Plangent – An Intelligent Multiagent System for Network Computing

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Recently as large scale networks such as the Internet and intranets grow, it is becoming harder to carry out our jobs like system development/maintenance and information gathering/utilization.

As solutions to this problem, the agent techniques such as WWW robots (Koster 1996), Telescript (White 1994), and Softbot (Etzioni & Weld 1994) are proposed.

In this paper, we propose a multiagent system called **Plangent** which integrates these agent techniques and presents a solution to the problem of large scale networks. Plangent has the following features.

- Plangent agents have planning functions. Agents can make the procedures to satisfy the users' requirements automatically by inference using knowledge. By this function, we do not need program the detailed procedures.

- Plangent has multiagent planning functions where the agents distributed among the networks coordinate and make plans. This function is realized by the contract net protocol (Davis & Smith 1983) and distributed constraint solving based on the blackboard architecture.

- The agents can execute the plans that they have made by themselves. In particular, they can ask agents in remote nodes to do the jobs that can be done only in the remote nodes and they can also move to the remote nodes and execute the jobs.

- When the agents fail to execute plans, they can make alternative plans to satisfy the requirements by re-planning. In networks, there often occur unexpected changes such as information updating in remote nodes, but the agents can cope with these changes by the re-planning function.

- As the Plangent system is implemented by Java, it is architecture-neutral and can be installed and executed in various platforms.

The architecture of the Plangent system is shown as follows.

- Each node contains one platform, some shared objects and some fields.
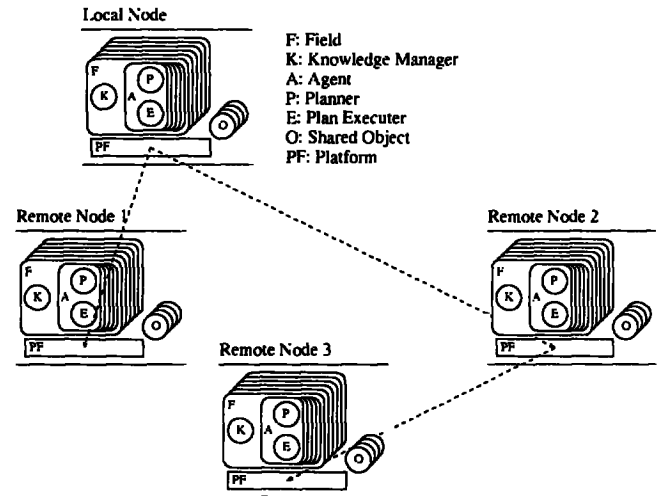

Figure 1: The architecture of the Plangent system

- Each field contains one knowledge manager and some agents.

- Each agent contains one planner and one executer.

We are currently applying Plangent to the problem of application development using component software and LAN device driver maintenance, and trying to evaluate the system.

References

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