Chapter XIII

Towards a Global Real-Time Enterprise

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Abstract

Frictionless interoperation of business processes even across enterprise boundaries, complete up-to-date view of the overall status, and full remote control over the business parameters for individuals in charge — this is the holy grail of a “global real-time enterprise”. Yet a vision, a number of enabling technologies brought us closer to accomplishing the challenges: sensing the position of mobile objects and processes status, distributing the status information with “zero latency,” discovering it according to specific demands across organization boundaries, providing and securing uniform service-oriented access to all kinds of entities ranging from smart items to business processes, and aggregating the overwhelming variety of elementary services to form high-value composite services. In this chapter, we overview the enabling technologies that drive the development and further discuss market factors, security and privacy concerns, and standardization processes that have to be considered. Then we propose our SEMALON approach, the SEMAntic
LOcation Network, intended as a basic infrastructure for discovery and composition of location-based services. Finally we describe our experiences from a case study implementation, the NOMADS Campus, which is a distributed spatial information system for our campus at Humboldt University, Berlin.

Introduction

The “Internet of things” (Gershenfeld, Krikorian, & Cohen, 2004) with billions and soon trillions of seamlessly interconnected devices is about to take over, and we expect for the next years a literally exploding number of services that not only provide information about physical objects, originating from Web pages, database entries, or sensors, but also allow to trigger activities and control the objects by some actuators. To support processes in the physical world by information technology, a location-based mapping that connects physical objects and their correlated information is required. Spatial interrelationship is what will put mobile users in the position to navigate through the growing complexity and dynamics of physical and informational spaces. Through the spatial organization of physical and informational objects, virtual and real spaces will tightly interconnect.

The Vision: A Global Real-Time Enterprise

In such a ubiquitous computing scenario, a “global real-time enterprise” envisions that positions and other status information of all objects and corresponding processes can be monitored and controlled in real-time — both, internally as well as across enterprise boundaries. Clearly, a number of prerequisites have to be satisfied, including enabling technologies as well as economic regulations and open standards. Actual market trends, global competition, integration requirements, and standardization in information technology are driving more and more enterprises to adopt their coordination model. The organizational structures should be extremely flexible and enable the integration of suppliers and customers processes. Real-time enterprises supply information just in time to customers, suppliers, employees, and partners, and integrate processes, systems, and media over organisational boundaries. Emerging technologies, network economics, and global standards are the main accelerators for the proliferation of real-time enterprises. Information systems of real-time enterprises have to support permanent change of processes, data formats, and interface specifications.
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