

What is Cloud Computing

Advantages and Disadvantages

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Abstract—

“Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

The first thing to understand is that “the cloud” is simply a metaphor for various data networks, generally located somewhere far away and accessed via the internet. With cloud computing, you eliminate those headaches because you’re not managing hardware and software. The shared infrastructure means it works like a utility: You only pay for what you need, upgrades are automatic, and scaling up or down is easy.

Of course, for the average computer user, some of the most important SaaS offerings are cloud storage services. These allow file hosting, file sharing, and remote data backup. Basically, after signing up for a cloud storage service, you get a certain amount of free storage space for hosting whatever data you would like, along with the option to pay for an upgrade to access more storage space. Just like with other SaaS software, you can increase or decrease your use of the service very quickly, without having to interact with any of the related computing infrastructure.

Index Terms: Cloud, Network, Storage, Services, IaaS, PaaS SaaS, On demand, Utility, Sharing.

ARCHITECTURE OF CLOUD



Fig. 1. Architector of cloud (Visual model)

When talking about a cloud computing system, it's helpful to divide it into two sections: the **front end** and the **back end**. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system.

The front end includes the client's computer (or computer network) and the application required to access the cloud computing system. Not all cloud computing systems have the same user interface. Services like Web-based e-mail programs leverage existing Web browsers like Internet Explorer or Firefox. Other systems have unique applications that provide network access to clients.

On the back end of the system are the various computers, servers and data storage systems that create the "cloud" of computing services. In theory, a cloud computing system could include practically any computer program you can imagine, from data processing to video games. Usually, each application will have its own dedicated server.

A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called **protocols** and uses a special

kind of software called **middleware**. Middleware allows networked computers to communicate with each other. Most of the time, servers don't run at full capacity. That means there's unused processing power going to waste. It's possible to fool a physical server into thinking it's actually multiple servers, each running with its own independent operating system. The technique is called server virtualization. By maximizing the output of individual servers, server virtualization reduces the need for more physical machines

II.WORKING OF CLOUD

Cloud computing is a broad term that describes a broad range of services as shown in Fig.2.. As with other significant developments in technology, many vendors have seized the term "Cloud" and are using it for products that sit outside of the common definition. In order to truly understand how the Cloud can be of value to an organization. Since the Cloud is a broad collection of services, organizations can choose where, when, and how they use Cloud Computing. Cloud Computing services commonly referred to as Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) . Cloud Computing is often described as a stack, as a response to the broad range of services built on top of one another under the moniker "Cloud". The generally accepted definition of Cloud Computing comes from the National Institute of Standards and Technology (NIST) NIST also offers up several characteristics that it sees as essential for a service to be considered "Cloud".

These characteristics are:

- On-demand self-service. The ability for an end user to sign up and receive services without the long delays that have characterized traditional IT
- Broad network access. Ability to access the service via standard platforms (desktop, laptop, mobile etc)
- Resource pooling. Resources are pooled across multiple customers
- Rapid elasticity. Capability can scale to cope with demand peaks
- Measured Service. Billing is metered and delivered as a utility service.

IaaS:

Resources are distributed as a service

- Allows for dynamic scaling
- Has a variable cost, utility pricing model
- Generally includes multiple users on a single piece of hardware

PaaS:

Services to develop, test, deploy, host and maintain applications in the same integrated development environment. All the varying services needed to fulfil the application development process

- Web based user interface creation tools help to create, modify, test and deploy different UI scenarios
- Multi-tenant architecture where multiple concurrent users utilize the same development application
- Built in scalability of deployed software including load balancing and failover
- Integration with web services and databases via common standards
- Support for development team collaboration – some PaaS solutions include project planning and communication tools
- Tools to handle billing and subscription management

Table 1:-

SaaS:among others are two of the activities that are catered by managed cloud service providers.

- Web access to commercial software
- Software is managed from a central location
 - Software delivered in a "one to many" model
 - Users not required to handle software upgrades and patches
 - Application Programming Interfaces (APIs) allow for integration between different pieces of software

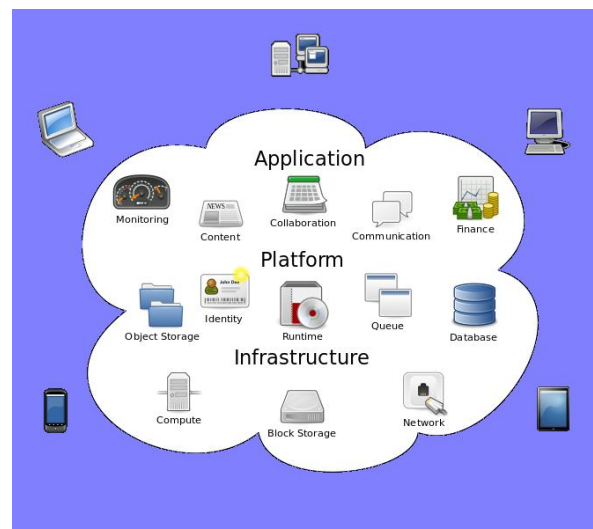


Fig.2. Cloud Computing environment

Comparison By	Advantage	Disadvantage
Price	Pay for only the resources used.	Expensive to have dedicated reserved resources.
Security	Cloud instances are isolated in the network from other instances for improved security.	Able to be access anywhere and on a shared network. Most cloud systems are not compliant with PCI, SSAE 16, and HIPAA standards.
Performance	Instances can be added instantly for improved performance. Clients have access to the total resources of the Cloud's core hardware.	Limited to the core hardware and hypervisor. Performance will also depend on the other cloud instances running in the network.
Scalability	Auto-deploy cloud instances when needed.	Some providers will auto-deploy instances when needed but not remove them when they are not needed.
Uptime	Uses multiple servers for maximum redundancies. In case of server failure, instances can be automatically created on another server.	Can take 4-6 minutes to detect a server fault and spin up a Cloud instance from an image snapshot.
Control	Able to login from any location. Server snapshot and a software library lets you deploy custom instances.	Due to running on a virtual environment, users have limited control over the base function of the core hardware.
Traffic	Deals with spike in traffic with quick deployment of additional instances to handle the load.	Costly for a business that can plan for the resources it needs and any spike in traffic.

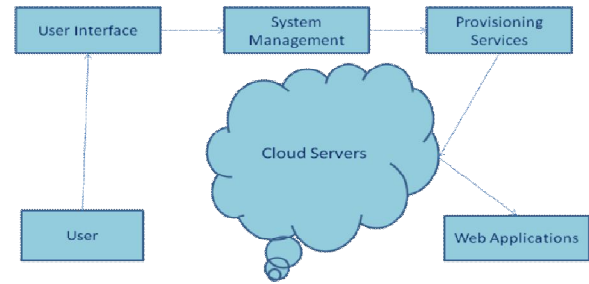


Fig.3.Working of cloud

Applications are created by user as shown in Fig.3.

III. USES OF CLOUD COMPUTING

Cloud Follows Pay for What you Use Model

This particular characteristic of cloud focus on the fact that cloud computing and managed cloud services are truly cost-effective. This means users will have to pay only for the amount of service used by them. This way, money spent on improving business through cloud doesn't prove to be expensive.

*24*7 Availability and Performance Oriented Infrastructure*

Cloud Technology believes in Optimization of Existing Resources

Suppose your company is facing hard time in managing hardware and software stuff. Servers are running extremely low and there is not enough space left for any new data to be stored. To overcome such a situation, cloud services are introduced so that existing servers get rest from the over loaded traffic and work environment of the company becomes more synchronized.

By doing so, not only the resources get optimized but with the help of managed cloud services businesses are able to focus on other business related activities as well.

Disaster Recovery Plan Help to Restore Data Quickly on Cloud

For every cloud to be a successful one, pre-configured disaster recovery plan is must. Cloud disaster recovery plan works automatically at the time a server or data crashes and help in restoring at the earliest. Incorporating such applications makes cloud an efficient platform for managing IaaS, PaaS and SaaS competitively.

Agile Development on Cloud

Agility in business operations comes with effective and efficient tools that help in constructing a strong and construing business or work environment. This is due to

the fact that cloud technology is built on norms like understanding service-level agreements or SLAs, developing various strategies to understand the business as a whole and then improvising as well as analyzing the steps necessary to keep the businesses running smoothly.

Organizations Experience Device Independence

When we say that by putting everything on cloud can

reduce your worry of keeping a track of hardware and software devices, we probably want to make your existing physical world into a virtual one. With managed cloud services you don't have to bother about what's going on in your in-house IT premises.

7) Cloud, Cost-Effective in Nature

If you haven't opted for cloud technology till date, don't lag behind and pop into the cloud market to enjoy a cost-effective business environment. As mentioned above that cloud promotes device independence, the cost of hardware and software automatically cuts short. Although, the initial expense of deploying cloud architecture is there, but that also focuses on pay for what you use model.

When we talk about cloud, one thing that concerns us is whether such a technology can cater to the client's needs or whether it can create a highly scalable environment. If such questions boggle your mind, don't worry as managed cloud services will do it for you. Things like cloud monitoring, cloud migration of data from one server to the cloud server etc

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