



Chapter XIII

A SCORM-Compliant U-Learning Grid by Employing CC/PP

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Abstract

In this study, a SCORM-compliant ubiquitous learning grid was constructed by using the grid services technologies combined with CC/PP. The purpose was to let anyone access any information at anyplace, anytime, by any device to learn. Several SCORM-compliant learning management systems collaborated by Globus Toolkit 3.2 grid engine and CC/PP were implemented to provide a content adaptive environment. In the experiment, English learning objects were produced with access to learn and made accessible using PC, Laptop, Tablet PC, PDA, and mobile phones. Results of this study demonstrate the feasibility of the proposed framework.

Introduction

Ubiquitous networks makes it easy for anyone to access any information at anytime from anywhere by using any appliances. One of the important applications on the ubiquitous network is learning. It will make a fast development for the future information society. Recently, electronic learning (e-learning) has become an important media of learning, and ubiquitous learning (u-learning) refers to learning at anytime and anywhere. SCORM (sharable content object reference model) is a standard for e-learning, which most of the learning management systems (LMSs) followed.

However, LMSs suffered several problems. First, e-learning resources are always distributed around several locations, and thus it makes e-learning systems difficult to integrate numerous e-learning resources. Second, most e-learning components are system-dependent, and cannot be combined with other systems. In other words, it means a component programmed by Visual Basic (VB) is difficult to migrate to a Unix-like platform, or communicate with a component hosted on it. Third, the service-level agreements across multiple LOs are insufficient to control workflow collaboration. Fourth, learners still cannot learn with restrictions of time and place. Most LMSs ask learners to use specific client devices to learn. Because of these problems, the ubiquitous learning system is devised to solve these problems based on the grid service core technologies combined with CC/PP (composite capability/ preference profiles), and is called the ubiquitous learning grid (u-learning grid, ULG). This study developed a service-oriented solution of ubiquitous e-learning system based on a ubiquitous learning grid using several SCORM-compliant LMSs. GT3 (The Globus Project) was employed as a grid engine for integrating the LMSs into a ubiquitous learning grid. Client learners can access the LOs from the ULG using PC, Laptop, PDA, and mobile phones.

The remainder of this chapter is organized as follows: related works are discussed in Section 2. Section 3 details the proposed framework of a SCORM-compliant u-learning grid. Section 4 presents and discusses the experimental results. Finally, Section 5 gives conclusions and directions for future research.

Related Works

The works related to our proposed framework is presented here in a way how we leverage existing solutions from grid technologies and public standards to provide the intended open and interoperable LMSs to solve the important SCORM-compliant e-learning system integration issues.

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