

# A LITERATURE REVIEW ON CLOUD COMPUTING SECURITY

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## ABSTRACT

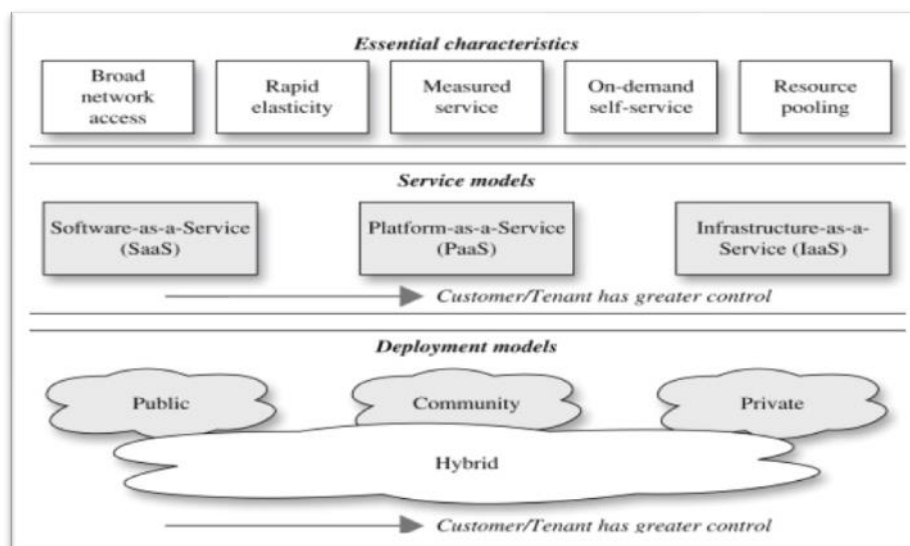
Cloud computing most trending technology nowadays because this pandemic situation all works from home small village to megacity, government sector to private sector and company, school,hospital,all home utility whole worlds depending on cloud base technology so it is on-demand technology that provides all over a solution like software, storage, or platforms and give a huge infrastructure over the internet with minimal cost. hence cloud needs more protection about user data to need more protection and secure framework from internal and external attacks like botnets, viruses, and worms, web application threats, dos attacks. So this paper gives an analysis and discusses about the cloud computing security working with different Algorithm,Ai and machine learning with different authentication control block chain analysis and discusses the review of cloud computing security in three different layer SaaS(Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service), and its deployment models private, public, hybrid, and community cloud.

**KEYWORDS:** CLOUD COMPUTING, CLOUD SECURITY, RISK ANALYSIS, CLOUD ATTACKS, AUTHENTICATION

## 1. INTRODUCTION

Our daily life starts with cloud computing in 2020 pandemic situation many nations announced lockdown that time all huge industries, public to the private sector and education are online class learning and start their business continues through cloud computing.[1]In cloud computing daily storage service is widely used by industries, Smartphone's users and other private sectors, education era, hospitality data vast amount of data created by the popularity of the cloud and the ease of the internet and large scale storage capacity is needed[1.1]so in this situation data security, privacy and safety are must important for cloud user confidentiality, integrity and data access control. cloud computing is on-demand technology because of its ability to reduce cost as you pay as you use for it associated with computing while increasing scalability and flexibility for computing services.[2]. Cloud computing now a days 80% present being used by the wide range of user ,So need to specific security model which provide protection from the other internal or external cloud attacks and 80% on solution security issue [7] Some national and multinational IT company taken 42% spend funds for security cloud cloud[4] given facility online storage in virtualized storage pool as a sub-service of infrastructure as a service(IaaS)

software as a service(SaaS), platform as a service(PaaS) in cloud computing. It plays significant use of resource and in the utilization of service and cloud has its deployment model (private, public, hybrid, community cloud) all service providers rely on domain server data[9]cloud computing has some attribute that follow in figure 1 define an essential characteristic of cloud including with service model and deployment model.



**Figure 1.** Architecture of cloud

As shown figure 1. first define cloud essential characteristic (Broad network access, Rapid elasticity, Measured service, on-demand self-service, resource pooling)it makes by The National Institute of Standard and Technology (NIST) [4][7][9]

Cloud has a broad network access available in wide range of device such as tablets, Macs, or smartphone it provide rapid elasticity and measured service which helps in monitoring billing and ensuring the optimum usage of resource [4]cloud computing is on demand self service and resource pooling it's based on business model and academic model in which resource are shared network level, host level, and application level [7][9]

Cloud computing has four different deployments model public, private ,community and hybrid and also has three service model Saas(Software as service)it has scalable internet based application ,Paas(platform as service)is used to build test application ,Iaas(Infrastructure as service)that provide the storage database for eg.google doc[4] so in research study work on different taxonomy and different framework classification

This paper research study about cloud security issue, risk and its implementation methods different techniques ,algorithm analysis framework in related journal and research paper.

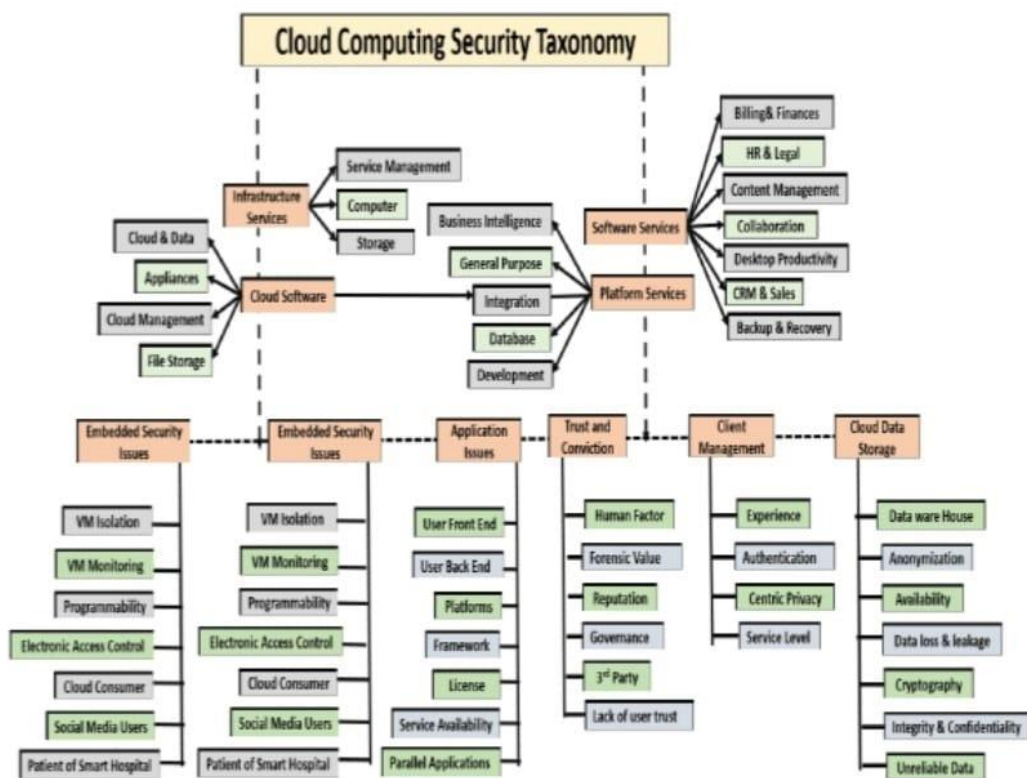


Figure 2. classification of cloud computing and cloud security[10]

Table 1. A Study on Related area under cloud computing security

Related Area Under Review	Techniques Used	Implementation	Discussion	Reference
Survey on fast flux bonnet detection with fast flux cloud computing	Command and control, internet relay chat, peer to peer botnet, domain system	Possible to implement	Fast flux detection improved it enhanced develop long term adaptive new technologies	Ahmad Al-Nawasrah, Taibah University, Saudi Arabia 2020[6]
Encryption and decryption different files and algorithm on cloud platform	AES, Blowfish and Twofish	Not possible	Need more capacity or memory size of the input file in future test with different algorithm with different input	M.Robinson Joel1, V.Ebenezer2, M.Navaneethakrishnan3, N.Karthik4 2020[12]
Efficient escrow free CP-ABE with	cipher text-policy attribute-	Possible to	It's right scheme for big data privacy and access control in cloud in future increase size cloud	Praveen Kumar Premkamal,

constant size cipher text and secret key for big data storage in cloud	based encryption	implement	storage for volume data and remove deduplication	National Institute of Technology Tiruchirappalli, Tiruchirappalli, India 2020[15]
Data security multidimensional protection system in cloud computing	Dynamic hash authentication scheme based on Markel tree	Possible implement to	Puts the more efforts in role based access control and standard or legal maintains for cloud security	Wang Xiaoyu, Gao Zhengming 2020[19]
An efficient security framework for data migration in cloud computing	(SSL)Secure socket layer, prediction based encryption	Possible implement to	Time consuming method data block are split in small parts so need to improve speed and security mean while transfer data	Dr. Subarna Shakya, Professor, 2019[22]
Security for electronic healthcare information using obfuscation and RSA algorithm	Obfuscation and RSA algorithm encryption	Possible implement to	Need for three layed architecture protection for EHR data from the(authentication,confidentiality,integrity)	Pratiksha Gautam, J, Mohd. Dilshad Ansari,2019 [31]
Cloud computing security with block chain	block chain	Possible implement to	Applying various block chain techniques for more protection in all cloud computing layers	Ashok Gupta1 , Shams Tabrez Siddiqui2 , Shadab Alam3 and Mohammed Shuaib 2019 [36]

## 2.LITERATURE REVIEW

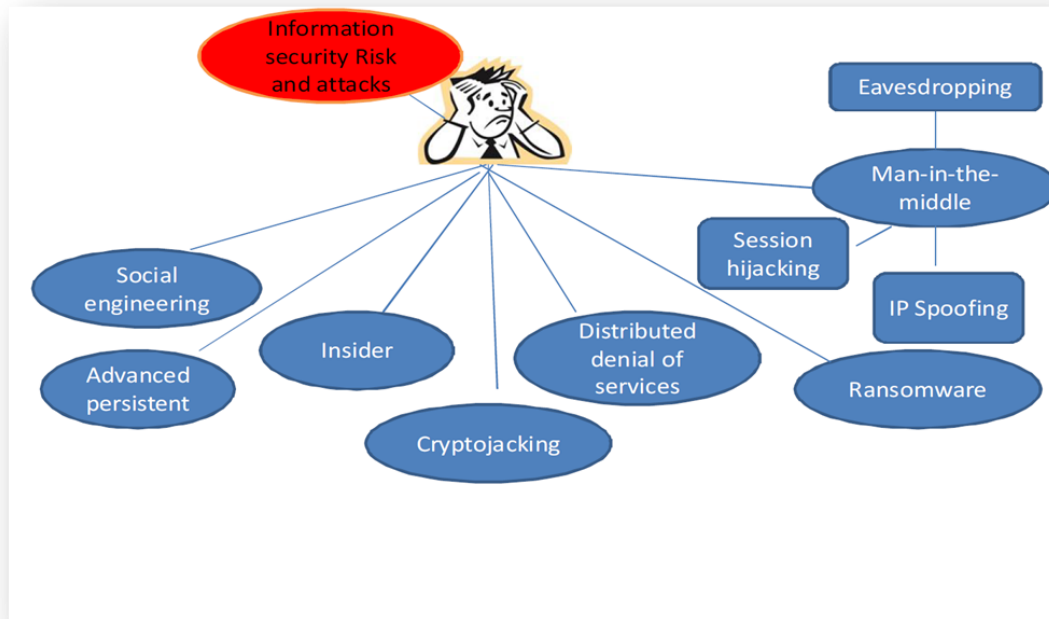
- Paramita Chatterjee\*, Shantanu Mukherjee, Rajesh Bose , Sandip Roy ..(2021) this paper author give review on information security cloud based system during covid 19 pandemic situation increase use of cloud platform so need prevention from attacks[3]
- Poonam Kumari, Meeta Singh, et al.,(2021)In this paper authors discuss security in cloud review they study is based on three service layers Saas, Paas, and Iaas and the development model. in this they finding analysis about different types of algorithms in cloud security according to the method prescribed and they finding security problems in the cloud it can be achieved with help cryptographic and genetic algorithm then result is that access and authentication of data under multi-provider environment as compared to other algorithm methods will exhibit better result in terms[4]

- Riddhi Doshi has provided [2020] A Review Paper on Security Concerns in Cloud Computing and Proposed Security Models. this paper mainly focuses on data security, data crash, authentication, data leakage, confidentiality, and integrity of data and the security model proposed to overcome the specified concerns.[7]
- Saleh M. Alqahtani 1\*, Hamza Arishi 1\*[2020]it discuss about cloud computing failure detection and prevent to build a cloud based system that detect and prevent failures before utilization[8]
- Rajesh Keshavrao Sadavarte ,Dr. G. D. Kurundkar et al.,[2020]are applying cryptography techniques in cloud computing security and also give a summary of basic security and also give a summary of basic security and privacy issue, also use encryption algorithms, symmetrical and asymmetrical algorithms but the result is that till date security and integrity in cloud computing lacking.[9]
- B. Thirumaleshwari Devi, S. Shitharth, M A Jabbar, et al.,[2020]this paper overall deals with common security and honey pot and discuss other different attacks and future they work with a machine learning algorithm that automates honey pot and information about a different attack like virtualization attack, malware-injection attack.[11]
- Hao Hao Song1,\*1[2020]cloud computing has no any professional testing tool for testing in this papar author test and evaluion cloud information security product and testing method database and service ability[13]
- Jahangir Jabbar 1 \*, Hussain Mehmood 1 , Hassaan Malik 1, 2[2020]it discuss about the cloud security challenges and major issue authentication,authorization and prevent from external attack
- Abdullah Sheikh1 , Malcolm Munro2 , David Budgen3[2019]here authors was proposed solution SSM ( Scheduling Security Model) developed cover for the issue of cloud computing security[25]
- Lubna Alhenaki, Alaa Alwatban, Bashaer Alamri, Noof Alarifi, et al.,[2019]this paper conducted a survey study on cloud computing addressing different types of virtual attacks, possible threats and its protection method and existing solution to such attacks.[29]
- Guddu Kumar et al.,[2019]present this paper risk in cloud computing and suggestion for data security, benefits, risk, data protection [41]

### 3. CLOUD COMPUTING SECURITY FUTURE CHALLENGE :

Many of research survey we identify till a date cloud need a security protection from external or internal attacks here some future challenge describe [28]

- Security of application programming interface [API]
- Data access
- Virtual Machine Isolation
- Security and Privacy
- Data recovery and Backup
- Confidentiality:-
- Integrity:
- Availability
- Data Breaches
- Identity Management
- Service Level Agreement [SLA]
- Dos Attacks



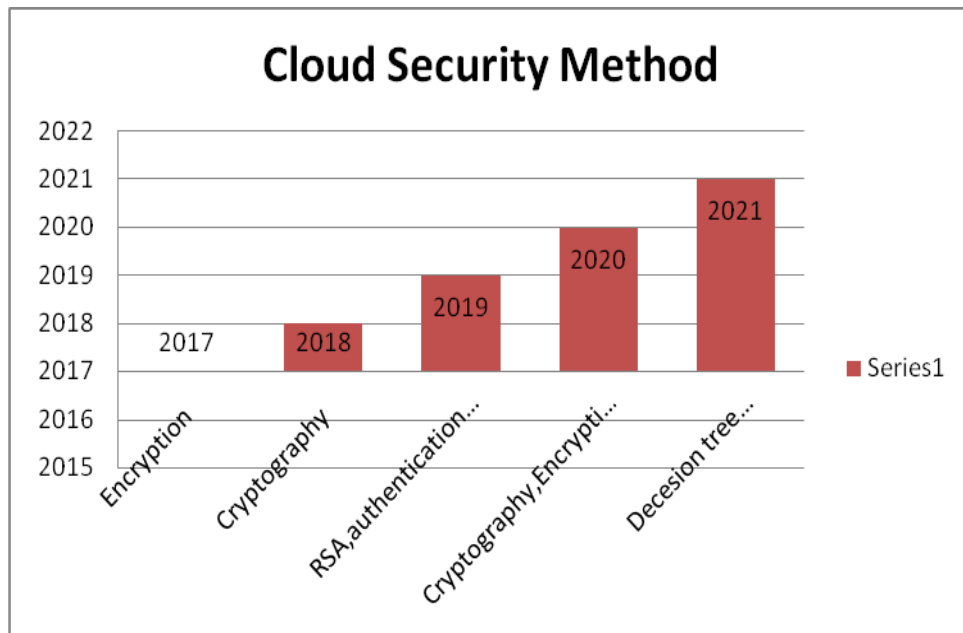
**Figure 3.** Various risk or threats in information security [3]

Figure 3 describe risk or threats so dealing with this type attacks here some technologies applied to protect cloud computing:

- Firewalls
- Security incidents and event management
- Data loss prevention
- Blockchain cyber security
- Endpoint detection and response
- Cloud security posture management
- User behavior analytic

#### **4.RESULT ANALYSIS, TOOLS, AND TECHNIQUES USED OF CLOUD SECURITY:**

Figure 3 present the analysis of method which use years of 2015 to 2021 implement in cloud security for security purpose day to day tools and technology will improve encryption to decision tree.



*Figure 3.* Method which use for cloud security

## 5. CONCLUSION

Analysis of all the research paper and journals we find outs cloud tread is increased day by day study about cloud computing security threats and virtual attack are also increase, based on many analysis papers of in cloud security apply encryption, decryption, blowfish method genetic algorithm are used but still date cloud suffering from some malicious attack from the malicious user so need to create secure cloud framework and stop to unauthorized person access.

In future cloud security with impressive infrastructure and robust algorithms can be implemented which will be help us protect from VM attacks, DDos attacks, Unauthorized and also helps in protecting the user data privacy

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