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.

References

- ITU-T recommendation M. 3400 (02/2000).
Mobile Agent Framework for Distributed Network Performance Management

- M. Bernich, F. Mourlin, "Mobile agent communication scheme," International Conference on Systems and Networks Communication (ICSNC '06), pp. 6-6, October 2006.

Index Terms

Computer Science Distributed System

Keywords

Network Management Network Management Applications Network Performance Management Mobile Agents and Agent-based Management