International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

A Cross-Tenant Access Control with Efficient Tenant Revocation Using CRMS Scheme in Cloud Computing

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Abstract- Sharing of assets on the cloud can be accomplished on a huge scale since it is savvy and area free. Regardless of the publicity encompassing distributed computing, associations are as yet hesitant to send their organizations in the distributed computing condition because of worries in secure asset sharing. In this paper, we propose a cloud asset intervention benefit offered by cloud specialist co-ops, which assumes the part of confided in outsider among its distinctive occupants. This paper formally determines the asset sharing system between two unique occupants within the sight of our proposed cloud asset intervention benefit. The rightness of authorization enactment and assignment component among various occupants utilizing four unmistakable calculations (Activation, Delegation, Forward Revocation and Backward Revocation) is likewise exhibited utilizing formal confirmation. The execution examination recommends that sharing of assets can be performed safely and productively crosswise over various inhabitants of the cloud.

KEYWORDS: Cross Tenant Access Control, Authentication, Verification, Cloud Computing, Security

1. INTRODCUTION

In cloud computing environment Database as a service (DaaS) offers to business organizations without investing and local maintenance they can outsource their data to the cloud. Now who is tenant, a tenant is a group of cloud users who share and collaborate common resources in cloud storage. In cloud computing tenants are single tenant and multitenant, if a storage server dedicated to single user called single tenant, whereas same storage server shared by multiple users called multi-tenant. Using single tenant we can achieve maximum privacy why because only one user can access the resource, and achieves good scalability. And single tenant is not most efficient use of cloud resources and it is more expensive compare multi-tenancy. A major advantage

using multi tenant is efficient use of cloud resource with low cost.

Multi-domain access control in traditional environments has been researched in various aspects such as role-based models, policy composition and decomposition, enforcement models and so on. However, the prior work is not directly applicable in the cloud environment or requires extra infrastructure for operation and administration. Furthermore, it is challenging for existing multi-domain models to encompass attribute-based access control (ABAC) which provides more expressiveness and flexibility especially meaningful in the cloud.

2.RELATED WORK

In [1] the author explains Cross Tenant Trust Models supported and enforced by the cloud service provider. Considering the On-demand Self-Service feature intrinsic to cloud computing. Author propose a formal cross tenant trust model (CTTM) and its role-based extension (RB-CTTM) integrating various types of trust relations into cross-tenant access control models which can be enforced by the multi-tenant authorization as a service (MTAaaS) platform in the cloud.

In [2] the author discusses Control Cloud Data Access Privilege and Anonymity With Fully Anonymous Attribute-Based Encryption which presents a semi-anonymous privilege control scheme AnonyControl to address not only the data privacy but also the user identity privacy in existing access control schemes. AnonyControl decentralizes the central authority to limit the identity leakage and thus achieves semi-anonymity. Besides, it also generalizes the file access control to the privilege control, by which privileges of all operations on the cloud data can be managed in a fine-grained manner. Subsequently, author presents the AnonyControl which fully prevents the identity leakage and achieve the full anonymity. Security analysis shows that both AnonyControl and AnonyControl-F are secure under the DBDH assumption, and performance evaluation exhibits the feasibility of schemes.

In [3] the author proposes Fine-Grained Two-Factor Access Control

for Web-Based Cloud Computing Services proposed 2FA access control system, an attribute-based access control mechanism is implemented with the necessity of both a user secret key and a lightweight security device. As a user cannot access the system if they do not hold both, the mechanism can enhance the security of the system, especially in those scenarios where many users share the same computer for web-based cloud services. In addition, attribute-based control in the system also enables the cloud server to restrict the access to those users with the same set of attributes while preserving user privacy, i.e., the cloud server only knows that the user fulfills the required predicate, but has no idea on the exact identity of the user. Finally, author also carry out a simulation to demonstrate the practicability of proposed 2FA system.

In [4] the author discusses the Jobber: Automating inter-tenant trust in the cloud that present Jobber: a highly autonomous multi-tenant network security framework designed to handle both the dynamic nature of cloud datacenters and the desire for optimized inter-tenant communication. Jobber prototype leverages principals from Software Defined Networking and Introduction Based Routing to build an inter-tenant network policy solution capable of automatically allowing optimized communication between trusted tenants while also blocking or rerouting traffic from untrusted tenants. Jobber is capable of automatically responding to the frequent changes in virtualized data center topologies and, unlike traditional security solutions, requires minimal manual configuration, cutting down on configuration errors.

In [5] author proposes Toward Fine-grained Data-level Access Control Model for Multi-tenant Applications, where role based and data based access control are both supported. Lightweight expressions are proposed to present complicated policy rules in solution. Moreover author also discuss the architecture and authorization procedure which implements these two models. Some technical implementation details together with the performance result from the prototype are provided.

In [6] the author proposes Data Security for Cloud Environment with Semi-Trusted Third Party (DaSCE) that explains the data security system that provides (a) key management (b) access control, and (c) file assured deletion. The DaSCE utilizes Shamir's (k, n) threshold scheme to manage the keys, where k out of n shares are required to generate the key. The author use multiple key managers, each hosting one share of key. Multiple key managers avoid single point of failure for the cryptographic keys. (a) implement a working prototype of DaSCE and evaluate its performance based on the time consumed during various operations, (b) formally model and analyze the working of DaSCE using High Level Petri nets (HLPN), and (c) verify the working of DaSCE using Satisfiability Modulo Theories Library (SMT-Lib) and Z3 solver. The results reveal that DaSCE can be effectively used for security of outsourced data by employing key management, access control, and file assured deletion.

3.PROPOSED WORK

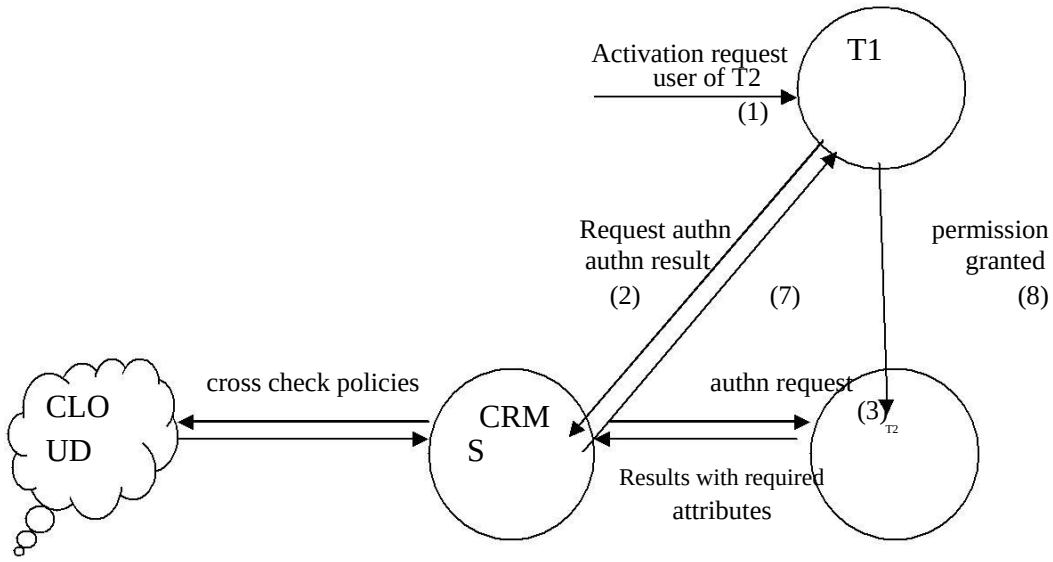

Fig1: System Architecture

In the Fig1 we describe our proposed cloud resource mediation service (CRMS) to be offered by CSP, designed to facilitate in managing cross-tenant resource access requests for cloud users. To explain the service,

we use an example of two tenants, T1 and T2, where T1 is the Service Provider (SP) and T2 is the Service Requester (SR) (i.e. user). T1 must own some permission pi for which user of T2 can generate a cross-tenant request. The resource request from a user of T2 must be submitted to T1, which then handovers the request to the CRMS for authentication and authorization decisions. The CRMS evaluates the request based on the security polices provided by T1. We use model checking to thoroughly explore the system and confirm the finite state concurrent system. We show a CTAC demonstrate for collaboration and the CRMS to encourage resource sharing among different tenants and their clients. for the modeling and analysis of the CTAC model we use High Level Petri Nets (HLPN) and Z language. We additionally introduce four distinct algorithms in the CTAC model, (activation, delegation, forward revocation and backward revocation). We at that point give an detailed introduction of modeling, examination and robotized confirmation of the CTAC show utilizing the Bounded Model Checking procedure with SMTLIB and Z3 solver, keeping in mind the end goal to exhibit the accuracy and security of the CTAC model.

4.LIMITATIONS

• Using single tenant resource utilization is less when compared to multi-tenant.

• Using single tenant more expensive.

• Difficult to define access control over multi-tenant

• Revocation of particular tenant is difficult process

5.OBJECTIVE

The objective of this research work is achieving access control and efficient revocation in multi-tenancy cloud storage. For this proposing two different access models one is R-RBAC model and RW-Access control.TSP using R-RBAC (Revocable-Role based access control) model can allocate roles to different tenants and when ever required he can revoke also. Tenant can enable security for his data using RW (Read Write)-Access control.

6. SCOPE

Multi tenant is a shared storage server paradigm where multiple tenants

are sharing single storage server in order to avoid cost and it avoid local storage maintenance, in multi tenancy achieving high scalability and effective access control is defined. In this implementation Tenant service provider (TSP), Tenant and Cloud service provider (CSP) are involved. From CSP storage server can accessed by TSP after TSP will share resource among multiple tenants.

7. RESEARCH METHODOLOGY

In cloud environment multi-tenant storage server is accessed by multiple users called tenants, so multi-tendency improve resource sharing and it reduces cost. But providing security between multi-tenants is major challenge so in this work in order to overcome challenges in multi-tendency proposing two levels of security. First level security for TSP, using R-RBAC the TSP can give set of privileges to set of tenants over storage server. Whenever tenant requesting for storage based on tenant signature the TSP will allocate particular block, and he can also revoke particular tenant and reassign storage to another tenant.

Second level security for Tenant, using RW-Access control, a tenant can define set polices over his storage like who can have read access control and write access control.

8. CONCLUSION

In this paper studied about multi tenant access control and efficient revocation by utilizing with two levels of security one is R-RBAC and RRW-Access control, the first level security for allocating set of resource to tenant and it can revoke when ever required. Second level security tenant can set policies by utilizing RW-Access control.

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