Analysis of Security Technique of Cloud Computing

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***Abstract*—**Cloud computing has the decentralized architecture in which hosts can join the network and start communicating with the cloud service provider. Due to such type of network, malicious hosts join the network which is responsible to trigger various type of security attacks. In the past years, various techniques are proposed by the authors to improve network security. In this review paper, techniques are reviewed and analyzed which are used to improve network security in terms of certain parameters.

Keywords— PaaS, SaaS, IaaS, Encryption

I. INTRODUCTION

A public or private type of connections amongst large pool of systems in order to facilitate scalable infrastructure for an application is known as cloud computing. Huge amount of data and files are stored and extracted as per requirement within cloud computing applications. There is a significant reduction in the computation host, hosting of application and the delivering and storage of content within this technology. Direct cost benefits are provided within the cloud computing applications in which the variable priced environment is setup on the basis of number of facilities used by the users. The basic methodology on which the cloud computing is based on is the reusability of IT capabilities [1]. Across the organizational boundaries, cloud computing has introduced grid computing, autonomic computing, utility computing, and distributed computing in order to broader the scopes which were not defined by traditional methods.

Service Models of Cloud Computing

There are various service-models present within cloud computing which are studied below:

a. Software as a Service (SaaS): On the basis of demand for a service, an application is provided to the user with the help of this model. On the cloud there is a single instance of service made to run through which services are provided to numerous end users. The customers here do not need any kind of servers or software licenses. Further, as the provider only requires maintaining and hosting of one application, the costs are minimized on its end as well. The companies such as Google, Salesforce, Microsoft, Zoho, and so on provides such SaaS services to end users [2].

b. Platform as a Service (PaaS): The encapsulation of a layer of software or development environments in order to be provided as a service is provided in PaaS. Higher levels of service can be generated on the basis of this encapsulated service. The applications that are possible to run on infrastructure of a provider can be built by the customer within his own applications. A predefined combination of OS and applications servers is provided by PaaS providers which help in meeting the managing and scalable requirements of various applications.

c. Infrastructure as a Service (IaaS): The standardized services are provided over the network through IaaS which provide storage and computing services to various users. A pool is generated which includes servers, storage systems, networking devices, and so on which help in managing the workload of the applications. The software of the customer himself is deployed on the infrastructure in this case. Amazon, GoGrid, 3 Tera, etc include such services.

Characteristics of Cloud Computing

There are various characteristics of cloud computing services. Some of such important characteristics are explained below [3]:

- *Shared Infrastructure:* The physical services, storage as well as networking capabilities are shared amongst users with the help of a virtualized software model with the help of cloud computing systems. Most of the present infrastructure is utilized by multiple users irrespective of the type of deployment models they have.
- *Dynamic Provisioning:* On the basis of current demands and needs of a customer, the services are provisioned in these systems. The software automation is used to provide this service automatically. This helps in expanding or contracting the capability of the service as per the requirement of the user in automatic manner. High level of reliability and security is maintained through dynamic scaling.
- *Network Access:* The standard-based APIs are used in order to access the networks across the internet from huge range of devices. Within the latest smartphones, numerous services are deployed irrespective of their positions or locations.

- *Managed Metering:* In order to manage and optimize the services along with reporting and billing of the information, the meters are utilized in these services. On the basis of utilization of services, the billing period is calculated and the consumers are billed within these applications.

The sharing and scalable deployment of services can thus be provided within cloud computing environments as per the needs of customers irrespective of their locations. On the basis of the number of services accessed by them, the customers are billed.

Challenges of Cloud Computing

Within cloud computing there are numerous challenges amongst which some are explained below. Some challenges might degrade the performance of some services within the cloud. However, there are several such challenges which might also provide several opportunities when they are resolved very carefully within the applications [5].

- *Security and Privacy:* The data can be stored and secured with the help of few number of hot buttons present around the cloud computing. With the help of service providers the utilization of cloud can be monitored. The speed of deployment of cloud services can be minimized due to the presence of such issues. In case where such situation occurs in which the data is stored within the organization but is accessed within the cloud as well causes privacy issues. Robust cloud is to be required in order to provide such exchange of information within the organization and cloud. Such type of deployment can be supported by the hybrid cloud.
- *Lack of Standards:* There are no standard related to the clouds which have document interfaces present within them. Thus, the clouds are interoperable in such conditions. Such issues can be resolved by developing an open cloud computing interface within these applications. The cloud computing standards and practices are presented on the basis of which the Open Cloud Consortium works. There is need of mature methods to identify such types of groups. Addressing the requirement of people which deploy the services and particular interests which are required by these services are to be fulfilled within this scenario. However, the latest standards that can help in providing leverage facilities is available within these conditions.
- *Continuously Evolving:* The requirements of the users, interfaces, networking as well as storage are evolving continuously. Thus, the public cloud especially in such conditions is not static and keeps evolving in continuous manner.

II. REVIEW OF LITERATURE

Abid Khan, et.al (2017) presented in this paper [9], that in order to provide details of the previous events and help in monitoring, troubleshooting and forensics of the system the logs are utilized within the systems. A secure way should be followed in order to provide logging process so that the facilities can be used here. For an extended period of time, the logging files must be kept secure since there is sensitive information present within these systems. A secure log as a service reversible watermarking (SecLaaS-RW) method is proposed in this paper. In order to authenticate the content, the fragile watermarking method which is reversible watermarking is utilized. The outsourced logs are considered to be the content upon which the reversible watermarking is used. The syslog is utilized for gathering the log records. Further, the logging server is processed and is further transferred to the outsource cloud storage. Within the extended period of time all the records are saved here. This proposed method is compared with the existing approaches. Results are achieved here on the basis of which the performance of proposed method is analyzed. As per these results, the proposed technique generates very less amount of overhead per log entry and from the outsourced logs, the changes can be identified through this technique.

Rita Choudhary, et.al (2016) presented in this paper [10], that there is an increase in demand of the robust and high quality of watermarking techniques as per the increment in growth of the digital data across the internet. The binary or grayscale watermark is embedded within the cover image or other multimedia images with the help of image watermarking methods. In order to insert the watermark in the low frequency component of the host image, the variable visibility factor is utilized within this technique. The 2-level is utilized in order to propose a DWT-based image watermarking technique in this paper. The comparison of various parameters like PSNR and NCC is done with relation to the 1-level DWT method. Within the simulation results, the enhancement is shown in comparison to the results achieved from existing techniques which shows the level of enhancement achieved here.

Mr. Y. Gangadhar, et.al (2016) presented in this paper [11], that various things have been converted into digital format on the basis of various enhancements made within the computer network and multimedia fields in the past few years. A comprehensive survey on various digital watermarking methods has been presented in this paper. An overview of various existing techniques is presented in this paper along with the various disadvantages being faced due to the presence of various types of attacks in the applications. Due to the robust nature of this technique, various geometric based watermarking methods are also presented in this paper. An effective study of the geometric

invariant methods is provided in this paper which can help in further enhancing the watermarking research field here.

Ahmed S. Salama, et.al (2016) presented in this paper [12], a technique which utilizes less execution time and facilitates better imperceptibility in the applications. This technique will also help in enhancing the robustness in comparison to already existing digital watermarking techniques. The Discrete Wavelet Transform (DWT) and Discrete Cosine Transform (DCT) techniques are combined here in order to generate improved technique (IMD-WC-T). With the help of PN-sequence and a specific key within the DCT transform, the watermark is spread. Further, the final watermarked image is generated by decomposing the host image with DWT within the level 2. An additional imperceptibility, minimized execution time and higher robustness is provided within the IMD-WC-T technique as per the results generated when this technique is compared within other existing techniques.

Mr. R. D. Shelke, et.al (2016) presented in this paper [13], the study related to numerous audio-watermarking techniques that will help in advising the owner to use the appropriate technique using the watermark within their image, audio or video data. It is very difficult to eliminate watermark from the data. If any person tries to copy the data, due to the presence of watermark he might not be able to extract the information. This helps in authenticating the data in proper way so that unauthorized users cannot access it. The newly proposed algorithms have the main objective

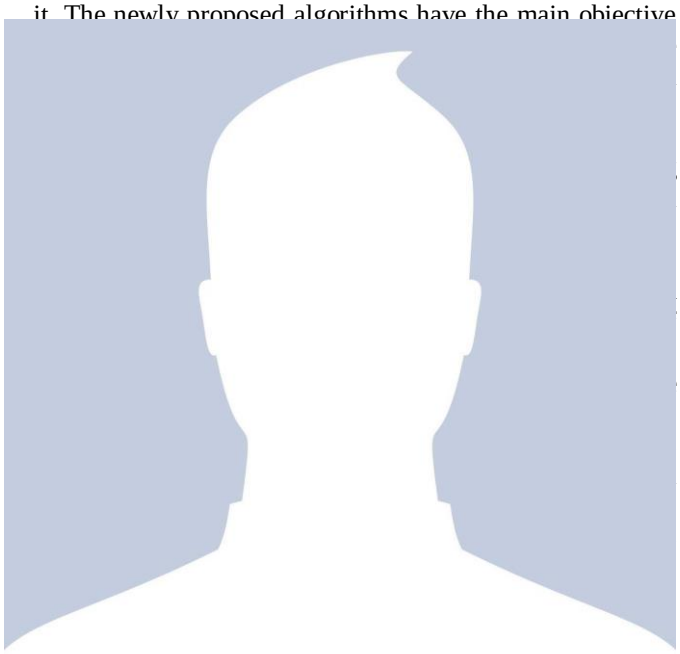

Table 1. Comparative Analysis

Author	Year	Description	Outcome
Abid Khan	2017	A secure way should be followed in order to provide logging process such that the facilities can be used here. For an extended period of time, the logging files must be kept secure since there is sensitive information present within these systems. A secure log as a service reversible watermarking (SecLaaS-RW) method is proposed in this paper	As per these results, the proposed technique generates very less amount of overhead per log entry and from the outsourced logs, the changes can be identified through this technique
Rita Choudhary	2016	The binary or grayscale watermark is embedded within the cover image or other multimedia images with the help of image watermarking methods. In order to insert the watermark in the low frequency component of the host image, the variable visibility factor is utilized within this technique	Within the simulation results, the enhancement is shown in comparison to the results achieved from existing techniques which shows the level of enhancement achieved here

Mr. Y. Gangadhar	2016	A comprehensive survey on various digital watermarking methods has been presented in this paper. An overview of various existing techniques is presented in this paper along with the various disadvantages being faced due to the presented of various types of attacks in the applications. Due to the robust nature of this technique, various geometric based watermarking methods are presented in this paper also.	An effective study of the geometric invariant methods is provided in this paper which can help in further enhancing the watermarking research field here.
Ahmed S. Salama	2016	This technique will also help in enhancing the robustness in comparison to already existing digital watermarking techniques. The Discrete Wavelet Transform (DWT) and Discrete Cosine Transform (DCT) techniques are combined here in order to generate improved technique (IMD-WC-T). With the help of PN-sequence and a specific key within the DCT transform, the water is spread.	An additional imperceptibility, minimized execution time and higher robustness is provided within the IMD-WC-T technique as per the results generated when this technique is compared within other existing techniques.
Mr. R. D. Shelke	2016	The study related to numerous audio-watermarking techniques that will help in advising the owner to use the appropriate technique using the watermark within their image, audio or video data. It is very difficult to eliminate watermark from the data.	Thus, the performance of the proposed algorithm can be enhanced and the complexity can be minimized along with the cost with the utilization of new techniques
Chengxiang Yin	2015	A novel approach which is introduced with the combination of cloud computing and audio watermarking. This approach helps in generating an innovative advertising technique which uses the background of music that is played within the public places for its execution.	The performance of proposed technique on the basis of various platforms and test the feasibility of this approach. The effectiveness of the system is also proved on the basis of usability test.

III. CONCLUSION

In this paper, it is concluded that cloud computing has the decentralized architecture in which hosts can join the network and start communicating with each other. Due to self configuring nature of the network certain type of security attacks are possible in the network. In this review paper, certain attacks are reviewed which improve security of the network.

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