

P.O.Box 8718, Beijing 100080, China	Journal of Software, September 2007,18(9):2295-2305
E-mail: jos@iscas.ac.cn	ISSN 1000-9825, CODEN RUXUEW, CN 11-2560/TP
http://www.jos.org.cn	Copyright © 2007 by <i>Journal of Software</i>

# 协同环境下CAD模型的多层次动态安全访问控制

方萃浩, 叶修梓, 彭 维, 张 引

[Full-Text PDF](#) [Submission](#) [Back](#)

方萃浩<sup>1</sup>, 叶修梓<sup>1,2</sup>, 彭 维<sup>1</sup>, 张 引<sup>1</sup>

<sup>1</sup>(浙江大学 计算机科学与技术学院, 浙江 杭州 310027)

<sup>2</sup>(浙江大学 CAD&CG国家重点实验室, 浙江 杭州 310027)

作者简介: 方萃浩(1977—), 男, 江西于都人, 博士, 主要研究领域为几何造型, 协同设计, 信息安全. 叶修梓(1966—), 男, 博士, 教授, 博士生导师, 主要研究领域为CAD, 几何造型, 图形图像技术, 生物信息, GIS, 数据库应用. 彭维(1973—), 男, 博士, 副研究员, 主要研究领域为三维CAD, 网络协同设计, 人机交互, 3D模型检索. 张引(1970—), 女, 博士, 副教授, 主要研究领域为计算机图形图像处理, CAD.

联系人: 叶修梓 Phn: +86-571-87953039, Fax: +86-571-87952690, E-mail: yxz@zju.edu.cn, http://www.zju.edu.cn

Received 2006-04-18; Accepted 2006-07-10

## Abstract

In this paper, a multi-level and dynamic security access control (MLDAC) model is proposed for CAD models in collaborative environment. A multi-level privilege model is developed to simplify the process of permission definition and assignment for enriching the expression ability and helping to realize multi-grained access control. The dependent relation of permission and the permission state migration are brought into MLDAC for dynamic authorization management based on the basic theory of workflow. Based on the practice, MLDAC model is more efficient to control collaborative operations. It meets the characters of design tasks, i.e. divisible, dependent and interactive.

Fang CH, Ye XZ, Peng W, Zhang Y. Multi-Level and dynamic security access control for CAD models in collaborative environment. *Journal of Software*, 2007,18(9):2295?2305.

DOI: 10.1360/jos182295

<http://www.jos.org.cn/1000-9825/18/2295.htm>

## 摘要

提出一个专门针对协同环境下CAD模型的多层次动态的安全访问控制(multi-level and dynamic security access control,简称MLDAC)模型.该模型利用一种多层次的权限模型,以简化权限定义及其分配过程,丰富了权限表达能力,实现了产品模型的多粒度访问控制.通过参照工作流的基本理念,引入权限的依赖关系及权限状态迁移概念,实现了权限的动态授权管理.通过实践证明,MLDAC模型可以对协同设计操作进行更加有效的控制,符合设计任务间的分工性、依赖性和交互性的特点.

基金项目: Supported by the National Natural Science Foundation of China under Grant Nos.60473106, 60333010 (国家自然科学基金); the National Research Foundation for the Doctoral Program of Ministry of Education of China under Grant No.20030335064 (国家教育部博士点基金)

## References:

- [1] Gladney HM, Worley EL, Meyers JJ. An access control mechanism for computing resources. *IBM Systems Journal*, 1975,14(3): 212?228.
- [2] Ohbuchi R, Masuda H, Aono M. A shape-preserving data embedding algorithm for NURBS curves and surfaces. In: Proc. of the Computer Graph Interface 1999 (CGI '99). Washington: IEEE Computer Society, 1999. 180?187. <http://citeseer.ist.psu.edu/273603.html>
- [3] Praun E, Hoppe H, Finkelstein A. Robust mesh watermarking. In: Proc. of the 26th Annual Conf. on Computer Graphics and Interactive Techniques (SIGGRAPH'99). New York: ACM Press/Addison-Wesley Publishers, 1999. 49?56.

- [4] Ohbuchi R, Takahashi S, Miyazawa T, Mukaiyama A. Watermarking 3D polygonal meshes in the mesh spectral domain. In: Watson B, Buchannan JW, eds. Proc. of the Graphics Interface. Ontario: Canadian Information Processing Society, 2001. 9?17.
- [5] Zhang XY, Peng W, Zhang SY, Ye XZ. Review of watermarking techniques for 3D polygonal models. Journal of Computer-Aided Design & Computer Graphics, 2003,15(8):913?920 (in Chinese with English Abstract).
- [6] Shen HH, Dewan P. Access control for collaborative environments. In: Proc. of the 1992 ACM Conf. on Computer-Supported Cooperative Work. New York: ACM Press, 1992. 51?58. <http://citeseer.ist.psu.edu/59575.html>
- [7] Bullock A, Benford S. An access control framework for multi-user collaborative environments. In: Proc. of the Int'l ACM SIGGROUP Conf. on Supporting Group Work (GROUP '99). New York: ACM Press, 1999. 140?149. <http://portal.acm.org/citation.cfm?doid=320297.320313>
- [8] Shyamsundar N, Gadh R. Internet-Based collaborative product design with assembly features and virtual design spaces. Computer-Aided Design, 2001,33(9):637?651.
- [9] van der Hoeven A, ten Bosch O, van Leuken R, van der Wolf P. A flexible access control mechanism for CAD frameworks. In: Proc. of the Conf. on European Design Automation. Los Alamitos: IEEE Computer Society Press, 1994. 188?193. <http://citeseer.ist.psu.edu/186662.html>
- [10] Cera CD, Kim T, Han JH, Regli WC. Role-Based viewing envelopes for information protection in collaborative modeling. Computer-Aided Design, 2004,36(9):873?886.
- [11] Shi ML, Yang GX, Xiang Y, Wu SG. WfMS: The manage system of workflow. Chinese Journal of Computers, 1999,22(3):325?334 (in Chinese with English Abstract).
- [12] Crampton J. A reference monitor for workflow systems with constrained task execution. In: Ferrari E, Ahn GJ, eds. Proc. of the 10th ACM Symp. on Access Control Models and Technologies (SACMAT 2005). New York: ACM Press, 2005. 38?47.
- [13] Thomas RK, Sandhu RS. Towards a task-based paradigm for flexible and adaptable access control in distributed applications. In: Proc. of the 1992-1993 ACM SIGSAC New Security Paradigms Workshops. New York: ACM Press,1993. 138?142. <http://citeseer.ist.psu.edu/184664.html>
- [14] Thomas RK, Sandhu RS. Task-Based authentication controls (TABC): A family of models for active and enterprise-oriented authentication management. In: Proc. of the IFIP WG11.3 Workshop on Database Security. 1997. 11?13.
- [15] Deng JB, Hong F. Task-Based access control model. Journal of Software, 2003,14(1):76?82 (in Chinese with English Abstract). <http://www.jos.org.cn/1000-9825/14/76.htm>
- [16] Wang XM, Zhao ZT, Hao KG. A weighted role and periodic time access control model of workflow system. Journal of Software, 2003,14(11):1841?1848 (in Chinese with English Abstract). <http://www.jos.org.cn/1000-9825/14/1841.pdf>
- [17] Xu F, Lai HG, Huang H, Xie L. Service-Oriented role-based access control. Chinese Journal of Computers, 2005,28(4):686?693 (in Chinese with English Abstract).
- [18] Fang CH, Peng W, Ye XZ. Network-Centric geometry modeling technology. Journal of Computer-Aided Design & Computer Graphics, 2005,17(5):879?888 (in Chinese with English Abstract).

附中文参考文献:

- [5] 张新宇,张三元,叶修梓.3D网格数字水印研究进展.计算机辅助设计与图形学学报,2003,15(8):913?920.
- [11] 史美林,杨光信,向勇,伍尚广.WfMS: workflow管理系统.计算机学报,1999,22(3):325?334.
- [15] 邓集波,洪帆.基于任务的访问控制模型.软件学报,2003,14(1):76?82. <http://www.jos.org.cn/1000-9825/14/76.htm>
- [16] 王小明,赵宗涛,郝克刚. workflow系统带权角色与周期时间访问控制模型.软件学报,2003,14(11):1841?1848. <http://www.jos.org.cn/1000-9825/14/1841.htm>

[17] 许峰,赖海光,黄皓,谢立.面向服务的角色访问控制技术研究.计算机学报,2005,28(4):686?693.

[18] 方萃浩,彭维,叶修梓.以网络为中心的几何造型技术.计算机辅助设计与图形学学报,2005,17(5):879?888.