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Harmony: A Resource Management Technique for better Cooperation between Cloud Service Providers

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Abstract: *Cloud computing became one of the most important platform for the cloud providers in order to install the cloud providers in the virtual manner via Internet to the customer. Cloud customer all over the world exchange their data with high range of computing resources, secondary level of data storage with high bandwidth. Hence the ongoing demand for demand for the scalable resources is very popularly increasing between the cloud customers. Therefore single cloud server could not able to detect and connect with high range of capacity to the application during run time. Hence the researchers are in need to build virtual lab environment for connecting the multiple cloud server thus advancement research leads to the collaborative cloud computing (CCC). This paper utilizes an efficient resource sharing platform called Harmony and then uses the Neural Networks (NN) for appropriate resource selection. Further the trust management is implemented and optimal time period for resource selection is optimized.*

1. INTRODUCTION

Cloud computing emerging technology, it is development of the parallel computing, distributed computing, and grid computing, utility computing. Cloud computing is considered as the future model for the computing. It gives the user ability to store data and access data using internet.

It included services like Software-as-a-service (SaaS), Infra structure-as-service (IaaS), Platform-as-a service (PaaS) [2].To users, cloud computing is a Pay-Per-Use-On-Demand that a conveniently access and shared resources through internet. In these cloud computing there are different cloud like public cloud, private cloud, hybrid cloud, community cloud. We know about the cloud computing is a security on technical level, here mainly focus on the attacks and hacking attempts. Many Business and industry owners are attracted to cloud computing concept due to many features due to many features. The features are as follows:

1. Lower investment.
2. Scalability
3. Reliability and Security.
4. Faster Deploy.

In SaaS, a premade application, along with any required software, operating system, hardware, and network are provided. In PaaS, an operating system, hardware and network are provided, and the customer installs or develops its own software and applications. In IaaS model provides just the hardware and network, the customer installs or develops its own operating systems, software and applications.

Where in the collaborative cloud customers can choose a private, public, hybrid, community to support discrete services, here customers can achieve more value by integrating third party applications. Private clouds are owned and operated by third-party services provider, Public cloud is an open wide to public, Hybrid cloud is an composition of two or more distinct cloud infrastructure, community cloud is an provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns. Where collaborative cloud is strategic framework for delivering communication services and applications to customers and partners via cloud [3]. Customers can choose a private, public or hybrid to support discrete services:

1. Build with cloud-grade applications and infra structure.
2. Manage part or all of your communications applications and infra structure.
3. Deliver services through public and hybrid clouds.
4. Enable service providers to deliver cloud services.

Collaborative Cloud Computing

Collaborative cloud computing (CCC), where globally-scattered distributed cloud resources belong to different organizations or individuals are collectively used in cooperative manner to provide services to customers.

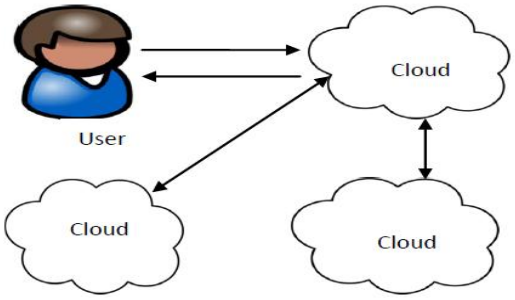

Figure 1. *Collaborative Cloud Computing Structure*

Collaborative cloud computing (CCC) platform is which interconnects the physical resources that allow sharing the resources between clouds and providers with huge amount of resources to customers, when a cloud doesn't have sufficient resources then it will use resources form other clouds which they want.

2. RELATED WORK

In paper [4] CTrust framework addressed for the security purpose by connecting various kinds of Virtualization Technology (VT) process in order to access resources like storage, network, and software. Secure Hypervisor Framework (SecHYPE) makes the root trust for the cloud running application. Currently cloud computing techniques mostly used in e-commerce, online auctioning companies even though cloud computing connecting different types of system without regarding underlying architecture of computer system security issues is the major threat in the cloud computing. The National Institute of Standards and Technology (NIST) makes the research in the field of security as a primary concern on the cloud computing. Software abstraction has been used to create hardware and operating system coupling each other in order the cloud applications. This paper gives the detailed information about security analysis, system analysis, and cryptographic key management.

In paper [5] makes the detail study about internet security problems, the major security problems are worms, spam and phishing attacks. In order to overcome the following problem they proposed Unified Threat Management (UTM) which is used to module and connects different types of networks. Intrusion Detection System (IDS) evolved quickly to the Distributed Denial of Service (DDoS) strings for identifying the signature steps to detected viruses. Collaborative Network Security Management System (CNSMS) creates the new integrated environment for developing Unified Threat Management (UTM). This paper mainly focuses on the security centre for the traffic data analysis and process to store large amount of data.

In paper [6] Collaborative Cloud Computing is used to support very promising trends in cloud information extraction techniques. Retrieving of information from the different user is not that much possible and easy hence we could access data directly from the storage devices by using Neural Network (NN) based system. Artificial Neural Network (ANN) mechanism tends to activate the inputs function with the help of output values this technique used to get the information at the same time without any kind of additional efforts. This paper makes use of the learning system based on the Neural Network which reduces single point failure and removes all the problems lying in the cloud computing hence it gives out efficient and effective extraction of information for the collaborative cloud computing.

In paper [7] Use of cloud computing with the collaboration of Multi cloud environment where cloud providers access software, platform, and infrastructure as the pay per use basis and gaining huge

attention as per industrial expectations. The user used to gain the access to the cloud services but at the same time user gets vendor lock in therefore user as to access particular cloud service providers for low cost management to authentication to multi service providers. Security issues generated with the mash up centre should be around the service providers while implementing nodes on the cloud server. The main issues in the multi cloud environment performing task on the distributed service hence the collaboration framework for multi cloud system can be implemented. Different types of proxy techniques like proxy based framework, cloud hosted proxy, Peer to Peer proxy, and on – premise proxy are used for the security issues. This paper describes various research parameters on the multi cloud environment in order to provide low cost functionalities.

In paper [8] cloud computing providers gives the bigger opportunity in order to deploy complex information technique as the infrastructure to the end user. Therefore cloud service needs very strong cloud control frame work which can orchestrate cloud resources like utilization, configuration, provisioning and decommissioning around physical resources. Infrastructure as a Service (IaaS) environmental model provides Virtual Machine (VM) as an operating system and hence make cloud server as the sophisticated combining virtual private cloud instance. This paper used to advocate a data centric approach for the cloud resource orchestration. Orchestration data format are structured and defined by using transactional semantics.

All the above mention literature work has been tabulated with their respective advantages and dis-advantages in table 1:

Table 1. *Comparison of various methods*

Ref.No	Technique used	Advantages and Disadvantages
[4]	CTrust frame Secure Hypervisor framework (SecHYPE)	**Advantages:** 1. Cloud computing allows multiple users to share their data. 2. CTrust helps to develop security paradigm. 3. SecHYPE framework provides security implementation. **Disadvantages:** 1. High Security threat provides hindrance to the customer.
[5]	Distributed Denial of Service (DDoS). Unified Threat Management (UTM). Collaborative Network Security Management System (CNSMS)	**Advantages:** 1. CNSMS used for the counter measure attack in the distributed manner. 2. Explore very large amount of collected data using CNSMS. 3. UTM used to analyze the data in distributed manner. **Disadvantages:** 1. Network traffic is very much congested over the nodes. 2. High security events.
[6]	Collaborative Cloud Computing (CCC). Neural Network (NN). Quality of Services (QoS)	**Advantages:** 1. Integrated retrieval of information management. 2. Interactions between trustworthy resources and efficient among clouds. 3. High quality of QoS is measured. **Disadvantages:** 1. Retrieving of the information from different user is very much difficult.
[7]	Elastic Compute Cloud (EC2). Software as a Service (SaaS). Virtual Machine (VM).	**Advantages:** 1. Provides scalability, flexibility for the storage of data. 2. Provides the customer paying money for the amount data has been used. 3. Data center uses Virtual Machine (VM) for the isolation process. **Disadvantages:**

		1. Deployment of VM is very much costlier. 2. Virtual infrastructure determines provision over/under performance.
[8]	Data centric management framework. Infrastructure as a Service (IaaS).	**Advantages:** 1. Advanced cloud services used to share complex operation like storage management, fault management, image management etc. 2. Orchestration creates management and manipulation of the resources. 3. Data Centric Management Framework (DMF) provides well defined semantic for accessing the data. **Disadvantages:** 1. Sophisticated cloud services needs dynamic orchestration for the service abstraction.

3. PROPOSED SYSTEM

To ensure the successful deployment of CCC the issues of resource management and reputation management must be jointly addressed for both efficient and trustworthy resource sharing in four tasks:

1. Efficiently locating required trustworthy resources and clustering based on services.
2. Choosing resources based on overall QoS.
3. Fully utilizing the resources in the system while avoiding overloading.
4. Getting feedback from the users.

The cloud collaboration services provided can be implemented in four modules:

3.1 User and Service Identity Management

An identity management mechanism can help authenticate users and services based on credentials and characteristics. While users interact with front-end service, this service might need to ensure that their identity is protected from other services with which it interacts. In multi-tenant cloud environments, providers must segregate customer identity and authentication information. This module gets authentication details from user or service and authenticate them before using the system to avoid faulty requests from external environments.

Service Directory offers multi-faceted reputation evaluation across multiple resources by storing the resource information and the QoS of each type of resource to the same directory node.

First, the services are registered to the directory and it can be looked up on request to directory and respectively each node periodically reports its available resources to directory. Nodes send resource requests to directory nodes when it needs resources. The directory nodes collect requests, and function as matchmakers between resource requesters and providers.

3.2 Overall QoS Based Resource Selection

After a directory node discovers the resource providers that have the obligatory reputation, available amount, and price, it needs to choose provider for the requester. The final QoS obtained by a provider is determined by a number of factors such as efficiency, trust, reliability, security and price which are the quality of service (QoS) demands (or attributes).

3.3 Resource Overload Control

Existing reputation management (repMgt) methods always boost nodes to choose the highest-reputed node as the server. However, with the highest-reputed server selection policy, a high-reputed server easily becomes overloaded by regulating its overload, a node can control the calculated overall QoS, thus controlling its own load and reputation. A load factor $f = l / c$ is defined, where l is the amount of a resource it allocated to nodes, and c is the total amount of that resource the node possesses. When a node's load factor, $0.8 < f < 1$ it is overloaded. A node from time to time checks its f. If it is overloaded, then the resource with next maximum QoS is selected.

3.4 QoS Feedback System

The feedback for each service is got from the user and the overall QoS of the particular service is changed accordingly to feedback from the users. Receiving constant feedback from the users make the system more efficient. The overall QoS of service is received from user as star rating. Based on feedback the QoS is updated in directory.

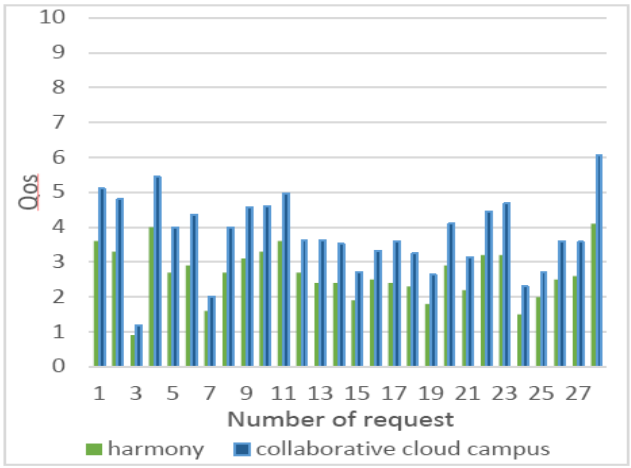

Fig2. *Comparative QoS calculation based on Feedback*

From the above graph we can infer that the harmony system depends only on QoS from the service vendors. But in real time cases, users don't always prefer the one with just highest QoS, they always prefer the one which maintains standard, satisfies them and makes work easier for them. So, our proposed system evaluates the QoS not only based on current values provided by vendor, it also takes into account the previous QoS values and the feedback got from the users of that service. Concentrating on how an individual QoS attribute value affects the system, we take reputation and price and see the efficiency of resource selection module

4. CONCLUSION

In this paper, we propose a collaborative cloud computing platform for campus cloud and education sector applications. In CCC, the resource management and reputation management are done for mutual interactions for efficient resource sharing among clouds. The multi-QoS-oriented resource selection module helps users to choose resource providers that offer the highest QoS attributes. The resource overload control module gives preferences for low priced resources. Also, feedback system helps providers keep their reputations high by getting feedback from users to know its performance from time to time and keep updated.

REFERENCES

[1]. R. Thandeeswaran, S. Subhashini, N. Jeyanthi1, M. A. Saleem Durai, "Secured Multi-Cloud Virtual Infrastructure with Improved Performance", cybernetics and information technologies XII, (2), pp. 11-22, 2012

[2]. Cong Wang, Student Member, Qian Wang, Student Member, Kui Ren, Senior Member, Ning Cao, and Wenjing Lou, "Toward Secure and Dependable Storage Services in Cloud Computing", IEEE transactions on services computing, V, (2), 2012.

[3]. Ayad Barsoum and Anwar Hasan, "Enabling Dynamic Data and Indirect Mutual Trust for Cloud Computing Storage Systems", IEEE transactions on parallel and distributed systems.

[4]. Fawaz Paraiso, Nicolas Haderer, Philippe Merle, Romain Rouvoy, Lionel Seinturier, "A Federated Multi-Cloud PaaS Infrastructure", 5th IEEE International Conference on Cloud Computing pp.392 – 399, 2012

[5]. Ana Juan Ferrer, Francisco Hernándezb, Johan Tordsson , , "OPTIMIS: A holistic approach to cloud service provisioning", Future Generation Computer Systems ELSEVIER pp. 66–77, 2012.

[6]. Mukesh Singhal and Santosh Chandrasekhar, Tingjian Ge, Ravi Sandhu and Ram Krishnan, Gail-Joon Ahn, and Elisa Bertino "Collaboration in Multicloud Computing Environments: Framework and Security Issues", Published by the IEEE Computer Society IEEE, 2013.

[7]. Mohamed Almorsy, John Grundy, and Amani S. Ibrahim, "TOSSMA: A Tenant-Oriented SaaS Security Management Architecture", 5th IEEE Conference on Cloud computing IEEE, 2012.

[8]. Yashaswi Singh, Farah Kandah, Weiyi Zhang, "A Secured Cost-effective Multi-Cloud Storage in Cloud Computing", IEEE INFOCOM Workshop on Cloud Computing, 2011.

[9]. Anton Beloglazov, Jemal Abawajy, Rajkumar Buyyaa, "Energy-aware resource allocation heuristics for efficient management of data centers for Cloud computing", Future Generation Computer Systems ELSEVIER , pp. 755– 768, 2011.

[10]. Jose Luis Lucas-Simarro, Rafael Moreno-Vozmediano, Ruben S. Montero and Ignacio M. Llorent, "Cost optimization of virtual infrastructures in dynamic multi-cloud scenarios", Concurrency and Computation: practice and experience Concurrency Computat.: Pract. Exper. Published online in Wiley Online Library (wileyonlinelibrary.com). 2012.