Universe Scientific Publishing

ORIGINAL ARTICLE

Distributed Workflow Environment of the Adaptivity of Color Matching of Access Control Model

Xiaoxi Zhang

Institute of Disaster Prevention And Technology, Shijiazhuang, Hebei Province

Abstract: To in distributed workflow environment inIn order to make user get the most appropriate of permissions to implementation workflow taskOften need to user are assigned the role.For a group given authorization. of user best role Matching ProblemPut forward a kind of distributed workflow environment of the adaptivity of Color Matching of access control model.The model can according to workflow of different taskFrom System of role in looking for related task implementation permissions of a group or multi-role collectionThen reference environment,Time Constraint and role between the inheritance relationship to the matching optimizationFinal for user select optimal of role collection.Experimental show thatThe model can eliminate redundant roleFor user accurate distribution a group the smallest role collectionSo as to achieve role matching optimization of objective.

Keywords: Access ControlDistributed WorkflowRole matchingEnvironment and Time Constraint

1. Introduction

With the study of in-depthAnd has the many kinds of access control model.People from flexibility,Control Particle Size,Scalability and other aspects of traditional model the improvementMake its to active,Fine-grained,Different levels of orientation developmentAnd from task,Properties,Behavior and trust and new perspective to review the establishment of model[3].King Serena and[9]Put forward the Based on Task-Role of access control(T-RBAC)Model will workflow decomposition into taskAgain will permissions by task distribution to roleAnd permissions of distribution and task of context aboutAlso has clear of role hierarchy Management,High scalability and adaptability[10]To achieve dynamic distribution management.King quiet yu and[11]Put forward of a kind of-oriented cloud computing environment of property Access Control Model for at present complex information system of fine-grained access control and large scale user dynamic extension of ProblemThrough the Main Body,Object,Environment properties and permissions of Unified ModelingDescribe authorization and access control constraintsMake its has enough of flexibility and scalability.Li FengHua and[12]Put forward the based on behavior of access control security model given the behavior of concept and its management methodsTo solve Network Environment under support mobile Calculation of Information System of Access Control Problem.Sue talents such[13]Will MAC; the MAC (Mandatory Access Control) is often used security enhancing technique of operating system. Model and based on behavior of access control model Phase CombinedGiven Implementation ProgrammeSolve access control process in user and data of classification management and problem.Lang Wave[14]Put forward of-Oriented Distributed System Access Control of trust quantitative model for user division trust levelAccording to the trust of Subjectivity,Fuzziness and uncertainty confidence-building Quantitative Model.Pay male and[15]The direct according to user of Real-Time BehaviorThrough corresponding algorithm calculation the

Copyright © 2019 .
This is an open-access article distributed under the terms of the Creative Commons Attribution Unported License (http://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

user of trust valueAnd accordingly for user distribution Permissions.

In order to solve mixed role hierarchy structure in permissions Query,Role activation and role find and ProblemJoshiSuch.[16]Put forward only active set(UniquelyActi-vableset UAS)Of ConceptConvenient the role hierarchy structure of analysisSimplified the role find of Process.For a given of a Group PermissionsUASCan in containing role inheritance and role activation relationship of hybrid role level in find out corresponding of only role collectionButUASCollection can't solve query optimal of role combination Problem.Willow and[17]OkayUASCollection The OptimizationProposed minimum only role set(Minimi-zinguniquelyrolesMUR),MURAlgorithm according to user of access request to find roleIn analysis different of access request of based onGet a group meet user request of role set.The algorithm in solving efficiency on the comparedUASAlgorithmBut can't meet workflow environment in task-oriented request of security demand.ZhangSuch.[18]Defined. Based onRBACOf user authorization query Problem(UserauthorizationqueryproblemUaq),Its using the greedy algorithm the searchAnd use dynamic mutually exclusive role constraints DetectionOnce detection to don't meet the requirements of role combination to stop searchPermissions request that was refused. LuSuch.[19]OkayUaqOf irreducible of and role collection permissions set of constraints this two aspects the OptimizationCan effective match the characterCan reduce the complexity of calculation andReduce operation time.

However more than access control model and can't completely meet distributed workflow environment in role of matching requirements.Because in distributed workflow environment inTask,Permissions and role between the many-to-many of corresponding relationship more complexFor user of access control permissionsOften there are many kinds of role assignment programmeThis need to system will many group different of role collection assigned to user to achieve the same of authorized objectiveTo

Implementation System Task.This a diversification of authorized style will make system consumption a large number of calculation resources and storage resources to maintain these assigned relationshipNeed in System in looking for a group best role collection assigned to userTo save system resources.But existingMURThe determine of minimum only role collection and does not take into account the distributed workflow of environment in permissions and role of more on dynamic mapping relationshipThe user in application last minute get of role collection not certain is only.This paper from role find this a issuesOkayMURThe improvedPut forward a kind of role matching of visit ask Control System Model(Rolematchingt-rbacmodelRMT-RBAC).According to the distributed environment in different workflow of Task TypeUse Role Lookup AlgorithmAnd increase the role of matching conditionsBy different of environment and temporalBasis role between inheritance relationship of how much to looking for task implementation permissions of a group role setFinally will the role set accurate matching to user.

2. Based on Role matching of access control

In distributed workflow environment underUser quantity increasedIs set of role also complex changeableEspecially in interaction process inThere may be more than a role can complete the same confidential task.In for user group with match the character set of process inCombination of role quantity for at least the role set not certain is only.SoNeed to increase some role matching conditionsThen to user matching just meet the demand of best role collection.

2.1 Put forward the access control model

In order to Implementation TaskUser Need To System Application PermissionsAnd user and role,Role and permissions,Permissions and task is many-to-many of mapping relationshipSystem can give user distribution and permissions relative should be of RoleTo by role to Implementation Task.Because the roles and permissions is many-to-many of the relationshipSo can by more a different of role to get with a Permissions.If other users have the permissions of other roleThe there may be security hidden danger.SoThis paper in and permissions corresponding of role set collection the

screeningIntroduced a role matching mechanismTo match the best role combination to distribution to userTo improve safety.

Session setS:User and activation role between the Mapping.When user activation the part or all was granted the role whenThe establishment of the session.User Implementation of permissions actually is in this session during activation of role Permissions.

Role matchingRM:Every need to perform a task whenFind the set of roles that match the task from the set of roles in the corresponding autonomous domain,And assign Permissions,Also restrict permissions to roles that have inheritance to this collection.

Constraint ConditionC:Rule constraints on various assignments in access control. Various assignment relationships are as follows:

2.2 Role matching

Permissions and users are associated,User gets permission by role assigned to it.Permission inheritance exists between roles,Enable a permission to be shared by multiple roles,A role may also have multiple Permissions,Therefore, certain permissions can be obtained through different role combinations..Therefore,In a distributed workflow environment,When a user requests one or more permissions to perform a task,There are often many different role assignment schemes.

To secure and secure access,Cannot assign redundant permissions to user,Need to find the best role combination and match it to the user.Considering the relationship between permissions and roles,Access can be obtained through different role combinations.Figure2.A hierarchical tree of mixed roles for a system is given.,Using Solid lines respectively,Dotted Line,Solid lines with arrows at both ends represent inheritance between roles,Activation Gate

Role collection discarded.Upper3.Set of roles meetMurDefinition,All permissions that each role collection has(Include permissions for role inheritance)Not the same,But they can get permissions through partial inheritance of $roles_P$,Also the minimum role combination.The minimum role set matched by this kind of permission is not unique,So after you get multiple minimum set of roles,A valid role set matching mechanism is required(The mechanism must meet the minimum permission Principle,But also to ensure security)To match appropriate roles from and assign to the user.

Color.Task which the environment refers to implementation task of Platform(Hardware Platform,Software Platform and),Location(Place of physical location and network location and)And other and access control related of external objective information andEnvironment of collectionEnvSaid.If roleRCan in EnvironmentEnvRole roleThe can saidEnv(R)Env;Task which of temporal refers to in some time need to "with to related role to Implementation TaskTime of collectionTimSaid.If roleRCan in temporalTimRole roleThe can saidTim(R)Tim.This paper "with and security related of environment information and time information to constraint some role distribution PermissionsTo limit have these role of user access task of resources.

WithR^*Said by role lookup algorithm find the minimum role setWithR^*(I)SaidR^*In Elements.Different of role is available for different of environment and different of temporal.If in $EnvironmentEnv_M$And $temporalTim_N$Situation underR^*(I)Completely application environment and temporal requirementsButR^*()Only applicable temporal requirementsThe Selection

2.3 Role Matching Algorithm

Role Matching Algorithm of steps describe as follows:

Steps1Disconnect role hierarchy tree in all activation relationshipGet a group independent of only with inheritance relationship of sub-tree;

Steps2For every tree only with inheritance relationship of sub-treeLooking for which don't contains permission inheritance relationship of role setThe character set any two role between all no permission inheritance relationship;

Steps3Will of earnings contains permission inheritance relationship of role set any

combinationAll role combination of a collection;

Steps4According to complete task the need of Permissions/In previous step income of set collection select the most appropriate of role combination of collectionAu(R^*);

Steps5According to task which of environment and temporal and role inheritance relationship of how muchMatching the best of role combinationR^*And will the distribution to user.

This paper inMURAlgorithm of based on the improvement and expansion Reference literature

3. RMT-RBACImplementation process

Step1.User request access.User sends access request to server,Server checks user-sent identity information,If identity information matches,Allowed access;Otherwise refuse.

Step2.Role matching.Depending on the task being performed,User gets different Permissions, RMT-RBACAccess Control Mechanism matches roles for users.First of all,Select the minimum set of roles for the corresponding permissions based on the role Lookup Algorithm,If the collection is unique,Then go to step3;Otherwise, filter based on the environment and tense of the task,Filtered role collection if it is unique,Then go to step3;Otherwise, filter based on the number of inheritance relationships in the role collection,Go to step3.

Step3.Access Authorization.Match the filtered roles to the user,User gets appropriate permissions for role. Step4.Task execution.Users perform corresponding actions on tasks based on the permissions they have received.

4. Simulation Experiment

In this paper, the proposed role matching algorithm is simulated.,And compare itMurAlgorithm comparison.Tu TU2.The role hierarchy tree is shown for experimental comparison..In the experiment, the environment is set to work environment and public environment.,Work time and work time,Different roles in different States,Specific as table1.Listed.

Conclusion This paper proposed distributed workflow environment of the adaptivity of Color Matching of access control model.For implementation a task the need of a Group PermissionsIn order to avoid role RedundancyFilter out the least number of roles in the set of roles to get the right to perform the task.But this set of roles may have multiple groups,So we added environmental constraints to the filtering process,Time Constraint and role inheritance,Then select the best set of roles from the above set of roles to match to the user.,Remove additional set of roles by sifting,Optimized role Matching Problem.Filters to add roles will be considered in the future,Optimize the algorithm,To reduce algorithm complexity.

References

1. Wangyd·Yangjh·Xuc·Etal.surfonaccesscontroltechnologiesforcloudcomputingJ .Journalofsoftware·2015·26(5.)·1129-11 50.(InChinese)
2. Fengcs·Qinzg·Yuand·Etal.keytechniquesofaccesscontrolforcloudcomputingJ .Acaelectronicasinica·2015·43(2.)·312-319. (InChinese)
3. Lifh·Sum·Shizg·Etal.researchstatusanddevelopmenttrendsofaccesscontrolmodelJ .Acaelectronicasinica·2012·40(4.)·805-813.(InChinese)
4. Lin. discretionaryaccesscontrolM Encyclopediaofcryp-Tographyandsecurity. springerus·2011·353-356.
5. andj·Gaoj·Zhaihl·Etal.researchdevelopmentofaccesscontrolmodelJ .Computerscience·2010·37(11)·29-33.
6. Upadhyayas. mandatoryaccesscontrolM Encyclopedia of Cryptography and Security. Springer US·2011·756-758.
7. Sandhurs·Coyneej·Feinsteinhl·Etal. Role-based AccesscontrolmodelsJ . Computer·1996·29.(2.)·38-47.
8. Zhangxm·Huangzq·SUNY. researchonprivacyac-CesscontrolbasedonrbacJ . Computerscience·2016·43(1.)·166-171.(InChinese)
9. Wangxw·Zhaoym.atask-role-basedaccesscontrolmodelforcloudcomputingJ.Computerengineering·2012·38(24)·9-13.
10. Wang yuding,Yang jiahai,Xu Cong,Wait..Overview of cloud computing Access Control TechnologyJ
11. Li FengHua,Su Chong,Shi zhenguo,Wait..Research Progress and Development Trend of access control modelJ .Journal of electronics·2012·40(4.)·805-813.
12. Zhang xueming,Huang Zhiqiu,Sun Yi.Based onRBACResearch on privacy Access ControlJ
13. Wang Xiaowei,Zhao yiming.A cloud computing access control model based on task roleJ .Computer Engineering·2012·38(24)·9-13.
14. Han dajun,Gao Jie,Zhai Hao Liang,Wait..Research Progress of access control modelJ.Computer Science·2010·37(11)·29-33.
15. Feng chaosheng,Qin zhiguang,Yuan ding,Wait..Key Technologies of access control in cloud computingJ