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Cloud Computing Technology as the Fastest Growing Part of Information Technology and Electronics Engineering for Providing Tremendous Benefits that Rapidly Treated as Exciting New Paradigm

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Abstract— we are interested to know about cloud computing technology and now with the help of this paper we are going to explain it's each and every term related to this technology. Federal government agencies are looking for better vehicles to tame IT budgets. Cloud computing has been recently introduced new infrastructure, training new personnel, or licensing new software. The cloud computing is a critical need to securely store, manage, share and analyse huge amounts of complex data. The computing technology is considered over communication network and this communication network is broadly categorised as infrastructure and wireless networks also known as ADHOC network. Cloud services contain online file storage, social networking sites, web mail and online business application. Cloud computing have changed the way applications are developed and accessed.

Index Terms—Cloud Computing, Architecture of Cloud Computing, Challenges, Cloud Storage, Types of Clouds.

I. INTRODUCTION

We have concluded that cloud computing technology is fastest growing information technology. Now we will introduce about this technology so that the reader will understand its each part easily. The goal of cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities.it is defined by a very large and complex computer network and used to metaphors for the internet. Cloud computing is a way of computing, via the Internet, that broadly shares computer resources instead of using software or storage on a local PC. The objective of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them [1, 2] Or in other words, Cloud Computing is a model for enabling on demand access to shared pool of computing resources, which are available in a remote location and accessible over a network. For e.g. Cloud services contain online file storage, social networking sites, web mail and online business application. Cloud computing have changed the way applications are developed and accessed. Many applications such as word processing, spreadsheets, presentations and database [3] [4, 5] infrastructure to application development as shown in figure1.1.

Figure1.1. Resources Application

Above shown figure1.1 suggested that resources applications of cloud are large in number and with the help of that we can compute cloud in greater extent [6]. The cloud also focuses on maximizing the effectiveness of the shared resources. This approach should maximize the use of computing powers thus reducing environmental damage as well as, since less power, air conditioning, rackspace, and so on, is required for the same functions. Cloud is based on application [7]. However, the Business applications are moving to the cloud. It's not just a fashion; the shift from traditional software models to the Internet has steadily gained momentum over the last 10 years. Looking ahead, the next decade of cloud computing promises new ways to collaborate everywhere, through mobile devices [8, 9].

II. THE CHALLENGE OF ASSUMPTIONS

We have concluded that at the same time cloud computing has large number of challenges that we assumpt few things. The word cloud is a metaphor for the internet or the online world. Cloud storage works as a combination of an online backup or storage service and cloud computing for data management. The amount and variety of hardware and software required to run them are discouraging. You need a whole team of experts to install, configure, test, run, secure, and update them. Traditional business applications have always been very complicated and expensive. Cloud Computing technologies and providers alike are rarely concerned with legacy systems or data, and most are barely over a decade old. Data is often "clean," as it was carefully curated upon ingestion, and providers can frequently control what data they will accept. Workloads are often static [10]. Applications are designed to run on a limited number of fixed components, many of which were built within the last decade. In general, many of these organizations operate relatively divested by legacy systems and data sets. By contrast, large corporations and government agencies don't have the luxury of living "legacy-free." Data holdings are anything but clean, and adversaries aren't going to comply with requests to standardize. Perhaps most notable, while successful analytical processes are critical to many "Web 2.0" businesses, the level of mission criticality varies a bit from traditional IT definitions [11]. That's not to say that Cloud Computing technology or providers are unreliable, and as time goes on our worlds will continue to move closer together. But assumptions must be understood, risks weighed, staffing and support factored into the cost equations, and the threat of orphaning measured. Some Cloud technologies won't exist within acceptable risk parameter [12].

III. HOW CLOUD STORAGE WORKS

Now author is going to explain how cloud storage works can be up and running in days or weeks, and they cost less. With a cloud app, you just open a browser, log in, customize the app, and start using it. It delivers remote services with a user's data, software and computation Cloud storage came, relatively recently, on to the computing scene as a means by which companies and individuals can store or backup files in their computers and mobile devices on an online server. Over time, the number of files and documents in a computer keep growing until they reach a point where there's simply not enough space to contain them all. A solution is then needed to store files in a separate location so as to free up computer space, as well as allow for more files to be acquired. One solution is to begin storing files on an external or portable hard drive [13]. While this may work for some, companies and individuals with terabytes of data would quickly fill an external drive and find themselves back where they started; they need more. Below shown figure 1.2 and 1.3 describes how cloud storage works.

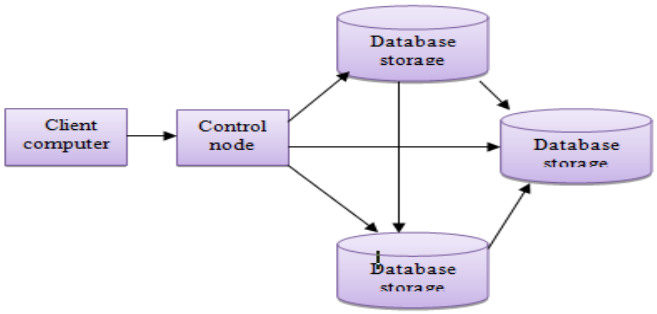

Figure 1.2. Cloud Storage.

Data centers can be located anywhere in the world depending on your storage provider. Most cloud storage services ensure the safety and privacy of your files by encrypting the data so that it is not intercepted and read by malicious third parties as shown in figure 1.3 [14]. In this way, we can say that the costs are spread over fewer users than a public cloud (but more than a private cloud), so only some of the cost savings potential of cloud computing are realized.

Figure 1.3. Another Figure that Depicts How Cloud Storage Work.

IV. ARCHITCTURE OF CLOUD COMPUTING

Now author will present the architecture of cloud computing .The baseline of our study assumes that the entire job is performed on one virtual machine running on the fastest physical node. The systems architecture of the software systems involved in the delivery of cloud computing [15], typically involves multiple cloud components communicating with each other over a loose coupling mechanism such as a messaging queue as shown in figure 1.4.

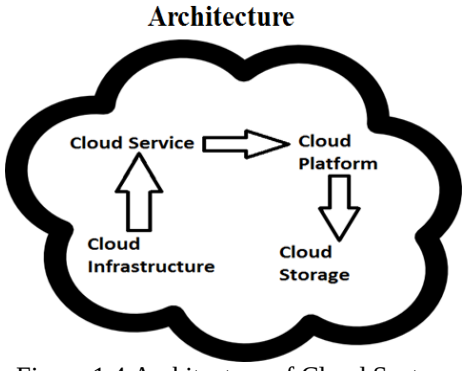

Figure 1.4 Architecture of Cloud System

Elastic provision implies intelligence in the use of tight or loose coupling as applied to mechanisms such as these and others. Cloud is necessarily the combination of at least one private cloud with public cloud or the vice versa. Clouds are formed when the service provider of a public cloud gets into partnership with the private cloud hosting company to provide mixed services to his clients and the reverse also holds true with hybrid cloud computing services.

V. CLOUD COMPUTING LAYERS

Now its turn to present layers of cloud computing .There are some cloud computing layers shown below 1.5 [16].

1. Cloud Client layer
2. SAAS
3. PAAS
4. IAAS

1. Cloud Client layer

It relies on cloud computing for application delivery, or that is specifically designed for delivery of cloud services and that, in either case, is essentially useless without it.

2. Software as Services

Software as a Service is the hosted delivery of Software that consumers can access over the internet." This definition is rather simplistic. By this definition web based email services such as Gmail, Hotmail etc. are SaaS applications. It includes such services as managed by email, CRM, and office productivity applications.

3. Platform as Services

It provides Microsoft Azure, Salesforce.com'sForce.com, and Google's App Engine. Applications developed on the platform are tied to the platform. Each platform has its own development model (can be more aptly called quirks) and developers need to be aware of these.

4. Infrastructure as Service

Infrastructure as a Service is the hosted delivery of infrastructure services such as servers, networks and other hardware to consumers. It provides consumers access to on-demand, scalable storage and compute power. Providers of cloud services—vendors, arriers, and service providers gain greater awareness of customer behaviour with cloud computing than with on-premise solutions. It includes consumers with the processing, storage, networks, and other fundamental computing resources required for running applications.

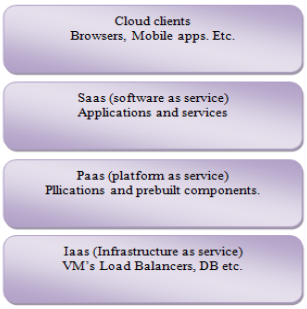

Figure 1.5 Cloud Computing Layers

There are hundreds of cloud storage providers on the Web, and more are popping up all the time. Providing storage isn't the only area in which competition is strong, but also the amount of storage each company offers to its clients seems to be growing daily. Cloud computing is impossible if you cannot connect to the Internet. Since you use the Internet to connect to both your applications and documents, if you do not have an Internet connection you cannot access anything, even your own documents.

VI. TYPES OF CLOUD

With cloud computing technology, large pools of resources can be connected through private or public networks. This technology simplifies infrastructure planning and provides dynamically scalable infrastructure for cloud based applications, data, and file storage. Businesses can choose to deploy applications on Public, Private, Hybrid clouds or the newer Community Cloud. Cloud systems automatically control and optimize necessary resources depending on the needs of users and required types of services. It is different types of cloud whose can be used to this cloud system [17, 18] and as shown in figures 1.6.

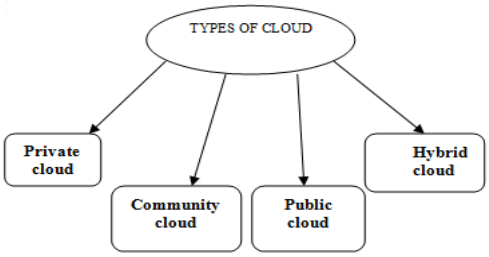

Figure 1.6 Types of Cloud

1. Private Cloud

Private clouds are of two types: On-premise private clouds and externally hosted private clouds. Externally hosted private clouds are also exclusively used by one organization, but are hosted by a third party specializing in cloud infrastructure. Externally hosted private clouds are cheaper than On-premise private clouds. Possibilities of cloud solutions can be available to the system user in a short period of time, if it is necessary A private cloud implementation aims to avoid many of the objections regarding cloud computing security is the phrase used to describe a cloud computing platform that is implemented within the corporate firewall, under the control of the IT department as shown in figure 1.7. We mean that a private cloud cannot be accessed from anywhere and at any point of time.

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Figure 1.7 as shown by private cloud

Because a private cloud setup is implemented safely within the corporate firewall, a private cloud provides more control over the company's data, and it ensures security, albeit with greater potential risk for data loss due to natural disaster.

2. Public Cloud

It is important to note that all customers on public clouds share the same infrastructure pool with limited configuration, security protections and availability variances. There are limited service providers like Microsoft, Google, etc., who own all infrastructure at their Data Center and the access will be through Internet mode only. No direct connectivity proposed in Public Cloud Architecture.

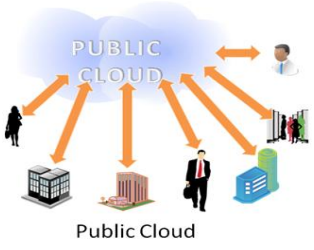

Figure1.8 As shown by public cloud

3. Community Cloud

It is managed by a third-party and hosted internally or externally as shown in figure 1.9.

Figure1.9. As shown by community cloud

4. A Hybrid Cloud

If you want a cheap way to store and access non-core business information, the public cloud may be a good option. If you have security information that can't get out though, the private cloud may be more your speed. And the best thing. If you need both, there's always the hybrid. This means that providers not only know the technology consumption habits and needs, but are also able to standardize consumers on their platforms and applications.

VII. ADVANTAGES OF CLOUD STORAGE

We know very well that behind every technology there are advantages and disadvantages now we will explain its advantages one by one [19].

1. Additional data storage is in right away.
2. It is able to retrieve data from any location that has Internet access.
3. Used to save and retrieve your information.
4. Turning a personal project into a collaborative effort.

In this way , Industry experts believe that this trend will only continue to grow and develop even further in the coming few years. While cloud computing is undoubtedly beneficial for mid-size to large companies, it is not without its downsides, especially for smaller businesses. We now bring you a list of advantages of disadvantages of cloud computing, with a view to helping such establishments fully understand the concept of cloud computing.

VIII. DISADVANTAGES OF CLOUD COMPUTING

There are many disadvantages of cloud computing, which we are to be formed [20]. Though it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. You should be aware of the fact that this technology is always prone to outages and other technical issues. Even the best cloud service providers run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, you will need a very good Internet connection to be logged onto the server at all times as shown in figure 1.10. You will invariably be stuck in case of network and connectivity problems.

1. Service Unavailability
2. Less Reliability
3. Migration is difficult
4. International / Political Issues

Figure1.10 Accelerating Cloud in Pacific

Baseline EDP

This configuration consumes W × ma joules for completing the entire workload, where *W* represents a physical node's powers as equation no 1. Thus, the EDP of this study's baseline is

$$EDP\ base = (W \times ma)\ (ma) = Wm2a2. \qquad (1)$$

IX. CHARACTERSTICS OF CLOUD COMPUTING

The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location-independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data centre). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.

1. Individual use on request
2. Wide range of network access capacities
3. Allocation of resources
4. The elasticity and flexibility of the system
5. Measurable service - payment pay-per-use

In this way, Dynamic federation of compute capacity as Dynamic geo-balancing; Instant workload migration; Virtualization-aware storage; Virtualization-aware networking; Virtualization embedded-software-based smart mobile phones; Trusted platforms and embedded supervisors for security; Virtualization management operations discovery, configuration, provisioning, performance, etc.; Energy optimization and saving for green datacenters; Virtualization supporting cloud computing; Applications as pre-packaged virtual machines; Licensing and support policies The support for data intensive computing is critical to advance modern science as storage systems have exposed a widening gap between their capacity and their bandwidth by more than 10-fold over the last decade. There is a growing need for advanced techniques to manipulate, visualize and interpret large datasets. Scientific Computing is the key to solving "grand challenges" in many domains and providing breakthroughs in new knowledge, and it comes in many shapes and forms: high-performance computing (HPC) which is heavily focused on compute-intensive applications; high-throughput computing (HTC) which focuses on using many computing resources over long periods of time to accomplish its computational tasks; many-task computing (MTC) which aims to bridge the gap between HPC and HTC by focusing on using many resources over short periods of time; and data-intensive computing which is heavily focused on data distribution, data-parallel execution, and harnessing data locality by scheduling of computations close to the data. Cloud isn't always cheaper; it's just likely to be cheaper if organisations follow the right use model. To get the best ROI out of cloud services and platforms organisations need to model the cost profile of applications, monitor the resources they use and adjust any deployment to balance cost against performance, according to the analysts. Cloud cost-monitoring tools like Cloudy, Cloud Cruiser, Cloud ability, Newvem and Right scale, plus the cost-reporting tools from large cloud vendors, provide a way of doing these calculations. Good cost management should also drive business' hybrid deployment, service selection, and discount schedule. While we will cover a little light background, our primary focus will be on the consequences, corollaries and techniques introduced by some of the leading cloud developers and organizations.

We each have a different deployment model, different applications and workloads, and many of us are still learning to efficiently exploit the platform services offered by a modern implementation. The discussion will offer the opportunity to share these experiences and help us all to realize the benefits of cloud computing Services Computing currently shapes the thinking of business modeling, business consulting, solution creation, service delivery, and software architecture design, development and deployment. The global nature of Services Computing leads to many opportunities and challenges and creates a new networked economic structure for supporting different business models. SCC 2013 will help in bridging the gap between business services and information technology by driving research in technologies such as service-oriented architecture (SOA), business process integration and management, service engineering and grid and cloud computing and Web 2.0.

X. CONCLUSION

Cloud computing is a style of computing over the internet. The word cloud is a metaphor for Internet Cloud Computing has become a scalable services consumption and delivery platform in the field of Services Computing. The technical foundations of Cloud Computing include Service-Oriented Architecture and Virtualizations of hardware and software. The goal of Cloud Computing is to share resources among the cloud service consumers, cloud partners, and cloud vendors in the cloud value chain. The resource sharing at various levels results in various cloud offerings such as infrastructure cloud.

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