



A Survey - Different Models in Cloud Computing

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Abstract— Cloud computing that has become an increasingly important trend is a virtualization technology that uses the internet and central remote servers to offer the sharing of resources that include infrastructures, software, applications and business processes to the market environment to fulfill the elastic demand. In today's competitive environment, the service vitality, elasticity, choices and flexibility offered by this scalable technology are too attractive that makes the cloud computing to increasingly becoming an integral part of the enterprise computing environment. This paper deals with a comparison of different models in Cloud Computing. Cloud computing model is composed of three service models Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) and four deployment models Public, Private, Hybrid/mixed. It includes a discussion of the evolution process of cloud computing, characteristics of Cloud, current technologies adopted in cloud computing. We are mainly concentrating about the models based on the computing area& their comparative features on different services.

Key words: Cloud computing, Development Model, Service Model.

I. INTRODUCTION

A technology that has fastest growing segments in IT and shown its high growth rate in the last few years, is Cloud Computing. The technology uses the Internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing storage, memory, processing and bandwidth. The technology is not revolutionary, but it is the outcome of the continuous advancement of the data management technology the phrase "Cloud" originates from the cloud symbol used by flow charts and diagrams to symbolize the Internet.

The term Cloud Computing refers to both the applications delivered as services over the Internet and the servers and system software in the data centers that provide those services. The Government agencies, enterprises, and more companies started to use Cloud Computing. The next revolution in IT and the big switch in IT is shifting the paradigm of classical computing to cloud environment. In Classical computing buying and owning the system software, hardware, application software to meet the peak needs. The system configuration, testing, verification and evaluation raise the demand of using resources. The cost of using the resource utilization is higher in order to meet the demands. In Cloud computing environment the storage of data and faster evaluation of CPU

utilization and provides subscription of the data storage and pay per use of service as per the quality of services. This paper describes the features of cloud computing, cloud computing service models, cloud computing deployment models and a comparative study of cloud computing models.

A. Features of Cloud Computing:

The major feature of cloud computing is that it allows for the sharing and scalable deployment of services, as needed, from almost any location, and for which the customer can be billed based on actual usage.

Some of the basic features or characteristics of cloud computing are given below:

- a. **On-demand self-service:** A consumer can provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with service provider.
- b. **Broad network access:** As the capabilities are available over the network and accessed through standard mechanisms, it can be accessed through heterogeneous thin or thick client platforms. In other words, access to user is available through the internet from a broad range of devices such as PCs, laptops, and mobile devices.
- c. **Rapid elasticity:** Capabilities can be rapidly and elastically provisioned, in general automatically, making a consumer feel that the capabilities available for provisioning are unlimited and can be purchased in any quantity at any time.

- d. Measured Service:** Cloud systems automatically control and optimize resource use by leveraging a measuring/metering capability appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

II. SERVICE MODELS

There are three service models that provide different aspects of services to the users of cloud environment.

- a. **Software as a Service (SaaS)** - This uses the provider's applications over the network
- b. **Platform as a Service (PaaS)** - This provides the facility to deploy the applications to cloud
- c. **Infrastructure as a Service (IaaS)** - This provides the fundamental computing resources such as rental processing, storage, network capacity.

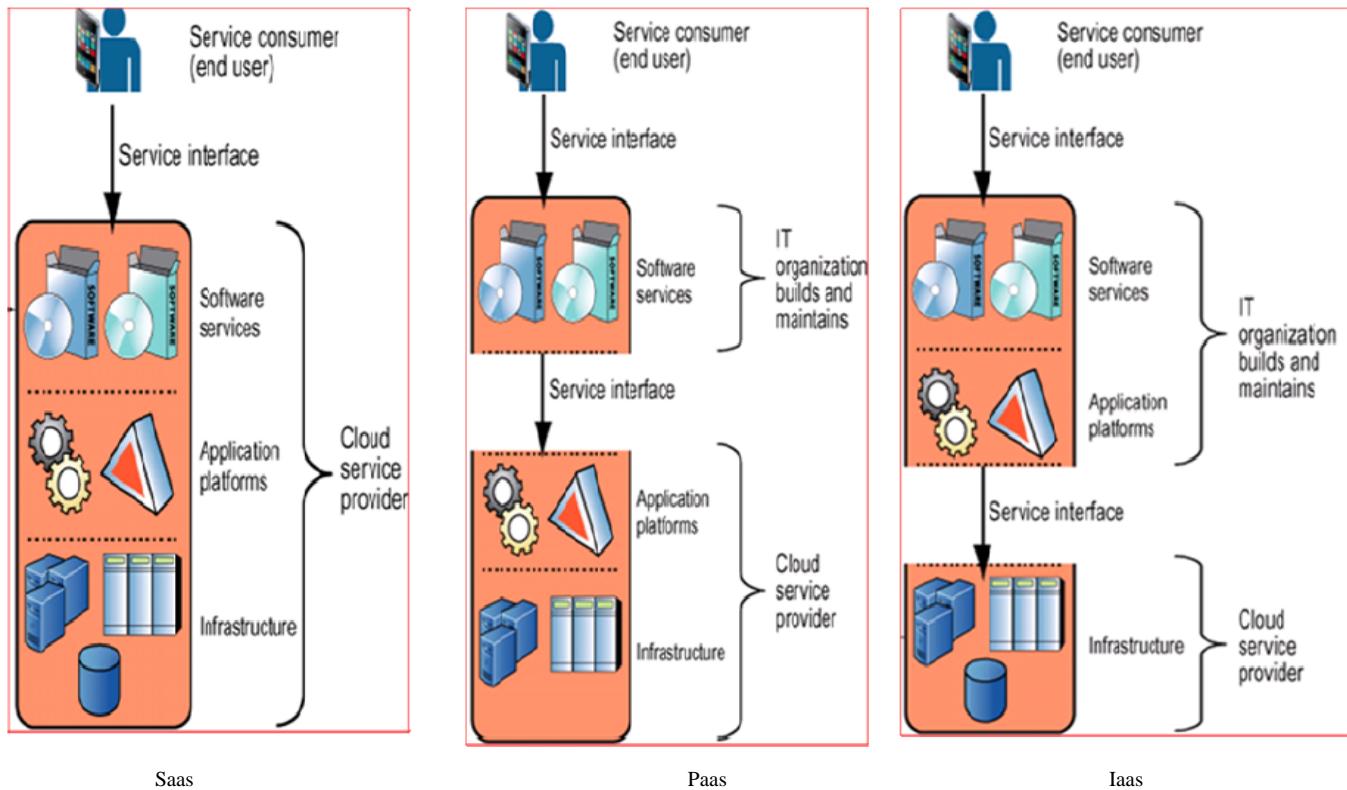


Figure 1. Types of Models of Cloud Computing Services

A. Software as a Service (SaaS):

As in case of software that are purchased and installed on our own personal computers, also referred to as software as a product. Software as a service is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the Internet. SaaS is increasingly becoming a competitive delivery model as an underlying technology that support web services and service-oriented architecture (SOA) models that makes challenging features and new developmental approaches which spreads the popularity and creates the suitable environment to customers by providing as a the service models. SaaS is also a pay-as-we-go subscription licensing model [2]. For example is SalesForce.Com uses SaaS

B. Platform as a Service (PaaS):

Cloud computing is an evolving and trendy platform for building and running traditional web-based applications, a concept of an environment that provides known as Platform-as-a-Service. PaaS is an outer layer of the Software as a service model application delivery model. The PaaS model makes all of the facilities required to support the complete life cycle of building and delivering web applications and services entirely available from the Internet, all with no software downloads or installation for developers, IT managers, or end users [2]. For example Google App Engine, Microsoft Azure.

C. Infrastructure as a Service (IaaS):

According to the online reference (wikipedia) IaaS is the delivery of computer or network as infrastructure by providing as a service. The technology, services, and data center that diverse across the network of different locations to deliver IT as a service to customers. IaaS manages in and out all the

services made by Platform as a service and software as a service on an overview model of service delivery that provisionally predefines standardization specifically for the infrastructure that are optimized and delivered for the customer's applications [2]. For example CPU utilization, Storage: Amazon.com, Nirvanix, GoGrid Are the cloud vendors.

III. DEPLOYMENT MODELS

Cloud Computing deployment has mainly flowing four deployment models from the point of view of architecture, each with specific characteristics that support the needs of the services and users of the clouds in particular ways :

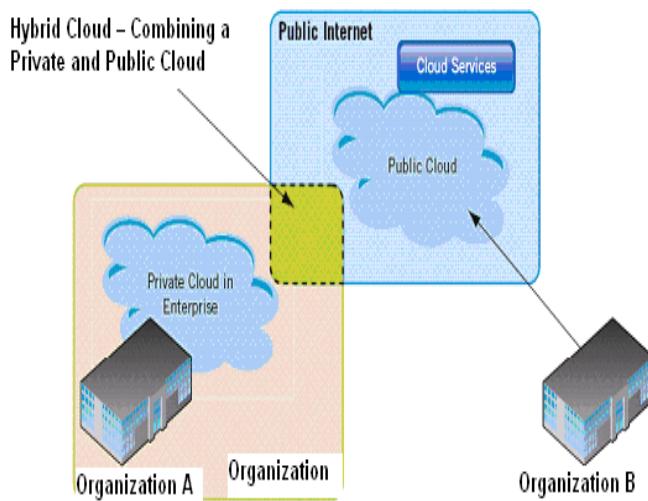


Figure 2: Deployment Models

- Private Cloud:** The cloud infrastructure is maintained and operated for a specific organization. It may be managed by the organization or a third party and may exist on premise or off premise.
- Community Cloud:** The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on premise or off premise.
- Public Cloud:** The cloud infrastructure is available to the public on a commercial basis by the cloud service provider. A consumer can develop and deploy a service in the cloud with very little financial outlay compared to the capital expenditure requirements normally associated with other deployment options.
- Hybrid Cloud :** The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

IV. COMPARISON

Table 1. Comparison of different service models in cloud Computing

Service type	IaaS	PaaS	SaaS
Service category	VM Rental, Online Storage	Online Operating Environment, Online Database, Online Message Queue	Application and Software Rental
Service Customization	Server Template	Logic Resource Template	Application Template
Service Provisioning	Automation	Automation	Automation
Service accessing and Using	Remote Console, Web 2.0	Online Development and Debugging, Integration of Offline Development Tools and Cloud	Web 2.0
Service monitoring	Physical Resource Monitoring	Logic Resource Monitoring	Application Monitoring
Service level management	Dynamic Orchestration of Physical Resources	Dynamic Orchestration of Logic Resources	Dynamic Orchestration of Application
Service integration and combination	Load Balance	SOA	SOA, Mashup
Service security	Storage Encryption and Isolation, VM Isolation, VLAN, SSL/SSH	Data Isolation ,Operating Environment Isolation, SSL	Data Isolation, Operating Environment Isolation, Authentication

V. CONCLUSION

In this paper, we have survey on service models and deployment models in cloud computing. Cloud Computing provides computing services in today's competitive environment in a highly scalable way, the environments provided by the cloud strives to be reliable, customizable, dynamic, elastic and robust with a guaranteed Quality of Service. Cloud computing enables a new business model that supports on-demand, pay-for-use, and scalable IT services over the Internet. In this paper, also we compared the different Service models SaaS, PaaS and IaaS in cloud computing. Many parameters in cloud computing still remains to be investigated .Future work delas with performance enhancement of the cloud area with reliability term.

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