Abstract

The traditional centralized network management approach presents severe efficiency and scalability limitations in large scale networks. The process of data collection and analysis typically involves huge transfers of management data to the manager which consumes considerable network bandwidth and causes bottlenecks at the manager side. Mobile agent technology provides an effective solution to alleviate this burden by distributing the management functionality over the network elements. A Mobile Agent has the ability to autonomously move among network elements to perform the required tasks locally. Thus, the code is transferred to the data location instead of moving the entire data to the manager's site. The present study aims to investigate the effectiveness of using mobile agents to overcome the limitations of the centralized structure. Focusing on the network performance
management functional area, a prototype is developed to assess the effectiveness of a
distributed mobile-agent-based network management system. The developed prototype installs
itself automatically on remote machines and periodically checks their software and hardware
status. Experiments are done to measure the network traffic volume when managing a typical
network. Practical measurements are compared for the traffic generated by both the developed
prototype and the current centralized network management standard (SNMP). This comparison
confirms that mobile-agent-based management employs much less traffic than the centralized
system. An estimation of the required management delays is provided for both sequential- and
parallel-dispatching of the mobile agents.

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Index Terms

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