Chapter XVIII

Networking E-Learning Hosts Using Mobile Agents

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ABSTRACT

With the rapid evolution of the Internet, information overload is becoming a common phenomenon. It is necessary to have a tool to help users extract useful information. A similar problem is faced by e-learning applications. At present, commercialized e-learning systems lack the information search tools needed to help users search for course information, and few of them have explored the power of mobile agent. Mobile agent is a suitable tool, particularly for Internet information retrieval.

This chapter presents a mobile agent-based e-learning tool which can help the e-learning user search for course materials on the Web. A prototype system of cluster-nodes has been implemented, and experiment results are presented.
INTRODUCTION

Increasingly, our society is being reshaped by the Internet. In the past decades, the Internet evolved so rapidly that it made the information technology industry grow extremely fast. Internet-based applications, such as e-commerce, e-payment, e-billing, e-learning, etc., have had a tremendous influence on society. Among them, e-learning is one of the killer applications.

Currently, the traditional education system faces challenges arising from the development of a knowledge-based economy. As school enrollment increases with population growth, the level of education required for the new economy also increases, and the cost of higher education escalates. In the workforce training market, on the other hand, as the information economy develops, the demand for skilled workers increases; as the technology keeps changing, the workforce needs continuous training to maintain its productivity level. Hence, both formal school-based education and continuous workforce training have become a big business, and it will be even bigger in the future (Kerrey & Isakson, 2000). A more sophisticated education model is required to meet this challenge, and e-learning came into being.

Compared to traditional classroom teaching, e-learning provides one major advantage: it makes access to information much easier and more convenient. Hence, it makes learning — of all kinds, at all levels, any time, any place, any pace — a practical reality (Kolar, 2001). E-learning also provides a tremendous cost savings for both instructors and learners. The learning model is shifted from instructor-centered to learner-centered, which focuses primarily on the needs of learners. Updating online material is also much easier. Many e-learning systems can develop personalized and interactive applications that allow users to customize their individual e-learning models and to learn at their own pace. It can truly engage the user in a type of learning that involves simulation of real world events and sophisticated collaboration with other learners and instructors (Quah & Chen, 2002).

PARADIGMS FOR E-LEARNING SYSTEMS

Mobile Agent Paradigm

The server-client paradigm is popular in current e-learning applications. Mobile agent is an emerging technology. Because it makes the design, implementation, and maintenance of a distributed system much easier, it is attracting a great deal of interest from both industry and academia. In particular, the mobile agent paradigm has already been used to design applications ranging
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