CHAPTER: 21

CLOUD COMPUTING MODELS

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ABSTRACT

Cloud Computing, often referred to simply as "the cloud," simply means storing or accessing your data and programs over the Internet rather than on your own hard drive. To achieve rapid provisioning of resources such as networks, servers, storage, etc. Cloud is structured into three primary models, mainly – Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), (XaaS) Software as a Service and (FaaS)Function as a Service. we also have a cloud deployment model which identifies a specific type of cloud environment based on ownership, scale and access, as well as the nature and purpose of the cloud. So, these are further elaborated

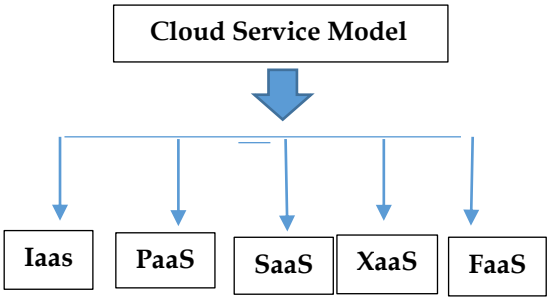
INTRODUCTION

Cloud computing is the availability of computer system resources on demand, especially data storage (cloud storage) and computing power, without direct active management by the user. Large clouds often have functions distributed across multiple locations, with each location being a data center. Cloud computing relies on sharing resources to achieve coherence and typically uses a "pay-as-you-go" model, which can help reduce capital expenditures, but can also lead to unexpected operational costs for unwitting users.

There are 2 types of cloud computing Models:

1. **Service Models: -**
    - IaaS
    - PaaS
    - SaaS
    - XaaS
    - FaaS
2. **Deployment Model: -**
    - Private
    - Public
    - Hybrid
    - Community
    - Multi-Cloud

Service Model



IaaS (Infrastructure as a Service)

IaaS is also known as Hardware as a Service (HaaS). It is a computing infrastructure managed via the Internet. The main advantage of using IaaS is that it helps users avoid the cost and complexity of purchasing and managing physical servers.

Eg: - Disc, RAM, Modem

PaaS (Platform as a Service)

A PaaS cloud computing platform is built for the programmer to develop, test, run and manage applications.

Eg: - Windows and LINUX

SaaS (Software as a Service)

SaaS is also known as "software on demand". It is software in which applications are hosted by a cloud service provider. Users can access these applications using an Internet connection and a web browser.

Eg: - Software

XaaS (Anything/Everything as a service)

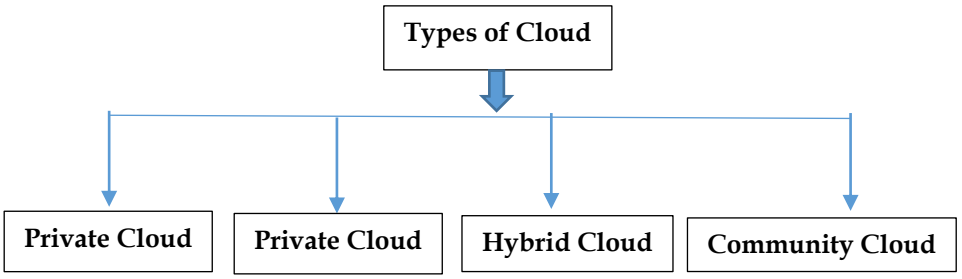
It is also known as Everything as a Service. Most cloud service providers today offer anything as a service that is a compilation of all the above services including some additional services.

Eg: - AWS

FaaS (Function as a Service)

FaaS is a type of cloud computing service. It provides its users or customers with a platform to develop, compute, run and deploy code or an entire application as a function. It allows the user to fully develop the code and update it at any time without having to worry about maintaining the underlying infrastructure. The developed code can be executed in response to a specific event. It is the same as PaaS. Eg: - EC2

Deployment Model



Private

The name says it all. It is open to the public. Public cloud deployment models are ideal for organizations with growing and fluctuating requirements. It is also a great choice for companies with low security concerns. So, you pay the cloud service provider for network services, compute virtualization and storage available on the public Internet. It's also a great delivery model for development and testing teams. It is quick and easy to configure and deploy, making it an ideal choice for a test environment.

Public

Now that you understand what a public cloud could offer you, you're naturally wondering what a private cloud can do. Companies looking for cost efficiency and greater control over data and resources will find a private cloud a better choice. This means it will be integrated with your data center and managed by your IT team. Alternatively, you can also opt for external hosting. Private cloud offers greater opportunities to help meet organizations' specific customization requirements. It is also a reasonable choice for critical processes that may have frequently changing requirements.

Hybrid

As the name suggests, a hybrid cloud is a combination of two or more cloud architectures. Although each model in a hybrid cloud works differently, they are all part of the same architecture. Furthermore, as part of this deployment of the cloud computing model, internal or external providers may offer resources. Let's better understand the hybrid model. A company with critical data will prefer to store on a private cloud, while less sensitive data can be stored on a public cloud. Hybrid cloud is also often used for "cloud breaking". This means that the organization runs the application on-premises, but due to heavy load, it can break into the public cloud.

Community

A community cloud works in a similar way to a public cloud. There is only one difference - it allows access only to a specific group of users who share common goals and use cases. This type of cloud computing deployment model is managed and hosted internally or by a third-par0ty vendor. However, you can also choose a combination of all three.

Multi-Cloud

In this paradigm, we are talking about employing multiple cloud providers simultaneously, as the name suggests. This is like a hybrid cloud deployment approach that combines public and private cloud resources. Instead of merging private and public clouds, multi-cloud uses many public clouds. Although public cloud providers provide several tools to improve the reliability of their services, accidents still happen. It is quite rare for two distinct clouds to have an incident at the same time. As a result, multi-cloud deployment further improves the high availability of your services.

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