Proficient Business Solutions through Cloud Services

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Abstract - This article aims to elucidate the reader about Cloud Computing and the types of service modelsfor which a customer can go for. There are three models on which the cloud services are mainly based namely- Software as a Service(SaaS),Platform as a Service(PaaS) and Infrastructure as a Service (IaaS). Each of these services works in different levels. SaaS works at top most level while PaaS is at middle level, leaving IaaS at the bottom most level. Customer according to their current needs and foresights choose the best suitable Cloud Service to manage and enhance their business effectively and efficiently.

1. Cloud Computing

Cloud Computing can be explained as the set of computing services which includes servers, storage, databases, networking, software, analytics, and intelligenceover the Internet (which is way we say "cloud"). It is Scalable, Affordable and Secure. One only has to pay for the services which he/she seeks to use. Using such services not only helps to cut down the operating costs, but also to run organisation more efficiently and scale your business as it needs change.
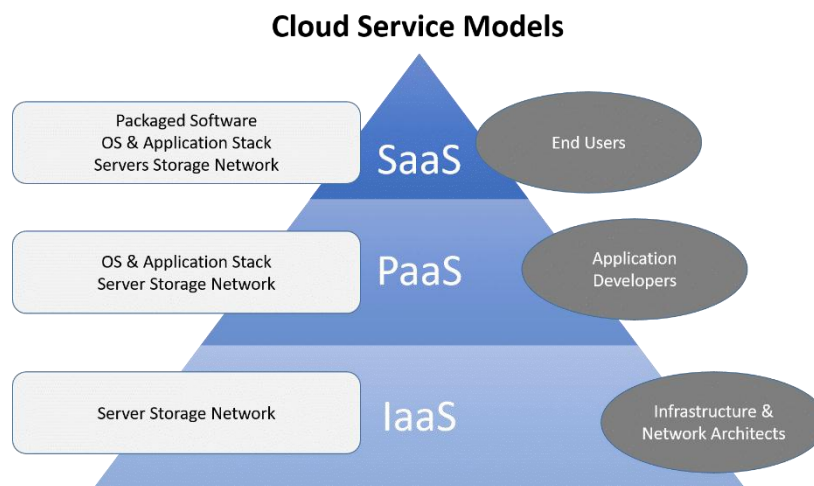

Figure 1: Resources provided by Cloud

Figure 2: Levels at which Cloud Services work.

2. Introduction

2.1 Cloud services are the IT services that are provided and accessed over the internet from a cloud computing provider. It unites all delivery and service models of cloud computing. Cloud services are delivered over the internet and made accessible globally from the internet.

2.2   Cloud services provide IT services which were usually hosted in-house, including an application or a database server from the cloud. This replaces the in-house storage/backup with the cloud storage and which can be accessed using the software service directly from a web browser without prior installation.

2.3   There are three types of cloud services:

(i)   Software as a service (SaaS)
(ii)   Infrastructure as a service (IaaS)
(iii) Platform as a service (PaaS)

2.4   Cloud services facilitates the user by providing great flexibility in establishing, replicating and scaling resources to even out the requirements of users, hosted applications and their respective solutions. Cloud services are created, driven and managed by the cloud service providers like Google Compute Engine, Amazon Web Service, AWS elastic beanstalk, Oracle Cloud Platform, Google App Engine, RackSpace Cloud, Digital Ocean and many more. These Cloud Service Providers works to ensure the reliable and secure end-to-end availability of Services.

2.5   Its advantages include:

- **Scalability –** A cloud service allows customer to a hassle-free up scaling or down scalingthe computing resources without actually worrying about the physical components of servers.
- **Affordability –** The customer has to pay for only what he uses and that is naturally cost effective than spending money in components like CPU, storage drive, network infrastructure, database etc and then managing these resources.
- **Security –** By signing up for a cloud service, you are essentially making your data more secure using their industry-grade security protocols.
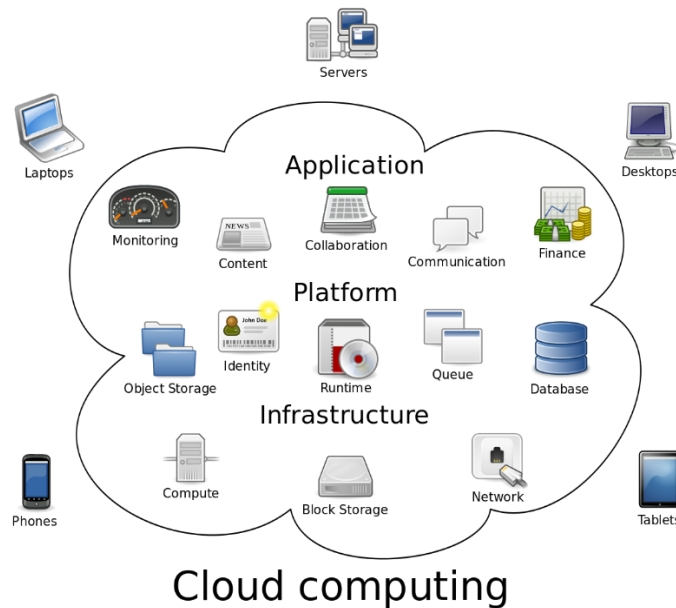

Figure 3: Different cloud services and things connected to them

3. **SaaS: Software as a Service.**

3.1   Software as a service (SaaS) is a software distribution model in which third-party providers are involved. The third-party provider hosts the applications and makes them available to customers over the Internet.

3.2   SaaS is very much similar to the application service provider (ASP) and also to on demand computing software delivery models. SaaS model includes the service provider which hosts the customer's software and delivers it to verified end users over the internet. For on demand approach in SaaS model, the customers are given with the network-based access to application. For each customer a specific copy of application is created for the SaaS distribution. The source code and main functionality of application is same for the all the customers. When new features are introduced, they are provided to all the customers. On accordance with the formal agreement between Customer and Service Provider called service level agreement (SLA), the data for each customer is

stored either on cloud or on both locally and on cloud. SaaS applications can be integrated with other APIs (application Programming Interface). Using this feature of SaaS, customer companies can create their own tools which can be linked SaaS application using SaaS provider's API.

3.3 There are many SaaS applications for basic businesses like email, sale management, customer relationship management (CRM), financial management and many more. SaaS providers include Salesforce, SAP, Oracle, Intuit and Microsoft.

3.4 WHEN TO USE:

- Start-ups or small companies are in a dire need to launch their product and don't have time for server issues or software.

- If customer is working on a short-term project then he might want to make it easy, quick, affordable and all these requirements are satisfied when using a SaaS Service.

- If company wants to create applications that aren't needed too often, such as tax software then using SaaS cloud service will be wise.

- When customer have applications that need both web and mobile access then SaaS cloud service is best.

3.5 Advantages:
- Saves heavy expenditure on buying, constructing, maintaining and managing the physical servers.
- As business grows the customer just have add the users and adjust the monthly subscription cost rather than increasing server capacity and other resources.
- Accessibility is a great advantage of SaaS model-based Services as you just need internet and browser which is apparently available on every device now a days.
- Load Free Upgradability is there which means that if you want any kind of upgradation in service you just have to convey it provider and he'll do it and your company will be free from doing such tasks.

3.6 Disadvantages:
- Security is topmost concern for businesses considering SaaS as third party is involved and if the sensitive company data and business logics are there to be used then issues like identity and access management might arise which must be handled.
- Performance of a browser-based application hosted by a remote datacenter and operated over an internet connection is likely to be lesser when compared to software running on a local machine or over the company LAN.
- There is situation when Customer Company might want to shift to another SaaS vendor or the current SaaS vendor company goes out of business then in such cases the customer should always prepare an exit plan to avoid getting stuck.

4. PaaS: Platform as a Service.

4.1 PaaS aims at providing a generic platform on which software can be developed and deployed. PaaS model provides an environment (which includes operating system and server software, server hardware and network connection) completely handled by Service Provider to customers on which they don't have to worry about how to deal with server and other software specifics (like versions, plugins), they are already given a platform complying their needs because of which they focus only on the business task which they have to perform and not on how to perform.

4.2 To summarize, a PaaS provider creates and provides a robust and optimized environment on which users can install applications and data sets. Users can focus on creating and running applications ins than assembling and managing the underlying infrastructure and services.

4.3 PaaS is made on top of virtualization technology. Customers can request resources for their business in accordance with their requirement, and because they don't have to buy resources in real but just have to pay for the platform services, this model is cost effective as it avoids wastage and supports optimum usage.

4.4 PaaS providers include Amazon Web Service, AWS elastic beanstalk, Oracle Cloud Platform, Heroku, Google App Engine, and Red Hat Software, OpenShift.

4.5   WHEN TO USE:

Utilizing PaaS is beneficial as well as necessary, in several situations.
When you are creating a web application based on php and you don't want to get involved in the fuzz of managing servers and running environment then in such case PaaS model based Service comes into the picture. This cloud service also can greatly reduce costs and it can simplify some challenges that come up if you are rapidly developing or deploying an app.

4.6   Advantages:

- PaaS vendors provide readymade business functionality for users to directly start the project because of which they can just focus on task rather than on maintaining the platform.

- It helps in cost cutting for the expenditure spent in buying and maintaining software which the platform comprises. Customer just have to get a computer and network over which they can operate on the task.

- Simple & easy to use

4.7   Disadvantages:

- Internet connection is a must. The whole system heavily depends on internet. No internet means No work.

- Moving from one PaaS vendors' application to another PaaS vendor is a tedious task and it might create problems.

- Data privacy might be on stake if it is not handled cautiously.

- The Interconnection between Cloud services and company's self-created tools via Cloud API might lead to increase in complexity.

5.   Iaas: Infrastructure as a Service.

5.1   IaaS is the fundamental building block in the classification of cloud services. IaaS includes all those components which a customer requires for his work and customer will have to pay for only those services which is being used by him. Components include highly systemized and scalable computing resources, cloud storage and network capability which can be self-equipped, monitored, and are available on demand.

5.2   Basically, in IaaS customer will have to pay only for what is uses. This helps the customer to circumvent the cost and complexity of buying and handling his own physical servers and networking infrastructure. An IaaS customer's requirements are scalable they me grow or decrease in future and he'll just have to ask for changes in the components and not to worry about actually doing it.

5.3   Each resource offered by provider is a separate service component and which will be rented to customers on monthly or yearly basis. A cloud computing service provider maintains and manages the infrastructure, whereas the customer purchases, installs and manages his own software like operating system, middleware and application.

5.4   IaaS Service Providers: Amazon AWS, Digital Ocean, Rack space Open Cloud, Microsoft Azure, Google Compute Engine and many more.

5.5   WHEN TO USE:
- In case of small companies, they might use IaaS to avoid spending time and money on buying, creating and managing in-house server machines.
- Larger companies want complete controls over their application and the resources of the servers and they also want to reduce cost as much as they can, so IaaS is ideal for them.

5.6   Advantages:
- IaaS is a flexible cloud computing model as it allows automated deployment of servers, processing power, storage, and networking.
- IaaS clients have true control over their infrastructure than users of PaaS or SaaS services.
- Users can dynamically choose and configure the specs of devices such as CPU, hard disk, number of cores, etc.
- Users can easily access the cloud computing power.

- It is very flexible and efficient in monetary as well as operating terms.

5.7 Disadvantages:
- Internet connection is a must.
- IaaS depends on virtualization services.
- This service restricts user-privacy & customization.

6. Conclusion

Cloud Computing can be explained as the set of computing services which helps any business to achieve its goal by providing services on the internet. Customer can choose the services and components which he/she needs and will have to pay for only those services and that too only for the time for which the resources are being used. This leads to great cost cutting and efficient usage of business resources as well as to reduce business complexity. Cloud services facilitates the user by providing great flexibility in establishing, replicating and scaling resources to even out the requirements of users, hosted applications and their respective solutions.

Customer must acquire knowledge about the cloud services -IaaS, SaaS, PaaS or consult a professional before going for any of these for their business so that they choose the cloud service which matches with their requirements.

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[10] Figure 3: Different cloud services and things connected to them. Image Sourcehttps://en.wikipedia.org/wiki/Cloud_computing