Cloud-Based Access Control Framework for Effective Role Provisioning in Business Application

Auxilia M., Research Scholar, Sathayabama University, Chennai, India

Raja K., Dhaanish Ahmed College of Engineering, Chennai, India

Kannan K., AudiSankara College of Engineering and Technology, Gudur, Nellore, India

ABSTRACT

In the evolution of social networks and big data, secure information sharing is a crucial task. When information is shared between the user and the organization admin, security plays a key role in any business organization in terms of privacy. Though many fruitful solutions prevail to protect the data integrity and privacy, there is a huge space for novel data protection schemes where a large set of data are involved. In this article, the Cloud-Based Access Control (C-BAC) framework is proposed which can fit in any business organization application. In this C-BAC, Policy Enforcement Point (PEP) is used to avoid unwanted information sharing with the neighboring employee. C-BAC framework with RSA provides security, based on the number of employees with the data handled by the particular employee, better than the existing access control framework with asymmetric encryption standard (AES) and Rivest–Shamir–Adleman (RSA) in terms of individual information handling.

KEYWORDS

Aggregate Zero-Knowledge Proof Knowledge, Information Sharing, Oblivious Commitment-Based Envelope, Policy Enforcement Point, Role Based Access Control, Security

INTRODUCTION

In recent days, web services are performing various computations on several scenarios like networks, big data and cloud computing, etc., where ambient computing plays a vital role. It acts as a framework to control several sets of services, resources to utilize it efficiently and seamlessly to any scenario. It also helps in making the services user-friendly and effective and it supports improved user interaction when the particular service is utilized for the users. Nowadays, resources are offered and utilized in large quantity, thus ambient computing plays an important role in cloud-based services.

Cloud Services in the web has been growing and attracting the attention of researchers based on issues like uncertainty during the authentication of Cloud services, lack of decision-making process during the authorization of services and information loss during confidential information exchange. World Wide Web plays a vital role in this current trend related to the concept of cloud technology. For every business organization, role provisioning is the initial step for every employee (Chandrashekar et al., 2017; Jonathan & Dusit, 2017). Every role provisioning system must have certain conditions to assign an appropriate role to the employee (Ilia & Rizos, 2016; Jonathan & Dusit, 2017). In general condition, 'R' provides a condition for each role assigned to all employees in the organization. The role of enrolment is done based on the concept of Role Based Access Control (RBAC) (Yiqun et al.,

2008) which is used to assign a role in a suitable way. Then each employee must be assigned and allowed to use several services based on a particular application by integrating with the workflow foundation (Ilia, 2016). Workflow is a sequence of the inter-connected process which contains a set of operations that include work assigned to a particular person or a group of persons or a set of persons in an organization or a mechanism having a simple or complex procedure to perform. (Ward et al., 2015). As all know, large sets of information are in existence in all other domains including networks, data mining (Santosh, 2018) Big data (Feldiansyah, 2018) and machine learning (Lazaros & Ahmad, 2017; Brian, 2018), etc.

For the execution of the above workflow, scheduling the task is needed and several methodologies of the workflow are detailed as 1. The work process is executed based on calling a thread which is not generated especially for workflow process which means that the process calling has to wait until the workflow completes its process by the invoker. 2. When the work process executes its method using a new thread by the application. At the same time, the executed process calling will be paused. 3. Window Communication Foundation (WCF) will be served when the work process executes its method. The resultant work process which is served will use the data as input from the network which contains the activities of the host service. There are two condition policies, which are applied during the workflow execution. There should be a fixed condition for a certain role in an organization. Aggregate Zero Knowledge Proof knowledge (AgZKPk) protocol (Uwe et al., 2008) is used to provide privacy and authentication. There will be no fixed condition and the conditions can be framed as an employee identity attributes. Oblivious Commitment Based Envelope (OCBE) (Jiangtao et al., 2006) protocol is used for these situations.

The situations in OCBE are applied based on certain conditions, condition1 to condition N which are identified as attributes. These attributes are framed based on employee information. Their information consists of identity attributes and conditions for several employees (Yiqun et al., 2008). For example, "social security number", "birth-date" and "employment" are represented as attributes which are unique. In this paper, services are concerned with the deployment of the proposed cloud-based business framework with better improvement, in terms of cost, execution time and slack deadline based on the number of resources utilized and the performance of the proposed C-BAC is analyzed based on different security levels.

The organization of this paper is as follows: several current research work solutions are explained in the 'Related Works' section. In the next section 'C-BAC Role Provisioning Framework', C-BAC framework is deployed based on role provisioning and its working prototype is briefed. Our proposed model is analyzed under varied parameters and is discussed in the 'Implementation and Performance Analysis' section. Finally, our conclusions along with future directions are presented in the last section.

RELATED WORKS

Federica Paci et al. (2008) proposed Business Process Execution Language (BPEL) with RBAC framework based on employee information as an attribute and provide privacy based on two protocols and cryptographic algorithm (AES) (Federica et al., 2008). Mainly, PEP acts as privacy tools to provide security in an organization (Kalliopiet al., 2016). Shenhai-bo and Hong Fan discuss the attribute-based access control model which has granted access to serve based on an attribute of inter-related entities which will be considered as the sensitive attributes (Hai-bo et al., 2006). They provide access control based on identity-based authorization and to protect user's privacy. Cloud services which contain insecurely application will be identified and executed through the internet without authentication. It is quite different with respect to protecting our system like files or document which contains executable software components which will be served as per the request set as an input parameter. To develop an effective access control model based on dynamic cloud-based XML in web service, the access control model will capture the information related to time, location based on the time where the request and control decision are accessed. Sheng et al. (2009) proposed tools

Related Content

Engineering and Reengineering of Technology Enhanced Learning Scenarios Using Context Awareness Processes

Clara Inés Peña de Carrillo, Christophe Choquet, Christophe Després, Sébastien Iksal, Pierre Jacoboni, Aina Lekira, El Amine Ouraibaand Diem Pham Thi-Ngoc (2012). *Intelligent and Adaptive Learning Systems: Technology Enhanced Support for Learners and Teachers (pp. 34-58).*

www.irma-international.org/chapter/engineering-reengineering-technology-enhanced-learning/56071

Enhancing Video Viewing Experience

Akio Takashima (2011). *Interdisciplinary Advances in Adaptive and Intelligent Assistant Systems: Concepts, Techniques, Applications, and Use (pp. 124-152).*

www.irma-international.org/chapter/enhancing-video-viewing-experience/46287

Systematic Design Principles for Cost-Effective Hard Constraint Management in Dynamic Nonlinear Systems

Satyakiran Munagaand Francky Catthoor (2011). *International Journal of Adaptive, Resilient and Autonomic Systems (pp. 18-45).*

www.irma-international.org/article/systematic-design-principles-cost-effective/51547

Recurrence Indicators for the Estimation of Characteristic Size and Frequency of Spatial Patterns

Chiara Mocenniand Angelo Facchini (2013). *Complexity Science, Living Systems, and Reflexing Interfaces: New Models and Perspectives (pp. 209-217).*

www.irma-international.org/chapter/recurrence-indicators-estimation-characteristic-size/69463

An OMA DM Based Framework for Updating Modulation Module for Mobile Devices

Hui Zhang, Xinheng Wangand Muddesar Iqbal (2011). *International Journal of Adaptive, Resilient and Autonomic Systems (pp. 13-23).*

www.irma-international.org/article/oma-based-framework-updating-modulation/55451