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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(IoT and
Cybersecurity Including BCT)**

COURSE NAME : Cloud Service Management /19OE219

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Unit II-

Topic : Cloud Service Reference Model



Cloud Service Reference Model



The cloud computing reference model is an abstract model that divides a cloud computing environment into abstraction layers and cross-layer functions to characterize and standardize its functions. This reference model divides cloud computing activities and functions into three cross-layer functions and five logical layers.

Each of these layers describes different things that might be present in a cloud computing environment, such as computing systems, networking, storage equipment, virtualization software, security measures, control and management software, and so forth. It also explains the connections between these organizations.

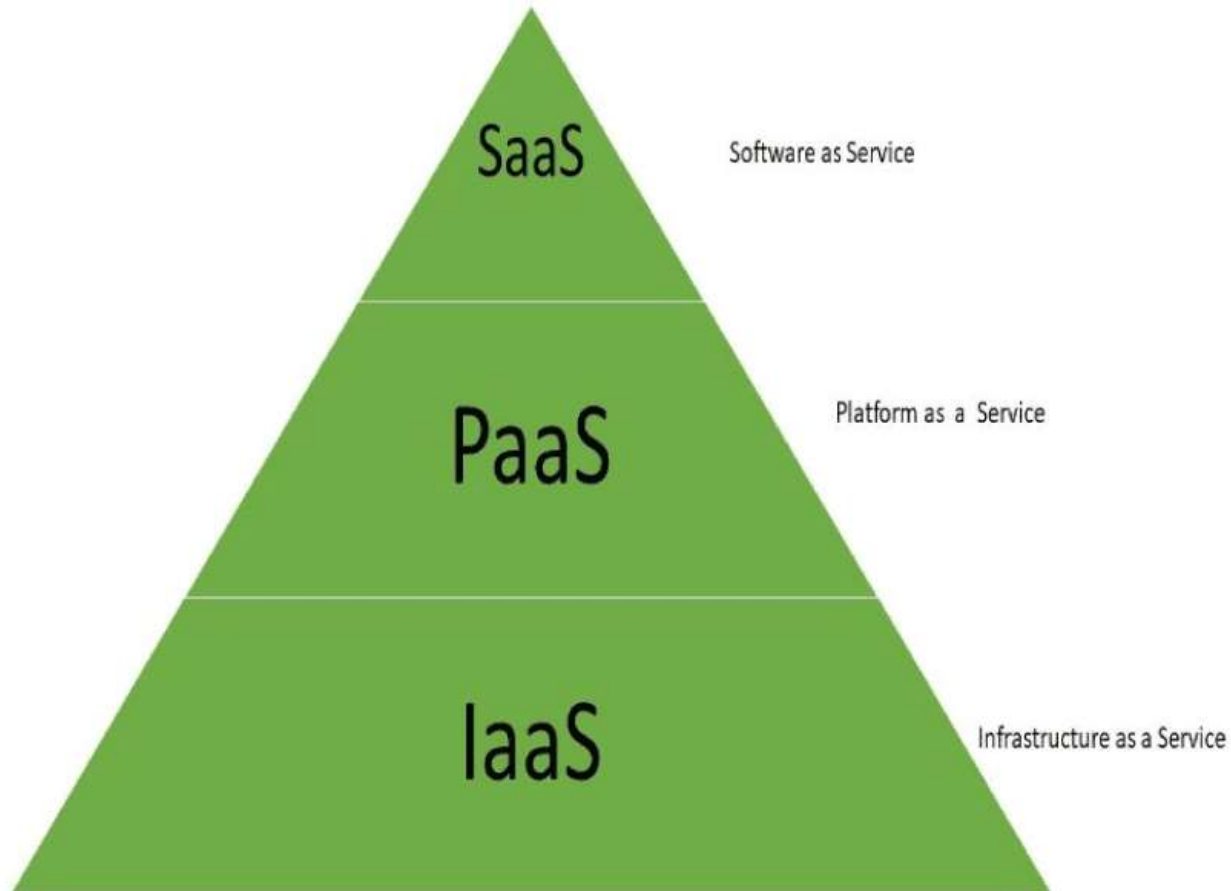
The five layers are the Physical layer, virtual layer, control layer, service orchestration layer, and service layer.

Cloud Computing reference model is divided into 3 major service models:

1. Software as a Service (SaaS)
2. Platform as a Service (PaaS)
3. Infrastructure as a Service (IaaS)



The below diagram explains the cloud computing reference model:





1. SaaS

Software as a Service (SaaS) is a form of application delivery that relieves users of the burden of software maintenance while making development and testing easier for service providers.

The cloud delivery model's top layer is where applications are located. End customers get access to the services this tier offers via web portals. Because online software services provide the same functionality as locally installed computer programs, consumers (users) are rapidly switching from them. Today, LMS and other application software can be accessed via the web as a service.

Features of SaaS are as follows:

- The cloud consumer has full control over all the cloud services.
- The provider has full control over software applications-based services.
- The cloud provider has partial control over the implementation of cloud services.
- The consumer has limited control over the implementation of these cloud services.



2. PaaS

Platform as a Service is a strategy that offers a high level of abstraction to make a cloud readily programmable in addition to infrastructure-oriented clouds that offer basic compute and storage capabilities (PaaS). Developers can construct and deploy apps on a cloud platform without necessarily needing to know how many processors or how much memory their applications would use. A PaaS offering that provides a scalable environment for creating and hosting web applications is Google App Engine, for instance.

Features of PaaS layer are as follows:

- The cloud provider has entire rights or control over the provision of cloud services to consumers.
- The cloud consumer has selective control based on the resources they need or have opted for on the application server, database, or middleware.
- Consumers get environments in which they can develop their applications or databases. These environments are usually very visual and very easy to use.
- Provides options for scalability and security of the user's resources.
- Services to create workflows and websites.
- Services to connect users' cloud platforms to other external platforms.



3. IaaS

Infrastructure as a Service (IaaS) offers storage and computer resources that developers and IT organizations use to deliver custom/business solutions. IaaS delivers computer hardware (servers, networking technology, storage, and data center space) as a service. It may also include the delivery of OS and virtualization technology to manage the resources. Here, the more important point is that IaaS customers rent computing resources instead of buying and installing them in their data centers. The service is typically paid for on a usage basis. The service may include dynamic scaling so that if the customers need more resources than expected, they can get them immediately.

The control of the IaaS layer is as follows:

- The consumer has full/partial control over the infrastructure of the cloud, servers, and databases.
- The consumer has control over the Virtual Machines' implementation and maintenance.
- The consumer has a choice of already installed VM machines with pre-installed Operating systems.
- The cloud provider has full control over the data centers and the other hardware involved in them.
- It has the ability to scale resources based on the usage of users.
- It can also copy data worldwide so that data can be accessed from anywhere in the world as soon as possible.

You can learn in-depth about these layers when you go for [AWS certification Cloud Practitioner](#) course.



Deployment models, which are as follows:

1. Public

This is the model where cloud infrastructure and resources are given to the public via a public network. These models are generally owned by companies that sell cloud services.

2. Private

This is the model where cloud infrastructure and resources are only accessible by the cloud consumer. These models are generally owned by cloud consumers themselves or a third party.

3. Community

This is the model where a group of cloud consumers might share their cloud infrastructure and resources as they may have the same goal and policies to be achieved. These models are owned by organizations or third-party.

4. Hybrid

This model consists of a mixture of different deployment models like public, private, or community. This helps in the exchange of data or applications between various models.