

Design and Development of Secure Cloud Architecture for E-Commerce

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Abstract. Use of E-trade has emerged from last a long time and it isn't always limited to buying and promoting items online. Now many groups are supplying software's, systems and infrastructure as their offerings beneath e-trade. Cloud computing in conjunction with e-trade is offering Pay-Per-Use-On-Demand mode this is without problems accessed and shared by way of IT resources with the assist of net. In this paper, we've discussed the software structure based on Cloud Computing. Different offerings which are offered via Cloud Computing may be categorized into 3 elements: Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). We have additionally described infrastructure and framework of E-Commerce Cloud. Furthermore, the development in reliability and safety of Supply Chain Management, because of Cloud Computing, has been mentioned. At the quit of the paper, we've mentioned safety issues of e-commerce system. Security of statistics and computer influences e-commerce cloud and its overall performance.

Keywords: *E-Commerce Cloud, Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS), Cloud Security.*

1. INTRODUCTION:

Software structure provides the design and implementation of the high-level structure of the software [1]. It is primarily based at the principal functionality and performance requirements of the gadget and, non-practical necessities which include reliability, scalability, portability, and availability is completed with the end result of assembling a certain range of architectural elements in properly way [2]. Software structure of a software machine can be advanced based totally on cloud computing.

Cloud computing is the maximum popular cutting-edge era inside the IT enterprise and also the commercial enterprise due to its elasticity inside the space career and additionally the better aid for the software program and the infrastructure. Cloud performs a important function to provide the instantaneous changes required in enforcing

better applications with the help of cloud computing [3]. It is an evolution from dispensed computing machine. Cloud computing is the combination and evolution of Virtualization, Utility computing, Infrastructure-as-a-Service(IaaS) Software-as-a-Service(SaaS), and Platform-as-a-Service(PaaS) To proportion statistics, running systems, programs, garage and processing strength, exist at the internet is achieved by means of the use of cloud service. Cloud computing acts as a Pay-in keeping with-Use-On-Demand mode that can be without difficulty accessed and shared with the aid of IT assets with the assist of the Internet facilities. It improves the provision of IT resources and also gives many blessings over different computing strategies. IT infrastructure may be used with Pay-in step with-Use-On-Demand mode via the customers [4].

E-Commerce (EC) is a developing Web application which gives various offerings for customers, partners and personnel [5]. Cloud computing is a new concept which has attracted the IT company interest particularly the e-commerce (EC) company development device. Currently there is a superb trouble of environmental costs for the duration of the businesses apply the ecommerce. But all the issues might be solved through the usage of cloud computing. Software programs and services are given by way of e-trade groups to pay the amount based totally on call for get entry to, in line with the quantity to calculate the value, entire the manufacturing, marketing, buying and selling and control [6]. Companies are used e-commerce device to reduce the cost so as to keep away from wastage of more resources that may be used for business activities. There are a hard and fast of factors which might be related with the progress of EC improvement, it wishes are changing into its constraints because of the challenge of corporation size, monetary electricity, and technical force [7].

This proposed framework for designing cloud primarily based software program structure for E-commerce

packages is based totally on the improvement criteria of cloud computing and also solves the problems of e-trade and the garage of sources [8]. A proposed framework lets in organizations to lower charges through the powerful implementation of E-Commerce sports, and also solves organizations troubles with the integration of E-trade actives based totally on Cloud computing era [9]. To lessen the value for purchasing components, preservation cost is viable with this cloud computing principles. It also trains the IT humans in this hardware and software code with this cloud answer. We did now not to purchase, preserve, update and replace luxurious gadget With One Network's era solutions in the cloud [10]. The cloud solution additionally allows us to offer industry-main time-to-cost, with implementation times averaging less than half the time of traditional supply chain answers. In addition, real-time information throughout all of your value chain members method expanded revenue opportunities Connect on your complete fee community in the cloud and see how smooth it's miles to lower your charges and increase your earnings [11]. This proposal presents the design of Cloud based totally software program architecture for E-trade programs and additionally provides an implementation of the device.

1.1 Related work:

Initially "Transforming the Way We Do Business in Electronic commerce become added through Till and T. Nash. State of Art," Handbook on Electronic Commerce is published by means of M.J. Shaw. Head M and Hassanein.K become focused on evaluating the impact of third-birthday party seals. Yan Wang and kwei-jay lin have been mentioned on "Reputation Oriented Trustworthy computing in e-commerce environments," A Walk inside the Cloud: Uncovering Cloud Computing idea is discussed via K.Meng [2008].C.L.Li, Z.H. Deng was targeted at the value of cloud computing. Improving software program assignment excellent using criticality analysis is given by means of VetriciM [2009]. Shao introduces "Based on Cloud Computing E-Commerce Models and Its Security .Xiaofeng Wang , changed into centered on "Research on e-trade development model in the cloud computing environment. Jiangyu Sun; Chun Yuan have been discussed on A multi-channel Online selling Syndicates based totally on cloud structure", Consumer electronics inside the 12 months of 2012,G. Boss, P. Malladi, D. Quan, L. Legregni, H. Hall. Were introduces the Cloud Computing concepts. [IBM White Paper] during the 12 months of 2007.Currently research is going on E-trade utility model based totally on Cloud computing by using Wang [from 2012 onwards] .

Methodology: According to the sort of service, the

software mode of cloud provider may be divided into Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS) [5].

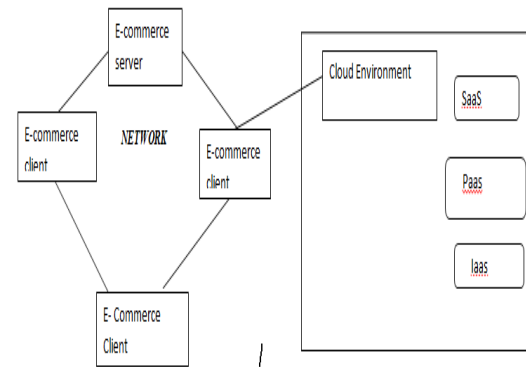


Fig: 1 Flow of process for E-Commerce application model by using Cloud computing

Infrastructure as a Service: Infrastructure Providers manage a large set of computing resources, such as storing and processing capacity. Through virtualization, they are able to split, assign and dynamically resize these resources to build ad-hoc systems as demanded by customers, the Service Providers. They deploy the software stacks that run their services.

Platform as a Service: Cloud systems can offer an additional abstraction level: instead of supplying a virtualized infrastructure, they can provide the software platform where systems run on. The sizing of the hardware resources demanded by the execution of the services is made in a transparent manner.

Software as a Service: Finally, there are services of potential interest to a wide variety of users hosted in Cloud systems. This is an alternative to locally run applications. An example of this is the online alternatives of typical office applications such as word processors. Relative to three service types of cloud computing, three cloud modes can be formed, namely Infrastructure Cloud, Platform Cloud, and Application Cloud [6]. Infrastructure cloud provides computing and storage for users in the form of authorization service, of which essence is virtualizing, computing or storage resources in one or several data centers, so as to divide resources flexibly. Typical applications of this model are Amazon's Elastic Compute Cloud [7] and IBM's Blue Cloud. The platform cloud make developers not worry about work details of large-scale server in background, and provide a transparent, safe and powerful operating environment and developing environment for them. Typical applications of this model mainly contain Google App Engine, Heroku, Azure and Force.com [8].

Application cloud faces directly final software users, usually presenting itself in the form of SaaS. Each module of software system can be customized, configured, assembled and installed, and tested by users.

Cloud computing subverts the traditional network architecture model, which enables the users to make use of the network resources freely and cost-effectively, as well as to get rid of the effect caused by a single computer

equipment failure, such as, unavailable devices, the loss of data and so on. With cloud computing, the majority of users do not need to buy their own hardware and software, even need not to know who is providing the service, as long as you focus on the resources or services that you really need. If the cloud-based e-commerce service called e-commerce cloud, based on the basic application form, we can describe the overall picture of infrastructure of the e-commerce cloud, as

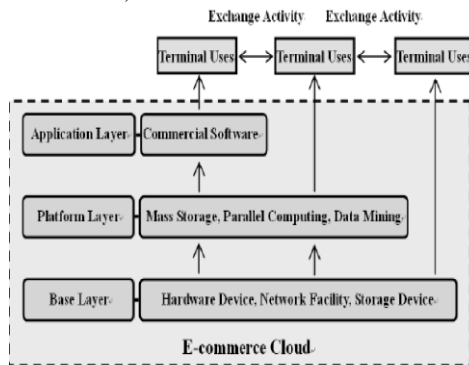


Fig: 2 A Framework for E-commerce Cloud

The base layer of e-commerce cloud

The base layer of e-commerce cloud shares IT infrastructure resources and connects the huge system pool together to provide services. Cloud computing allows the hardware layer to run more like the internet, to make the hardware resources shared and accessed as data resources in secure and scalable way. Virtualization technology separates the physical hardware from the operating system, which on the one hand can make computing and storage capacity of the existing server into smaller size and re-integration, to improve the utilization and flexibility of IT resources; on the other hand can provide a common interface for large-scale cloud computing integration that enables the publication of calculation. The base layer can provide the basic hardware resources for the platform layer, and the users can also make use of it as the same as using a local device to use.

The platform as a service layer of e-commerce cloud:

With the support of the powerful hardware, platform layer carries out the tasks of data storage, computing and software development. It can even achieve the tasks of completion of the original mass data storage, business intelligence processing and so on which have been difficult to complete. Users can choose the devices and the number of devices according to the complexity of dealing with the content. Virtualization technology enables the platform to show a strong level of flexibility.

Software as a service (SAAS) of e-commerce cloud:

The applications software or services provided by a professional company e-commerce, the companies to pay in the similar way of on-demand access, according to the amount to calculate the cost, complete the production, marketing, trading and management. Companies use e-commerce system in lower cost to avoid wasting, and more resources can be used for business activities.

E-commerce cloud environment provides user-oriented

ubiquitous adaptive hardware resources, computing environment and software services. In e-commerce cloud space, users can access digital services transparently at any time anywhere. The users can obtain the necessary network and computing services very naturally at any position. The information space and physical space will be integrated because of ubiquitous computing capability. And the ubiquitous information terminals together with the embedded system equipment will be the vehicles of e-commerce in the future.

- The cloud computing provides some major security benefits for individuals and companies that are using/developing e-commerce solutions. Improved improbability. Virtualization Centralized data storage. Monitoring of data access
- E-Commerce based on cloud computing (e-commerce cloud) environment provides a large scale of data center in which mass data storage, data mining capacity, high-speed computation, and significant cost advantage to develop e-commerce business model.
- The e-commerce cloud environment reduces the demand of access to the terminal, the problems of information processing, transmitting and security can be solved neatly.
- E-commerce business Operation and management based on cloud computing can process data flexibility, Accessibility, minimize the operation cost, and realize the automation of solutions in application without considering the position of equipment resources.
- Supply Chain Management (SCM) based on the cloud computing offers reliable and secure data storage service and calculation in time whenever clients needed.

Security issues for E-commerce system:

Security is the component that affects e-commerce which includes Computer Security, Data Security and other areas. Security is one of the concerns which is affecting customer and organizations trade. Web application which is offering online payment system (net banking, credit card, debit card, PayPal or other token) are at more risk from being targeted and there is a big loss if data is being hacked. The e-commerce website those offering online payment are giving guidelines for securing systems and networks available for the ecommerce system. To educate the customer is the more critical part of the e-commerce security architecture. Trojan horse programs are the biggest threat to e-commerce because they can overthrow the authorization and authentication mechanisms used in trading transaction. These programs are installed on remote computers by simple means: mail attachments. Privacy has become the biggest issue for consumers with the rise of identity theft, this cause's major concern for e-commerce providers.

Now a day's people prefer to shop online than going for traditional business, because it's easier and more convenient. Almost anything can be bought online as books, kitchenware, toiletries, clothes, music, electronic peripherals and many more. Some of the popular websites are eBay, amazon, Best Buy, iTunes and many more. Types of security threats are Technical Attacks, Denial of

service attacks, ICMP Flood, Teardrop Attack, Brute force attacks, Phishing Attacks, Social Engineering.

Security Features :

AUTHENTICATION: It verifies one's identity. It enforces that you are the only one allowed to login to your Online banking account. **AUTHORIZATION:** Allows only you to manipulate your resources in specific ways. This prevents you from increasing the balance of your account or deleting a bill.

ENCRYPTION: Deals with information hiding. It ensures you cannot spy on others during Internet banking transactions.

CONFIDENTIAL: Information is not accessible to unauthorized person.

AUDITING: Keeps a record of operations. Merchants use auditing to prove that you bought specific merchandise.

INTEGRITY: Prevention against unauthorized data modification

NONREPUDIATION: Prevention against any one party from reneging on an agreement after the

AVAILABILITY: Information is available wherever and whenever is needed without any time limit.

DDOS (DISTRIBUTED DENIAL OF SERVICE ATTACKS): involves hackers placing software agents onto a number of third-party systems and setting them off to simultaneously send requests to an intended target

SNIFFERS: software that illegally access data traversing across the network.

CONCLUSION

E-Commerce industry faces a challenging future in terms of the security risks it must avert. With increasing technical knowledge, and its widespread availability on the internet, criminals are becoming more and more sophisticated in the deceptions and attacks they can perform. Novel attack strategies and vulnerabilities only really become known once a perpetrator has uncovered and exploited them. In saying this, there are multiple security strategies which any ecommerce provider can instigate to reduce the risk of attack and compromise significantly.

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