Accepted Manuscript

Research on access control model of social network based on distributed logic

Li Ma, Wenyin Yang, Yingyu Huo, Yong Zhong

PII: S0167-739X(17)31651-5
DOI: https://doi.org/10.1016/j.future.2017.11.041
Reference: FUTURE 3833

To appear in: *Future Generation Computer Systems*

Received date : 28 July 2017
Revised date : 31 October 2017
Accepted date : 25 November 2017

Please cite this article as: L. Ma, W. Yang, Y. Huo, Y. Zhong, Research on access control model of social network based on distributed logic, *Future Generation Computer Systems* (2018), https://doi.org/10.1016/j.future.2017.11.041

Research on Access Control Model of Social Network Based on Distributed Logic

Li Ma[a],Wenyin Yang[a],Yingyu Huo[a],Yong Zhong[a*]

[a] *Department of Computer Science,Foshan University Foshan, China*

Abstract

Highly decentralized, dynamic and fine-grained access control models of social networks need that the access control mechanisms of social networks own sufficient expressiveness and flexibility. Most of current authorizations are difficult to satisfy the requirements of social network. Some access control models need a centralized access control mode or implementation. Some access control models use hybrid declarative/imperative languages with operational semantic. This paper develops an access control model of social network based on distributed logic with active rules and triggering mechanism, which we call DUD_RuleSN, a rule-based access control model of social network based on distributed updatable datalog. The logic makes the model a powerful authorization expressiveness and flexibility that can meet the requirements for access control of social network appropriately. Firstly, the paper elaborates syntax, semantics and evaluation algorithm of Active-UD-Datalog, which is a distributed updatable datalog with active rules and triggering mechanism we develop for the model. Secondly, access control model DUD_RuleSN for Social Network is introduced and the authorization framework is explained. Finally, a motivational example and a contrastive analysis are discussed.

Keywords: social network; access control; DUD_RuleSN; active rule; distributed logic

1. Introduction

In recent years, social networking service (SNS) develops rapidly and is becoming one of the popular application services on the Internet[1], which enables people to share private information and makes social connections with others easily. However, the unprecedented growth in the popularity of social network brings many stories concerning the privacy and security of such household names as Facebook and MySpace appearing repeatedly in mainstream media[2-3]. So in research fields, many topics are talked and papers have been written about the security and privacy of social network[4-10].

But the massive data and the unique system structure of social networks make traditional access control models difficult to implement. Authorization mechanisms of social networks are distributed that are different from the traditional access control models based on reference monitor. Diversity of Social Network data, complexity of authorization requirements, dynamics of access control policies, autonomy of authority management mode, hugeness and variety of personal information all make traditional access control model unapt to the complex environment of social network[11].

* Correspondence to Yingyu Huo: Electronic and Information Engineering School, Foshan University, Foshan, China. Email: fosuhyy@163.com

Email addresses: molly_917@163.com (Li Ma), yangwenyin1982@163.com (Wenyin Yang), fosuhyy@163.com(Yingyu Huo), zhongyong@fosu.edu.cn (Yong Zhong)