Chapter XVIII

VMware as a Practical Learning Tool

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Abstract

Providing a dedicated lab to each group of students in order to gain hands-on learning experience is not always possible due to budget and space constraints. For example, in one class of 20 students, each student requires at least three computers with each computer capable of running three operating systems, such as UNIX, Linux, and Windows Server 2003. This requires a large computer laboratory with 60 computers in total. In addition, it is difficult to manage the laboratory to accommodate students from other classes. For example, once one class leaves the laboratory, another class of 20 students needs to start immediately with each person configuring Windows Server 2003 Active Directory on four computers. This requires another large computer laboratory with 80 computers. This chapter presents VMware as a teaching and learning tool to overcome the problems mentioned above. Under VMware, students do not require administrative privileges on physical machines. Consequently, they have complete freedom to experiment within their own virtualised environments.
Learning Objectives

After completing this chapter, you will be able to:

• Discuss the usefulness of VMware in teaching and learning contexts.
• Use VMware in laboratory settings for hands-on learning experience.
• Define the following key terms: DHCP, ISA, NTFS, RIS, VMware, and Virtual PC.
• Suggest further enhancements to the practical activities presented in the chapter.

Introduction

VMware is an application that emulates a hardware environment. It allows one or more virtual machines (guests) to run on one physical machine (host). On top of the existing operating system of the physical machine, one or more operating systems can run in this environment, including any of a number of Microsoft operating systems, Linux distributions, Netware, Solaris, or variants of BSD. These systems running within VMware behave, with only a few exceptions, in exactly the same way as any other conventional system (Stockman, 2003). What VMware does is to “carve a single physical system into compartments, each running its own copy of an operating system, applications and content in the illusion that it is a complete, independent machine” (Deane, Haff, & Enuice, 2004). This partitioning of a system through the use of VMware has several distinct benefits for teachers of computer studies; notably, the ability to:

a. provide a richer learning environment,
b. offer a safe environment for learners,
c. exploit powerful and flexible networking options,
d. employ cost-effective solutions that scale well, and
e. simplify the administration of the learning environment.

Some of the technology students are exposed to through VMware would simply not be practicable through conventional means because of the prohibitive cost of additional hardware and the physical space and maintenance it would entail.
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