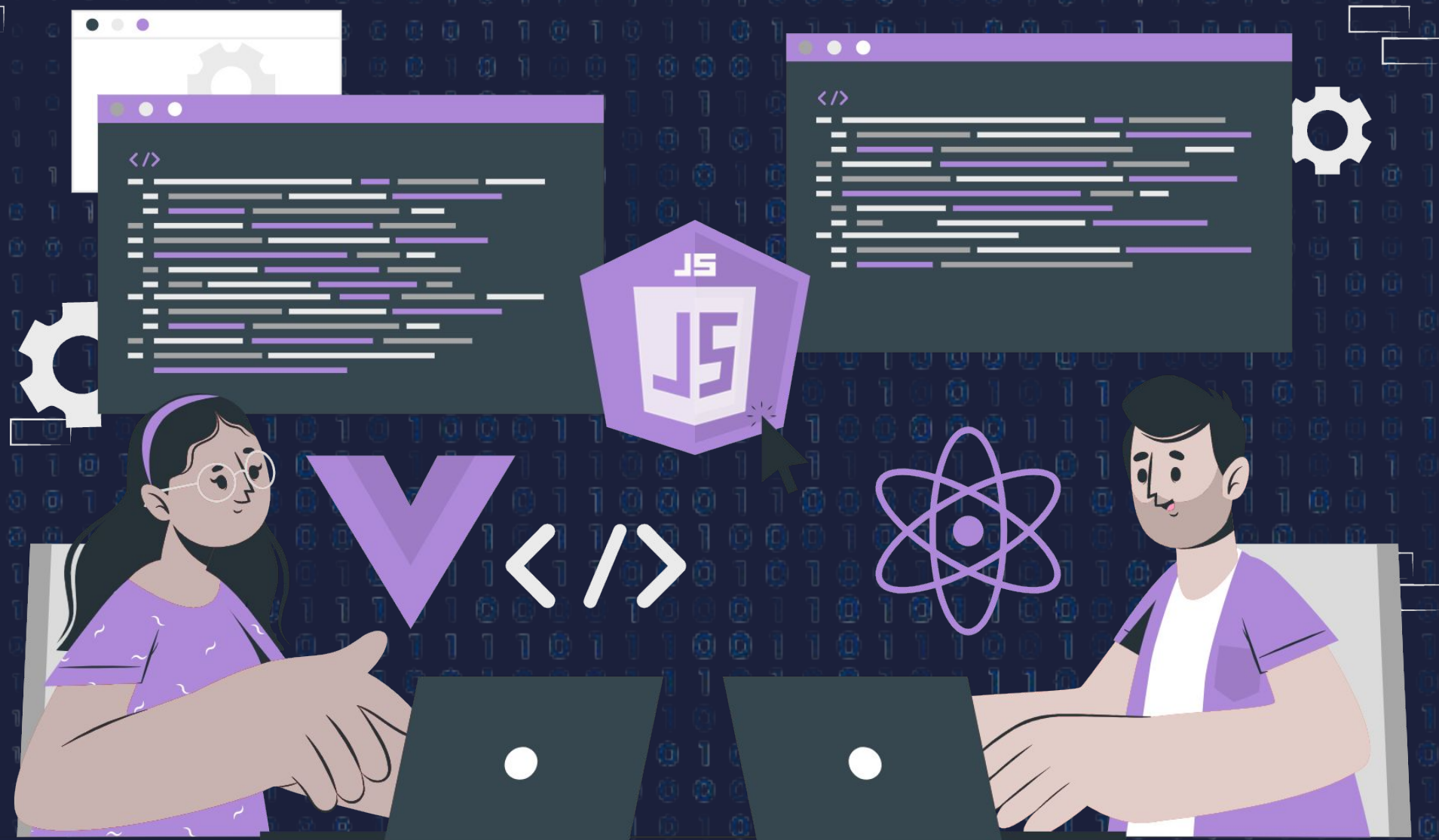# OSI Model

Lecture CheckList

1. Introduction.

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Introduction

The OSI (Open Systems Interconnection) model is a conceptual framework that defines how different communication systems should communicate with each other. It is divided into seven layers, each of which performs a specific function and communicates with the layers above and below it. The OSI model provides a standardized way for different computer systems to communicate with each other, regardless of their underlying technology or protocols.

Web developers need to understand the OSI model because it provides a framework for understanding how web applications communicate with each other over networks. Web applications rely on a wide range of network protocols, such as HTTP, TCP, and IP, which operate at different layers of the OSI model. By understanding how these protocols interact with each other and with the underlying hardware and software systems, web developers can design more efficient and secure applications that work seamlessly with other systems. Additionally, the OSI model provides a common language and terminology that developers can use to communicate with other stakeholders in the development process, such as network administrators and software engineers.

OSI Model

The Open Systems Interconnection (OSI) Model is an International Standard Organisation(ISO) standard that covers all aspects of network communication. It is a reference model developed in 1984 by the International Organization for Standardization that specifies how information from one computer's software application passes through physical media to another computer's software application.

The OSI model is a conceptual framework consisting of seven layers, each with a specific function that governs how computer systems communicate with each other over networks. By providing a standardized approach to network design, the OSI model enables interoperability between different types of computer systems, regardless of their underlying architecture and protocols. This ensures that data can be transmitted reliably and efficiently across a wide range of networks and systems, from local area networks (LANs) to the internet.

Layers of OSI Model

The OSI model consists of 7 separate but related layers, each of which defines a part of the process of moving information across a network.

1. Physical layer
2. Data Link layer
3. Network layer
4. Transport layer
5. Session layer
6. Presentation layer
7. Application layer

Basic Principle of dividing layers in the OSI Model

The OSI model is designed to break down the complex process of network communication into smaller, more manageable parts, which are organized into seven distinct layers.

Each layer of the OSI model is responsible for a specific aspect of network communication, such as data transmission, addressing, error correction, and flow control. By dividing the process of network communication into these distinct layers, the OSI model enables hardware and software manufacturers to develop products that adhere to a standardized approach to network communication.

Understanding layers of OSI Model

1. Physical layer

2. Data Link layer

3. Network layer

4. Transport layer

5. Session layer

6. Presentation layer

7. Application layer

Advantages of OSI Model

- The OSI model establishes a standard framework for network communication, allowing different vendors to create network devices and software that can communicate with each other.

- The seven-layer design of the OSI model allows for easier troubleshooting and problem diagnosis by providing a clear separation of network functions and responsibilities.

- By breaking down complex networks into smaller, more manageable components, the layered approach of the OSI model simplifies network design and maintenance.

- The interoperability between different network devices and software is enhanced by the OSI model, which allows for seamless communication between different networks and applications.

- Each layer in the OSI model has a specific function, which reduces complexity and allows for the development of specialized network equipment and software.

- The flexibility of the OSI model allows for the development of new protocols and technologies to meet the changing needs of network communication.

Disadvantages of OSI Model

While the OSI model has several advantages, it also has some disadvantages, including:

- **Complex:** The OSI model is complex and can be difficult to understand for beginners, which can make it challenging to implement and troubleshoot.

- **Expensive:** Implementing the OSI model requires significant investment in specialized hardware and software, which can be expensive for organizations with limited budgets.

- **Inefficient:** The OSI model involves a lot of overhead due to its layered approach, which can slow down network communication and make it less efficient.

- **Limited applicability:** The OSI model was designed for use in traditional wired networks and may not be suitable for newer technologies such as wireless networks or the Internet of Things.

- **Lack of adoption:** Despite its advantages, the OSI model has not been widely adopted in the industry, with many organizations using simpler models such as the TCP/IP model.

THANK YOU