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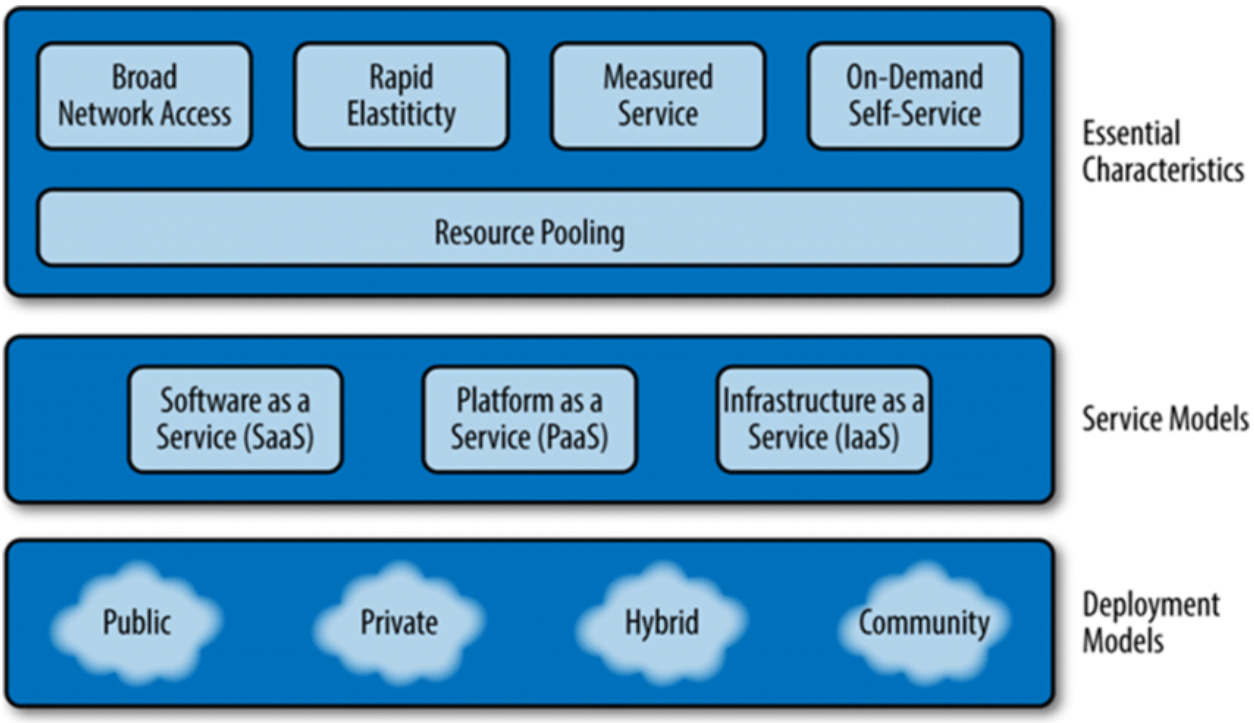
**Cloud Computing**
**Experiment 1**
**NIST Model of Cloud Computing**

**Aim :- Study of NIST model of cloud computing**

**Theory -**
**Definition -**
The official definition provided by NIST(National Institute of Standards and Technology) that "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with little management effort or service provider interaction."




According to the **NIST definition**, **cloud computing** must have **five key features**:

1. **Broad network access** - The user can access the data of the cloud or upload the data to the cloud from anywhere just with the help of a device and an internet connection. These capabilities are available all over the network and accessed with the help of the internet

2. **Rapid Elasticity** - Rapid elasticity is the capacity of a cloud that helps clients and users automatically enlarge and compress the company's resources. The process is done in a short period to manage the workload efficiently. It helps minimize the cost required to set up the company's infrastructure.
3. **Measured service** - Cloud Computing resources used to monitor and the company uses it for recording. This resource utilization is analyzed by supporting charge-per-use capabilities.
4. **On-demand self-service** - It is one of the important and valuable features of Cloud Computing as the user can continuously monitor the server uptime, capabilities, and allotted network storage. With this feature, the user can also monitor the computing capabilities.
5. **Resource pooling** - It means that the Cloud provider pulled the computing resources to provide services to multiple customers with the help of a multi-tenant model. There are different physical and virtual resources assigned and reassigned which depends on the demand of the customer.

It specifies four **Deployment Types :**

1. **Private** - Resource managed and used by the organization.
2. **Community** - Resources shared by several organizations, usually in the same industry.
3. **Public** - Resource available for the general public under the Pay as you go model.
4. **Hybrid** - This cloud deployment model is partly managed by the service provided and partly by the organization.

And three **Service Models :**

1. **Software as a Service (SaaS)** - Software as a Service provides you with a completed product that is run and managed by the service provider. In most cases, people referring to Software as a Service are referring to end-user applications. With a SaaS offering you do not have to think about how the service is maintained or how the underlying infrastructure is managed; you only need to think about how you will use that particular piece of software.
2. **Platform as a Service (PaaS)** - Platforms as a service remove the need for organizations to manage the underlying infrastructure (usually hardware and operating systems) and allow you to focus on the deployment and management of your applications.

3. **Infrastructure as a Service (IaaS)** - Infrastructure as a Service contains the basic building blocks for cloud IT and typically provides access to networking features, computers (virtual or on dedicated hardware), and data storage space. Infrastructure as a Service provides you with the highest level of flexibility and management control over your IT resources.

## Conclusion -

NIST's cloud computing definition allows organizations to compare various cloud services and deployment strategies. A deep understanding of this definition can help organizations better appreciate the benefits of this technology, implement NIST compliance best practices, and guide decision-makers to make optimal cloud investment decisions.