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EXPERIMENT 1

Aim: Study of NIST model of cloud computing

Theory:

Cloud computing is the virtual management of central data center resources that are stored in software-defined pools. This description just scratches the surface of the capabilities of cloud-based services though. From applications to storage and processing power, cloud solutions can deliver on-demand computing services to entities over the internet usually on a pay-as-you-go basis.

With many companies opting to run their software development in an agile environment where many new applications are being continuously developed and tested to various audiences, cloud computing can be a great solution. The elastic nature of cloud means it is easier to scale it up fast if a new application turns out to be widely popular. many companies primarily use cloud computing services to backup their data in case of a disaster or emergency. If, somehow, ransomware feeds into the internal servers of a company with a private cloud, that company doesnt need to pay the ransom; they can effectively mitigate the attack and immediately pull their data from their private cloud

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Although, NIST is credited with having the most succinct and accurate definition of cloud computing, the term itself was first coined nearly 15 years ago when Netscapes web Browser was big news.

In 2011, NIST defined cloud computing as a model for enabling ubiquitous, convenient, on-demand access to a shared pool of configurable computing resources (eg: networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This short description is intended to serve as a means for broad comparisons of cloud services and deployment strategies while providing a baseline for discussion on the overall best use of cloud computing.

NIST's definition identified self-service, accessibility from desktops, laptops, and mobile phones, resources that are pooled among multiple users and applications, elastic resources that can be rapidly reapportioned as needed, and measured service as the five essential characteristics of cloud computing. When these characteristics are combined, they create cloud computing infrastructure that contains some physical layer and an abstraction layer. The physical layer contains hardware resources that support the cloud services. The abstraction layer consists of software deployed across the physical layer, thereby expressing the essential characteristics of cloud per NIST's definition.

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Deployment Models

A cloud deployment models represent a specific type of cloud environment that are distinguished by ownership, size and access. NIST offers guidance via their definitions of each of the four deployment cloud models. Although a one-size-fits all cloud solution does not exist, each model offers to fill a specific niche for a client based on its inherent features and abilities.

- Private cloud

Private cloud computing is a deployment model that is purchased and dedicated to a single client or company in a single-tenant environment where the hardware, storage and network assume the highest levels of security. Data that is stored in private clouds data center cannot be accessed by anyother client. Private cloud is a great solution for firms wishing to stay PCI and HIPAA compliant as this model allows sensitive data to be delivered through a fully private cloud deployment within the network configurations that only they own.

- Community cloud

NIST defines a community cloud deployment model as the one that is used exclusively by a specific community of consumers from organizations that have shared concerns. It may be owned, managed and operated by one or more of the organizations

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is the community. This multi-tenant platform allows several companies work on the same platform if they share similar needs and concerns-

- Public cloud

A Public cloud is a deployment model that is owned by cloud service providers and made available to the public. Customers can gain new capabilities on demand without investing in new hardware or software by tapping into the public cloud. Each public cloud can simultaneously handle massive amounts of storage that allows business the ability to handle multiple projects and become more available to their users at a moments notice.

- Hybrid cloud

Hybrid cloud deployment models are a collaboration of private and public cloud models in a single environment. Hybrid clouds are comprised of parallel environments where applications can easily move between private and public clouds. Hybrid clouds are bound together by proprietary technology that enables data and applications portability. Companies that are constantly transitioning between managing public cloud projects and building applications of a sensitive nature on their private cloud is likely to seek out a hybrid cloud solution.

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Service models

The many paradigms of cloud computing can be broken down into three unique service models classifications:

- Software as a service (SaaS)

NIST defines SaaS as a service model where a consumer does not manage or control the underlying cloud infrastructure including network, servers, operating system, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings. Users access the service via a web browser or app buying the service on a per-seat or per-user basis. SaaS implementation is simple as local installation of SaaS is not necessary.

- Platform as a service (PaaS)

NIST defines PaaS as a service model that allows consumers to deploy onto the consumer-created cloud infrastructure or acquired applications created using shared programming tools, processes, and APIs to accelerate the development, test, and deployment of applications. This service model provides users with application platforms and databases that is similar in function to middleware services.

once the consumer final code is complete, the cloud service provider will begin to host the application,

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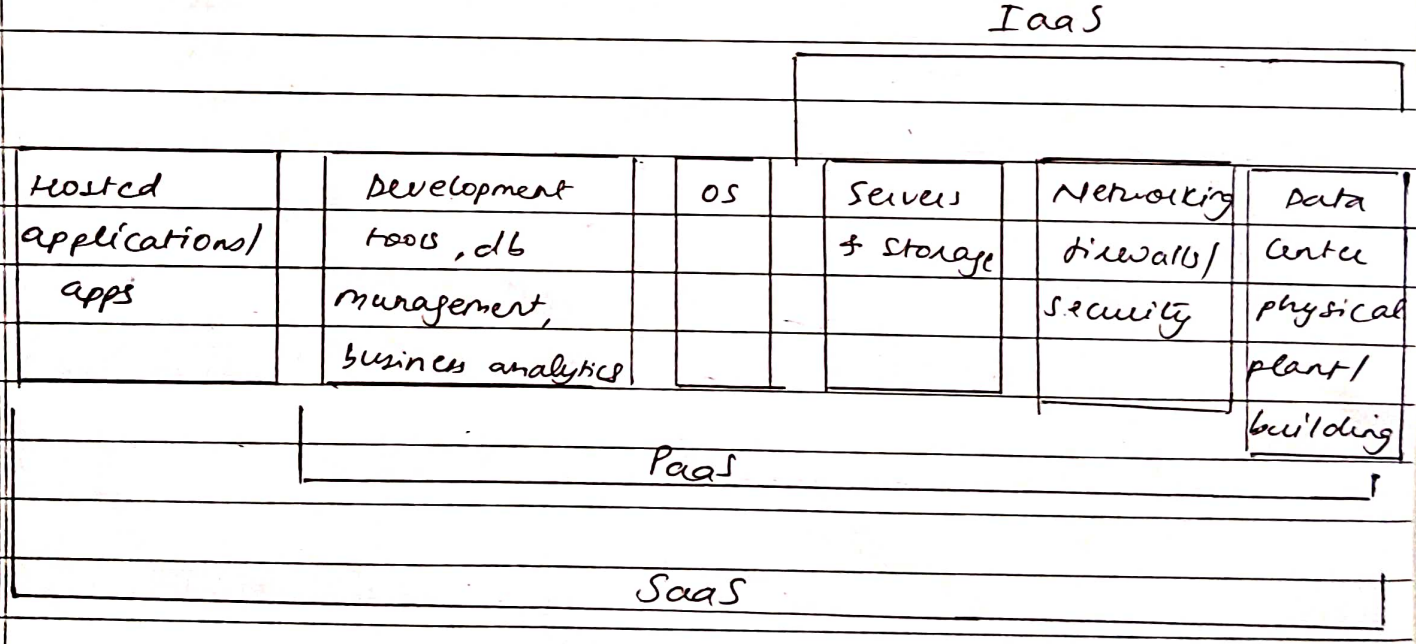
thus making it available to other internet users.

- Infrastructure as a service (IaaS)
IaaS gives the consumer provision processing, storage, networks, and other fundamental computing resources where the consumer deploys and runs arbitary software which can include OS and applications. IaaS is the most basic model tech companies use to access raw computing power without the responsibilities of installation or maintenance



Conclusion: Thus we have successfully studied NIST model of cloud computing.

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