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Chapter IV

Strategies for Developing Online Computer Labs

Introduction

In Chapter III, we have discussed the issues of planning for an online computer lab. From the collected information, the online lab designer can get the users' views about the project. The next task is to design a lab that will meet the design objectives. To accomplish this task, you need to first develop a model of the online computer lab. Then, use the model to verify if the objectives have been achieved. Modeling allows you to select appropriate architecture for the lab project. During the modeling process, you need to illustrate the flow of activities. We will discuss the modeling issues in this chapter. We will first investigate the types of lab architectures and analyze how lab architecture fits a specific design objective. For each of the architectures, we will discuss the strategies to select technologies to be used to construct the lab.

After the model is developed, we will deal with issues in the physical design phase. We will specify the hardware and software requirements for various technology-

based courses. Different courses may also require different network structures. In this chapter, we will look into some network design related topics. After we have walked through the topics about the selection of hardware, software, and network equipment, we will consider the issues related to remote access. It is another important topic to be covered in this chapter. This chapter provides various possible remote access plans and the selection of a remote access schema.

Background

A lab system development process can be considered a special case of a general solution development process. A solution development process contains two components, software development and infrastructure deployment. The development of a lab system partially involves both components on a smaller scale. Solution design processes can be applied to various projects such as modeling a health system (Chong, Clark, Morris, & Welsh, 2005) and design of a grid computing system (Meliksetian et al., 2004).

Modeling service-oriented solutions is a process to convert the user's view about a project into a logical model which will be used for the implementation of the project (Erl, 2005). In a modeling process, the server-side architecture needs to be specified. The designer has to make a decision on the selection of the server-side architecture among many possible choices (Chevance, 2005). The decision should be based on the project objectives and the challenges to be faced in the project (Wiehler, 2004). In this chapter, we will summarize the strategies on meeting the challenges for the development of online computer labs.

Major IT product companies such as IBM, Microsoft, and Cisco provide service to clients who implement the systems with their products. Solution design is a tool used by these companies to implement the systems for their customers. Therefore, these IT companies often require that solution design be a subject for professional certification. IBM has been using solution design for globalized architecture (Stearns, Zhu, Cui, Shu, Xu, Li, Li, & Qu, 2004). The globalized architecture allows the execution of a program to be processed across multilingual data and to be presented in a culturally correct way. To be certified, one needs to pass the exam, IBM Certified for On Demand Business-Solution Designer (Ransom et al., 2005). The Microsoft certification program offers the Microsoft Certified Architect (MCA) program for solution architecture (Microsoft, 2006). The program provides the latest information about solution architecture and modeling tools (Andersen, McDermott, Dial, & Cummings, 2005). The training materials are available to help IT professionals to be MCA Microsoft certified architects (ePlanetLabs, 2005). The Cisco Solutions Architecture Fundamentals exam is about the Internet solution architecture (Recore,