Comparison of Cloud Computing Service Models: SaaS, PaaS, IaaS

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Abstract:

Cloud computing is the term which is widely used nowadays. Cloud computing is based on several service models such as SaaS, PaaS, NaaS, DbaaS, IaaS and many more. These service models are compared from various angles in order to clearly define there origin, working, advantages, disadvantages and limitations from existing other service models.

Keywords:
Cloud Computing ,IaaS,PaaS,SaaS

Introduction:

Cloud computing is term for anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). The name cloud computing was inspired by the cloud symbol that is often used to represent the Internet in flowcharts and diagrams.

These three different services are becomes very popular now a days.In this paper we will study the comparison of these three services & how they are becomes a choice of consumers.

IaaS:

Infrastructure as a Service is a model in which an organization outsources the equipment used to support operations, including the storage, hardware, servers and networking components.The service provider owns the equipment and is responsible for housing, running and maintaining it. The client typically pays on a per-use basis.[1].

IaaS is sometimes referred to as Hardware as a Service (HaaS).

Automation of administrative tasks, dynamic scaling, desktop virtualization, Internet connectivity these are the various characteristics or we can say components of an Infrastructure as a Service.

IaaS in India:

There are various companies who offers the IaaS services:

1.InstaCompute fromTATA Communication.

2.Simplicloud from NetMagic.

3.eNlight from ESDS.

At this movement, the Indian market does not have a mature ecosystem which supports cloud IaaS services.

A few players from the service provider segment such as Tata Communications, Wipro and NetMagic have announced services which are likely to evolve into more stable cloud offerings.[7].

Some of the challenges the market currently faces include:

• Ecosystem maturity.

• Customer awareness of services.

• Connectivity.

The market is seeing a concerted effort in the related Software as a Service (SaaS) space.

The SaaS market is increasingly gaining acceptance in the SMB segment, indicating a shift in the thought process of CIOs and IT decision makers.[6]

PaaS:

Platform as a Service (PaaS) is a way to rent a hardware, operating systems, storage, network capacity over the Internet. The service delivery model allows the customer to rent virtualized servers and associated services for running existing applications or developing and testing new ones.

PaaS Service Providers in India:

Amazon Service, caTechnologies, salesforce.com, thinkgrid etc… These are some of the PaaS service providers in india.

Key Characteristics of PaaS:[3]:

• Customizable /Programmable User Interface.

• Unlimited Database Customizations.

• Robust Workflow engine/capabilities.

• Granular control over security/sharing (permissions model).

• Flexible "services-enabled" integration model[5].

Below are some of the benefits of PaaS to   application developers:

• They don't have to invest in physical infrastructure; being able to 'rent' virtual infrastructure has both cost benefits and practical benefits. They don't need to purchase hardware themselves or employ the expertise to manage it. This leaves them free to focus on the development of applications. What's more, clients will only need to rent the resources they need rather than invest in fixed, unused and therefore wasted capacity.[7].

• Makes development possible for 'non-experts'; with some PaaS offerings anyone can develop an application. They can simply do this through their web browser utilising one-click functionality.

Salient examples of this are one-click blog software installs such as WordPress.

• Flexibility; customers can have control over the tools that are installed within their platforms and can create a platform that suits their specific requirements. They can 'pick and choose' the features they feel are necessary.[8].

• Adaptability; Features can be changed if circumstances dictate that they should.

• Teams in various locations can work together; as an internet connection and web browser are all that is required, developers spread across several locations can work together on the same application build.

• Security: security is provided, including data security and backup and recovery.[8].

SaaS:

Top companies as a service providers in SaaS are given below:[5]:

• Antenna Software.

• Cloud9 Analytics.

• CVM Solutions.

• Exoprise Systems.

Characteristics of SaaS:

• Centralized Hosting / Delivery.

• Uniform Platform for Delivery.

• Open Collaboration / Sharing.

There are many other important characteristics of software on demand that are related to the development, management and marketability of each SaaS solution an ASP (application service provider) or ISV (independent software vendor) has to offer to consumers. . These characteristics include (but are not limited to): SaaS Architecture (e.g. Service Oriented Architecture), SaaS Integration (e.g. Web Application Interfaces)and SaaS Development (e.g. agile software methodologies).

Comparison Between Iaas ,Saas ,Paas:

	Paradigm shift	Characteristics	Key terms	Advantages	Disadvantages
Infrastructure as a Service (IaaS)	Infrastructure as an asset	Usually platform independent; infrastructure costs are shared and thus reduced; service level agreements (SLAs); pay by usage; self-scaling	Grid computing, utility computing, compute instance, hypervisor, cloudbursting, multi-tenant computing, resource pooling	Avoid capital expenditure on hardware and human resources; reduced ROI risk; low barriers to entry; streamlined and automated scaling	Business efficiency and productivity largely depends on the vendor's capabilities; potentially greater long-term cost; centralization requires new/different security measures
Platform as a Service (PaaS)	License purchasing	Consumes cloud infrastructure; caters to agile project management methods	Solution stack	Streamlined version deployment	Centralization requires new/different security measures
Software as a service (SaaS)	Software as an asset (business and consumer)	cloud components; communication via APIs; stateless; loosely coupled; modular; semantic interoperability	Thin client; client-server application	Avoid capital expenditure on software and development resources; reduced ROI risk; streamlined and iterative updates	Centralization of data requires new/different security measures

Conclusion:

The concept of cloud computing comes from the network diagrams illustrating the Internet as a cloud, where it is not possible, or not important, to know the information path. While the main reasons for adopting services based on cloud computing are cost saving, flexibility and start-up speed, there are still doubts about the security guarantees and the portability and integration options offered by this model of services.

The services offered in any of the cloud computing models(platform, infrastructure or software as a service) are closely related to mobility and, therefore, depend heavily on the continuity of the connectivity, the quality of the service and the security offered by the networks for an optimal user experience.

Cloud computing provides companies with new options for managing infrastructures and new business models. In particular, it can mean a big improvement for small and medium-size companies, for whom the cloud represents the opportunity to reduce costs in administration and in maintaining proprietary infrastructures, providing them with technological possibilities similar to those of large companies.

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