Cloud computing: an overview

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Abstract- This overview gives the basic concept of cloud computing. It's defines the terms used in the industry, and outlines the general architecture, advantages and disadvantages of Cloud computing. It gives a summary of Cloud Computing and provides a good foundation for understanding.

Keywords – Cloud, gid computing, cloud computing, cloud computing services.

I.INTRODUCTION

When plugging an electric appliance into an outlet, we care neither how electric power is generated nor how it gets to that outlet. This is possible because electricity is virtualized; that is, it is readily available from wallsocket that hides power generation. Stations and a huge distribution grid. When extended to information technologies, this concept means delivering useful functions while hiding how their internals work. Computing itself, to be considered fully virtualized, must allow computers to be built from distributed components such as processing, storage, data, and software resources. The term cloud is used as a metaphor for the internet, based on the cloud drawing USED TO cloud computing is a general term for anything that involves delivering hosted services over the internet [3]. So any application would be not considered as cloud computing application if it don't uses internet to store some kind of data neither any web application where we can store information but doesn't provide any way of recover it, so it hasn't api (application program interface).then all the cloud computing applications/software that feats to this definition will be named as cloud ware.

What is cloud computing? : Buyya et al have defined it as follows: "Cloud is a parallel and distributed computing system consisting of a collection of inter-connected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service- level agreements(SLA) established through negotiation between the service provider and consumers"[3]. It also provides facilities for users to develop, deploy and manage their applications 'on the cloud', which entails virtualization of resources that maintains and manages itself. Cloud computing is a service software architecture/infrastructure system aimed to deliver service to users through web applications on independent platforms.

II. CLOUD STORAGE

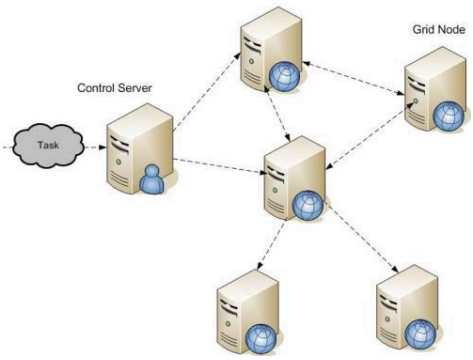
Two types of cloud storage:

2.1 Cloud Computing-

Cloud computing is a broader concept than utility computing and relates to the underlying architecture in which the services are designed. It may be applied equally to utility services and internal corporate data centers. The big news is for application developers and IT operations. Done right, cloud computing allows them to develop, deploy and run applications that can easily grow capacity , work fast (performance), and never — or at least rarely — fail (reliability), all without any concern as to the nature and location of the underlying infrastructure[12].

2.2.Grid Computing-

Grid computing is the combination of computer resources from multiple administrative domains applied to a common task, usually to a scientific, technical or business problem that requires a great number of computer processing cycles or the need to process large amounts of data. One of the main strategies of grid computing is using software to divide and apportion pieces of a program among several computers, sometimes up to many thousands. Grid computing is distributed, large-scale cluster computing. The size of grid computing may vary from being small — confined to a network of computer workstations within a corporation, for example — to being large, public collaboration across many companies and networks[13].



III. TYPE OF SERVICES

Services delivered by Cloud computing is broadly divided into three categories:

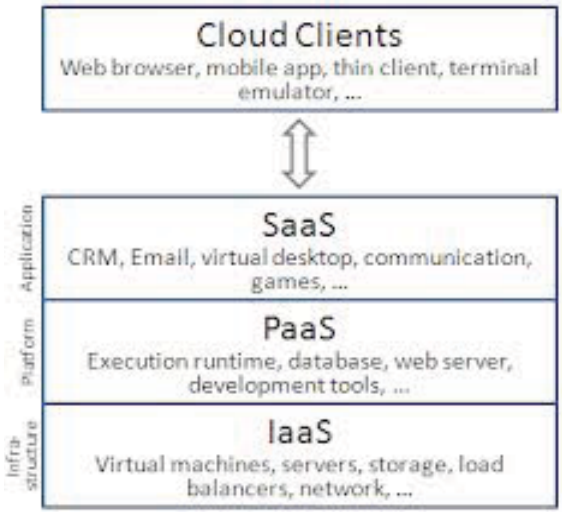
- Software-as-a-Service (SaaS).
- Platform-as-a-Service (PaaS)
- Infrastructure-as-a-Service (IaaS)

3.1 Software-as-a-Service (SaaS):

SaaS style clouds deliver access to collections of software application programs. SaaS providers offer users access to specific application programs controlled and executed on the provider's infrastructure. SaaS is often referred to as "Software on Demand."[4] Examples of SaaS include: Google Apps, Microsoft Office 365, Onlive, GT Nexus, Marketo, and Trade Card[7].

3.2 Platform-as-a-Service (PaaS):

PaaS style clouds provide access to a programming or runtime environment with scalable compute and data structures embedded in it. With PaaS, users develop and execute their own applications within an environment offered by the service provider[4].Examples of PaaS include: AWS Elastic Beastalk, Cloud Foundry, Heroku, Force.com, Engine Yard, Mendix, Google App Engine, Windows Azure Compute and Orange Scape [7].

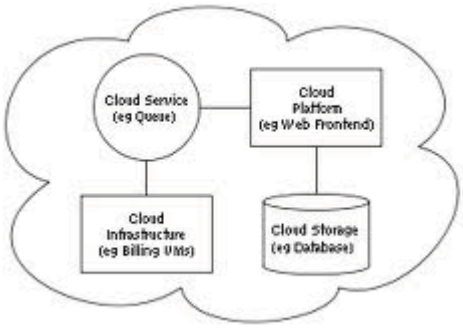


3.3 Infrastructure-as-a-Service (IaaS)-

IaaS clouds provide access to collections of virtualized computer hardware resources, including machines, network, and storage. With IaaS, users assemble their own virtual cluster on which they are responsible for installing, maintaining, and executing their own software stack. Features: Geographic distribution of data centers, variety of user interfaces and APIs to access the system, specialized components and services that aid particular applications, choice of virtualization platform and operating systems. Amazon's EC2, through which users can request Linux Virtual Machine instances that are created on the fly and billed based on actual usage [3].

IV. CLOUD COMPUTING ARCHITECTURE

The two most significant components of cloud computing architecture are known as the front end and the back end. The front end is the part seen by the client, i.e. the computer user. This includes the client's network (or computer) and the applications used to access the cloud via a user interface such as a web browser.



This includes the client's network (or computer) and the applications used to access the cloud via a user interface such as a web browser. The back end of the cloud computing architecture is the 'cloud' itself, comprising various computers, servers and data storage devices. Services – Complete business services such as PayPal, OpenID, OAuth, Google Maps, Alexa. Application – Cloud based software that eliminates the need for local installation such as Google Apps, Microsoft Online. Development – Software development platforms used to build custom cloud based applications (PAAS & SAAS) such as Sales Force [10].Platform – Cloud based platforms, typically provided using virtualization, such as Amazon ECC, Sun Grid. Storage – Data storage or cloud based NAS such as CTERA, iDisk, CloudNAS. Hosting – Physical data such as those run by IBM, HP, NaviSite, etc.

V.CHARACTERISTICS OF CLOUD COMPUTING

*Multi-tenancy***:** Multi-tenancy enables sharing of resources and costs across a large pool of users thus allowing for:

1.1. *Centralization* of infrastructure in locations with lower costs (such as real estate, electricity, etc.)

1.2. *Peak-load capacity* increases (users need not engineer for highest possible load-levels)

1.3. *Utilisation and efficiency* improvements for systems that are often only 10–20% utilised.

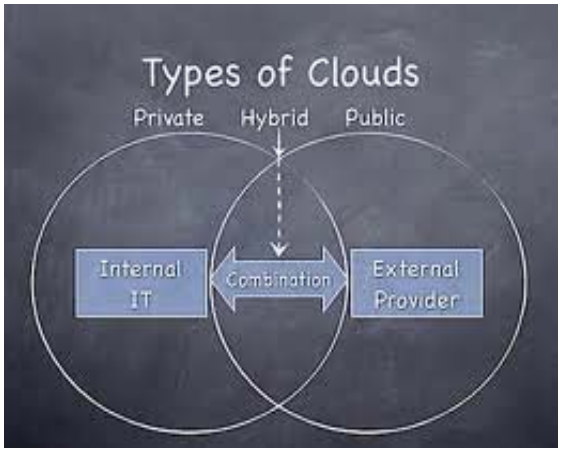
Scalability and elasticity: Scalability and elasticity via dynamic ("on-demand") provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads.

Security: Security could improve due to centralization of data, increased security-focused resources, etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for stored kernels.

Maintence: Maintence of cloud computing applications is easier, because they do not need to be installed on each user's computer and can be accessed from different places.

Virtualization: Virtualization technology allows servers and storage devices to be shared and utilization be increased. Applications can be easily migrated from one physical server to another [7].

VI.TYPES OF CLOUD



Private cloud: Private cloud and internal cloud are neologisms that some vendors have recently used to describe offerings that emulate cloud computing on private networks. These (typically virtualisation automation) products claim to "deliver some benefits of cloud computing without the capitalising on data security, corporate governance, and reliability concerns. They have been criticized on the basis that users "still have to buy, build, and manage them" [14].This is a Cloud that is isolated from outside access either logically or physically (logically being through virtualization and VPN) or physically by being located only at a physical data center. While an analyst predicted in 2008 that private cloud networks would be the future of corporate IT. Analysts also claim that within five years a "huge percentage" of small and medium enterprises will get most of their computing resources from external cloud computing providers as they "will not have economies of scale to make it worth staying in the IT business" or be able to afford private clouds [14].

Public Cloud: Public cloud or external cloud describes cloud computing in the traditional mainstream sense, whereby resources are dynamically provisioned on a self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who shares resources and bills .This is a Shared Cloud that is accessible by anyone, the only separation is via credentials and commonly the underlying infrastructure is shared by many or all users. The separation is usually purely logical.

Hybrid cloud: A hybrid cloud environment consisting of multiple internal and/or external providers "will be typical for most enterprises". A Hybrid Cloud is somewhere between that of a Public and Private Cloud. A Hybrid Cloud uses resources the majority of the time in either the Private Cloud (The Most Common Configuration) or the Public Cloud (Less Common), then when specific needs arise, thresholds are met, alarms are triggered, etc[14]. Resources are brought online in the other cloud to meet demands. An example would be an online retailer that for two months out of the years has an extreme demand placed on its web servers. This demand is outside the normal capabilities of their infrastructure, yet it doesn't make sense to buy additional hardware to service a need that is short and temporary. This is an ideal scenario for Hybrid Cloud usage.

VII. ADVANTAGES OF CLOUD COMPUTING

Achieve economies of scale increase volume output or productivity with fewer people. Your cost per unit, project or product plummets.

Globalize your workforce on the cheap. People worldwide can access the cloud, provided they have an Internet connection.

Reduce capital costs. There's no need to spend big money on hardware, software or licensing fees.

Improve accessibility. You have access anytime, anywhere, making your life so much easier!

Monitor projects more effectively. Stay within budget and ahead of completion cycle times.

*Improve flexibility***.** You can change direction without serious "people" or "financial" issues at stake[5].

VIII. DISADVANTAGES OF CLOUD COMPUTING

Doesn't use a hard drive, while it also can be a benefit it is also a negative as some applications might require a hard drive attached to the computer.
Changes in applications happen without your knowledge or consent, your data is not directly in your hands but in the hands of a third-party.
You are dependent on your internet connection which could be a problem if connection fails and could be a problem for mission critical applications. When your offline cloud computing simply doesn't work
Doesn't work with low-speed connections, if you have a low-speed connection it may take a long time just to get from page to page in a document and would not be beneficial to you.
Although even on a fast connection it may be slow trying to access a similar software program on your desktop.
Stored data might not be secure; with cloud computing all your data is stored on the cloud.
Stored data can be lost as well, data stored on the cloud is unusually safe but if your data goes missing you have no physical or local backup.

IX. CONCLUSION

Cloud computing is changing the way IT departments buy IT. Businesses have a range of paths to the cloud, including infrastructure, platforms and applications that are available from cloud providers as online services. Many people may be confused by the range of offerings and the terminology used to describe them and will be unsure of the risk and benefits.

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