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Develop an Alternative Novel Service tool for Cloud Computing

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ABSTRACT: Nowadays, as cloud computing technology is so widely used and is developing so quickly, many companies utilize cloud services to build their business systems or applications. The cloud computing environment is made up of a number of involved entities with varying goals and expectations, such as end users, cloud consumers, cloud service brokers, and cloud service providers. Choosing a reliable cloud service provider is a difficult issue. Furthermore, while evaluating cloud service Quality of service (QoS), decision makers are more based on linguistic descriptions. This paper presents Develop an Alternative Novel Service Tool for Cloud Computing. Providing security both at the Cloud service provider (CSP) and domain levels, the Security Framework and Cloud Security Protocol have been recommended. Through essentially verifying the information and its owner on the server, the Data storage protocol (DSP) was developed to provide increased security to data stored in a cloud environment. This analysis additionally provides useful suggestions for enhancing cloud security control. The results of the experimental investigations demonstrate that described system operates with good high accuracy, efficiency, security, and short execution time.

Keywords: Cloud Computing, Cloud Service Provider, Alternative Novel Service Tool.

I. INTRODUCTION

These has completely changed the small, medium, and large businesses use IT services: cloud computing offers on-demand, scalable, and adaptable IT services over the Internet [1]. Cloud computing is becoming more and more popular, and hundreds of IT businesses including Google, Amazon, Salesforce, IBM (International Business Machines), Microsoft, Yahoo, Arsys, Cloud Provider, and many more are attempting to make profit in this new market [2]. A broad term that includes a wide range of services is "cloud computing." It's essential to first understand the concept of the cloud and the many components and resources that are accessible for use in providing cloud services, in order to understand how the cloud may benefit the organization. Organizations have a wide range of options when it comes to where, when, and how they could use cloud computing because of the wide range of services [3]. When consumers (users) decide to migrate their computing infrastructure into the cloud, they certainly provide them additional choices, better services, and cost savings. On the other hand, businesses use their own business models and service offerings to represent cloud services and the selection process. Users find it difficult to choose between multiple vendors. Furthermore, users may lack technical competent needed to accurately evaluate and understand their requirements. As a result, it gets increasingly difficult to choose the best cloud services.

A number of user and cloud provider inputs regarding cloud services is the standard process for choosing cloud services [4]. The next step is to compare user and the provider inputs determine the best matches exist between them using various approaches, procedures, and algorithms. Choosing a cloud service differs from choosing other online services, like a hotel or flight reservation. This is because cloud services have unique properties [5]. For example, different cloud service models, such as Software-as-a-service (SaaS) [6], Platform-as-a-service (PaaS), and Infrastructure-as-a-service (IaaS), can be provided through various provisioning mechanisms.

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This SaaS refers to the provision of cloud-based programs that are accessible to users through the Internet, as their hosting and operation. These applications can be accessed by a number of clients, including web browsers and specialized program interfaces [7]. Salesforce and Google Apps are two examples. Users are given the resources they need to develop internet-accessible applications when they use PaaS [8]. Users have control over their applications, but the underlying infrastructure is not under their management or control. Google App Engine is one example. Heroku, Windows Azure. Hardware, including CPU (Central Processing Unit), storage space, and memory is made available to consumers by IaaS so they may deploy and utilize their applications [9]. Users are control of own storage, applications, and operating systems. Rackspace, Amazon EC2, and Google Compute Engine are a few examples.

Furthermore, the quality of service attributes of various cloud services vary, including variables like price, performance, usability, security, and privacy [10]. Users and service providers may interpret and expect varying levels of quality from cloud services, hence these characteristics are susceptible to interpretation. Security is one of the primary problems preventing the expansion of cloud computing, the major concern is the lack of mutual trust as awareness of managing data and information to cloud provider's third party providers seems to be subscribers to cloud services to be problematic [11]. Hence, the user should consider the threat of data vulnerability in this new setting. This thought about the challenges of big data and cloud computing. The main focus is on security issues in cloud computing because data for the operational management of an enterprise of importance's the threat of cloud computing, including security, increases very rapidly IT, privacy, data protection and network threats [12].

An open security framework for 3-layer cloud computing that can be implemented by anyone supports the trust of customers who are not familiar with the CSP security guidelines [13]. The security model is better protected and accessibility is improved by integrating disaster recovery and fault tolerance procedures. Using an effective data resistance mechanism helps the data safe from strangers. It is advisable to select the deployment type that conforms with the user's requirements and capabilities. This mechanism helps to increase efficiency in the cloud.

The article's remaining structure is as follows. In Section II, the relevant work is provided. The proposed model's overall architecture is presented in Section III. Results and discussion are presented in Section IV, and Section V concludes the paper.

II. LITERATURE SURVEY

Xu Minxian, Wang Xinyang, Tian Wenhong, and Qin Xiong, et. al. [14] has put out a flexible and extensible model for assessing virtual machine allocation performance. FlexiCloud ensures flexibility and extensibility by implementing suitable design patterns. This type includes capabilities for load balancing, energy efficiency scheduling, and support for public cloud providers. Ilango Sriram, et. al. [15] have suggested using a simulation program named Simulation Program with Integrated Circuit Emphasis (SPICE) to investigate cloud-scale data centers. The topology, architecture, and components of a data center are represented through the use of SPICE simulation tools in order to carry out and measure experiments.

Ashutosh Kumar, Puja Das, and Ajanta Das, et. al. [16] had discussions about the execution research of cloud simulators using the cloud computing load balancing technique. Comparative research and cloud simulations are clearly important. Here is a brief discussion of the cloud simulators' performance evaluation graph.

Evangelinos, Constantinos, and C. Hill, et. al. [17] have discussed the different uses of high performance computing (HPC) standard benchmark tests for data centers operated by Amazon elastic compute cloud (EC2). The best option for a number of HPC applications is

determined to be the EC2 cloud computing system.

K. M. Sim, et. al. [18] presented a model based on agents for building an effective cloud economy negotiating system. The outcomes of the negotiations between broker and provider agents in a market for cloud resources may have an impact on the outcomes of the negotiations between broker and consumer agents in a market for cloud services. This System supports complicated negotiation activities in interconnected markets. Additionally, MASs (Multi Agent Systems) were used in cloud computing to optimize costs..

A. Nunez, C. Andres, and M. G. Merayo, et al. [19] created the MAScloud framework, which is based on multi-agent systems, then find the configuration in cloud computing systems that minimizes the cost for operating a certain application through simulations. This approach is founded in simulation as the multi-agent systems. The agents are responsible for both creating and launching simulated cloud environments derived from a particular cloud mode, as monitoring the design and deployment of various cloud models.

S. Venticinque, L. Tasquier and B. Di Martino, et. al. [20] Explain how the Open Cloud Computing Interface (OCCI\cite{OCCICORE}) standard proposal being expanded upon at the cloud infrastructure level by Cloud Agency. Cloud Agency is a group of agent-based services that go beyond is often offered by open-source and commercial cloud providers for the provisioning, monitoring, and automated reconfiguration of cloud resources at the infrastructure level. In order to simplify communication between the agents' world and the Cloud world, they show the Cloud agency design and the implementation of a Restful to/from ACL (Adult Community Learning) gateway. This gateway conforms with OCCI expands its model and services.

L., Sun, H., Dong, F. K., Hussain, Hussain, O. K. and Chang, E et al. [21] examined several strategies and methods for choosing cloud services. First, the approaches that were being utilized have been divided into two main categories: the multi-criteria optimization approach and the Multi-criteria decision making (MCDM) method. The inputs and outputs of each method, next, they examined the application context of each approach and methodology, numerous parameters required and used language or model. Following the review and analysis, a number of interesting open challenges were discovered for additional research.Following the review and analysis, a number of interesting open challenges were discovered for additional research. Among them are the absence of a cloud marketplace and effective user preference measurement.
G. Baranwal, and D. P Vidyarthi, et al. [22] suggested a ranked voting methodology for choosing cloud services. For every cloud provider, a normalized preference score is determined using this procedure. The top cloud provider is determined by providing the provider with the greatest normalized preference score.

Z. Zheng, X. Wu, Y. Zhang, M. R. Lyu and J. Wang, et. al. [23] makes use of previous customer service usage data to provide a QoS (Quality of Service) rating prediction methodology for cloud services. Described framework predicts QoS ranking without requiring more connections to cloud services. To directly predicted the QoS ranks, two customized methods for ranking prediction are presented. Extensive experiments are carried out using real-world QoS data, involving 500 real-world online services worldwide and 300 scattered users. The experimental results demonstrate that described method performs better than those of other competitors.

Emeakaroha V. C., Werff L. v. d., Fatema K., Healy P., Lynn T. and Morrison J. P., et. al. [24] The operationalization of a trust label system intended to convey reliability and confidence in cloud services is presented in this research. The environment of digital services is fast evolving due to cloud computing. The number of Cloud providers has increased, making options for

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consumers more challenging. One aspect that has been highlighted as preventing cloud adoption is trust issues. They over the implementation and technical specifications of the trust label elements. An early assessment was conducted based on a use case to examine its functionality and efficiency for increasing customer confidence in Cloud services.

Cedillo P., Insfran E., Abrahão S. and Vanderdonckt J. et. al. [25] 58 undergraduate students participated in an experiment to evaluate their perceptions of the effectiveness of the monitoring infrastructure came to integrating the monitoring of cloud services deployed on the Microsoft Azure platform. The results of the experiment are reported, along with the design of the monitoring infrastructure that supports the suggested method with its to each platform. The results demonstrate that participants thought Monitoring cloud services using models at RunTime (MoS@RT) was a workable and approachable approach, and they also said they planned to keep using it in the future. MoS@RT has shown to be an effective method for cloud service monitoring, even if more research is needed to validate these results.

III. ALTERNATIVE NOVEL SERVICE TOOL FOR CLOUD COMPUTING

The architecture of Develop an Alternative Novel Service Tool for Cloud Computing is represented in below Figure 1.

In this paper, multi phase system structure was used, with each phase fulfilling its own duty to ensure cloud data security. Cloud computing is a category of computers with various business processes, data applications and information on servers can be managed through CSP (Cloud Service Provider) and accessed through a customer internet service instead of them to store and install in different offices or PCs (Personal ComputerS). Software and additional resources can also be published at the customer's request. Customers can use it to carry out computer services without having to acquire and set up an IT structure. The first phase is responsible for user authentication, digital user certificates issued by the appropriate users, managing user permissions and protecting user privacy. Even when the key has been obtained illegally, user data is encrypted at this phase.

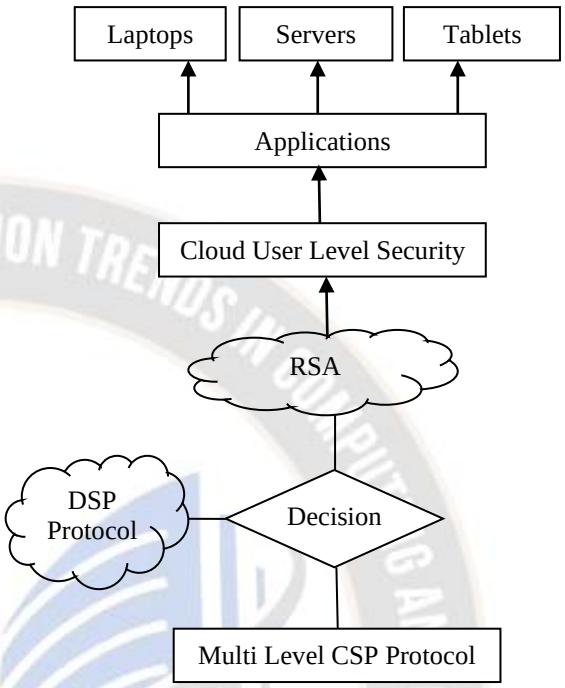

Figure 1: Architecture Of Alternative Novel Service Tool For Cloud Computing

In terms of cryptography, the RSA algorithm is asymmetric. Working on both the public and private keys, as the term "asymmetric" suggests, is what is meant to be understood. The public key is distributed to all parties while the private key is kept private, as indicated by the name. Because a huge integer is hard to factorize, the concept of RSA was born. Two numbers, one of which is the product of two huge prime numbers, make up the public key. These two prime numbers are also the basis of the private key. The private key will thus be compromised if the big number can be factorized. As a result, the size of the key determines the encryption strength entirely, and the strength of the encryption increases exponentially as we double or triple the key size. Although 1024-bit keys are expected to be broken in the near future, RSA keys are normally 2048 or 1024 bits long. However, it appears that this goal is currently unfeasible.

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However, the information is effectively protected from the malicious user by privacy protection, which is crucial for protecting business users trade secrets in cloud computing environments. During this stage, CSUS (Cloud Service User Security) tools are used to provide security.

When both the user manager and the provider have a confidence score over the predetermined threshold, they will be able to access the data stored in the cloud during the second phase. The SP (Service Protocol) is developed and used in this phase to provide multi-level security for the user and provider. A multi-level security framework is also proposed for cross-checking.

In the last phase, user data can be recovered quickly. Check the data from cloud server on the user's computer from the distance. The data will be using at this stage of the DSP protocol protected. Thanks to the fast recovery algorithm, user data is measured in order to achieve maximum recovery even in the event of damage.

The Data Storage Protocol (DSP) was created to give greater security to information put away in a cloud climate by somewhat checking the information and its proprietorship on the server. The DSP convention empowers clients to acquire probabilistic proof from stockpiling specialist co-ops. The log for confirming that a record is being put away in a server machine as an assortment of n blocks. Prior to transferring the information to far off capacity, the information proprietor pre-processes the dataset and a metadata thing is created. The metadata is put away on the information proprietor's side and the record is moved to the capacity server. The distributed storage administration stores the dataset and sends the information to the client in light of future solicitations from the information proprietor. The information proprietor (client) can perform information tasks like B. Growing the information or producing extra metadata to be put away on the cloud server side. The information proprietor can run the Data Storage Protocol (DSP) prior to erasing the neighborhood duplicate to guarantee that the downloaded duplicate was effectively saved money on the server Personal Computers.

IV. RESULT ANALYSIS

To verify the effectiveness and superiority of Alternative Novel Service Tool (ANST) for Cloud Computing, comparing cloud computing models with other service tools as Basic Service Tool (BST). Accuracy, Execution time, security analysis and efficiency are used Performance parameters for comparison. This work assists with understanding how the organization's prerequisites for cloud benefits.

In order to achieve or develop best Alternative Novel Service Tool (ANST) for Cloud Computing, Security is must be high with high accuracy and also efficiency must be high compared to other service tool for cloud computing. Depending on the number of computing nodes (or mappers), both service tools operate differently. Therefore, the performance between the service tools is tested with respect to this factor. They are executing these service tools of cloud computing network for 6, 12, 18, 24 and 30 cloud nodes.

The total amount of time needed for the computer to complete a task, including operating system overhead, CPU execution time, disk and memory accesses, I/O (Input/ Output) operations, and so on, is known as execution time.

In a cloud climate, information security is basic requirement for both client side and the server side. In the ongoing climate, security and control endeavors are made by distributing a specific level of assets. Since cloud computing systems design projects store and process data on remote servers that may be shared by numerous users and applications, data security is especially important. Data security and privacy can be achieved by using information encryption and individual firewalls. In this model we are using RSA algorithm for encrypting the data.

Accuracy of cloud computing is explained as the Data accuracy refers to how closely the data

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reflects the real-world phenomena or values that it represents.

The capacity to utilize cloud resources to their greatest potential at the lowest possible cost while avoiding waste and needless effort is known as cloud efficiency. Depending on their particular requirements, different organizations will use different standards for measuring cloud efficiency.

Below Table 1 shows the comparative analysis of Accuracy, Security and Efficiency parameters for both described Alternative Novel Service Tool (ANST) for Cloud Computing as well as Basic Service Tool (BST) for Cloud Computing.

Table 1: COMPARATIVE ANALYSIS IN TERMS OF EFFICIENCY, ACCURACY, SECURITY

Models	Security (%)	Efficiency (%)	Accuracy (%)
Alternative Novel Service Tool (ANST)	98	97	96
Basic Service Tool (BST)	90	89	91

Below Figure 2 shows the graphical representation of Security analysis of two service tools for cloud computing networks. It is clear that Alternative Novel Service Tool (ANST) for Cloud Computing is more secured with high security 98% than basic service tool.

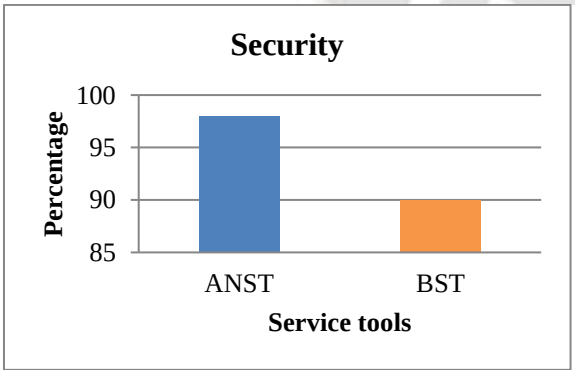

Figure 2: COMPARATIVE SECURITY ANALYSIS

Efficiency comparative analysis of ANST and BST models is graphically represented in below Figure 3 and it states that described ANST model achieves best efficiency than BST.

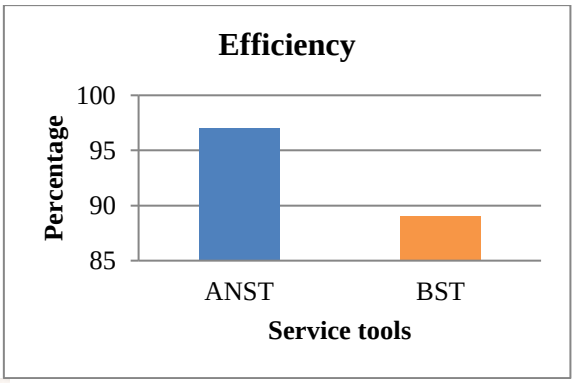

Figure 3: COMPARATIVE EFFICIENCY ANALYSIS

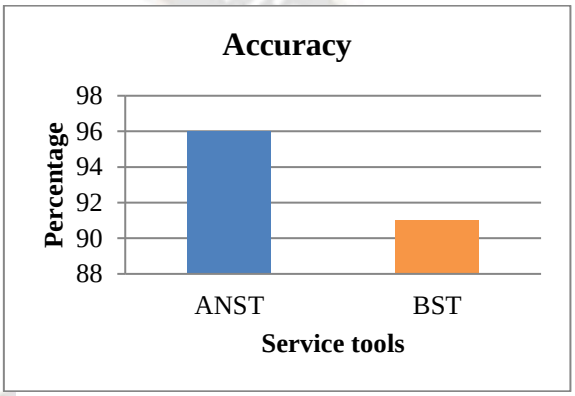

Figure 4: COMPARATIVE ACCURACY ANALYSIS

Figure 4 shows the graphical representation of Accuracy parameter of two service models as ANST and BST. The Accuracy of ANST model is high compared to BST model.

Table 2 shows the execution time comparative analysis for two service tools according to the number of computing nodes.

Table 2: EXECUTION TIME OF TWO MODELS

Models	Execution time (sec)				
	6	12	18	24	30
Alternative Novel Service Tool (ANST)	112	110	90	84	74
Basic Service Tool (BST)	180	160	130	125	114

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Figure 5 shows the graphical representation of execution time of two service models. As the computing nodes are increased then execution time is decreased because the load or task is distributed among cloud nodes. The execution time of ANST model is less compare to BST model.

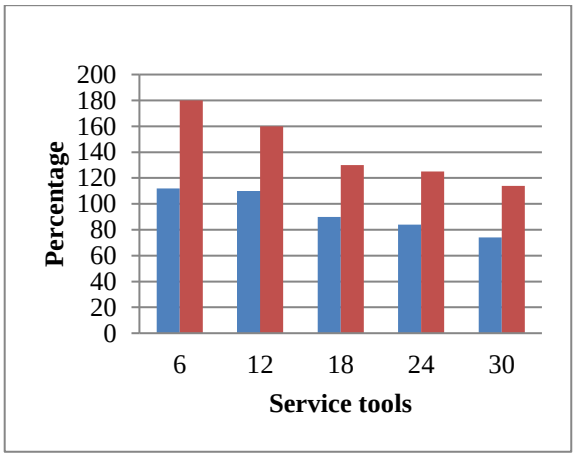

Figure 5: COMPARATIVE EXECUTION TIME

From result analysis, the Develop an Alternative Novel Service Tool for Cloud Computing (ANST) is more efficient and effective than BST model.

V. CONCLUSION

In this paper Develop an Alternative Novel Service Tool for Cloud Computing is described. Because of the cloud computing technology's rapid development and broad application, cloud services are commonly utilized by businesses throughout the development of their business applications or systems. Through minimal management or communication with service providers, cloud services are able to supply and release resources like servers, computer networks, hardware, and software efficiently. Cloud services are widely used by individuals, businesses to build their individual applications and commercial systems, by depending on the advanced cloud computing service concept for new development models. The Data Storage Protocol (DSP) was created to give greater security to information put away in a cloud climate by somewhat checking the information and its proprietorship on the server. From result analysis, the Develop an Alternative Novel Service Tool for Cloud Computing (ANST) is more efficient and effective than BST model. The results of the experimental investigations demonstrate that described method operates with excellent accuracy, efficiency, security, and less of execution.

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