AN INSIGHT OF CLOUD COMPUTING

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Abstract : Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services).The word "cloud Computing" is recent but the idea of centralizing computation and storage in distributed data centers maintained by third party companies is not new, it came in the way back 1990s along with distributed computing approaches like grid computing. Cloud Computing aimed at providing IT as a service to the cloud users with greater flexibility, availability, reliability and scalability with utility computing model. The key characteristics of cloud computing are agility, cost, device and location independence, maintenance, performance, productivity, scalability and elasticity, security. There are substantial arguments for the adoption of Cloud Computing: the lasting improvement of cost structures, faster reaction to changes in the market and potential for increases in productivity.

IndexTerms **- flexibility, storage, accessibility.**

I. INTRODUCTION

Relational The term CLOUD refers to a network or internet. It is present at remote location. Cloud can provide services over network which can be public or private, i.e., WAN, LAN or VPN.

What is cloud computing?

Cloud Computing refers to manipulating, configuring and accessing the applications online. It offers online data storage, infrastructure and application. Cloud Computing is both a combination of software and hardware-based computing resources delivered as a network service.

History of cloud computing:

During the 1960s, the initial concepts of time-sharing became popularized via RJE (Remote Job Entry); this terminology was mostly associated with large vendors such as IBM and DEC. Full time-sharing solutions were available by the early 1970s on such platforms as Cambridge CTSS, and the earliest UNIX ports (on DEC hardware).Since 2000, cloud computing has come into existence. In early 2008, NASA's Open Nebula, enhanced in the RESERVOIR European Commission-funded project, became the first open-source software for deploying private and hybrid clouds, and for the federation of clouds. By mid-2008, Gartner saw an opportunity for cloud computing "to shape the relationship among consumers of IT services, those who use IT services and those who sell them" and observed that "organizations are switching from company-owned hardware and software assets to per-use service-based models" so that the "projected shift to computing will result in dramatic growth in IT products in some areas and significant reductions in other areas. In August 2006 Amazon introduced its Elastic Compute Cloud. Microsoft Azure was announced as "Azure" in October 2008 and was released on 1 February 2010 as Windows Azure, before being renamed to Microsoft Azure on 25 March 2014 [1].

II. LITERATURE SURVEY

Why cloud computing?

Two teenagers would be using a good 4GB per month just with Facebook, assuming that they were only average users. At 2MB per minute, an everyday Facebook user can use around 2GB per month. "Web surfing" covers a lot of online activity. Broadly speaking, you can easily use around 2.5MB per minute when browsing on a laptop or desktop. Standard Definition (SD) viewing expect around 700MB per hour. For High Definition (HD) streaming expect around 3GB per month. As an example, if you bingewatch the first season of House of Cards (13 episodes at about 50 minutes each) you will use 65GB of data. Where is all these generated data being backed up or stored? How is it being managed? In order to get solutions to all these kinds of questions, let us first know about what exactly cloud computing is [2].

III. DESIGN AND METHODOLOGY 3.1Architecture of cloud computing

The cloud providers have the physical data centers to provide virtualized services to their users through Internet. The cloud providers often provide separation between application and data. The underlying physical machines are generally organized in grids and they are usually geographically distributed. Virtualization plays an important role in the cloud scenario. The data center hosts provide the physical hardware on which virtual machines resides. User potentially can use any OS supported by the virtual machines used. Basic Cloud Computing Architecture Operating systems are designed for specific hardware and software. It results in the lack of portability of operating system and software from one machine to another machine which uses different instruction set architecture. Virtualization can be very roughly said to be as software translating the hardware instructions generated by conventional software to the understandable format for the physical hardware. Virtualization also includes the mapping of virtual resources like registers and memory to real hardware resources. The underlying platform in virtualization is generally referred to as host and the software that runs in the VM environment is called as the guest. Here the virtualization layer covers the physical hardware. Operating System accesses physical hardware through virtualization layer. Applications can issue instruction by using OS interface as well as directly using virtualizing layer interface. This design enables the users to use applications not compatible with the operating system. Virtualization enables the migration of the virtual image from one physical machine to another and this feature is useful for cloud

as by data locality lots of optimization is possible and this feature is helpful for taking back up in different locations. This feature also enables the provider to shut down some of the data center physical machines to reduce power consumption [3].

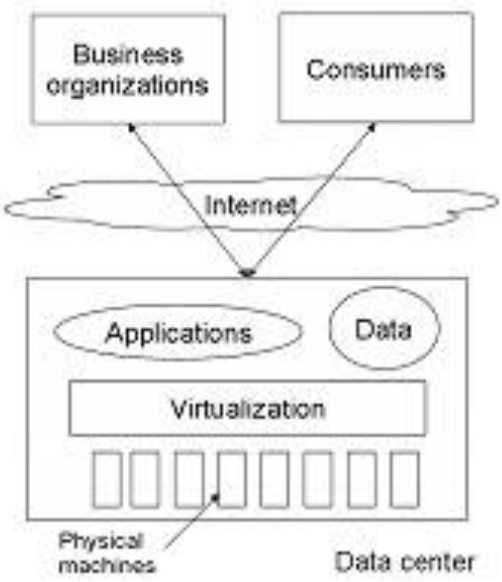

Fig-1: architecture of cloud computing [4]

3.2 Working models of cloud computing

3.2.1 Deployment models:

- **Public Cloud:** is a type of cloud hosting in which the cloud services are delivered over a network which is open for public usage. Public cloud is better suited for business requirements which require managing the load; host application that is SaaS-based and manage applications that many users consume [5].
- **Private Cloud:** is also known as internal cloud; the platform for cloud computing is implemented on a cloud-based secure environment that is safeguarded by a firewall which is under the governance of the IT department that belongs to the particular corporate. Private cloud as it permits only the authorized users, gives the organization greater and direct control over their data.
- **Community Cloud:** is a type of cloud hosting in which the setup is mutually shared between many organizations that belong to a particular community, i.e. banks and trading firms. It is a multi-tenant setup that is shared among several organizations that belong to a specific group which has similar computing apprehensions. The community members generally share similar privacy, performance and security concerns. The main intention of these communities is to achieve their business related objectives [5].
- **Hybrid Cloud:** is a type of cloud computing, which is integrated. It can be an arrangement of two or more cloud servers, i.e. private, public or community cloud that is bound together but remain individual entities. Benefits of the multiple deployment models are available in a hybrid cloud hosting.

3.2.2 Service Models:

- **SaaS (Software as a service):** Delivers a single application through the web browser to thousands of customers using a multitenant architecture. On the customer side, it means no upfront investment in servers or software licensing; on the provider side, with just one application to maintain, cost is low compared to conventional hosting. Under SaaS, the software publisher (seller) runs and maintains all necessary hardware and software. The customer of SaaS accesses the applications through Internet. For example, Salesforce.com with yearly revenues of over $300M, offers on-demand Customer Relationship Management software solutions. This application runs on Salesforce.com's own infrastructure and delivered directly to the users over the Internet. Salesforce 12 Cloud Computing does not sell perpetual licenses, but it charges a monthly subscription fee starting at $65/user/month. Google docs is also a very nice example of SaaS where the users can create, edit, delete and share their documents, spreadsheets or presentations whereas Google have the responsibility to maintain the software and hardware. E.g. - Google Apps, Zoho Office [6].
- **PaaS (Platform as a service)**: Delivers development environment as a service. One can build his/her own applications that run on the provider's infrastructure that support transactions, uniform authentication, robust scalability and availability. The applications built using PaaS are offered as SaaS and consumed directly from the end users' web browsers. This gives the ability to integrate or consume third-party web-services from other service platforms. E.g. - Google App Engine [7].
- **IaaS (Infrastructure as a Service)**: IaaS service provides the users of the cloud greater flexibility to lower level than other services. It gives even CPU clocks with OS level control to the developers. E.g. - Amazon EC2 and S3 [7].

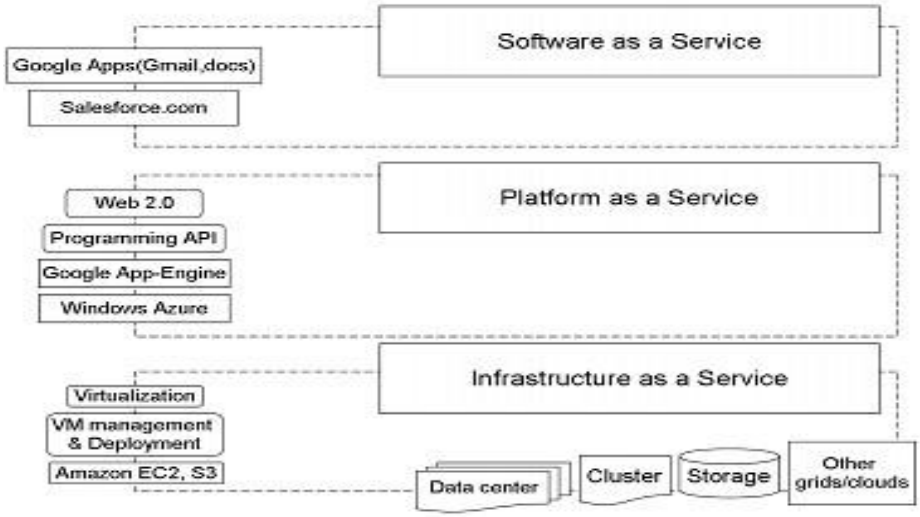

Fig-2 service models of cloud computing [8]

3.3 Advantages of cloud computing

"The move towards the cloud holds a lot of exciting potential for non-profits of all sizes. Not only are many organizations able to realize cost savings through not having to run and maintain their own server(s) (or pay a consultant to do so), many cloud tools enable new levels of sharing and collaboration, which can transform how we work. We live in a world where our supporters are looking to us for greater transparency and there is an increasing need to partner with other organizations to achieve real impact. Using the right cloud tools can help us break down the barriers we currently face and be the more open, effective, and resilient organizations that we need to be."

Reduced Support and Hardware Needs

As you move more business-critical applications into the cloud, you'll likely find that you don't need to upgrade computers as regularly, and many employees can make do without higher-end computers. That's because the actual computing isn't happening on the computer: A $200 tablet can access your Salesforce and Google Apps accounts just as quickly as a $2,000 premium laptop can. Similarly, you may find that a cloud computing infrastructure requires a smaller IT staff than a traditional IT setup does because your organization won't be managing the software anymore.

Anywhere, Anytime Collaboration

Software as a service can act as a great simplifier for many organizations. If you have staff members working off site, they can access their work just as easily at home as they can in the office. If they're using a private or secure Wi-Fi connection, there's also no need to set up a virtual private network (VPN). What's more, cloud tools can make it easier to collaborate with colleagues from outside the organization. If you're planning an event with staff from another non-profit, for example, it's easy to create a Basecamp project where everyone can see each other's work. People working in the same organization might benefit from team collaboration tools like shared calendars, video conferencing, instant messaging, and file sharing via Office 365.

A Green Choice

Cloud computing solutions are also generally greener than traditional IT because they require less in-office IT equipment. While huge data centres require a lot of electricity, it's still a lot less than the thousands of office-grade computers it would take to perform the same big tasks. Large cloud computing providers can also optimize their data centres for energy efficiency much more precisely than manufacturers of desktops and laptops can.

3.4 Disadvantages of cloud computing Security and Availability

Security and availability are still the main concerns that most people have about relying on cloud-based services. You've probably heard of the many high-profile news stories of security breaches in cloud-based services. Although you should certainly think about the implications of a breach in your organizational data, you should also consider that in both cloud-based and on-premises software, most security breaches are attributable to human error. When thinking about cloud security and availability, you should also have a realistic sense of your current technology situation. Fears about the cloud are sometimes based on a utopian vision of an organization's current situation. Odds are that your security isn't perfect, you don't have 100 percent systems uptime, and you may not have staff resources dedicated to IT management. In the cloud, security and management are in the hands of trained, dedicated experts [9].

Cloud Vendors Going Out of Business

Cloud computing is still a quickly changing field, and there's always the danger that a new company might go out of business or radically change its service. A sudden change in service might not be too detrimental if you were only using the application for a one-time project, but it could be disastrous if you were using it for your entire donor database.

When evaluating cloud providers, find out what options you have for backing up and extracting your data. The best services allow you to download your data in a standard, non-proprietary format [9].

The Need for Reliable Internet Service

Finally, you will become more dependent on a good Internet connection if you rely on the cloud. As more mission-critical work is done on the Internet, organizations will need much more bandwidth and few, if any, failures in Internet connectivity. If consistent

Internet access, connection speed, or bandwidth are problems for your organization, cloud solutions may not be right for you at this time.

IV. CONCLUSION & FUTURE ENHANCEMENTS

Cloud computing is a quickly changing area that will undoubtedly continue to play an increasingly major role for non-profits, charities, and libraries as well as their IT systems. But which elements of your IT infrastructure you should move into the cloud and when will vary a lot from organization to organization. Finally, because technology is changing constantly, you can't just evaluate cloud solutions once. An issue that may make cloud computing difficult or impossible for you today may be resolved six months from now. And more cloud tools are being developed all the time. So even if you're not quite ready for the cloud right now, you may find a good cloud solution later. There is a wealth of chatter and hype around the cloud right now, especially as more start-ups continue to go public. Separating the hype and fleeting trends from the reality is often difficult. That said, here are top five cloud predictions for the coming years:

1. More application availability on the cloud
2. Increased growth in the market for cloud
3. More hybrid cloud adoption
4. Increased development for the cloud
5. More innovation because of cloud

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