

Mobile Agents

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Mobile Agents

Principles of Operation and Applications

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Preface

Multi-agent systems are one of the most effective software design paradigms, and they are considered to be the most recent evolutionary step of object-oriented programming. Agents have several advantages when compared with objects. The most important among them is to be made of active code which is capable of acting autonomously.

Agents can be a suitable choice to exploit the internet reality, since users can operate easily in a less compelling way and also reduce internet connection time. Mobile agents thus make a PC an intelligent entity able to autonomously accomplish boring human tasks, starting from document search up to actual business negotiations. In other words, mobile agents allow the PC-internet system to be more active and autonomous, and leave a human owner to decide if and when his intervention is suitable or required. We can therefore say an agent is an autonomous software entity within the virtual environment in which entities and relationships are devoted to the management and provision of electronic information .

A mobile agent is just an agent endowed with advanced mobility features. In particular we refer to the so-called strong mobility, which gives an agent the ability to accomplish its task migrating from site to site, thus starting somewhere a process to be continued elsewhere.

Mobile agents are a well-known technology by this time, which can be considered a valid alternative to traditional web navigation. Unfortunately, and probably due to the wariness to commit important decisions to virtual entities within a digital environment which does not have countermeasures enough to clash with attacks to data integrity and privacy, mobile agents are not so popular so far. Actually, security is still a problem, not only for mobile agents, but for all software and data within the internet environment.

The book describes the mobile agent principles of operation in detail. It starts from giving some definitions, and illustrates their main features such as mobility, communication, coordination, interoperability, fault tolerance and security. Comparisons of these features between most relevant multi-agent developing platforms are then discussed.

The book ends with a discussion on a mobile agent application field, data mining and information retrieval namely, thus showing how mobile agents can help us to

face these field related problems.

The whole work was accomplished with the contribution of students of Operating Systems and Distributed Systems classes provided by Alessandro Genco at the University of Palermo. The final synthesis, revision and management was carried out within the Ph.D. school in Computer Engineering by professors, researchers and doctoral students.

The Editor, 2007

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