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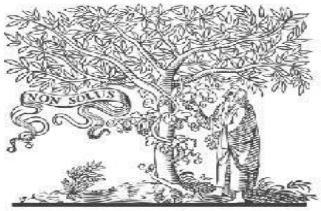

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Security Improvement for Big Data in the Cloud

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ABSTRACT
Big data security in cloud computing is explored together with the sophisticated encryption technology. Because they are platform neutral, cloud computing services are utilized widely. The necessity to install particular software on a user's device is gone thanks to cloud computing. The idea of Advanced Encryption Standard (AES) and Intrusion Detection System (IDS) approach is merged here to increase the security of cloud. It has the ability to provide protection in accordance with needs. Moreover, the network's overall temporal span is extended. It is designed to reduce the node's power consumption. The local node network is divided into small zones for best performance. Moreover, the encoding algorithm used by the Advanced Encryption Standard for encryption is explained (AES).

Keywords: Cloud Computing, Encryption Mechanisms, Cryptography, AES and IDS.

1. INTRODUCTION

Cloud computing is the access of computer system services based on user demand. The accessibility of disk space and computer power is very essential. The customer of cloud services is not needed to do direct active management with cloud computing. Storage systems which are simple for numerous users to access via the Internet are essentially what the phrase "cloud computing" refers to [15]. Cloud computing is the simple access to both software and hardware for the purpose of finishing a certain task over the internet or possibly another network. Users can access files and programmes located on the cloud using the notion of cloud computing and an internet connection. One example of a cloud-based app is Gmail from Google [16]. Information and data of user are stored on real or virtual servers in cloud computing. These servers are controlled and maintained by cloud computing companies. One example is the Amazon Corporation and their AWS product [17]. Both personal and professional uses of cloud-based services are possible. Through the Internet, one can save and access their data or information in the "cloud." There are three primary categories of cloud computing. A good example is software as a service (SaaS). It is utilized to make web-enabled applications.

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Infrastructure as a Service comes in second (IaaS). To access the storage and computing power, it is necessary [18]. Platform-as-a-Service comes in third (PaaS). For this kind of hosting, developers are given the necessary tools [19].

CLOUD COMPUTING

It's storage or accessing your data or information and programs over a internet rather than in your hard disk drive or personal computer.

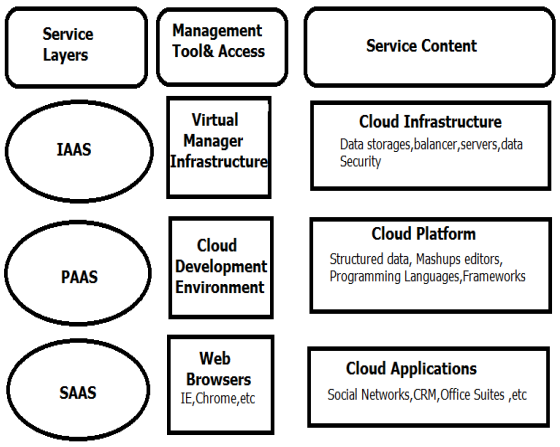

Fig:1. Service Layers of Cloud Computing.

2. SECURITY CHALLENGES WITH CLOUD SERVICES

In addition to their many advantages, cloud services can provide a number of security risks. They are also taken into account here:

a. Data Stealing: With cloud computing, external data servers are employed to carry out flexible and affordable tasks. There is therefore a possibility of data theft from an external server.

b. Unsecure APIs: Any third party has authority over the Application Programming Interface (API). It does user verification. As a result, there could be some problems with sensitive data.

c. Denial of service: A type of attack on data or information. Attackers of this kind occur when millions of users request a shared service. In addition to their many advantages, cloud services can provide a number of security risks. They are also taken into account here:

d. Data theft: With cloud computing, external data servers are employed to carry out flexible and affordable tasks. There is therefore a possibility of data theft from an external server.

e. Misuse of cloud services: A type of attack on data or information is called a denial of service. Attackers of this kind occur when millions of users request a shared service.

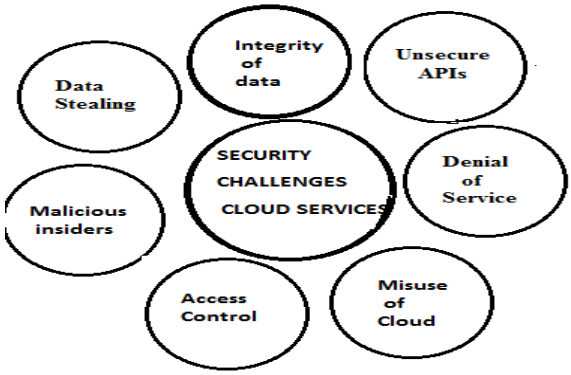

Fig.2 Security challenges cloud services

BIG DATA

Big data refers to enormous data sets that are studied to determine patterns, trends, and other things and it is particularly utilized to study how people behave. An amalgamation of new and ancient technology is used to handle Big Data. Companies or organizations can get actionable perspective thanks to this integrated method. It is true that big data, which consists of a sizable volume of unconnected data, requires the use of a variety of methodologies. As the

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production of big data on the web climb every day. So, it is crucial to suggest the appropriate methods or strategies.

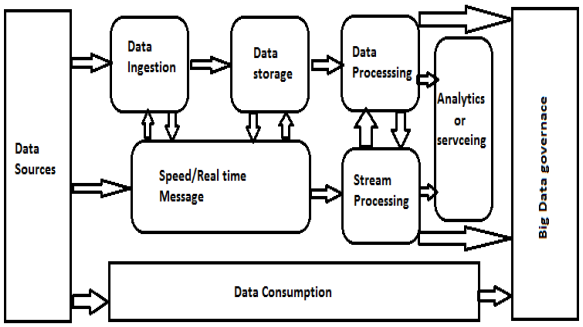

Fig:3. Big Data architecture

3. LITERATURE REVIEW

To educate people on cloud computing and its importance on this technology, a number of papers and articles have been planned. Below is a review of a few studies:

In year 2020 Amalarethinam [1] cloud security algorithms were researched. As every client stores their data on the cloud, there needs to be a sincere focus on data security. This overview demonstrates the various Cloud Security Algorithms and suggests the need for new, enhanced algorithms while taking many security aspects, including speed and cost, into account.

In year2020, Sinchana, [2] the difficulties with cloud computing security were surveyed. The main goal here is to secure the data by preventing access from unauthorized clients at the time of data transmission. For this, many encoding techniques are employed. This article also discussed current practices and methods that are suggested by them to ensure the security of cloud data.

In 2019, Herardian, et al[3] suggested Soft Security-related underbelly of cloud services. Despite their best efforts to establish suitable security measures and controls. Building up security measures and carrying out consistency-related evaluations only serve to foster the dream of control unless there is a specific requirement and demonstrable accountability.

In 2018, R. Merla et al[4] Using Hadoop MapReduce, evaluate your data. With the use of the Hadoop Map Reduce paradigm, the YouTube data is examined in this study project. Multi-hub Hadoop configuration on the AWS private cloud (Amazon Web Services). The HDFS (Hadoop Distributed File System) is used to store the video measurements obtained via the API, and the MapReduce framework.

In 2017, Suraj R. Pardeshi,[5] using improved cryptographic techniques for information security in a cloud computing environment. Despite the fact that symmetric and asymetric key cryptography procedures already exist, there is a security risk. A brief description of the proposed system is given, which uses an unusual combination of open and private keys.

In 2017,Sateesh Nagavarapu,[6].We identified a potential internal security risk from cloud suppliers who offer data mining services in this investigation. The IR encryption technique was suggested as a solution to the security problem. To protect the outcomes of the data mining, we have installed IR. The IR protocol aids the system in protecting the outcomes of data mining. To prevent the information from being seen from the server side, the original IR protocol

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calls for extracting the complete dataset; however, we decided to use a more effective IR methodology in this study

In 2016, Aaron Zimba,[7] Integrated State Transition-Boolean Logic Model was suggested. This approach was put up to offer an assessment of cloud computing's security. Yet, security requirements do evolve over time, necessitating a continuous process of evaluating the security state of the cloud infrastructure. This article suggests a paradigm for decomposing the cloud framework's security state. They have offered accessibility, uprightness, and confidentiality in their model.

In 2016 SakshiChhabra,[8] Map Reduce Computational Security on the Cloud was their suggested solution. They develop techniques that help with the enhancement of working effectively. Despite this, they ensure that the data is accurate while using Map Reduce. Their main objectives are to protect against data outflow and achieve data assurance.

In 2016, Babitha. M. P [9] written a study that focused on several data security and disengagement issues in the context of distributed computing. They put up a plan to secure offices with elegance, tact, and support for accreditation. Data is encoded using AES in such plans. Then, the data is uploaded to a cloud Openness and uprightness.

In 2016 AL-MuseelemWaleed, Li Chunlin [10] In the context of distributed computing, problems like security and segregation are underlined. One of the main goals of this work is to draw attention to the issues with security and segregation in distributed computing. The Ubuntu Enterprise Cloud can be used.

In 2015, A. Bhardwaj, et al[11] he wrote about Hadoop and BigData. According to the findings of this study, CPU execution time to complete the jobs decreases as the number of Data Nodes in the HDInsight group grows. These results show a superior reaction time along with an increase in execution and more customer loyalty.

4. PROPOSED MODEL

Data packets and control packets are taken into account in this proposed paradigm. There are two different sorts of packets. The chosen data must be transmitted to the destination by the data packet.

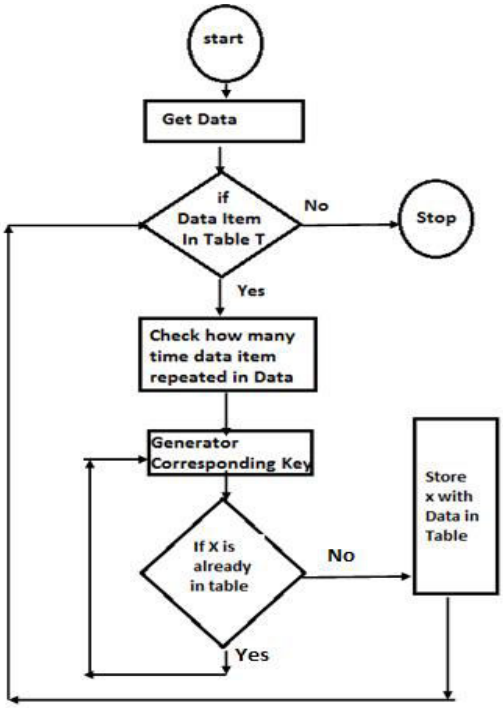

Fig.4.Process Flow of Proposed Model

Data transmission via the internet is known to be securing thanks to the art of cryptography. To ensure safe data transfer between the sender and the intended recipient over the internet, many cryptography techniques and codes are utilized. Cryptography techniques are used to encrypt and decrypt data that may be sent over email or another Web-based application when it is delivered electronically. Complex mathematical formulas or algorithms are used in modern cryptography. Secret keys are also established in conjunction with this for the encryption and decryption of data. In the current situation, cryptography represents the confidentiality and integrity of web-based applications or their data.

5. CONCLUSION

The data packet and the control packet are taken into consideration in the proposed protocol. The idea of IDS approach is applied here to increase cloud security. It has the ability to provide protection in accordance with needs. In any case, it can be said that the suggested IDS technique and encryption mechanism are effective in protecting huge data in cloud computing. According to routing performance, the virtual coordinator is employed in the research work with an effective hop selection.

6. FUTURE SCOPE

Given that this paper takes cloud-based huge data sets' security into account, it might be useful. For the security of cloud-based services, it offers the combination of Advanced Encryption System (AES) and Intrusion Detection System (IDS) technology. This suggested model has the capacity to provide security in accordance with needs. It has the ability to extend the network's entire life. As some Nodes use less power, it is feasible. The local node is designed to segment the network into more manageable zones. Using this strategy might help safeguard huge data in the cloud.

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