

Cloud Computing: Impact on IT Industries

***Sweta Kumari Barnwal, Dr. Arun Kumar Marandi,**

**ARKA JAIN University, Jamshedpur-831014, India*

**NIT Jamshedpur-831014, India*

Email- kumar.sweta85@gmail.com, dr.arun@arkajainuniversity.ac.in,

Abstract - This is the time of it businesses where cloud computing is an exceptionally viable and more quickly developing improvement. It relies upon internet with unbelievable structure of figuring. It is giving wide vocation territories to IT experts. It has been given the hypothetical base to future computational gadget. It gives the capacity to run an application on a few entomb associated framework simultaneously. It chip away at the premise of pay according to request through internet and can have the option to get to shared assets without physical procurement. Cloud computing is extremely valuable since it sets aside cash just as few points of industry. Regardless of its few points of interest, it additionally brings a few security issues and difficulties for regulars as well as service providers both.

Keyword: - Cloud Computing, Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Security, Quality of Service (QoS)

I. INTRODUCTION

In Cloud computing the word of cloud men's collection of networks as like water molecules in real cloud. It is a completely new technology combination of SaaS, PaaS, IaaS, utility computing virtualization. Cloud is a algorithm which is used to explain Web as a free space and provide services, data applications, storage, operating system, processing power that exists on the web for sharing. The information technology resources which include storage, server, application, network, services etc provides quick management and easy interactions, least management with providers. Cloud computing is available on demand basis as pay-per-use, which reduces the cost to purchase the physical resources provides benefit to users and providers both. It reduces the workload and requisition of software and hardware at the user side. This paper mainly focused on its features, services, architecture, security challenges and there advantages. Figure - 1 showing the evolution of computing [1].

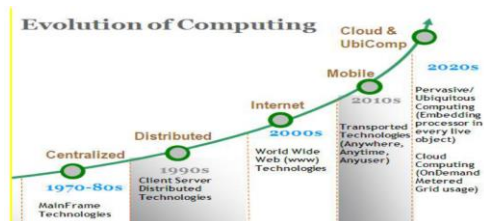


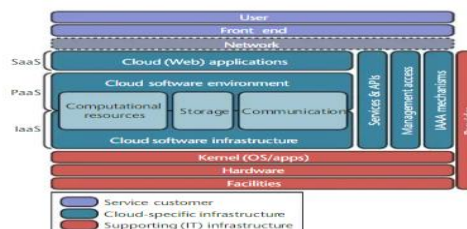
Fig. [1] Evolution of Cloud Computing

II. FEATURES OF CLOUD COMPUTING

Cloud Computing, the long-held dream of computing as a utility, has the potential to transform a large part of the IT industry, making software even more attractive as a service. Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services [2]. There are several features of Cloud Computing. It provides self services, resources pooling and on-demand services with high QoS and low pricing. Resources Pooling: Cloud computing required addition and allocation of resources as well as reallocation and detaching of resources when workload increases. Cost Reduction: It is very economical for the users as they have to pay in accordance to their need and use of the system. On-demand and Self Service: In cloud computing user can continuously vigil the server uptime, allotted network storage and computing capabilities. Pay-as-Use: The user has to pay only for the space/service which they have used, no extra charge taken. Easy to Maintain: its server is easy to maintain and recovery is very fast. Quality of Service: Service quality also plays an important role in cloud computing in which the efficiency and reliability of the service can be considered as two important aspects [4].

III. ARCHITECTURE OF CLOUD COMPUTING MODELS

This model is generally subdivided into three sections; SaaS, PaaS and IaaS, which makes the cloud components. Fig. [2] Exhibits an architecture with reference model that prepares the most prominent cloud components explicitly that irrelevant to security and it manifests an abstract overview of Cloud Computing for the analysis of security issues [3, 4].



V. CHALLENGES IN CLOUD COMPUTING

Fig. [2] Architecture of Cloud computing system

IV. SERVICES

Government and private organizations avail the facilities of services of cloud computing just because of availability of several applications such database management, Customer Relationship Management, data storage, computation etc. It provides the localization of data availability from any web connected device, anywhere at any time. There are three services that are explained in the cloud computing as shown in figure [3].

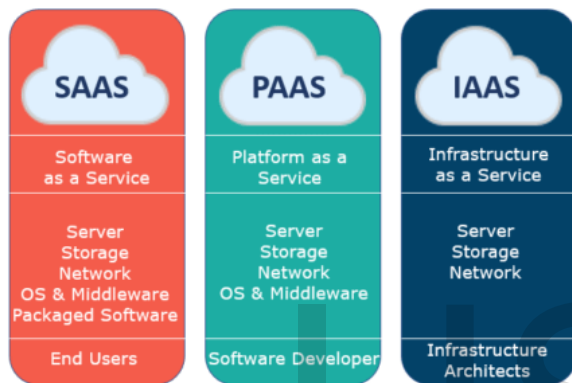


Fig. [3] Services provided by Cloud Computing

- SaaS (Software as a Service)** The service of software which can be accessed by the user via the Internet is called SaaS. This is no need to install such software on system, which makes the management of complex hardware and software very simple. There is no need to purchase, maintain and update such hardware or software. It only requires connection of Internet. Examples; Gmail, Google Docs, Google apps etc.
- PaaS (Platform as a Service)** Under this section of service of Cloud Computing, it provides a suitable platform or environment to the users. The consumers having freedom to install their own required software, which can run on the services provider's infrastructures. Examples; Linux, Oracle, Google App etc.
- IaaS (Infrastructure as a Service)** There are several resources are directly can be used by cloud users such as storage, processing, networks, hardware, operating system etc. on the basis of demand over a wide area of network /Internet. Examples; Cisco, Drop Box etc.

The cloud computing provides on demand self service internet infrastructure which provides the facility to users access computing resources from anywhere at any time. The main challenge is that absence of data integrity, confidentiality and privacy creates uncertain providers compliances. Trust is very important in Cloud Computing because when the sensitive or any private data has been moved to cloud computing paradigm then users don't get guarantee of the effectiveness of their privacy and security controls from the service providers [7]. Sometimes providers do not offer a commitment to allow the client to audit its data. The loss of data governance could have a severe impact on a cloud user's strategy and therefore on the capacity to meet its mission and goals. If providers don't follow certain rules/compliances such as applicable laws, contracts, regulations, standards policy changes etc., then confidentiality of costumers may be at risk. There are several challenges in Cloud Computing.

Reliability of Service Providers: The capability and capacity of service provider is very important. The main objective of a technical service provider must be availability and renown. They have to follow certain laws, regulations, contracts, policies, so that can be trustworthy for their users.

Password Security: It is most important to concern in cloud computing. More accessibility of users in cloud account makes it less secure and very easy to access by unauthorized users. Anyone who knows the password can access the data stored there. Therefore password must be protected and changed regularly.

Auditing: The internal operations of the Cloud Services Providers are not transparent in nature, therefore the auditing process is a big challenge. Customers with unnatural computing resources and capabilities, they hire external audit party to check the integrity of their data. They required the assurance that there is no information leakage in any means, even by this third party. Third party auditing process should bring in no new vulnerabilities towards the privacy of client's personal data [7].

Data Security: It is very risky to keep our personal and sensitive data over the cloud. It must be defined for personal use only not to be shared with other parties. Providers must keep this in their mind, so that gathered data can be effectively and securely managed. It can be resolve by providing Ensure limited access to the users' data by the Cloud service Provider's employees [8].

Insider Malicious: In the data center of cloud computing service provider's employees having authority to access the private/sensitive data of few or all users that also creates a big challenge. It also decreases the integrity of data and ultimately reduces the trust on providers.

Compliance/Adherence: The move of personal/sensitive data towards cloud computing could expose a compliance gap – especially for organizations. This technique comes in force when data protection regulations are tightening significantly. Not only European Union's General Data Protection Regulation (GDPR) has come into force, but other regulations, such as PCI-DSS standard for payment cards, have prompted

organizations to review how they gather and process information. Every time a company moves data from the internal storage to a cloud, it is faced with being compliant with industry regulations and laws. Depending on the industry and requirements, every organization must ensure these standards are respected and carried out.

Performance: Cloud customers need to look for vendors that can provide compliance and check if they are regulated by the standards they need. Some vendors offer certified compliance, but in some cases, additional input is needed on both sides to ensure proper compliance regulations. When a business moves to the cloud it becomes dependent on the service providers. The next prominent challenges of moving to cloud computing expand on this partnership. Nevertheless, this partnership often provides businesses with innovative technologies they wouldn't otherwise be able to access. On the other hand, the performance of the business and other cloud-based systems is also depends upon the performance of the cloud provider when it falters. When provider is down, users are also down.

Mitigation: There are so many organizations have acquired cloud computing solutions, but this acquisition has not involved mature risk management methodologies. Instead, cloud providers are trusted to take care of security or simply they activate security controls that are widely considered. By implementing few risk management methodologies, such as determination of the organization's needs (such as key security requirements), assess risk, selection and implementation controls to mitigate those risks, assess the controls and identify any shortcomings, monitor the controls to ensure that they are working effectively etc., the service of cloud computing can be enhanced.

VI. ADVANTAGES OF CLOUD COMPUTING

Improved Efficiency: Cloud environment improves the ability of communication of any organization and also provides easy accessing/sharing of data rather than the traditional methods. If anybody is working on a project across different locations then they can compute the details of employees, data or details of project life cycle. Vendors and third party can also retrieve the same.

Fast in Speed: Cloud computing system makes the data sharing or transfer very fast. Anybody associated with this can access the resources at anytime from anywhere by using any web connected device.

Encryption: It is the most widely used method in cloud computing for data securing. It requires high computational power. When a query is run the encrypted data need to be decrypted every time so it decreases the overall database performance. Many methods are presented to ensure better encryption in terms of better security or the operations. A method proposed by suggests that by using several cryptographic methods instead of only one can increase the overall throughput [5]. Data is encrypted using these methods in each cell of a table in cloud. Whenever a customer generates a query, the query parameters are evaluated against the data stored. The query results are also decrypted by the

user not the cloud itself so it increases the overall performance.

Facility of Backup and restore Data: In any enterprise's data center, for backup data stores on a different media or any different storage system for easy access in the event of a recovery situation. There are multiple options to off-site backup; cloud backup provides the facility of off-site for many organizations. In an organization, that might have own off-site server if it hosts its own cloud service. But if the company uses a service provider to manage the cloud backup environment than that have to pay for that. Back up service can be taken by self using public cloud or provided by service provider on payment basis or cloud to cloud backup, online cloud backup etc.

Mobility: It is the ability to migrate, move or transfer the data, jobs or application software over the cloud that is also known as computational mobility [9]. It makes easy to access the jobs and others users requirements from anywhere at any time through the public internet or a dedicated private network connection. Cloud computing helps to enhance the performance of operating application by reposition of data as per the requirement of host and decreases the communication wastage as well as reduces the load problems.

Very Large Capacity Storage: Cloud storage allows users to store their data on cloud and reduces the burden from the user's devices by saving data and files in an off-site location (over cloud) that accessed by user either through any web connected device. The cloud providers secure, manage, maintain data and provide services with assurance that whenever they required data can access. It delivers a cost-effective, scalable alternative hard drives or storage networks to storing files on on-premise. It also provides smoothness that means customers can scale capacity as their data volumes increase or dial down capacity if necessary.

Cost Saving: By storing data over the cloud, organization can save their money by paying for storage system and capacity as a service, rather than investing in the capital costs of building and maintaining in-house storage networks. In this customers have to pay for only exactly the capacity they use. This cost might increase if customers use that cloud for more data volumes than they have allotted.

VII. FUTURE SCOPS AND RESULT

Security is a clear example of cloud risk. In the early days of cloud computing, IT leaders had serious concerns about the security of cloud computing itself. For example, many were worried that vulnerabilities in cloud-based virtualization software would be easily exploited to bypass the protection and isolation that virtualization provides. Therefore a wide future scope in cloud computing to make it trustworthy and provide the security of data stored over this.

VIII. CONCLUSION

This paper discussed about the features, architecture, services, challenges, advantages and future scope of cloud computing.

In spite of several drawbacks and limitations cloud computing is going to be very popular and effective, especially in large organizations. It just needed some better algorithm/methodologies process for data security. In cloud computing there are two important parameters named as availability and reliability, so we need certain security methods, which can be used to minimize its challenges and issues.

IX. REFERENCES

- [1] Priyanshu Srivastava and Rizwan Khan, "A Review Paper on Cloud Computing," International Journals of Advanced Research in Computer Science and Software Engineering, ISSN: 2277-128X (Volume-8, Issue-6).
- [2] Md. Rahul, et. Al., "Impact of Cloud Computing on IT Industry: A Review & Analysis", International Journal of Computer and Information Technology, 2012/12/01.
- [3] B. Grobauer, T. Walloschek, and E. Stöcker, "Understanding Cloud Computing Vulnerabilities," 2011 IEEE Security and Privacy, pp. 50-57, DOI= March/April 2011.
- [4] Santosh Kumar and R. H. Goudar, "Cloud Computing – Research Issues, Challenges, Architecture, Platforms and Applications: A Survey," International Journal of Future Computer and Communication, Vol. 1, No. 4, December 2012
- [5] Seyedeh Solmaz Madani and Shahram Jamali, "A Comparative Study Of Fault Tolerance Techniques In Cloud Computing," INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATIONS AND ROBOTICS ISSN 2320-7345
- [6] Kuo MH, "Opportunities and Challenges of Cloud Computing to Improve Health Care Services", J Med Internet Res 2011;13(3):e67
- [7] Anand Singh, et. al., "Study of Challenges for Cloud Computing and Cloud Security", International Journal of Scientific Research in Computer Science, Engineering and Information Technology
- [8] Nidal M. Turab, et. al., "Cloud Computing Challenges and Solutions", International Journal of Computer Networks & Communications (IJCNC) Vol.5, No.5, September 2013.
- [9] Tariq Alwada "Mobility in Cloud Systems", *International Journal of Computer Trends and Technology (IJCTT)* – volume X Issue Y–Month 2013.