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Study of Monitoring Server Environments with Mobile Agent Technology

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The network systems are becoming large scale and complicated by the improvement of the network technology and the infiltration of computers in recent years. In case of the management of large and distributed networks, the topic of management cost is very significant for network administrators. Now, centralization management attracts network administrators because of that's management cost is very low.

There are many problems to apply SNMP, the basic network management protocol mainly for network machines, to the server monitor. Other monitoring way to apply special agents bound to the server is very efficiently for the network traffic. However, it is difficult to manage their agent properly, and as a result, the management cost will increase.

I focused the distributed object technology, a mobile agent, and use this technology to reduce the management cost by making agents move around the network. This study's goal is realization of the server monitor suitable for the centralization management applied to the large and distributed network system.

In this paper, I supposed the server monitor with various functional mobile agents, which their agents work cooperating with each other. The proposal system monitors not only a server itself but also the peripheral network near the server, and it can make sure whether the services are provided to the clients exactly. The proposal system consists of three monitoring agents and a manager which manages the agents and their information. The guarantee of the monitoring system with mobile agents has never been implemented in existing studies, so I implemented the guarantee for a mobile agent loss, and make the system more reliable. The notification about server troubles will be reported to the manager as soon as the agent discovers the fault.

Based on the design mentioned above, I implemented the prototype system for evaluation itself. I showed the fundamental abilities and the comparison to the SNMP monitor. In some

experiments, I realized the amount of all management packets in the proposal system will be more than SNMP monitor's, but the amount of all management packets is not so important because their packets are distributed over the network, and not assembled in the proposal system. On the other hand, the amount of packets shared by the monitoring system is by far smaller than that of all packets. Application experiments about the multiple mobile agents resulted in showing the most suitable number of mobile agent from standpoints of time and packets under the server monitor with multiple agents.

I discussed advantages of the proposal system with the comparison to other monitoring systems. In case that much information is needed for the management, the proposal system can reduce the management packets because the agents can condense the information, which causes no data corresponding. Usual monitors have decided the scale of network, for the corresponding is gathered near the management station. Mobile agents can move all over the network, and their corresponding is distributed. Therefore, mobile agent system can keep the high scalability of networks.

In proposal system, the management station is unified because it is very suitable for the centralization management. The decrease of the number of monitor programs can cause the management cost cut off.

The network administrator using mobile agents can make the management variety met the demands. In proposal system, agents come back to the management station, and it is easy for the management station to grasp them, and then to notify the change of monitoring and so on. It can be said to be suitable for the concentrated management.

The network will be becoming large and distributed hereafter. I showed the validity about proposal way especially in the centralization management.