Computer Networking Introduction

Computer Networking I

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Outline

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Internet and World Wide Web

- **Internet** is a global network of networks that connects millions of computers and other devices. **Here** your could check the origin of the internet.
- **World Wide Web** is a system of interlinked hypertext documents accessed via the Internet.

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Software and Hardware

- **Software** is the set of instructions that tell the computer `what to do`.
- **Hardware** is the physical components of a computing system.

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Applications Development

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Network Services snd Shared Resources

Network Services are the services that are provided by a network, like programs execution or shared resources.

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Client-Server Model

Client-Server Model is a distributed application structure that partitions tasks or **workloads** between the providers of a resource or service, called **servers**, and service requesters, called **clients**.

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Wired Networks

- **Wired Networks** are the networks that use cables to connect devices.
- **Fiber Optics** is a technology that uses glass or plastic threads to transmit data.
- **Copper Wires** are the traditional technology to transmit data.

Wireless Networks

- **Wireless Networks** are the networks that use radio waves to connect devices.
- Wi-Fi, Bluetooth, Zigbee, Matter, and among others, are technologies which uses radio waves to both transmit data and connect devices.

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Modern Networks

- **Modern Networks** are the networks that use a combination of wired and wireless technologies.
- **5G** is the fifth generation technology standard for cellular networks.

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Security and Privacy

- **Security** is the protection of data and resources from `unauthorized access`.
- **Privacy** is the right of an individual to be free from intrusion or interference.
- **Cybersecurity** is the practice of protecting systems, networks, and programs from *digital attacks*.

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The Internet of Things

- **The Internet of Things** is the network of physical objects that are embedded with sensors, software, and other technologies, for the purpose of connecting and exchanging data with other devices and systems over the Internet.
- **Smart Devices** are the devices that are connected to the Internet and can be controlled remotely.

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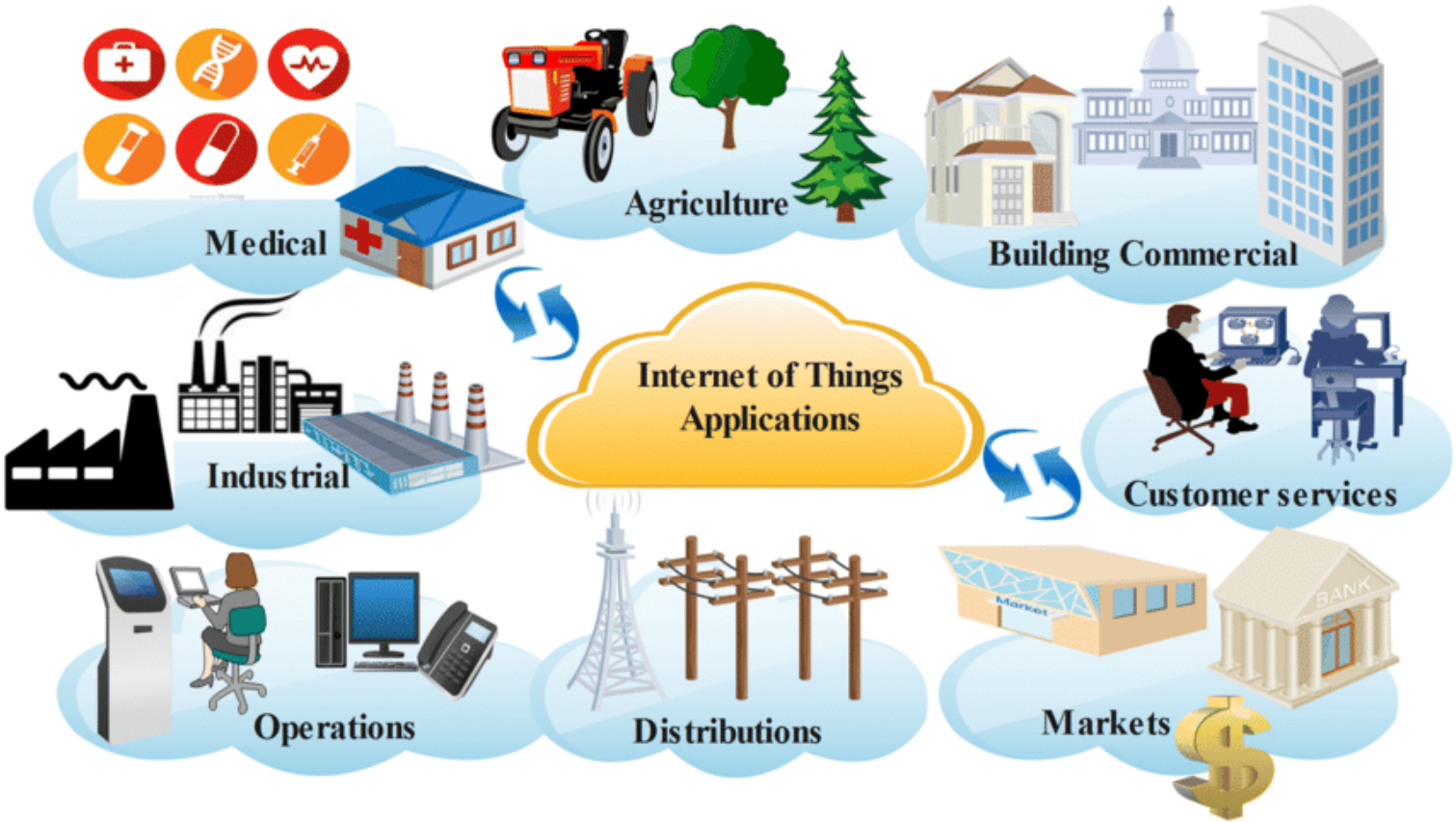
IoT Applications



Operative Systems and Virtualization

- **Operative Systems** are the software that manages the hardware and software resources of a computer.
- **Virtualization** is the process of creating a virtual version of something, like an operative system, a server, a storage device, or a network resource.

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On-premises Computing

- **On-premises Computing** is the traditional computing model where the software and hardware are located in the same physical location.
- **Data Centers** are the facilities that house the servers and other computing equipment.

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Typical On-Premises Infrastructure

Cloud Computing

- **Cloud Computing** is the model where the software and hardware are located in different physical locations.
- **Public Cloud** is the cloud infrastructure that is owned and operated by a third-party cloud service provider.
- **Private Cloud** is the cloud infrastructure that is operated solely for a single organization.

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Typical Public Cloud Infrastructure

Scalability and High-Performance

- **Scalability** is the ability of a system to handle a *growing amount of work*.
- **High-Performance** is the ability of a system to handle a *large amount of work*.

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Web Protocols

- **Web Protocols** are the protocols that are used to communicate over the Internet.
- **HTTP** is the protocol that is used to transfer hypertext documents over the Internet.
- **HTTPS** is the protocol that is used to transfer hypertext documents over the Internet `securely`.

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Layer Model

- **Layer Model** is a conceptual framework that describes the functions of a networking or telecommunication system.
- **OSI Model** is a conceptual framework that standardizes the functions of a networking or telecommunication system.

Networking Standards and Organizations

- Networking Standards are the standards that are used to define the functions of a networking or telecommunication system.
- IEEE, IETF, ISO, ITU, and W3C are some of the organizations that are responsible for the development and maintenance of the networking standards.

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Sockets and Ports

- **Sockets** are the endpoints of a bidirectional communication channel.
- **Ports** are the communication endpoints in a computer's operating system.

Data Transmission

- **Data Transmission** is the process of sending data from one place to another.
- **Bandwidth** is the maximum rate of data transfer across a given path.
- **Latency** is the time it takes for data to travel from one point to another.
- **Packet Loss** is the loss of data packets in a network.
- **Jitter** is the variation in the time it takes for data to travel from one point to another.
- **Quality of Service** is the ability of a network to provide different priority to different applications, users, or data flows.
- **Reliability** is the ability of a network to provide consistent and dependable service.

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Thanks!

Questions?

Repo: *https://github.com/EngAndres/ud-public/tree/main/courses/computer-networking*

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