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## 可扩展和可配置事件通知服务体系结构

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### Abstract

Event notification services, specially based on Publish/subscribe infrastructures, are used in a large spectrum of distributed applications as their basic communication and integration infrastructure. With their recent popularization, event notification services are required to support various specific application domains. The state of practice is that, in the development of distributed applications, developers face the dilemma of choosing between application-specific or general purpose notification servers. In this paper, a flexible solution is proposed—a dynamically customizable and extensible architecture for notification services, which is presented based on configuration management and meta-service mechanisms with the ability to customize and extend the subscription, event description, interaction protocol and configuration languages. It allows dynamical extension and customization of the notification service to satisfy not only functional requirements but also non-functional features from application domains..

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### 摘要

基于发布/订阅模式的事件通知服务,作为基本的通信与集成基础设施已广泛应用于分布式应用系统.由于日益增长的应用需求,事件通知服务需要应对各种来自不同应用领域的新需求.但在开发基于事件中间件的分布式应用时,开发者面临特殊化与通用化通知服务的两难选择.针对这种现状,提出了一种灵活的解决方法,设计一个动态可扩展和可配置的事件通知服务体系结构,允许针对不同应用领域定制不同的通知服务.该体系结构基于XML的可扩展订阅、事件、协议和配置语言,以配置管理和元服务管理的机制,提供了通知服务功能的动态扩展和定制以及非功能性特征的满足.

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### References:

[1] Hilbert-Redmiles D. An approach to large-scale collection of application usage data over the Internet. In: Proc. of the 1998 Int'l Conf. on Software Engineering. IEEE Computer Society Press, 1998. 136-145.

- [2] Dourish P, Bly S. Portholes: Supporting distributed awareness in a collaborative work group. In: Proc. of the SIGCHI Conf. on Human Factors in Computing Systems. New York: ACM Press, 1992. 541-547.
- [3] Cugola G, Nitto ED, Fuggetta A. The JEDI event-based infrastructure and its application on the development of the OPSS WFMS. IEEE Trans. on Software Engineering, 2001,27(9):827-849.
- [4] OMG. Notification Service Specification v1.0.1. Object Management Group, 2002.
- [5] Gruber RE, Krishnamurthy B, Panagos E. The architecture of the READY event notification service. In: Proc. of the 19th IEEE ICDCS Workshop on Electronic Commerce and Web-Based Applications. IEEE Computer Society Press, 1999. 108-113.
- [6] L?vstrand L. Being selectively aware with the Khronika system. In: Proc. of the European Conf. on Computer Supported Cooperative Work (ECSCW'91). Kluwer Academic Publishers, 1991. 17-31.
- [7] Kantor M, Redmiles D. Creating an infrastructure for ubiquitous awareness. In: Proc. of the 8th IFIP TC 13 Conf. on Human- Computer Interaction (INTERACT 2001). IOS Press, 2001. 431-438.
- [8] Krishnamurthy B, Rosenblum DS. Yeast: A general purpose event-action system. IEEE Trans. on Software Engineering, 1995, 21(10):845-857.
- [9] Mansouri-Samani M, Sloman M. GEM: A generalised event monitoring language for distributed systems. IEE/IOP/BCS Distributed Systems Engineering Journal, 1997,4(2):96-108.
- [10] Carzaniga A, Rosenblum DS, Wolf AL. Design and evaluation of a wide-area event notification service. ACM Trans. on Computer Systems, 2001,19(3):332-383.
- [11] Bates PC. Debugging heterogeneous distributed systems using event-based models of behavior. ACM Trans. on Computer Systems, 1995,13(1):1-31.
- [12] Rosenblum DS, Wolf AL. A design framework for Internet-Scale event observation and notification. ACM SIGSOFT Software Engineering Notes, 1997,22(6):344-360.
- [13] Sun Microsystems, Inc. Java Management Extensions White Paper. 2002.
- [14] Santos N, Marques P, Silva L. A framework for smart proxies and interceptors in rmi. In: Proc. of the 15th ISCA Int'l Conf. on Parallel and Distributed Computing Systems (ISCA PDCS-02). 2002.
- [15] Koster R, Kramp T. Loadable smart proxies and native-code shipping for CORBA. In: Linnhoff-Popien C, Hegering HG, eds. Proc. of the 3rd IFIP/GI Int'l Conf. on Trend towards a Universal Service Market. LNCS 1890, Springer-Verlag, 2000. 202-213.
- [16] Liu Y. Event filtering for content-based Pub/Sub system. Technical Report, Technology Center of Software Engineering, Institute of Software, the Chinese Academy of Sciences, 2004 (in Chinese with English abstract).
- [17] Zhang JF. Composite event detection of distributed system. Technical Report, Technology Center of Software Engineering, Institute of Software, the Chinese Academy of Sciences, 2004 (in Chinese with English abstract).
- [18] Kohler E, Morris R, Chen B, Jannotti J, Kaashoek MF. The click modular router. ACM Trans. on Computer Systems, 2000,18(3): 263-297.
- [19] Rio M, Pezzi N, Meer HD, Emmerich W, Zanolin L, Mascolo C. Promile: A management architecture for programmable modular routers. In: OPENSIG 2001 Workshop on Next Generation Network Programming. London, 2001.
- [20] Oreizy P, Taylor RN. On the role of software architectures in runtime system reconfiguration. IEE Proc. of Software Engineering, 1998,145(5):137-145.
- [21] Mansouri-Samani M, Sloman M. A configurable event service for distributed systems. In: Proc. of the 3rd Int'l Conf. on Configurable Distributed Systems. IEEE Computer Society, 1996.

[22] Schmidt DC, Cleeland C. Applying a pattern language to develop extensible ORB middleware. In: Rising L, ed. Design Patterns and Communications. Cambridge University Press, 2000.

附中文参考文献:

[16] 张菊芳. 分布式系统的复合事件检测研究. 技术报告, 北京: 中国科学院软件研究所, 软件工程技术中心, 2004.

[17] 刘昱. 基于内容Pub/Sub系统事件过滤机制的研究. 技术报告, 北京: 中国科学院软件研究所, 软件工程技术中心技术报告, 2004.