Agent-Based Management

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The management of computer networks becomes more and more difficult with an increasing variety of hardware devices, protocols and services. Agent technology has been proposed to support service and network management in several ways. The resulting area of agent-based management emerged as one of the few acknowledged application domains for intelligent and mobile software agents. The typical characteristics of intelligent agents, like autonomy and high-level communication, can for instance lead to more flexible and general network control structures. Furthermore, mobility of agents can result in reduced communication delay and bandwidth if computation involved with managing a network node can be performed closer to the node or even directly on the node. The autonomous character of agents can also give support for better fault tolerance in case of connectivity problems.

The papers presented in this section cover in various ways the area of agent-based management:

In the first paper *An Approach to Network Control and Resource Management Based on Intelligent Agents*, open programmable networks are described as a way to overcome the difficulties in customizing network resource control for the benefit of new services. The authors suggest a new network control architecture using intelligent agents. The architecture addresses the requirements for flexible network control by providing an open framework for the deployment of network control schemes.

The second paper in this section on agent-based management, entitled *Providing Customisable Network Management Services Through Mobile Agents*, shows how an initial set of management services could be customized and extended on demand. The units of extension are mobile software agents that are used as deployment vehicles carrying management functionality to specific servers. Agent mobility provides in this application context better performance and support for fault management.

The next paper in this section, *Accounting Architecture Involving Agent Capabilities*, presents an accounting management model that incorporates intelligent and mobile agents supporting user/provider negotiation, creation of service offers, event collection and service analysis. The author assumes a TINA-oriented service creation architecture into which software agents are carefully introduced.

The paper *IN Load Control Using a Competitive Market-Based Multi-Agent System* presents an agent-based load control mechanisms to prevent QoS degradation at Service Control Points in Intelligent Networks. The proposed mechanism uses a decentralized, market-based model for IN load balancing. The realization of the model as a multi-agent system is described and evaluated.