A Review on Trust Management In Cloud

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Abstract- *In cloud computing environment, Trust is one of the most important means to improve the reliability of computing resources.Trust management techniques provide an insight to cloud customer in the selection of appropriate resources from trust worthy cloud providers. The trust factor in cloud computing depends on the parameters such as reliability, availability, scalability, security and past behavior of the cloud provider.In this highly competitive and distributed service environment, the assurances are insufficient for the consumers to identify the dependable and trustworthy Cloud providers. Due to these limitations the consumers are not sure how to establish trust factor in cloud service providers. This paper presents a review of various available trust management techniques in cloud.*

Keywords- Cloud computing, Trust Model, Security, Privacy

I. INTRODUCTION

Cloud computing is a new way of delivering and sharing of computing resources, infrastructure and services to run web based applications. In this era of e-commerce cloud providers provide a huge platform for sharing information and services according to the need of the customer. Cloud providers give assurance of the services they provide by specifying the details in service level agreement. A recent survey [13], conductedamong more than 3000 cloud consumers from 6 countries, shows that 84% of the consumers are concerned about their data storage location and 88% of the consumers worry about who has access to their data. Trust plays an important role in commercial cloud environments because the user want an assurance that his private data will be secured. To handle this issue of security and privacy of user's data different trust models and techniques are developed which are reviewed in this paper

II. RELATED WORK

Firdhous et al[1]proposes that Bees algorithm is successfully applied in cloud environment to tackle trust management by giving a comparative study on cloud computing environment and real life bees environment by focusing on features like server systems,types of services, number of clients

Sidhu et al[2] proposes a framework to generate trust factor of cloud service provider using the concept of cloud auditor. Cloud auditor is an entity that calculates trustworthiness of service provider by evaluating service level agreement (SLA) along with required quality parameters using technique for order preference by similarity to ideal solution (TOPSIS) method.

Noor et al [3] the author proposes the "Trust as a Service" (TaaS) by introducing credibility model that can differentiate between credible trust feedbacks and malicious feedbacks by considering the Majority Consensus and the Cloud Consumer's Capability.

Noor et al [4] proposes a reputation based trust management model that provides Trust as a service model used to measure the credibility of feedbacks given by the user for cloud providers which are ultimately used when trust values are calculated for cloud providers. This model is well suited for the identification of collusion attacks and Sybil attacks.

Ding et al[5] introduce a new framework by integrating QoS prediction and customer satisfaction to evaluate trustworthiness of cloud providers in offline situations. To predict the value of QoS and to reduce the effect of negative neighbors in similar computation usage structure factor is used. Then using these similar parameters the missing value of QoS is filled.

Yang et al [6] presents a cross domain access model that grants access to the trusted user by verifying their trust degree. This model calculates the inter-domain (service domain) user's trust degree according to the trust degree of user in intra-domain (request domain). The trust degree of user is further analyzed using requested attributes, previous access behavior and policy rules to grant access.

Liu et al [7] presents an approach to identify mutual reputations using method of data coloring by cloud watermarking. The user data is embedded with watermark following three steps Watermark producing, Watermark embedding, Watermark detection. The attacker can easily crack the embedding algorithm, if the contents of embedded watermark are open.

Habib et al [8] presents a Multifaceted Trust Management to identify trustworthy cloud providers. Proposed model uses probability technique on trust information collected from different sources using required attributes like security, latency, availability, mobility and customer support. The architecture combines two different trust management techniques (reputation and recommendation) where propositional connectives (e.g., AND, OR, and FUSION) are used to combine two or more attributes.

Garg et al [9] propose a framework that measures the quality of cloud service and gives a rank to it accordingly. It includes Service Measurement Index (SMI cloud) that helps in measuring the quality of service provided by cloud providers based on Key Performance Indicators (KPIs).In order to rank a service according to the quality AHP technique is used to reduce the complexity.

Huang et al [10] introduce a trust management system that is based on evidence-based trust judgment which is a combination of policy based approach and attribute based approach. The framework defines certain attributes that are expected to be examined according to the consumer. Then each and every cloud entity is tested against those attributes and an audit is also provided to check the validity against some trusted policies.

Cuomo et al [11] present a new framework which supports the concept of private Cloud providers, i.e., Cloud providers that decide to share their own resources voluntarily.In future, an approach is required to deal with situations where resources are gathered from many volunteer providers.

Corradiniet al [12]provide a survey of existing trust models that arePolicy based models are based on SLA agreement by cloud service providers to deliver services to the user, but SLAs rarely focus on issues of security &privacy.Recommendation based models are based on the recommendation of cloud provider by some agent or third party to the user, but recommendations can be biasedReputation& Feedback based models based on the collection of feedback & opinions from other users that are used to evaluate trust factor of cloud service provider. The limitation in this model is to collect the opinions from huge number of users in order to evaluate different service providers.

Abdul-Rahman et al [14] have proposed the reputation is an expectation about and agent behavior based on information about or observations of its past behavior.

Josang et al [15] have proposed reputation is the belief about the persons or things character or standing and also they have argued the reputation is the meaning of building trust using this trust value, one can trust another based on reputation. Therefore, reputation is a measure of trustworthiness in the sense of reliability.

Urquhart [16] explains the biggest cloud computing issue is trust and he mentions that there is need of more trust between customers and service providers because of the dynamic nature of cloud.

Nuno Santos et al [17] have proposed a design of trusted cloud computing platform (TCCP). This design enables IaaS providers such as Amazon EC2 to provide a closed box execution environment that guarantees confidential execution of guest virtual machines. The TCCP does not consider the reputation, identity and capability based trust.

III. CONCLUSION

With the growth in business and telecommunication industry new cloud providers are entering into the market with each passing day. Reliable trust management systems are needed to support users in identifying appropriate and trustworthy cloud service providers. Therefore Trust management is an important research area in cloud computing environment. In this paper some of the existing trust management models and approaches are discussed. It is believed that there is more work needs to be done in developing a robust trust management model that consider all important quality of service parameters.

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