Trustworthy of Resource Sharing on Collaborative Cloud Computing

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ABSTRACT: In the present generation, the developments in cloud computing leads to a bright future for collaborative cloud computing (CCC). In CCC, the resources are universally scattered and distributed across the globe which belong to different organizations and the resources are used to provide services to the clients. Because of the self-governing highlights of elements in CCC, the issues of reputation management and resource management must be mutually communicated in order to guarantee the fruitful development of CCC. These two issues are jointly addressed in the past but when we address these two issues jointly, it creates twofold overhead. Hence, resource management and reputation management strategies are not well designed and they are not powerful. If the client selects the highest reputation node, then the other reputation nodes are neglected and there is no full utilization of resources and it doesn't meet client Qos demands [1]. In order to overcome this, we propose a technique called Harmony. Harmony involves three stages: multi-faceted resource/reputation management, selection of multi Qos-oriented resource and price-assisted resource/ reputation management.

Index Terms: Distributed systems, reputation management, resource management, cloud computing.

1. INTRODUCTION:

Cloud computing has become an on-demand one by which we can provide services to the clients over the internet. There are many cloud service providers such as Amazon, Google, and IBM etc. These service providers charge according to the usage of storage, bandwidth and various other parameters. The service provider cannot provide the services using only one cloud and it is not possible when the clients are increasing. It also can't provide resources to an application fully in some situations during peak time. In order to provide services, the researchers need to connect multiple clouds having a virtual lab environment in order to provide super-computing capabilities to the clients in order to fully utilize the resources. Due to this futures and developments in cloud computing, the demand for collaborative cloud computing (CCC) has grown [2]. Due to CCC, we can provide services to people where the resources belonging to different organizations are largely pooled. CCC interconnects various physical resources to empower sharing of resources in the clouds in order to provide virtual perspective of resources to its clients. This perspective is useful when a client requests resources and cloud does not have sufficient resources. It has to discover and use the resources in different clouds [3]. Importance of Resource management and reputation management: CCC works in an extensive environment involving thousands or millions of resources which are distributed universally. It may be noticed that many clients will be using and leaving the system due to which resources utilization and availability are constantly changing. Due to this, resource management becomes a productive one. Because of the unique qualities in CCC, we can allocate different Qos parameters to distinctive nodes. A node may give low Qos due to machine breakdown or it is not ready to provide high Qos to spare expenses. This shortcoming is uncovered in Amazon, Google [5] and other service providers. Security has been considered as a major factor in all these service providers and also in grids [6]. Hence, resource management needs reputation management for quantifying the resource provision Qos for guiding resource selection [2] [5].

In order to guarantee the development of CCC, the issues of resource management and reputation management must be jointly communicated. It can be achieved in three errands.

1. Productively finding trustworthy resources.
2. Choosing resources from the found alternatives.
3. Completely using the resources in the system while to keep away from overloading any node.

2. LITERATURE SURVEY:

In paper titled "Building a Secure Virtual Organization for Multiple Clouds Collaboration**",** the authors found the resource capability of a single cloud is generally limited, and some applications often require various cloud centers over Internet to deliver services together and Virtual Organization (VO) will be a promising approach to integrate services and users across multiple autonomous clouds. They proposed a technique build a secure virtual organization to achieve the collaboration goals is a critical problem, and some issues such as membership agreement, policy conflict and trust management should be adequately addressed. They presented a framework Cloud VO which based on security policies and trust management techniques to provide some flexible and dynamic VO management protocols for clouds.

In paper titled "Cloud Security with Virtualized Defense and Reputation-based Trust Management" [6], the researchers found that Internet clouds work as service factories built around Web-scale data centers. The elastic cloud resources and huge datasets processed are subject to security breaches, privacy abuses, and copyright violations. Provisioned cloud resources on-demand are especially vulnerable to cyber-attacks. The cloud platforms built by Google, IBM, and Amazon all reveal this weaknesses. They proposed a new approach to integrating virtual clusters, security-reinforced data centers, and trusted data accesses guided by reputation systems. A hierarchy of P2P reputation systems is suggested to protect clouds and data centers at the site level and to safeguard the data objects at the file-access level. Different security countermeasures are suggested to protect cloud service models: IaaS, PaaS, and SaaS, currently implemented by Amazon, IBM, and Google, respectively.

3. SYSTEM DESIGN:

To investigate and research the trustworthy platform in cloud computing and get a solid understanding of the concepts together with its difficulties, problems and the ability to be used in real world applications. Previous methods have concentrated only on either resource management or reputation management. When the researchers tried to combine both the techniques, it creates two fold overhead and is a challenging one. In this, only highest node always has highest priority and other nodes are neglected for resource selection. It is also possible that by selecting always the highest node, it may get overloaded [8]. In order to combine resource management and reputation management and to have utilization of all nodes for resource selection, we propose a technique called harmony.

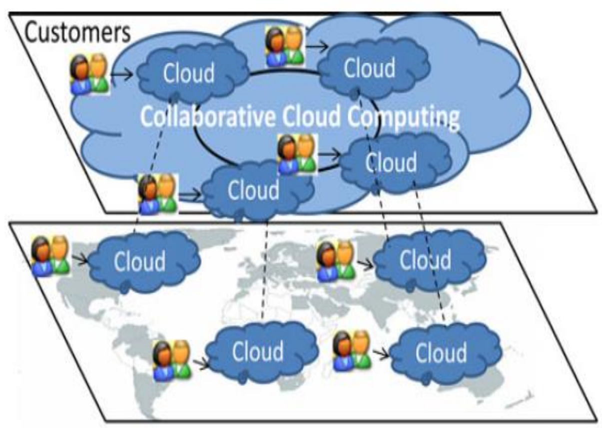

Fig.1.collaborative cloud computing

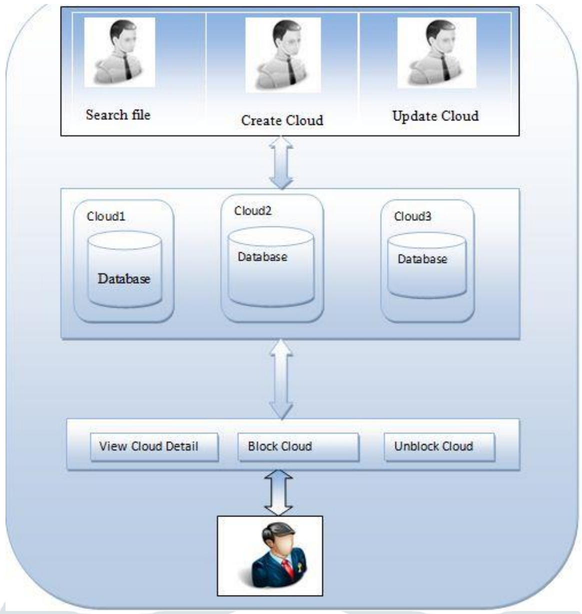

Fig.2.Architecture of collaborative cloud.

The contributions of this work can be summarized as below:

1. Preliminary study on real trace and experimental results:

We analyzed the transaction and feedback rating data we collected from an online trading platform. We found that some sellers have high QoS in providing some merchandise but offer low QoS in others, and buyers tend to buy merchandise from high-reputed sellers. The findings verify the importance of multi-faceted reputation and the drawback of the highest-reputed node selection policy.

2. Integrated multi-faceted resource/ reputation management:

Relying on a distributed hash table overlay (DHT), Harmony offers multi-faceted reputation evaluation across multiple resources by indexing the resource information and the reputation of each type of resource to the same directory node. In this way, it enables nodes to simultaneously access the information and reputation of available individual resources.

3. Multi-QoS-oriented resource selection:

Unlike previous resMgt approaches that assume a single QoS demand of users, Harmony enables a client to perform resource selection with joint consideration of diverse QoS requirements, such as reputation, efficiency, distance, and price, with different priorities.

4. Price-assisted resource/reputation control:

In a resource transaction, a resource requester pays a resource provider (in the form of virtual credits) for its resource. The transactions are conducted in a distributed manner in Harmony. Harmony employs a trading model for resource transactions in resource sharing and leverages the resource price to control each node's resource use and reputation. It enables each node to adaptively adjust its resource price to maximize its profit and maintain a high reputation while avoiding being overloaded, in order to fully and fairly utilize resources in the system.

Fig. 2. Harmony components in resource market stages.

4. PERFORMANCE EVALUATION:

To validate the design of Harmony, we implemented on dual-core processor, 2GB RAM windows operating system. First we created 12 resource types in our system. In order to derive node overall reputations and individual reputations for these resource types, we first identified 13 sellers from the Zol trace data with three merchandise types in common. We then mapped this trace data to the 13 sellers with 12 merchandise types in different collaborative cloud computing.

In order to show the importance of integrating resource management and reputation management, we first evaluated Harmony in comparison with Harmony without reputation management (denoted by resMgt) and the Power Trust reputation management system [11]. To make the methods comparable, we use Harmony's structure and resource discovery algorithms for Power Trust. These methods are only different in resource selection. After locating resource providers, Harmony chooses a lightly loaded provider with the highest individual reputation, Power Trust chooses the provider with the highest overall reputation, and resMgt randomly chooses a provider.

- Integrated Multi-Faceted Res/Rep Management.
- Multi-QoS-Oriented Resource Selection.
- Price-Assisted Resource/Reputation Control.

As shown in the below figure it shows the individual reputation of the merchandise in the cloud computing based on it provide their service to the user. If reputation service of merchandise defined as [0,100] based on that it defines individual reputation.

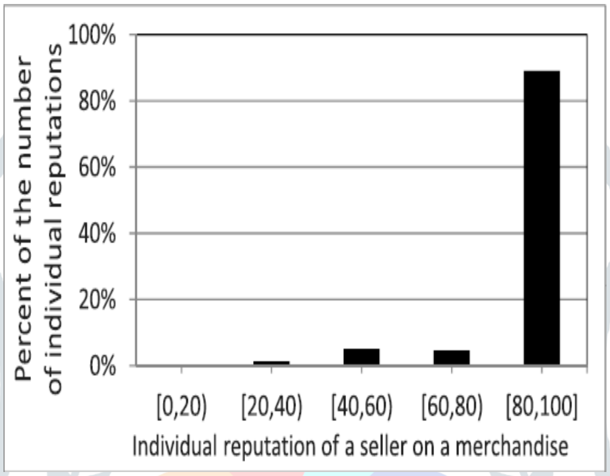

Fig.3.Individual reputation.

5. RESULTS:

Results are based on the demand of the merchandise and their service to the user. As shown in the fig.3 it represents how the individual performance of a seller based on their quality of service they get reputation of the product. As shown in the below figures snapshots of the project.

Fig.4.Homepage

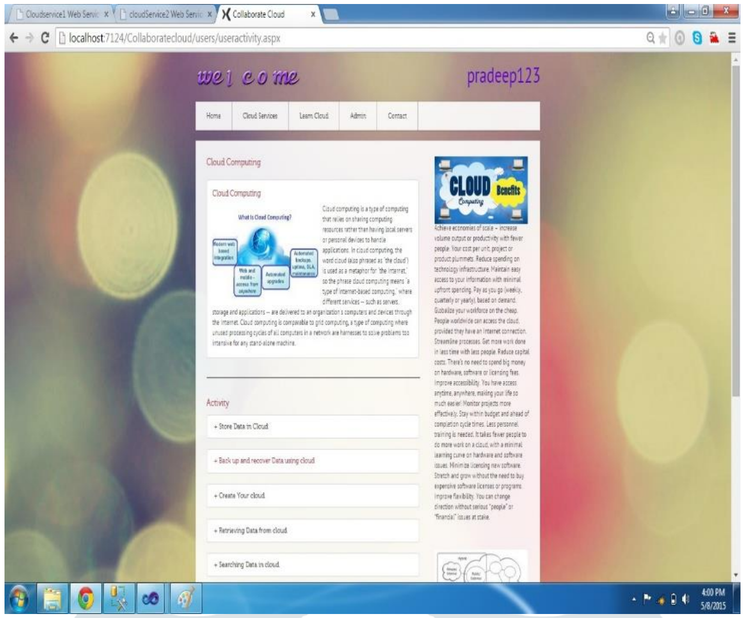

Fig.5.User activities.

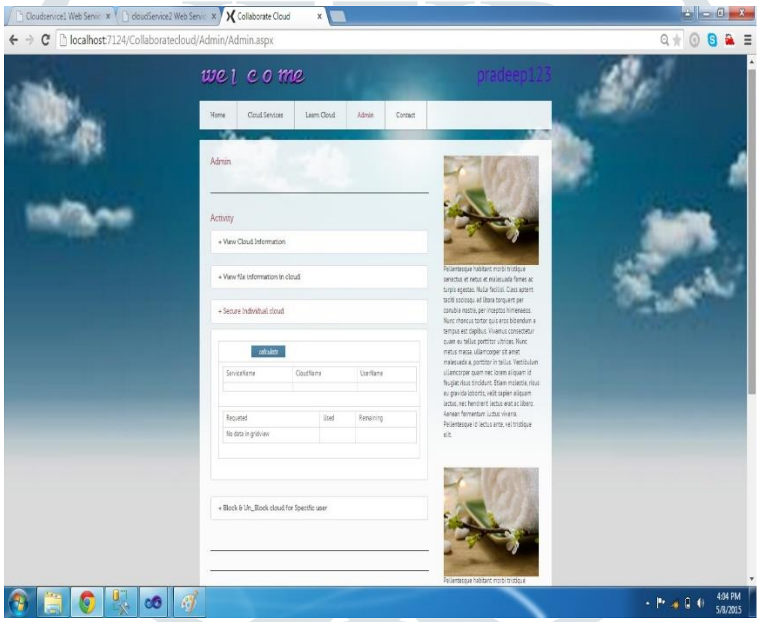

Fig.6.Admin Activity

As shown in the above figures it shows the different module can provide the service based on their requirement of the merchandise. It is calculated their value of individual reputation based on the user response of the service.

6. CONCLUSION:

In this paper, we propose an integrated resource/reputation management platform, called Harmony, for collaborative cloud computing. Recognizing the interdependencies between resource management and reputation management, Harmony incorporates three innovative components to enhance their mutual reliability of sharing globally-scattered distributed resources in CCC. Interactions b/w efficient and trustworthy resource sharing among clouds. The integrated resource/reputation management component efficiently and effectively collects and provides information about available resources and reputations of providers for providing the types of resources. The multi-QoS-oriented resource selection component helps requesters choose resource providers that offer the highest QoS measured by the requesters' priority consideration of multiple QoS attributes. The price-assisted resource/ reputation control component provides incentives for nodes to offer high QoS in providing resources. Also, it helps providers keep their high reputations and avoid being overloaded while maximizing incomes. The components collaborate to enhance the efficiency and reliability of sharing globally-scattered distributed resources in CCC. In our future work, we will investigate the challenges of deploying the Harmony system for the real-world applications which involve cooperation between cloud providers.

7. REFERENCES:

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