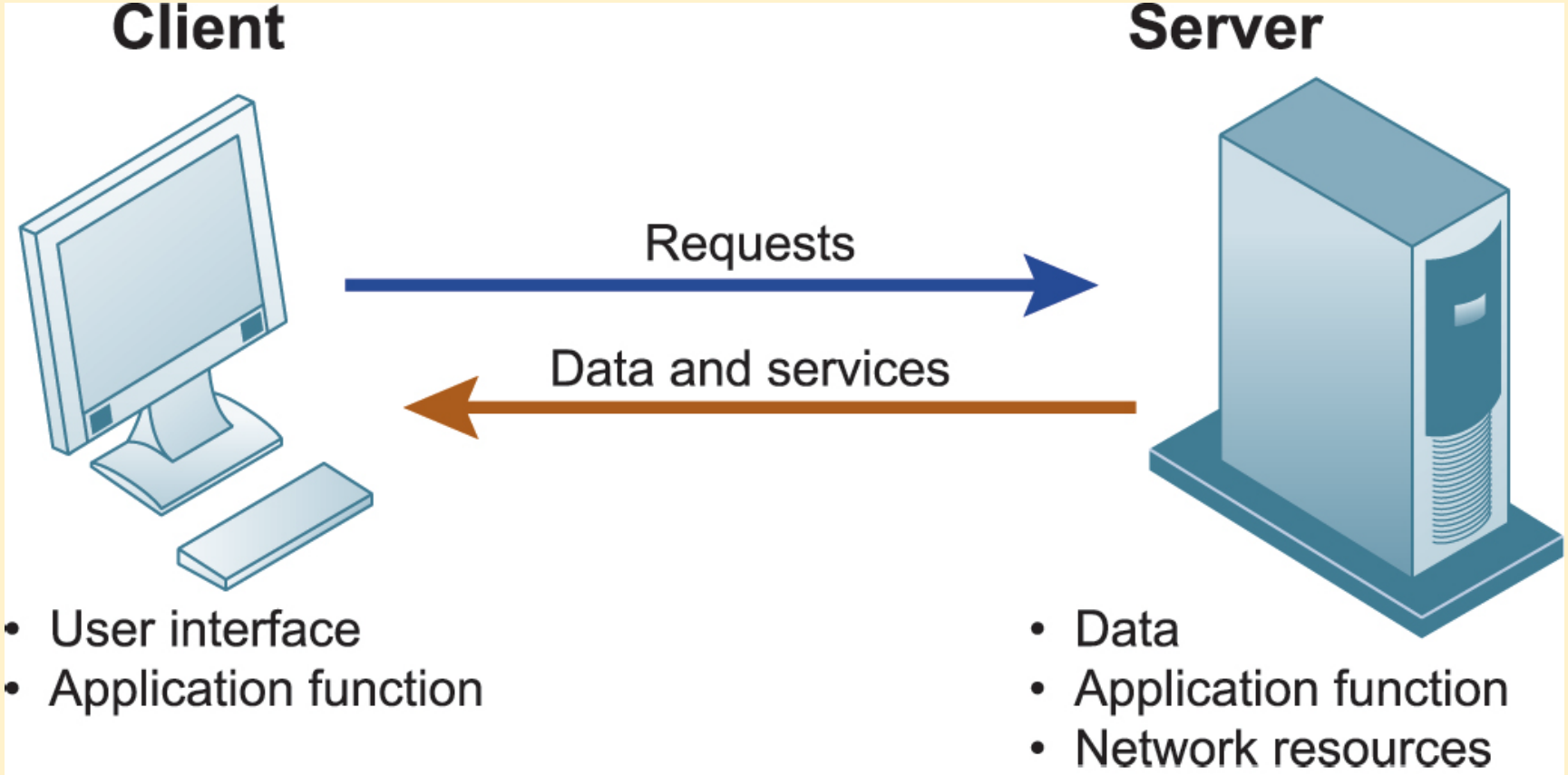
- **Peer-to-Peer LANs**
  - A peer-to-peer LAN doesn't have a central server and cannot handle heavy workloads like a client/server LAN can, and so they're typically smaller.
  - On a peer-to-peer LAN, each device shares equally in the functioning of the network.
  - The devices share resources and data through wired or wireless connections to a switch or router. Most home networks are peer-to-peer.

- **Client/Server LANs**

Client/Server Computing

- Splits processing between “clients” and “servers”
- A client/server LAN consists of several devices (the clients) connected to a central server
- **A client** can be any connected device that runs or accesses applications or the Internet. The clients connect to the server either with cables or through wireless connections.
- **The server** manages file storage, application access, device access, and network traffic.
- Server sets rules of communication for network and provides every client with an address so others can find it on the network

Client/Server Computing



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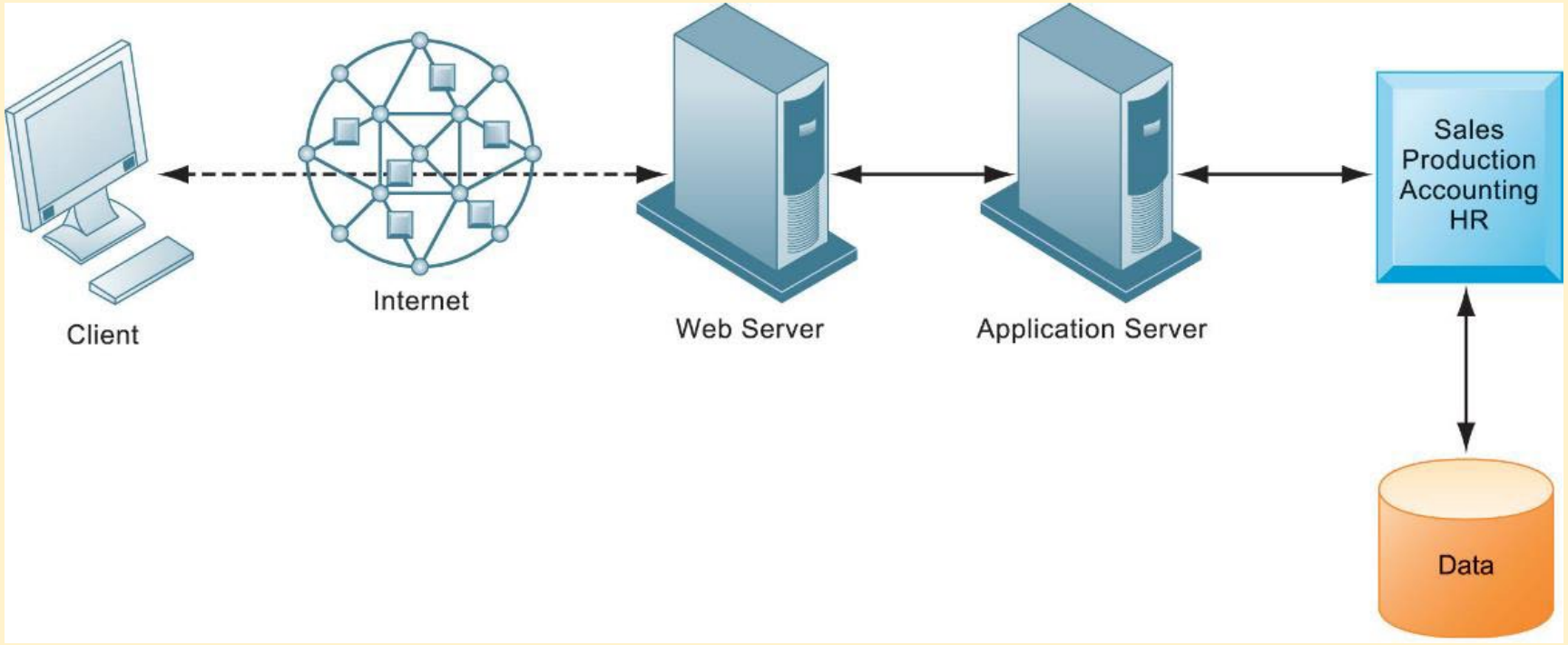
A Multi-tiered Client/Server Network (N-Tier)



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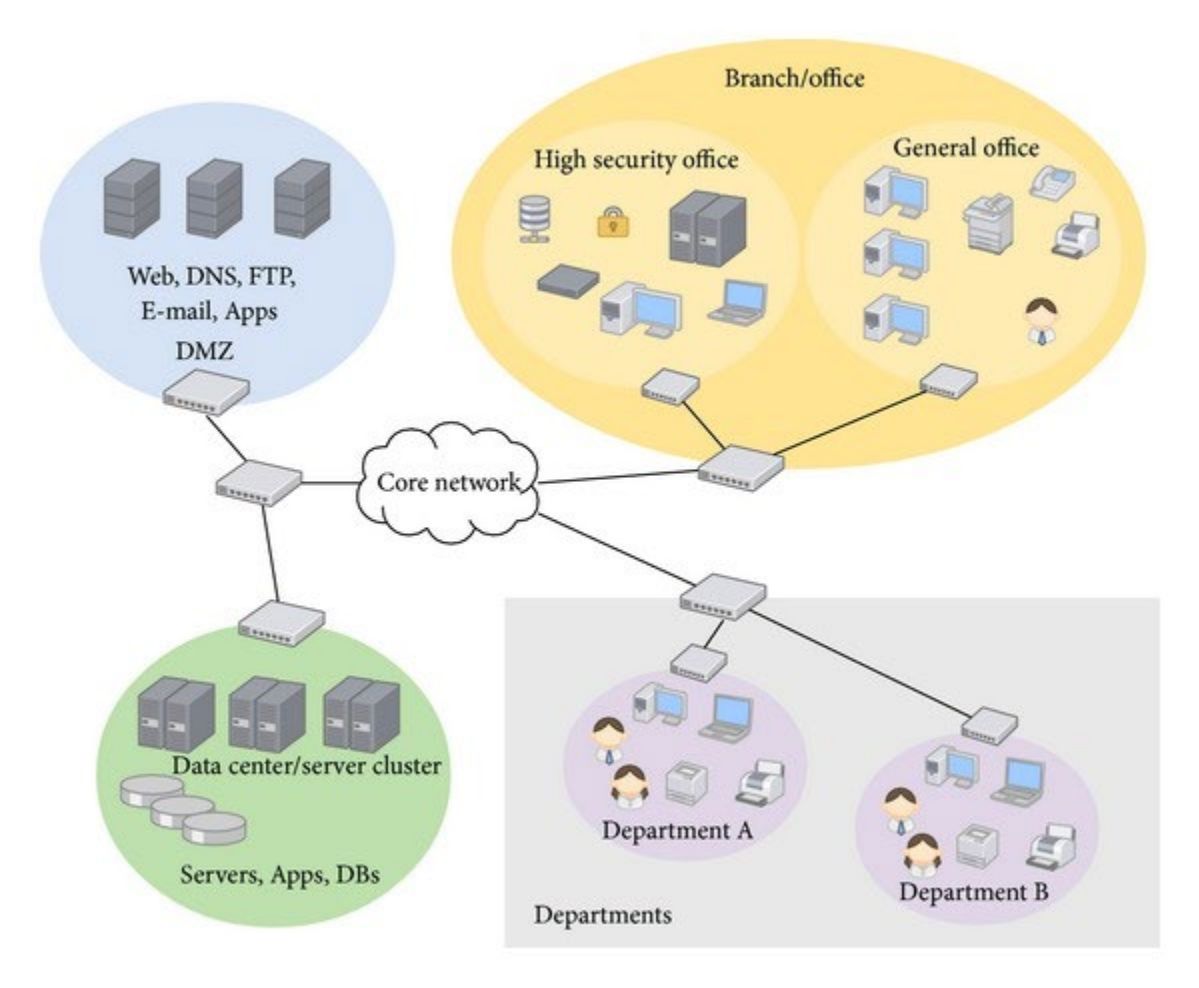
Networks in Large Companies

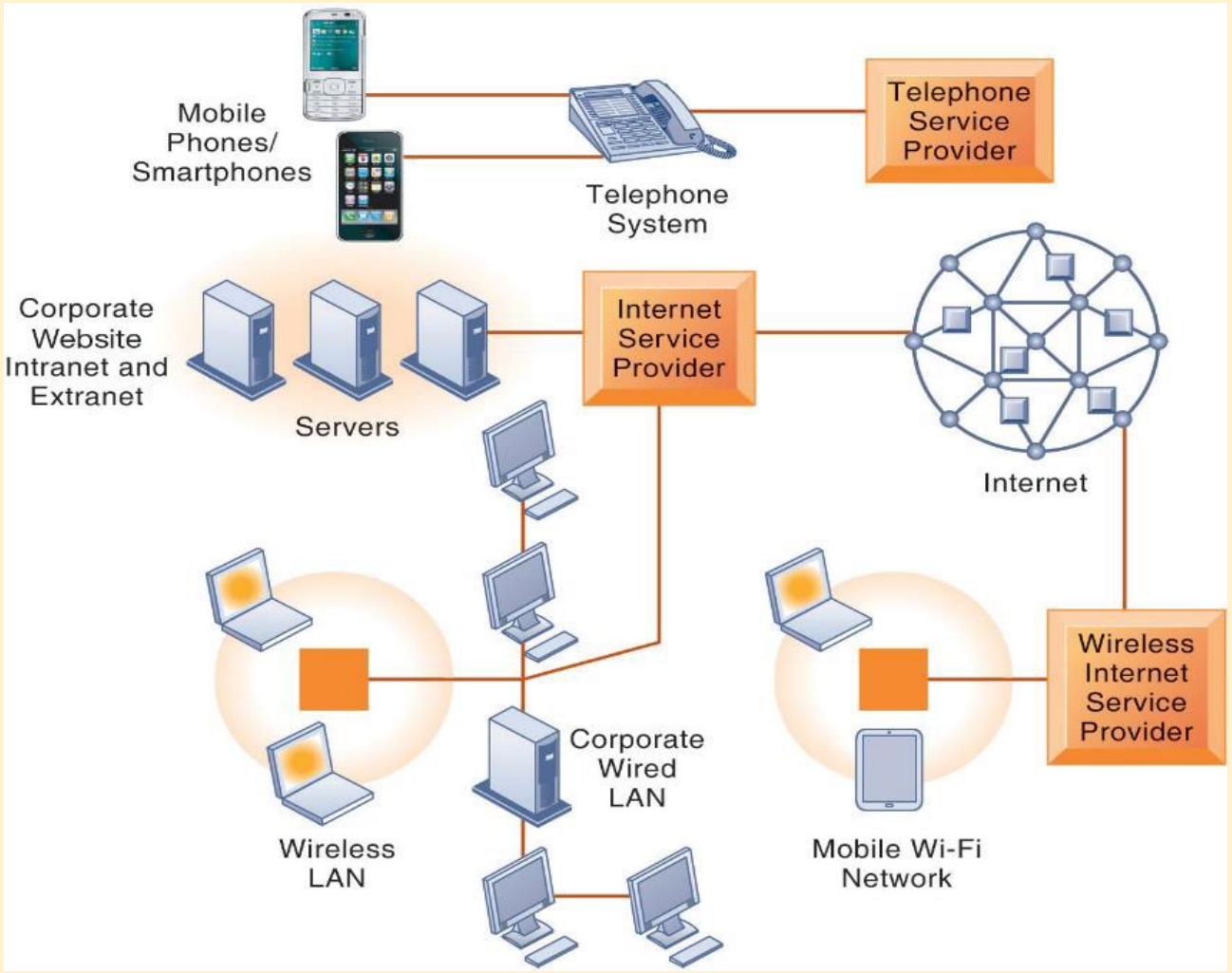
- Large numbers of local area networks (LANs) linked to firm-wide corporate network
- Various powerful servers
  - Website, corporate intranet, extranet
  - Backend systems
- Mobile wireless LANs (Wi-Fi networks)
- Videoconferencing system
- Telephone network, wireless cell phones

Enterprise Network Architecture

- "Enterprise network" denotes the IT infrastructure that **midsize and large organizations** use to provide connectivity among users, devices, and applications.
- What does an enterprise network comprise?
  - LAN's
  - Data Center
  - WAN



Corporate Network Infrastructure



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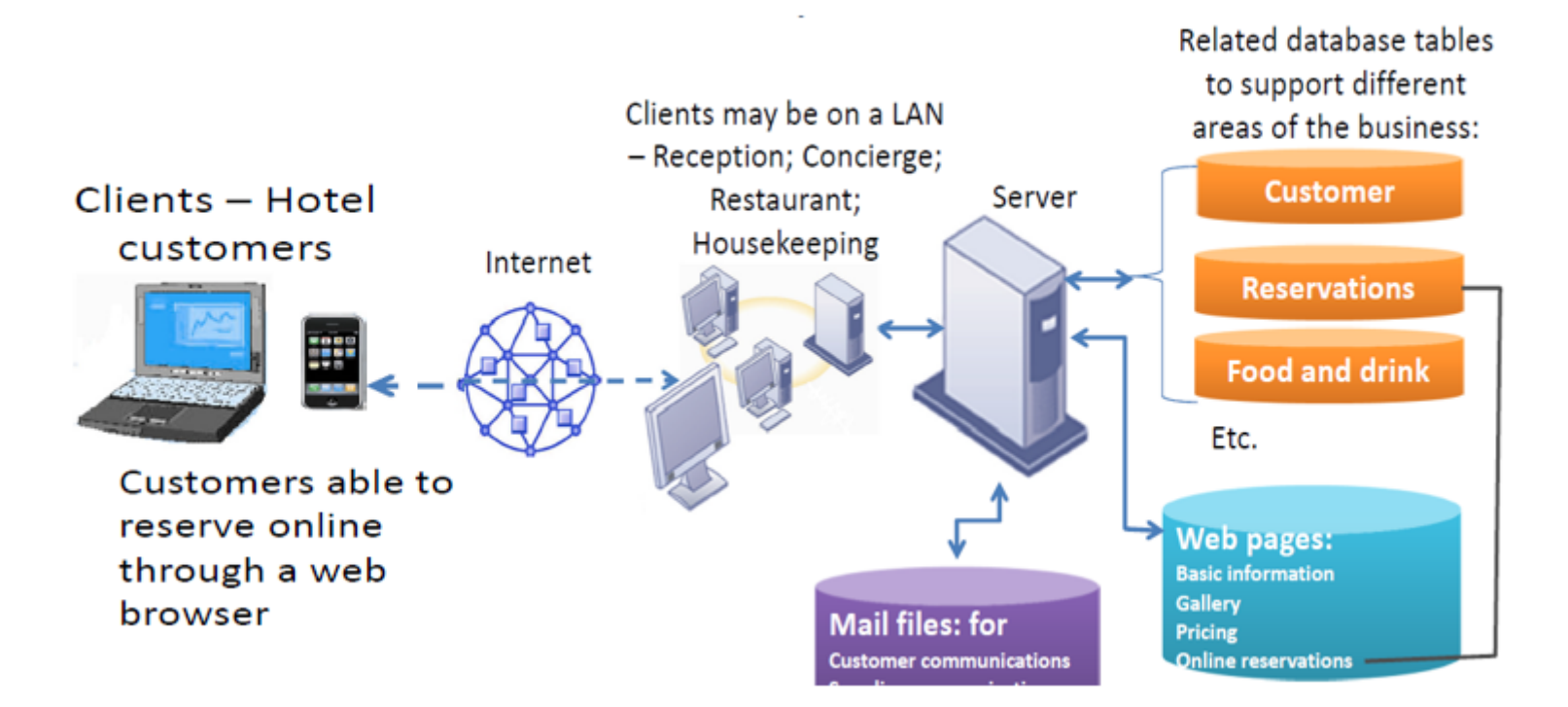
DESIGN THE IT AND NETWORK INFRASTRUCTURE TO SUPPORT THE PLAZA HOTEL

- Hotel Plaza Nouveau are unlikely to need multiple servers due to the relative size of the business.
- They may choose to outsource to an external provider or owned by the Hotel



Network Security

Network Security

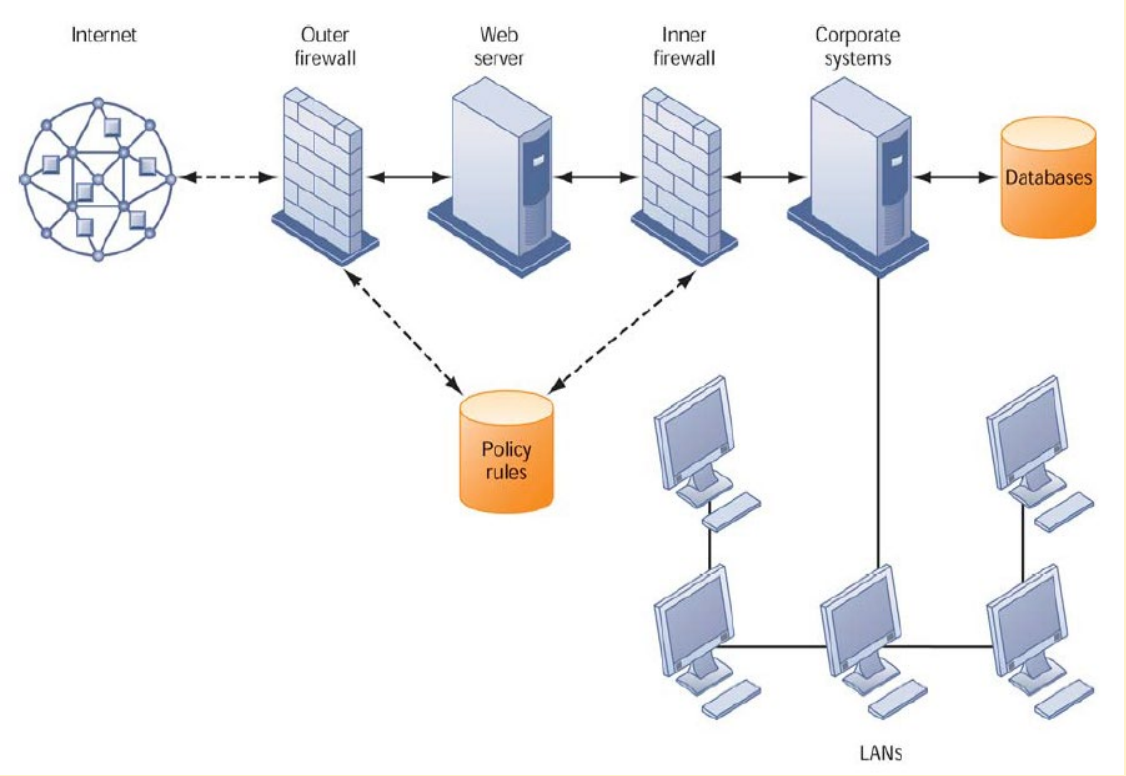
- Network security is **any activity designed to protect** the usability and integrity of your network and data.
- It includes both **hardware and software technologies**
- It **targets a variety of threats**
- It stops them from entering or spreading on your network
- Effective network security manages access to the network

How does network security work?

- Network security **combines multiple layers of defenses** at the edge and in the network.
- Each network security layer implements policies and controls.
- Authorized users gain access to network resources, but malicious actors are blocked from carrying out exploits and threats.

Types of network security

- **Firewalls:**
  - Firewalls put up a barrier between your trusted internal network and untrusted outside networks, such as the Internet.
  - They use a set of defined rules to allow or block traffic.
  - A firewall can be hardware, software, or both.



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- **Anti-virus and anti-malware software**
  - "Malware," short for "malicious software," includes viruses, worms, Trojans, ransomware, and spyware.
  - Sometimes malware will infect a network but lie dormant for days or even weeks
  - Antivirus software prevents, detects, and removes these threats

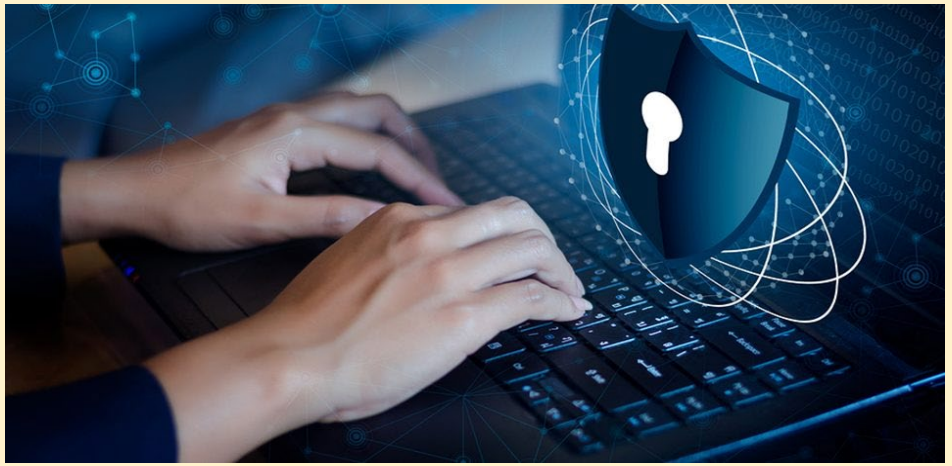
- **Access control**
  - Not every user should have access to your network.
  - To keep out potential attackers, you need to recognize each user and each device through **User Authentication**
  - Then you can enforce your **Security Policies.**

- **Intrusion Prevention Systems**
  - An IPS scans network traffic to actively block attacks.
  - It feature full-time monitoring tools placed at “hot spots” of corporate networks to detect and deter intruders continually.
  - The system generates an alarm and blocks a suspicious activity

- **Physically secure your network hardware**
  - Network hardware such as switches and routers should not be in the open where anybody can access it.
  - Store hardware in a controlled room or building
  - An extra precaution would be to monitor the hardware using a manned security camera system.

- **Wireless security**
  - Wireless networks are not as secure as wired ones.
  - Should use:
    - A **virtual private network (VPN)** which encrypts the connection from an endpoint to a network, often over the Internet to access internal corporate data.
    - **WPA2 encryption** which ensures that only authorized users access the network. Since passwords are encrypted, longer, stronger and harder to crack

- Web security
  - A web security solution will control your staff's web use, block web-based threats, and deny access to malicious websites.
  - It will protect your web gateway on site or in the cloud.
  - "Web security" also refers to the steps you take to protect your own website



Next Session

Next Topic: Database Design

Groups Should:
Read Case Study
As a Group discuss and decide on:

Design a Network for EPS
OR
Design a Database

Self Managed Learning

- Read:
  - Chapter 4, 6 and 7- Essentials of Information Systems

References

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