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Trust Aware Brokering System for Resource Distribution in Large Scale Multi Cloud Environment

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Abstract:

This paper proposes a service operator-aware trust scheme (SOTS) for resource matchmaking across multiple clouds. Through analyzing the built-in relationship between the users, the broker, and the service resources, this paper proposes a middleware framework of trust management that can effectively reduce user burden and improve system dependability. Based on multi-dimensional resource service operators, we model the problem of trust evaluation as a process of multi-attribute decision-making, and develop an adaptive trust evaluation approach based on information entropy theory. This adaptive approach can overcome the limitations of traditional trust schemes, whereby the trusted operators are weighted manually or subjectively. As a result, using SOTS, the broker can efficiently and accurately prepare the most trusted resources in advance, and thus provide more dependable resources to users. Our experiments yield interesting and meaningful observations that can facilitate the effective utilization of SOTS in a large-scale multi-cloud environment.

Keywords — **Multiple Clouds, Middleware framework, Matchmaking**

1. INTRODUCTION

Cloud computing refers to the practice of transitioning computer services such as computation or data storage to multiple redundant offsite locations available on the Internet, which allows application software to be operated using internet-enabled devices. Multicloud is the use of multiple cloud computing services in a single heterogeneous architecture. There are a number of reasons for deploying a multicloud architecture, including reducing reliance on any single vendor, increasing flexibility through choice, mitigating against disasters, etc. Various issues also present themselves in a multicloud environment. Security and governance is more complicated, and more "moving parts" may create resiliency issues. A cloud broker is a third-party individual or business that acts as an intermediary between the purchaser of a cloud computing service and the sellers of that service. A broker is someone who acts as an intermediary between two or more parties during negotiations. We proposes service operator-aware trust scheme (SOTS) for resource matchmaking across multiple clouds to avoid existing issues. Through analyzing the built-in relationship between the users, the broker, and the service resources, a middleware framework of trust management that can effectively reduce user burden and improve system dependability.

2. LITERATURE SURVEY

In [1], K. M. Khan and Q. Malluhi discussed about Establishing trust in cloud computing. The emerging technologies that can help address the challenges of trust in cloud computing. Cloud computing provides

many opportunities for enterprises by offering a range of computing services. In today's competitive environment, the service dynamism, elasticity, and choices offered by this highly scalable technology are too attractive for enterprises to ignore. These opportunities, however, don't come without challenges. Cloud computing has opened up a new frontier of challenges by introducing a different type of trust scenario. Today, the problem of trusting cloud computing is a paramount concern for most enterprises. It's not that the enterprises don't trust the cloud providers' intentions; rather, they question cloud computing's capabilities.

In [2], K. Hwang and D. Li discussed about Trusted cloud computing with secure resources and data coloring. Trust and security have prevented businesses from fully accepting cloud platforms. To protect clouds, providers must first secure virtualized data center resources, uphold user privacy, and preserve data integrity. The authors suggest using a trust-overlay network over multiple data centers to implement a reputation system for establishing trust between service providers and data owners. Data coloring and software watermarking techniques protect shared data objects and massively distributed software modules. These techniques safeguard multi-way authentications, enable single sign-on in the cloud, and tighten access control for sensitive data in both public and private clouds.

P. D. Manuel, S. ThamaraiSelvi discussed about Trust management system for grid and cloud resources. Trust plays an important role in all commercial grid and cloud environments. It is the estimation of competence of a resource provider in completing a task based on reliability, security, capability and availability in the context of distributed environment. It enables users to select the best resources in the heterogeneous grid and cloud infrastructure. They introduce a novel trust model to evaluate the grid and cloud resources by means of resource broker. The resource broker chooses appropriate grid/cloud resource in heterogeneous environment based on the requirements of user. They proposed trust management system is implemented with Kerberos authentication and PERMIS (privilege and role management infrastructure standard) authorization to enhance the trust of the broker itself. The proposed trust enhanced resource broker evaluates the trust value of the resources based on the identity as well as behavioral trust. Their proposed model considers metrics suitable for both grid and cloud resources. [3].

Cloud computing is the result of evolution and adoption of existing technologies and paradigms. The goal of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them. The cloud aims to cut costs, and helps the users focus on their core business instead of being impeded by IT obstacles.

Disadvantages of existing system

- Universal and expanded trust scheme designed specifically for a multi-cloud computing environment is still lacking, and previous studies have some limitations
- Most of these platforms do not provide trust management capabilities for making trust decisions.
- Existing system did not cover trust in detail, omitting numerous key issues of trust management and computing.

- Some previous schemes are based on expert opinion to weight trust factors however, this approach lacks adaptability and may lead to inaccurate results in trust evaluation.

3. PROPOSED SYSTEM

A systematic trust management scheme for multi-cloud environments based on multi-dimensional resource service operators. SOTS evaluate the trust of a cloud resource in contrast to traditional trust schemes that always focus on unilateral trust factors of service resources. The overall System Architecture is shown in the figure Fig 1.

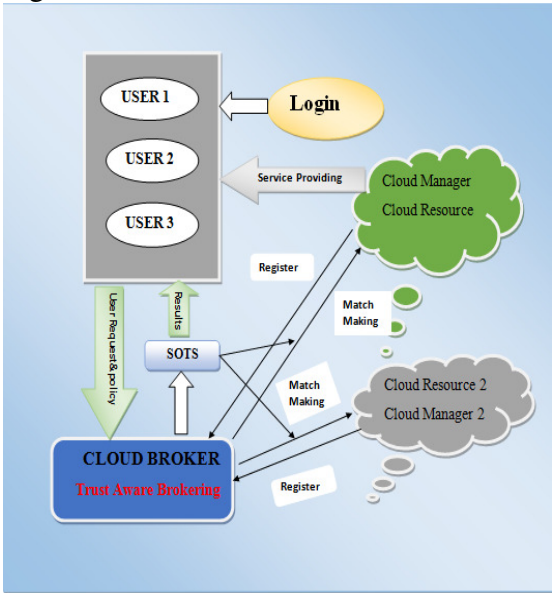

Fig 1. Overall System Architecture

The system modules Classifications:

Cloud provider
a. Provider services
b. Service status

Cloud broker
a. Broker Matchmaking Services
b. Messaging

User
a. User Request and policies

Cloud provider

In these module implements the cloud services provides by a cloud provider. It includes,

a. Provider services

The provider provides the various services through the broker so that the broker with trust worthy for the service operator and to the consumer.

b. Service status

The broker after serving the request or responding the request, the service status has to update whether it is processed or it is pending.

Cloud broker

Cloud broker act as an intermediate between cloud provider and user, it matches the user request with clouds available in the system. It includes,

a. Broker Matchmaking Services

The Broker on viewing the request and services from the consumer and provider, matches and sends the messages and mail to the user with id and password so that files and documents can be shared and stored in the cloud.

b. Messaging

The messages send to the user with password and security key for the services can be utilized for the user convenience.

User

User is the person who using the services provided by the provider. It includes,

a. User Request and Policy

The user request for the service to the broker with the policies so that client needs the specific services for production usability, reliability and security to the consumers.

Advantages of the Proposed System

- It incorporates multiple factors into a trust vector to form an expanded trust scheme to evaluate a resource.
- This trust scheme is more consistent with the essential attributes of a trust relationship, thus, it is more in line with the expectations of cloud users.
- Sots model the problem of trust evaluation as a process of multi-attribute decision-making, and then develop an adaptive trust evaluation approach.
- This adaptive fused computing approach can overcome the limitations of traditional trust schemes, in which the trusted attributes are weighted manually or subjectively.
- This system provides means for identifying cloud providers in terms of different attributes (e.g., security, performance, compliance) that are assessed by multiple sources of trust information.

4. RESULTS

The Proposed system is implemented in Dot Net. First we need to register with the mail id and the mobile number as shown in the figure Fig.2.

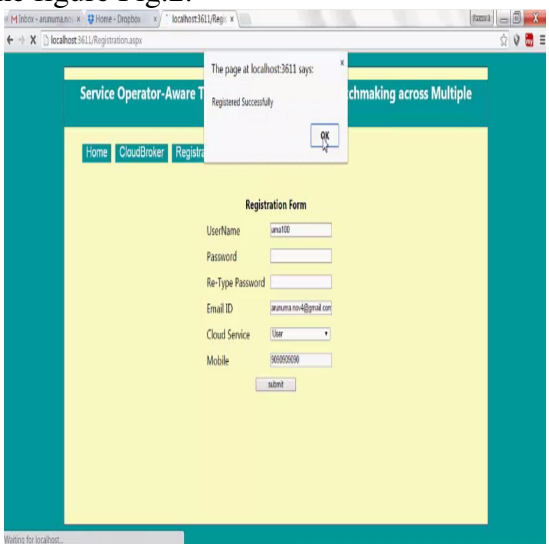

Fig.2 Resgistration Page

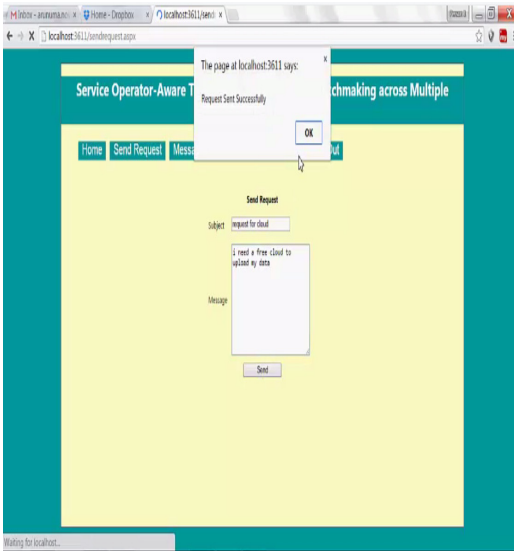

Fig.3 Request Page

After registration login with the username and password that is given during the registration. Then sent the request to the service operator along with the message and the subject as shown in the figure Fig. 3. After the request message is sent, we need to upload the file as shown in the Fig. 4.

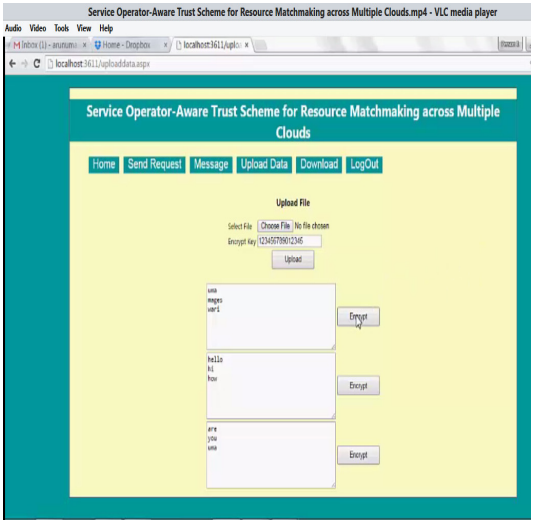

Fig.4 Upload Datas File Page

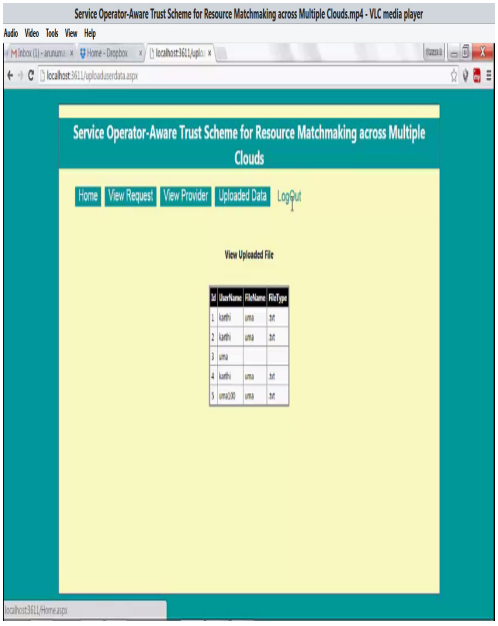

Fig.5 View the upload file

The uploaded file are viewed then sent the request for decryption key for view the uploaded file. The key is sent to the registered mail address as shown in the Fig.6.

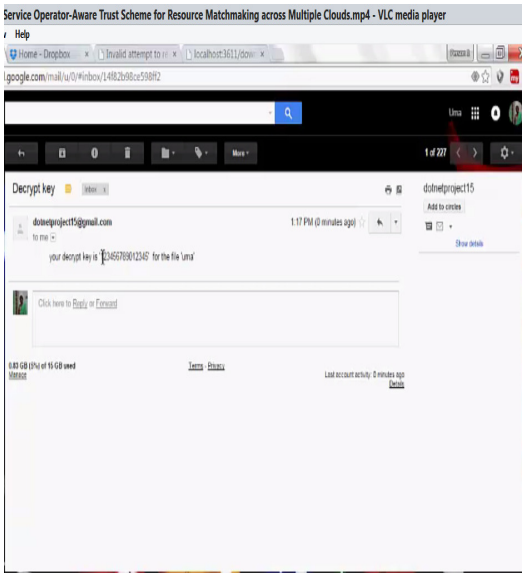

Fig.6 Decryption Key in Mail

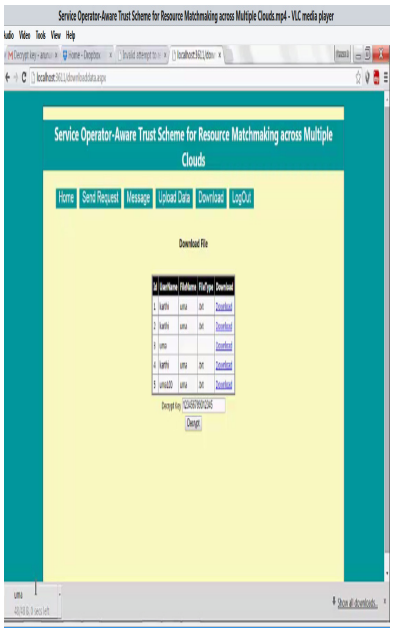

Fig.7 Download the File with the Decryption Key

By using the decryption key which was sent to the mail is used to decrypt the file when it is downloaded as shown in the Fig.7

5. CONCLUSION AND FUTURE ENHANCEMENT

In this work, we propose SOTS for trustworthy resource matchmaking across multiple clouds. We have shown that SOTS yields very good results in many typical cases. However, there are still some open issues we can apply to the current scheme. First, we are interested in combining our trust scheme with reputation management to address concerns in Users' feedback. A universal measurement and quantitative method to assess the security levels of a resource is another interesting direction. Evaluation of the proposed scheme in a larger-scale multiple cloud environments is

also an important task to be addressed in future research.

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