

Innovations in the worth of Cloud Computing

Dr. Mukeh Kumar, Head of Computer Science Department, Hindu College, Sonapat

Abstract— In the last few years Information Technology reach the new heights. In which the concept of cloud computing is an innovative way that accelerate the revolution that cloud organization provide more reliable service, software and infrastructural facility anytime and anywhere to its users. Cloud computing is a different way to deliver computer resource rather than a new technology; the paper defines the value of cloud computing and conventional Grid computing and its major components. This paper also highlights the advantages and disadvantages of cloud computing.

Traditionally, we are using the computer by installing software along with the data files created, stored and retrieve data in Personal computer. After innovation in the worth of cloud computing instead of clicking an icon in your START menu to access a program, you can click a "Bookmark" in your web browser to access it and every software you access and data you store are secure and safe in all respect.

Originally Information Technology was dominated by the mainframe computing. This strong configuration eventually gave way to the client-server model. Innovation in the field of Information Technology has increase the functioning of mobile technology and ofcourse the cloud computing. But this revolution, like every revolution that contains components of the past which it now developed to put the concept of cloud computing in proper context, keep in mind that DNA of cloud computing is essentially the creation of its predecessor systems. This absolute change in computing technology by the IT professionals get this opportunities to hold wheel of change and use them for the benefits of the nation.

This paper also introduces the value of implementing cloud computing in the real world as well as outlines cloud architecture with its major components and highlighting the strength and weaknesses of cloud computing.

Index Terms—Cloud Computing, Technology innovations in Traditional Computing, Revolution in Cloud Computing, Cloud architecture, Strength and weaness of Cloud Computing, Cloud Computing and corporates

1 INTRODUCTION

Cloud computing is a process to enable with powerful tools, technique, technology and applications by configuring a computing machine dynamically and virtually with other computing resources such as Storage Area Networks (SANs), network equipment, Network resources, applications, firewall, antiviruss and other security perspectives.

Cloud computing also describes applications that are extended to be accessible through the Internet. These cloud applications use as big data centers and powerful servers that host web applications and web services. Anyone with a suitable Internet connection and a standard browser can access a cloud application. To understand it in better way we can compare between Grid computing and cloud computing.

1.1 Grid Computing:

Grid computing is a term referring to the combine the computer resources from multiple administrative domains to reach a common goal. The grid can be thought of as a distributed system with non-interactive workloads that involve a large number of files. What distinguishes grid computing from conventional high performance computing systems such as cluster computing is that grids tend to be more loosely coupled, heterogeneous, and geographically dispersed. Although a grid can be dedicated to a specialized application, it is more common that a single grid will be used for a variety of different purposes. Grid Computing is computing technology that includes a combination of computer resources that offers perfect access to computing power and data storage capacity as

distributed pattern over the segments. Users utilizing grid computing will not perform as system administrator tasks but system administrators are involved in installing, upgrading servers and its applications. Grid computing systems require a significant financial investment because high software and hardware cost.

1.2 Cloud Computing:

The inventive concept of Cloud Computing came from grid computing technology, cloud computing technology offers highly flexible on-demand provisioning of its resources to help corporate / enterprise significantly and cut IT costs in al respect and help industry to accommodate this innovative IT technology. The customer does not own the platform, infrastructure, or software in the cloud computing technology. With cloud computing, users have the ability to scale up to larger capacities at a moment's without purchasing new computing infrastructure or hire more IT experts and license software etc. Cloud computing operates on a utility basis where users pay for only the resources they use which makes it a more economical computing choice as well, the computing infrastructure involves connecting various computers across multiple servers making it a large virtual environment which allows users to use the power and performance of the many resources that available online.

Cloud computing enterprise can outsource their data infrastructure ensuring data remains safe and secure in the event of a disaster such as a power outage. Another benefit for business is companies can avoid the high costs of creating an internal

data center that is secure. The cloud provider maintains the servers and networks and the sharing of resources among a large pool of users decreases infrastructure costs and peak load capacity. As long as users have access to a computer device and the internet, they can access the server from anywhere.

Although Cloud Computing and Grid Computing both offer high scalability, multitasking, however the Cloud offers better storage solutions, in grid computing it is not economical for storing even very small data. The choice of computing technology for each business will depend on their particular of Information Technology frastructure needs and requirements.

Some how many experts refer to the Internet as the "the cloud", and Cloud Computing is simply "Internet-based Computing", where shared resources, software and information are provided to computers and other devices on-demand, much like electricity. If you use google drive is cloud computing, because you didn't have to install any software on your computer, you simply accessed your storage drive via e-mail over by web browser, your activities of create, delete, retrieve messages and your content were all accomplished & stored online. The bigger benefits of Cloud Computing are especially for corporates are many more but primarily benefits is the costs of the followings

- Software licensing,
- Software maintenance
- Server Management
- Data security & Integrity

get minimized, or the case of a 'server', removed completely. Another huge advantage for many corporate have the ability for their employees to work from anywhere, any time; they have access to company's data as well as information for the different purposes. Innovative improvement is always required to ride the predictable move of change. Indeed, the success of the transformation of Corporate to an on demand Business depends on driving the right force in the right direction of efficiency, productivity, and innovation to achieve constant growth.

Enterprises efforts, to reduce computing costs. Cloud computing takes these steps to a new level and allows an organization to further reduce costs through improved utilization, reduced administration and infrastructure costs, and faster deployment cycles and a secrate and secure vision. The cloud is a next generation platform that provides dynamic resources, virtualization, and high availability.

Cloud computing infrastructure accelerates and promotes the implementation of ever growing changes in the fast moving environment. Companies are accepting these hassle free envi-

ronments at their highest priority. The major issue for a corporate to reduce infrastructural cost and increase profit in this highly competitive environment, hence this acceptance of adopting the new challenges driven by the pressure to cut costs and grow to succeed simply by doing the same things better way by cloud computing.

Innovative expansion always requires extraordinary flexibility and awareness. In this context, a cloud computing service is a necessity of individual as well as corporates. It provides automated support to deliver standardized services quickly and cheaply. Cloud computing infrastructure allows enterprises to achieve more efficient use hardware and software form Information System. Cloud computing is a way which through we can accommodate more advance resource timely at very reasonable cost and enhance profitability by centralized use of computing equipments. It allows individuals, corporates to streamline procurement processes and eliminate high cost maintenance technical skills related to setup, configuration, and support etc.

2. DEFINITION

A cloud is a collection of virtualized computer resources enable services to a computing machine anytime and anywhere on the earth. A cloud is a host with variety of different workloads, including batch-style, back-end jobs and interactive, user-facing applications. It deployed and scaled-out quickly through the rapid provisioning of virtual machines or physical machines. It also Support redundant, self-recovering, highly scalable programming models that allow to recover from many unavoidable hardware / software failures

2.1 Cloud computing

Cloud computing environments support web computing by quickly providing physical and virtual servers on which the web applications can run. Cloud computing should not be confused with Grid computing. Grid computing involves dividing a large task into many smaller tasks that run in parallel on separate servers. Grid requires many computers, typically in thousands, and commonly uses servers, desktops, and laptops. Clouds support web and non-web environments, such as a three-tier web architecture running standard or as web applications. A cloud is more than a collection of computer resources because a customer does not own the platform, infrastructure, or software in the cloud computing technology. With cloud computing, users have the ability to scale up to larger capacities at a moment's without purchasing new computing infrastructure or hire more IT experts and license software etc. Cloud computing operates on a utility basis where users pay for only that they use of it.

2.1.1 Example for Cloud computing

Google drive, is an example for cloud computing service. End-users no longer required document editing software to be installed on their PCs, in order to create the most popular document formats. End users create an account with Google, and are able to create, edit, store documents in many of the popular document formats. Moreover, since the documents are stored in the cloud, they can be accessed from anywhere in the world as long as you have an internet connection! End-users no longer have to worry about storing and backing up the data and carrying with them when on move.

3. ROLE OF IT IN CLOUD COMPUTING

Let us consider the probability that corporates will require greater automation, requiring a change in the tasks of personnel due to the growth in production and to get crucial information in time. You see, IT may be consolidating, with a need for less hardware and software implementation in the new paradigm, the technical expert will have greater responsibilities for enhancing and upgrading general business processes.

3.1 The developer:

In the growing use of computing devices, the popularity of social networking, and other aspects of the evolution of commercial IT processes and systems, will guarantee work for the developer community; however, some of the traditional roles of development personnel will be shifted away from the enterprise's developers due to the systemic and systematic processes of the cloud configuration model.

Survey shows power of cloud computing and application development demonstrated that the demand for mobile technology will grow exponentially. To meet the growing needs of mobile connectivity, more developers will be required, to understand how cloud computing works.

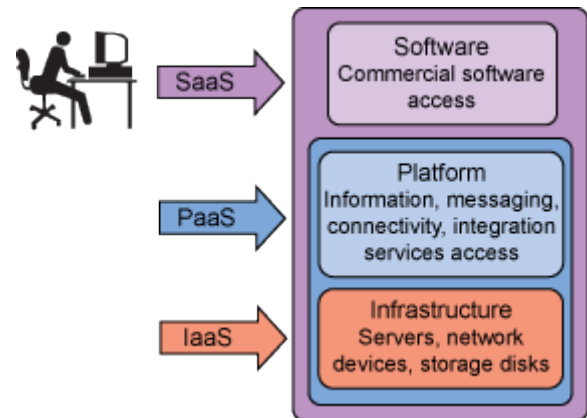
3.2 The Administrator:

Administrators are the guardians and legislators of an Information Technology System. They are responsible for overall control of resources as well as user access to the network. This means sitting on top of the creation of user passwords and the formulation of rules and procedures for such fundamental functionality as general access to the system assets.

3.3 The Architects:

The function of the architecture is the effective modeling of the given system's functionality in the real IT world. The basic responsibility of the architect is development of the architectural framework of the agency's cloud computing model. The architecture of cloud computing is essentially comprised of the abstraction of the three layer constructs, SaaS (Software as a Service), PaaS(Platform as a Service), and LaaS (Logging as a

service) in such a way that the particular enterprise deploying the cloud computing approach meets its stated goals and objectives.



The role of the architect in the age of cloud computing is to conceive and model a functional interaction of the cloud's layers. The architect must use the abstraction as a means to ensure that IT is playing its proper role in the attainment of organizational objectives.

3.4 Risk assessment:

The main concerns voiced by those moving to the cloud are security and privacy. The companies supplying cloud computing services know this and understand that without security and reliable security, their businesses will collapse. So security and privacy are high priorities for all cloud computing entities.

3.4.1 Governance:

How will industry standards be monitored? Governance is the primary responsibility of the owner of a private cloud and the shared responsibility of the service provider and service consumer in the public cloud. However, given elements such as transnational terrorism, denial of service, viruses, worms are the primary assessment. There is a need for some kind of broader collaboration, particularly on the global, regional, and national levels. Of course, this collaboration has to be instituted in a manner that will not dilute or otherwise harm the control of the owner of the process or subscribers in the case of the public cloud.

3.4.2 High Bandwidth requirements:

If you are going to adopt the cloud framework, bandwidth and the potential bandwidth bottleneck must be evaluated in your strategy. So what is the best current solution for the bandwidth issue? In today's market the best answer is the sharp edge server. A sharp edge server is a server that has been optimized to minimize the use of physical space and en-

ergy. One of the huge advantages of the sharp edge server for cloud computing use is bandwidth speed improvement so look to the capabilities of your provider to determine if the bandwidth bottleneck will be a major performance issue.

3.4.3 Financial impact:

The cost in IT operations comes from administrative and management functions, the implicit automation of some of these functions will cut costs in a cloud computing environment. Automation can reduce the error factor and the cost of the redundancy of manual repetition significantly. There are other contributors to financial problems such as the cost of maintaining physical facilities, electrical power usage, cooling systems etc.

4. CLOUD COMPUTING TYPES

4.1 Public Cloud :

It is referred to as external cloud and describes the conventional meaning of cloud computing: scalable, dynamically provisioned, often virtualized resources available over the Internet from third-party provider, which divides up resources and bills its customers on a utility basis. An example is think web, a company that provides a multi-tenant architecture for supplying services such as Desktops, Software and Platform. Other popular cloud vendors include homeshop18.com, Salesforce.com and Amazon.com etc.

4.2 Private Cloud :

It is referred to as corporate or internal cloud. It is a term used to indicate a proprietary computing architecture providing hosted services on private networks. Such type of cloud computing is generally used by large companies, and allows their corporate network and data centre administrators to effectively become in-house service providers' catering to customers' within the organization. However, it contradicts many of the benefits of cloud computing, as organizations still need to purchase, set up and manage their own clouds.

4.3 Hybrid Cloud :

Experts recommend that a hybrid cloud environment combining resources from both internal and external providers will become the most popular choice for enterprises. For example, a company could choose to use a public cloud service for general computing, but store its business-critical data within its own data centre. This may be because larger organizations are likely to have already invested heavily in the infrastructure required to provide resources in-house or they may be concerned about the security of public clouds.

5. CLOUD SERVICES

There are numerous services that can be delivered through cloud computing, taking advantage of the distributed cloud model. Some brief descriptions of a few of the most popular cloud-based IT solutions are:

5.1 Hosted Desktops

Hosted desktops remove the need for traditional desktop PCs in the office environment, and reduce the cost of providing the services that you need. A hosted desktop looks and behaves like a regular desktop PC, but the software and data customers use are housed in remote, highly secure data centers, rather than on their own machines. Users can simply access their hosted desktops via an internet connection from anywhere in the world, using either an existing PC or laptop or, a thin client.

5.2 Hosted Email:

As more organizations look for a secure, reliable email solution, they are increasingly turning to hosted Microsoft Exchange email plans. Using the world's premier email platform, this service lets Big or small organizations both collect the benefits of using MS Exchange accounts without having to invest in the costly infrastructure themselves. Email is stored centrally on managed servers, providing redundancy and fast connectivity from any location. This allows users to access their email, calendar, contacts and shared files by a variety of means, including all Outlook Access like Outlook Mobile Access (OMA) and Outlook Web Access (OWA).

5.3 Hosted Telephony (Voice over IP) : Voice over Internet Protocol (VOIP) is a means of carrying phone calls and services across digital internet networks. In terms of basic usage and functionality, VOIP is no different to traditional telephony, and a VOIP-enabled telephone works exactly like a 'normal' one, but it has distinct cost advantages. A hosted VOIP system replaces expensive phone systems, installation, handsets etc. are available to use on a monthly subscription basis.

5.4 Cloud Storage

Cloud storage is growing in popularity due to the benefits it provides to access anywhere and the removal of the burden of in-house management and maintenance. It is basically the delivery of data storage as a service, from a third party provider, with access via the internet and billing calculated on capacity used in a certain period (e.g. per month).

5.5 Dynamic Server (Next Generation Environment)

Dynamic servers are the next generation of server environment, replacing the conventional concept of the dedicated server. A provider like Think Grid gives its customer's access to resources that look and feel exactly like a dedicated server, but that are fully scalable. One can directly control the amount of processing power and space used, meaning one doesn't have to pay for hardware they don't need. Typically, they can make changes to their dynamic server at any time, without the costs associated with moving from one server to another.

6. POTENTIAL PROBLEMS

Of course, there are some potential issues that could be barriers to this shift in mobile computing. The most prominent problem is the lack of speedy mobile Internet access everywhere. For example, 3G coverage is spotty outside urban areas, leading to intermittent connection issues and slow speeds.

6.1 Consider these possible risks factors

- Adverse impact of mishandling of data.
- Unwarranted service charges.
- Financial or legal problems of vendor.
- Vendor operational problems or shutdowns.
- Data recovery and confidentiality problems.
- General security concerns.
- Systems attacks by external forces.

With the use of systems in the cloud, there is the ever present risk of data security, connectivity, and malicious actions interfering with the computing processes. However, with a carefully thought out plan and methodology of selecting the service provider, and an astute perspective on general risk management, most companies can safely leverage this technology.

7. ADVANTAGES OF CLOUD COMPUTING

Reduced administration costs, IT solutions can be deployed extremely quickly and managed, maintained, patched and upgraded remotely by service provider. Technical support is provided round the clock by responsible service providers like Think Grid for no extra charge, reducing the burden on IT staff. This means that they are free to focus on business-critical tasks, and businesses can avoid incurring additional manpower and training costs. IT giant IBM has pointed out that cloud computing allows corporate simplify procurement processes, and eliminates the need to duplicate certain computer administrative skills related to setup, configuration, and support.

7.1 Efficient Resource utilization

Combining resources into large clouds reduces costs and maximizes utilization by delivering resources only when they are needed. Moving more and more applications, infrastructure, and even support into the cloud can free up precious time,

effort and budgets to concentrate on the real job of exploiting technology to improve the mission of the company. It really comes down to making better use of valuable time – focusing on your business and allowing cloud providers to manage the resources to get you to where you need to go. Sharing computing power among multiple tenants can improve utilization rates, as servers are not left idle, which can reduce costs significantly while increasing the speed of application development.

7.2 Economies of scale

Cloud computing customers can benefit from the economies of scale enjoyed by providers, who typically use very large-scale data centers operating at much higher efficiency levels, and multi-tenant architecture to share resources between many different customers. This model of IT provision allows them to pass on savings to their customers.

7.3 Cloud Scalability

Scalability and flexibility are highly valuable advantages offered by cloud computing, allowing customers to react quickly to changing IT needs, adding or subtracting capacity and users as and when required and responding to real rather than projected requirements. Even better, because cloud-computing follows a utility model in which service costs are based on actual consumption, customer only pay for what he use. Customers benefit from greater elasticity of resources, without paying a premium for large scale.

7.4 Quick and easy implementation

Without the need to purchase hardware, software licences or implementation services, a company can get its cloud-computing arrangement off the ground in minutes.

7.5 Absolute helps smaller businesses

There has been a huge disparity between the IT resources available to small businesses and to enterprises. Cloud computing has made it possible for smaller companies to compete on an even playing field with much bigger competitors. Renting IT services instead of investing in hardware and software makes them much more affordable, and means that capital can instead be used for other vital projects. Providers like Think Grid take enterprise technology and offer services that would otherwise cost hundreds of thousands of dollars for a low monthly fee.

7.6 Quality of service Access anywhere anytime

A selected vendor should offer 24 x 7 customer support and an

immediate response to crisis situations. Cloud-based IT services let you access your applications and data securely from any location via an internet connection. It's easier to collaborate too; with both the application and the data stored in the cloud, multiple users can work together on the same project, share calendars and contacts etc. It has been pointed out that if your internet connection fails, you will not be able to access your data. However, due to the anywhere access nature of the cloud; users can simply connect from a different location

7.7 Technical Support

A good cloud computing provider will offer round the clock technical support. The customers, for instance, are assigned one of the support pods, and all subsequent contact is then handled by the same small group of skilled engineers, who are available 24/7. This type of support model allows a provider to build a better understanding of your business requirements, effectively and becoming an extension of team.

7.8 Disaster recovery / backup

Recent research has indicated that around 75% of businesses do not have adequate disaster recovery or business continuity plans, leaving them vulnerable to any disruptions that might occur. Providers can provide an array of disaster recovery services, from cloud backup allowing you to store important files from your desktop or office network within their data centers to having ready-to-go desktops and services in case your business is hit by problems. Hosted Desktops from popular magazine "Think Grid", for example, you don't have to worry about data backup or disaster recovery, as this is taken care of as part of the service. Files are stored twice at different remote locations to ensure that there's always a copy available 24 hours a day, 7 days per week.

8. DISADVANTAGES OF CLOUD COMPUTING

8.1 Lack of Secure

We live in an age in which 41 percent of companies utilize their employee / subordinate to read their workers email. Certain companies and industries have to maintain strict watch on their data at all times.

8.2 Fears of security

Attached closely to fears of security is a fear that putting certain data in the cloud makes it hard to log for compliance purposes. While there are currently some technical ways around this, and undoubtedly start-ups out there waiting to launch their own products that make it possible to log conversations

between virtualized servers sitting in the cloud.

8.1 Lack of faith on Cloud Platform

Most clouds force participants to rely on a single platform or host only one type of product. Google Applications Engine locks users into proprietary formats, and Windows lovers out there have Go Grid for supporting computing offered by the Serve Path guys. If you need to support multiple platforms, as most enterprises do, then you're looking at multiple clouds. That can be a terrible to manage.

8.2 Reliability is still an issue

Earlier this year Amazon's S3 service went down, and while the entire system may not crash, some services that can affect users. Even inside an enterprise, data centers or servers go down, but generally the communication around such outages is better and in many cases, fail-over options exist. Amazon is taking steps toward providing costly information and support, but it's far more comforting to have a company-paid IT guy on which to rely.

8.3 Portability isn't faultless

As all-encompassing as it may seem, the so-called cloud is in fact made up of several clouds, and getting your data from one to another isn't as easy as IT managers would like these attach to platform issues, which can leave data in a format that few or no other cloud accepts, and also reflects the bandwidth costs associated with moving data from one cloud to another.

8.4 Cloud still has to exist on physical servers

As cloud computing seems, the data still resides on servers around the world, and the physical location of those servers is important under many nations' laws. For example, Canada is concerned about its public sector projects being hosted on U.S.-based servers because under the U.S. Patriot Act, it could be accessed by the U.S. government.

9. CONCLUSION

Without a doubt, cloud computing is truly a revolutionary concept for many business organizations. Because of the technology's ease of adoption, significantly lower maintenance costs, and greater work efficiency, there is no doubt that cloud computing will gain widespread popularity going forward.

For managers dealing with the growing demand for IT in their respective organizations, cloud computing presents itself as an all-in-one solution, being able to satisfy the growing IT needs while, at the same time, reducing energy usage—all at

an affordable price.

In present global and competitive market, companies must get the most from its resources to succeed. Cloud computing requires enabling its employees, business partners, and users with the platforms and its collaboration tools that promote innovation.

Cloud computing infrastructure is next generation platform that can provide tremendous value to companies of any size. They can help companies achieve more efficient use of IT tools like hardware and software investments and provide a means to accelerate the adoption of innovations.

Cloud Computing is expected to boom as many services that are likely to be hosted on the internet with broadband becoming more and more affordable and beneficial to several.

Business houses with critical data still need to be careful and take necessary precautions before putting their applications on the cloud, as well as the security is concern many debates are already on regarding the safety aspects of cloud computing.

9.1 Why it deserves managerial attention

Cloud computing deserves managerial attention for three fundamental reasons:

- In terms of dealing with the growing organizational IT needs, cloud computing providers enable businesses to instantly add more resources – servers, software, databases etc. by merely completing a web-based interactive solution. It works in the other direction as well; businesses also have the ability to reduce expensive resources instantly.
- Cloud computing presents managers with a way to significantly reduce expenses and costs. Because the concept involves having a business's data stored on the Internet through a cloud computing provider's data center, almost only the cost to be incurred is the result of subscribing to the service provider's.
- For the most part, if a manager fails to give much attention to cloud computing, to discover new and effective ways of increasing their bottom line, cloud computing is an attractive option.

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