Methods of Data Access in Cloud Computing and It's Challenges in Network Security

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***Abstract*:** Cloud computing owes to its potency, value effectiveness, flexibility and quantifiability for being a trend setting technology. In this paper, a cloud computing and education based theory has been studied and analyzed. This paper is based on the utilizations of cloud computing services in network security and its applications.

Keywords: *Cloud Computing, Models, Security issues, Architecture.*

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I. Introduction

Cloud computing could be a terribly broad term, however the study by Mell and Grance, it may be characterized by the subsequent 5 basic options that are common for all cloud services: self-service queries, network access, resource pooling and its utilization , speedy snap and measured service. The cloud computing is useful within the infrastructure of the business. The cloud computing involves varied technologies, comprised of hardware and software system with the construct of distributed computing, virtualization, net systems management, communication networks, huge information services, and information analytic. The planned theme maintains a brief list to minimize several issues. Nowadays, cloud computing has become the middle of heed within the IT world.[1]

It produces dominant computing services to people and organizations via the net, and allows them to access a pool of shared resources like storage servers and applications. Businesses of all sizes area unit adopting cloud computing at associate increasing rate because it provides them with nice advantages like price potency, since they are doing not even have to shop for the hardware and computer code resources, however merely pay per use. [2] Cloud service suppliers supply network services, infrastructure and applications within the cloud to each corporations and people .The most objective of cloud computing is to enhance the employment of distributed resources and be part of them to attain higher outturn, and be able to solve large-scale computation issues. Cloud computing deals with quantifiability, ability, virtualization, delivery models and quality of service.

a) Cloud Computing Architecture:

In this architecture, there are two sections namely , Front End and Back End. The cloud computing architecture is split into two main sections: Front End and Back End. The Internet connects these two sections. The network can be used by end users, applications or any client and they constitute the front end. Services like multiple computers, servers and data storage together compiles the back end.

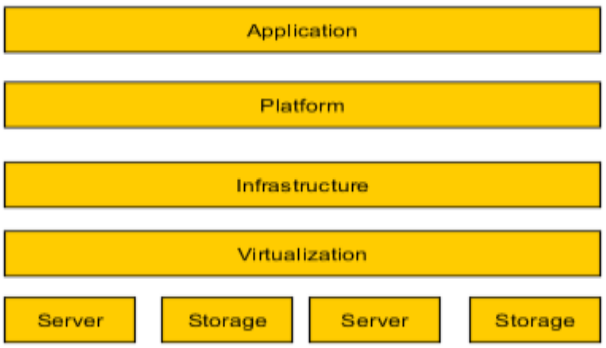

Fig1: Cloud Computing Architecture

[3] The cloud includes a central server that monitors the traffic and manages the system and client demands. The demand of resources isn't continually consistent from client to cloud. So, server virtualization techniques are pertaineded in which all physical servers are:

IaaS- Infrastructure as-a-Service:

Infrastructure as A Service (IAAS) directs to IT facilities, as well as computers, storage, networks and different pertinent software and hardware facilities. Main purpose of IAAS mean that tenants input their subscriber range. Service suppliers of IAAS give the preceding IT infrastructure services needed by tenants through computing distribution. During the course of this paper, the classical 4-layer logical designstyle of IAAS is applied, as well as physical resource layer, virtual layer, scheduling layer and service layer This provides the infrastructure as a service to its clients. The

customer does not required to purchase the desired servers, data center or the network resources. Customers are ready to win a far quicker service delivery with less value.

PaaS-Platform as-a-Service:

In the model, cloud suppliers offer customers with a computing platform usually as well as the software, execution environments, database, and the various net servers. The buyer won't manage the software and network, and there may be the various limitations on that applications are often deployed into the cloud[4].

Platform as a Service PAAS could be an inclusive platform to develop, design, mix and manage function parts of the cloud wisdom education platform. Practical parts are used as a service for users to use and provide services to SAAS, thus on supervise platform resources in real time. The PAAS may be divided into service delivery, service governance and operational supporting.

SaaS-Software as-a-Service:

[5] This service may additionally be brought up as Application Clouds and is that the most elementary cloud service model. It provides applications and services employing a cloud infrastructure or platform, instead of providing the cloud options. Software as a Service SAAS has the service characteristic of providing numerous instructional internet application services for tenants(elementary faculties, middle faculties and high faculties, instructional coaching organizations and course schools) through the Internet. Data management center provides approved and consistent information for faculties, instructional coaching organizations and adult faculties, offers high-quality information foundation to information statistics, analysis and exploration, offers support to correlative question of academics and students' personal data, and provides uniform and categorized applied mathematics statements for daily business data question in every department. Data education is that the direction of future instructional teaching development. The cloud wisdom education platform shaped by combining instructional services with cloud computing is that the inevitable product underneath the event direction. Cloud computing not solely will offer basic application support and application conditions, however can also supply the massive area for developing wisdom education.

b) Utilization of Cloud Services:

Now a days Cloud computing is an abstraction supported the day of association of physical resources and their presentation as a virtual supply. It's a model of providing sources and freelance user access on a service platform. Cloud computing could be a model that ought to bring ubiquitousness, comfort and network access for the asking into a bunch sharing organized computing resources which may be quickly operated with minimum management or provider's effort[6][7].

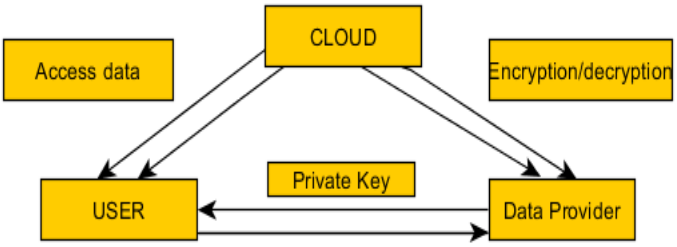

Fig2 Security in Cloud Computing

There are various cloud computing services and these are as follows:

USER-AUTHORISATION:
To access the data from cloud server, the user should be registered first. At first, a registration request to the CSP has to be sent by the user.

DATA STORAGE:

It is the main process that includes method for storing the data at DO's finish and CSP's end. Data Storage is an important parameter for the cloud computing services.

DATA OWNER: A secret key is generated by the Dos for data storing. Encoding with the PROWN is done after the encryption of secret key by DOs. PUSP is used to encrypt the whole message again by Dos and a three layer encryption is bundled.

DATA ACCESS:A data access request is send by the user. At the first time to access the data , the data encryption key and certificate is requested by the CSP from DO to decrypt the dara. After the completion of authorization, the CSP send the information for data access. After receiving the credentials from the DO, the CSP doesn't request users to get the certificate and secret key from the DO.

c) Cloud Operating System:

[8] An Operating System is that the software package that manages all of the computer's hardware resources and similarly as software package. A cloud Operating System is designed to manage giant collections of infrastructure as a seamless, flexible, and dynamic in operation surroundings.

It conjointly includes software package support for the freelance scaling and opportunist preparation of distributed applications. Secondly, the additionally to a group of network-based interfaces that modify applications to

question the management system and management of the cloud resources.

Cloud Computing Models:

Cloud computing readying models are divided into four classes and every model represents a particular kind of cloud services and setting with bound characteristics that support the requirements of the cloud users. The deployment models are Private Cloud, Public Cloud, Hybrid Cloud and so on.

A cloud Operating system should satisfy the subsequent necessities to make it confirm and sure economical and reliable use of the cloud. A cloud OS ought to be ready to continue its operation in spite of loss of nodes, entire clusters, and network partitioning. The cloud Operating System should give AN abstraction of the cloud computing as a logic on the far side the individual elements of hardware component from that it's engineered [9].

The cloud OS management system should be decentralized and ascendable such no human intervention is needed to expand the cloud resources once required. Each application must not be needed to form essential functions like virtual machine observance, scheduling, security, power and memory management.

Virtualization is prime to cloud computing. An OS in cloud computing thus should be ready to manage and management not solely virtualized physical servers however also virtualized resources like memory, networks, storage and software package

PRIVATE CLOUD :

A private cloud refers to internal services of a business that's not on the market for normal people. The cloud infrastructure is installed, maintained and operated for a particular organization.

PUBLIC CLOUD :

A public cloud may be a form of cloud hosting that the cloud services are delivered over a network which is open for public usage.

HYBRID CLOUD:

The cloud infrastructure is comprised of variety of clouds of any sort. This may be a mix of personal and public clouds. The clouds have the power to maneuver information and applications from one cloud to a different cloud.

E-Learning Concept in Cloud Computing:

E-learning has become an irreplaceable a vital part of the academic method not solely at universities, however recently conjointly at basic and secondary colleges. Nowadays, e-learning may be outlined as a learning platform that uses data and communication technologies in addition as electronic media. On the opposite hand, there exist sure risks which could contradict with the on top of mentioned statements. From the institutional purpose of read, one will list the subsequent pitfalls. The current models of e-learning don't have a comfortable support of the underlying infrastructure to store giant knowledge [10].

The key purpose of cloud computing implies that infrastructures, development platforms and software system applications belong to services and might be ordered from service suppliers. Such a platform could also be helpful to resolve information for business, improve processing capability and supply powerful information support for the management to try and do decision-making analysis. With the affordable resource distribution and improvement of resource utilization rate, the server could create a fast response to alternation of business desires. From cloud computing service hierarchy to vary division, the computing framework of superior cloud data education platform may be divided into 3 layers, as well as Infrastructure as a service (IAAS), Platform as a service (PAAS) and Software as a service (SAAS).

Applications of E-Learning concept:

Here , we are exploring the benefits of e-learning support in cloud computing. There are many benefits of e-learning in cloud computing for the establishments of higher learning. Cloud computing provides opportunities for businesses to extend their efficiency and cut back their conservation and performance price whereas providing merchandise to their customers. It points intent on its proximity in sense of various recent opportunities of data technologies resembling cloud computing.

The aim of this study is to investigate e-commerce manager’s decision-making in terms

of the adoption of public cloud computing modes namely- SaaS, PaaS and IaaS and its determinants within the context of e-commerce. E-commerce refers to the merchandising and shopping for of merchandise or services over the web. the employment of technology is inflated in our lifestyle. The e-commerce is such quite utilization of technology that has remodeled the e-commerce and business to a technological dimension[11].

Advantages of E-Learning Education in the field of Cloud Computing:

1) No worry for backing up all the knowledge on a hard disk.
2) There is a chance of the centralized data storage.
3) There's no threat of losing the information.

4) Students will work from multiple places like home, work or library.

Network Security Issues in Cloud Computing:

The2majorproblemsseasonedwhile availing these blessings of cloud computing are data security and access management. A procedure by which a user can access data or file or any resources from a server control will be outlined as access management. A replacement knowledge access management model has been proposed during this paper for economical data accessing, which might minimise several issues, like high looking out time for providing the general public key of the info owner, high data accessing time, maintenance of the info, etc

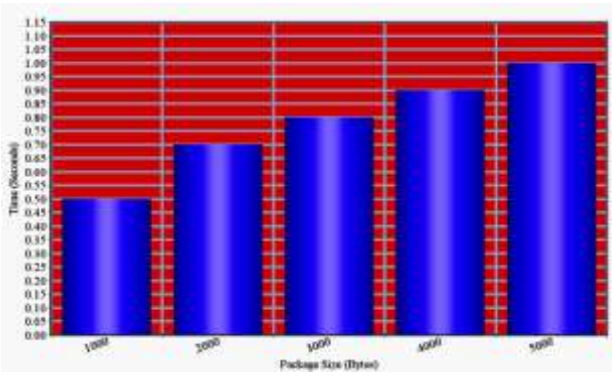

Fig3. Total time versus Data Sizes

With the progressively high informationization in China, currently academic modernization is one among standards exploitation for mensuration international soft power. Actually, teaching informationization might have a distinction to some extent between regions, urban and rural areas, and faculties, even though overall degree of informationization is also higher[12].

Some areas might have a series of issues, likethe bigdistinction of resource configuration in computer code and hardware, serious data island and low resource utilization, etc. currently SOA technology will solve data island, understandknowledge resource sharing and work with all departments, thereforeonunderstandfast response in digital academic development.

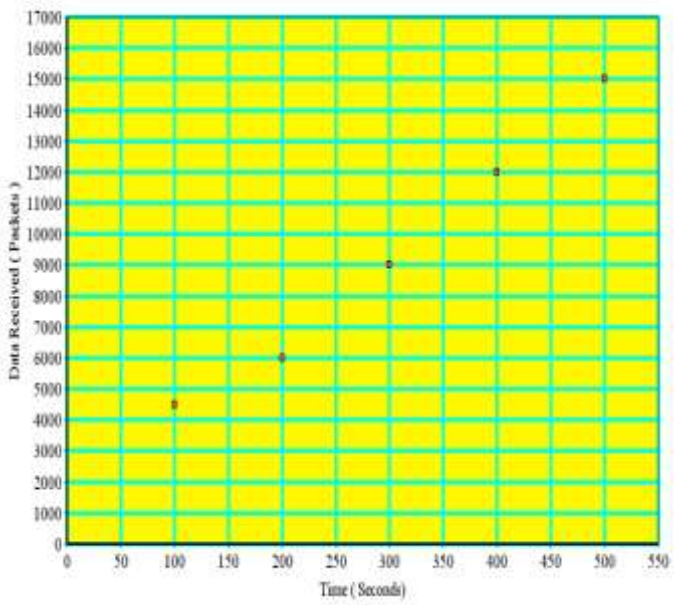

Fig4. Data Received versus time.

However, with the ascent of knowledge size and relative insufficiency of knowledge handling capability, the idea of cloud computing emerged at the correct moment, attributable to the progressively high knowledge demand, low utilization rate of mass knowledge and unbalanced resource distribution.

Conclusion:

Cloud computing promises enhanced quantifiability, pliability, and cost-efficiencyparameters for secured transmission of data and its application in e-learning education. The time for searching the key has been reduced. In this paper, the data access methods in cloud computing has been studied and analyzed. For providing the security in cloud computing, we analyzed the secured transmission and receiving of data packets.

References:

[1] Majumder, A., Namasudra, S., Nath, S.: 'Taxonomy and classification ofaccess control models for cloud environments'. in Mahmood, Z. (Ed.):'*Continued rise of the cloud*' (Springer, 2014), pp. 23–53

[2] Schuster, F., Costa, M., Fournet, C., *et al.*: 'VC3: trustworthy data analytics inthe cloud using SGX'. Proc. of the IEEE Symp. on Security and Privacy, SanJose, CA, May 2015, pp. 38–54.

[3] Zhu, Y., Hu, H., Ahn, G.J., *et al.*: 'Towards temporal access control in cloudcomputing'. Proc. of the IEEE INFOCOM, Orlando, FL, March 2012, pp.2576–2580.

[4] Ma Mingli, "Study and Realization of Comprehensive Service Platform Based on Cloud Foundry,"Dalian: School of Computing, Dalian University of Technology, 2014.

[5] Yang Zhaohua and Yang Haojie,"SOA Enterprise Framework Design Based on Cloud Computin],"Computer Disc Software and Application, 2012.

[6] W. Treesinthuros, "E-commerce transaction security model based on cloud computing," in *2012 IEEE 2nd International Conference onCloud Computing and Intelligence Systems*, 2012, pp. 344-347.

[7] G. Hemlata, D. Hema, and R. Ramaswamy, "Developing a Cloud- Computing Adoption Framework," *Global Business Review*, vol. 16, pp. 632–651, 2015.

[8] M. Naderpour, J. Lu, and G. Zhang, "An intelligent situation awareness support system for safety-critical environments," *Decision SupportSystems*, vol. 59, pp. 325-340, 2014.

[9] C. Diwaker and P. Dembla ,"Survey on Cloud Computing", International Journal of Advanced Research in Computer Science, vol. 5, no. 5, May-June 2014, pp. 53-55.

[10] Allen, I.E., Seaman, J. Changing Course: Ten Years of Tracking Online Education in the United States, Oakland, Babson Survey Research Group and Quashog Research Group, LLC. (2013)

[11] A systematic literature review of software requirements prioritization research. Information & Software Technology 56(6): 568-585 (2014