

# A Review on Cloud Data Security Challenges and Opportunities Related to Big Data

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## ABSTRACT

Now days in every sector of IT, cloud computing is involved and implemented. Cloud computing with big data application is additional reward and provides the important services to the society. Cloud computing offers the plenty of services to the users by using the internet. However the users are victim because of unsecurity and unauthorised access. By expansion in using the network and sharing data between the end users, it is very important to maintain the data security and privacy. But still after the tremendous improvement in the technology to provide security for the data is big challenge in front of IT technology. So it is very prime thing to provide security to the user's data in cloud computing services which are interconnected with big data. Big data provides a great profit to organizations, commerce, companies and many large scale and small scale industries.

**Keywords:-** Data Security, Cloud computing and Big data

## I. INTRODUCTION

While dealing with complex data it is very important to store the data securely. Data sharing should be free from the unauthorised accessed. Cloud has the features that it never gives the control to the user while storing the data on the cloud; user never knows the location where the data is placed on the cloud. The explanation following this control issue is that if one desire to acquire the profit of cloud computing, user must operate to share the resources and also the scheduling given by the controls [2]. It is very important to remove this complexity in the data computing. For this cloud computing is the basic and

firm Dias to perform and remove the large scale complexities. The main goal of this cloud computing technology is that to provide solution and different method for handling Big Data [4].

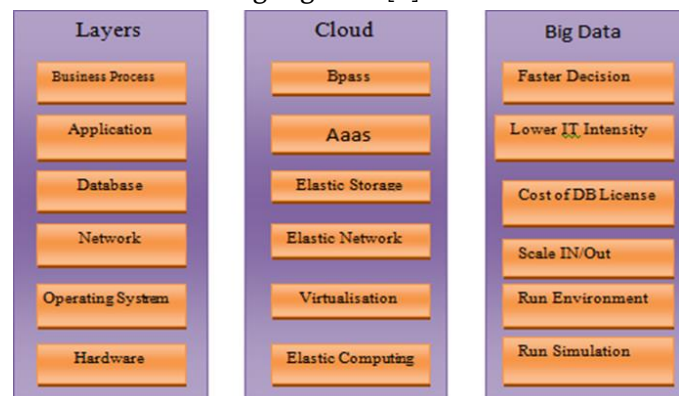


Fig1: Big Data and Cloud [4]

Fig1. Shows the different layers in the cloud and Big Data technology which provide the complexity solution and keep data safe from the untrusted access.

### 1. Cloud Computing

Initially, because of huge involvement of the users in accessing the resources, IT sector was failed to provide the required resources and many stakeholders could not complete their projects due to lack of availability of resources. But today many users can access many resources for the unlimited time period as cloud computing provide this facility to the end users. This technology provide paid resources to the users so that they can used any type of resources (either hardware or software) according to their requirement. Cloud is set of computing devices and nodes that shares services publically on the World Wide Web. Cloud implemented and managed applications by gathering all computing resources together also maintains user's history information in their internet usages, processes and offer accurate information, so that it offers intellectual support service to IT users[1].

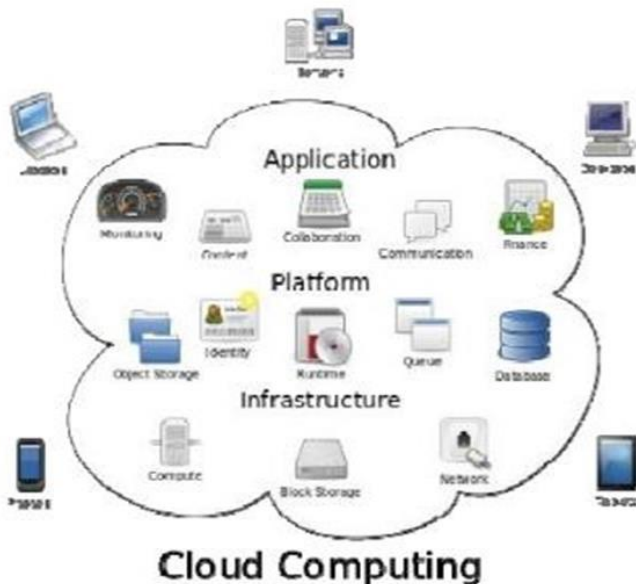


Fig2: Cloud computing environment [9]

### 2. Big Data

Big data is nothing but the high volume of data which is categories into two main category one is structured data and other is unstructured data that is too much large that is very hard to used and process this data by using traditional databases and software technologies. The Big data has the following properties.

- Volume:** Many factors contribute towards increasing Volume streaming data and data collected from sensors etc.
- Variety:** Today data comes in all types of formats emails, video, audio, transactions etc.,
- Velocity:** This means how fast the data is being produced and how fast the data needs to be processed to meet the demand[4,3].

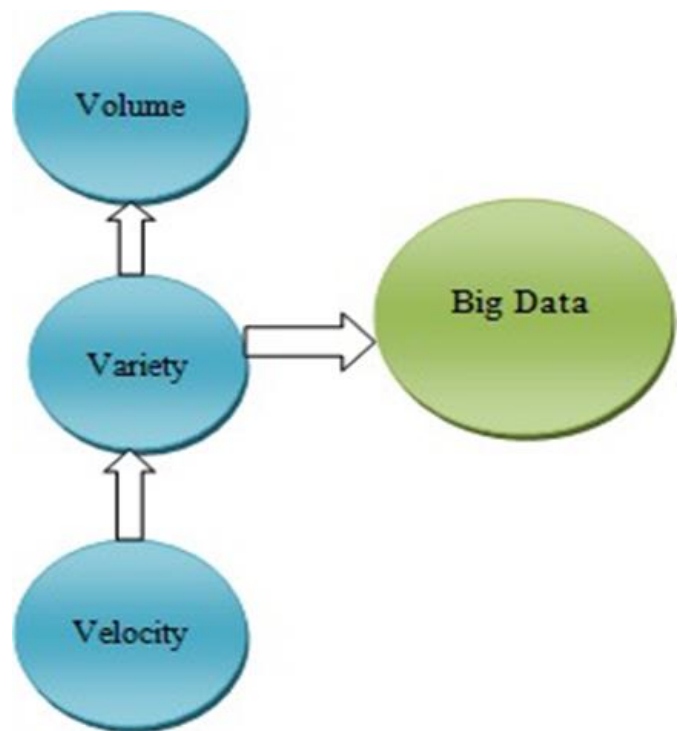


Fig3: V criteria of Big Data[6]

## II. CLOUD COMPUTING IN BIG DATA

The increase of cloud computing and cloud data stores has been a forerunner and facilitator to the emergence of massive data. Cloud computing is that the commoditization of computing time and data storage by means of standardized technologies. It has important advantages over traditional physical deployments. However, cloud platforms are available several forms and sometimes need to be integrated with traditional architectures. This results in mystify for decision makers responsible of massive data projects, results in an issue of how and which cloud computing is that the optimal choice for his or her computing needs, especially if it's an enormous data project? These projects frequently show changeable, stuffed, or immense computing power and storage needs. At an equivalent time business stakeholders expect swift, inexpensive, and reliable products and project outcomes[4].

## III. BIG DATA APPLICATIONS

The big data application refers to the massive scale distributed applications which usually work with large data sets. Data exploration and analysis became a difficult problem in many sectors within the span of massive data. With large and sophisticated data, computation becomes difficult to be handled by the traditional processing applications which triggers the event of massive data applications. Google's map reduce framework and apache Hadoop are the defacto software systems for giant data applications, during which these applications generates an enormous amount of intermediate data. Manufacturing and Bioinformatics are the 2 major areas of massive data applications. Big data provide an infrastructure for transparency in manufacturing industry, which has the power to unravel uncertainties like inconsistent component

performance and availability. In these big data applications, a conceptual framework of predictive manufacturing begins with data acquisition where there's an opportunity to accumulate differing types of sensory data like pressure, vibration, acoustics, voltage, current, and controller data. The combination of sensory data and historical data constructs the big data in manufacturing. This generated big data from the above combination acts because the input into predictive tools and preventive strategies like prognostics and health management. Another important application for Hadoop is Bioinformatics which covers subsequent generation sequencing and other biological domains. Bioinformatics which requires a large scale data analysis, uses Hadoop. Cloud computing gets the parallel distributed computing framework alongside computer clusters and web interfaces[4].

## IV. ADVANTAGES OF BIG DATA

Big data, the software packages provide an upscale set of tools and options where a private could map the whole data landscape across the corporate, thus allowing the individual to analyze the threats he/she faces internally. There are some common characteristics of massive data, like a) Big data integrates both structured and unstructured data. b) Addresses speed and scalability, mobility and security, flexibility and stability. c) In big data the belief time to information is critical to extract value from various data sources, including mobile devices, frequency identification, the online and a growing list of automated sensory technologies. All the organizations and business would enjoy speed, capacity, and scalability of cloud storage. Moreover, end users can visualize the info and corporations can find new business opportunities. If big data are combined with predictive analytics, it produces a challenge for several industries. The combination

leads to the exploration of those four areas: a) Calculate the risks on large portfolios b) Detect, prevent, and re-audit financial fraud c) Improve delinquent collections d) Execute high value marketing campaigns[5]

## V. NEED OF SECURITY IN BIGDATA

IT Vendors offers storage, computation, application hosting services with backed performance and charge on pay-per- use techniques via cloud service providers (CSP). But also, cloud computing undergoes several security issues and defined below: i) Data occurrences of user data has got to be integrated, linked, mapped and transformed from other occurrences of another user data. ii) Data migration over the web exposes sensitive information to malicious intruders results in loss of privacy, legal liability and reputational loss to the IT organizations. iii) Internet is hospitable global users, an intruder can exploit a software bug to smell trustworthy information, to misuse IT resources, or generates a pathway resulting in advanced threats and attacks. iv) Outsourcing information must be limited to a authorized users with access rights, so to avoid the abuse of malicious access. v) Lack of knowledge replication and recovery technique in cloud computing results in loss of knowledge .vi) Cloud services must be made accountable mandatory as an application requirement[1].

## VI. ISSUES AND CHALLENGES

Cloud computing comes with numerous security issues because it encompasses many technologies including networks, databases, operating systems, virtualization, resource scheduling, transaction management, load balancing, concurrency control and memory management. Hence, security problems with these systems and technologies are applicable to

cloud computing. For example, it is vital for the network which interconnects the systems during a cloud to be secure. Also, virtualization paradigm in cloud computing leads to several security concerns. For example, mapping of the virtual machines to the physical machines has got to be performed very securely. Data security not only involves the encryption of the info , but also ensures that appropriate policies are enforced for data sharing. In addition, resource allocation and memory management algorithms even have to be secure. The big data issues are most acutely felt in certain industries, like telecoms, web marketing and advertising, retail and financial services, and certain government activities. The data explosion goes to form life difficult in many industries, and therefore the companies will gain considerable advantage which is capable to adapt well and gain the power to analyze such data explosions over those other companies. Finally, data processing techniques are often utilized in the malware detection in clouds. The challenges of security in cloud computing environments is often categorized into network level, user authentication level, data level, and generic issues. Network level: The challenges which will be categorized under a network level affect network protocols and network security, like distributed nodes, distributed data, Internode communication. Authentication level: The challenges which will be categorized under user authentication level deals with encryption/decryption techniques, authentication methods such as administrative rights for nodes, authentication of applications and nodes, and logging. Data level :The challenges that can be categorized under data level deals with data integrity an availability such as data protection and distributed data. Generic types: The challenges which will be categorized under general level are traditional

security tools, and use of various technologies [4,6,7,8].

## VII. CONCLUSION

Cloud surroundings are widely utilized in industry and research aspects; therefore security is an important feature for organizations management on these cloud environments. Using proposed approaches, cloud environments are often secured for complex business operations.

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