**Lecture-15: Cloud Computing, APIs, and JSON**

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**Cloud Computing and Service Models:**

* Cloud computing is a technology that delivers computing services over the internet.
* It provides resources like servers, storage, databases, networking, software, analytics, and more.

**Services Models:**

1. IAAS (Infrastructure as a Service):

* Provides virtualized computing resources over the internet.
* Users rent IT infrastructure on a pay-as-you-go basis.

1. PAAS (Platform as a Service):

* Offers a platform that includes an operating system, programming language, and runtime environment.
* Developers can build, deploy, and manage applications without worrying about underlying infrastructure.

1. SAAS (Software as a Service):

* Delivers software applications over the internet on a subscription basis.
* Eliminates the need to install and run software on individual computers.

**APIs - Application Programming Interfaces:**

* APIs allow different software applications to communicate with each other.
* They define the methods and data structures that developers can use to interact with the application.

**API Usage and Interaction:**

* APIs handle requests and responses, acting as intermediaries between clients and servers.
* Similar to placing an order in a restaurant and getting a response from the kitchen.
* APIs make data accessible and available in a structured way.

**API Security and Keys:**

* API keys are used to authenticate requests and ensure data security.
* Sensitive data is managed using API keys, which should be kept confidential.
* API keys are crucial for protecting data integrity and preventing unauthorized access.

**Encoding and Decoding JSON:**

* JSON (JavaScript Object Notation) is a lightweight data interchange format.
* Data is encoded in JSON format using **`JSON.stringify()`**.
* JSON data can be decoded back into its original format using **`JSON.parse()`**.

Understanding cloud computing, APIs, and JSON is essential for building modern web applications and leveraging cloud services effectively.