A Hands-On Lab Component to Supplement the First IS Computer Networking Course

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A few years ago it was rare to find a required Computer Networking course in the Information Systems (IS) curriculum. Some departments had an elective course in the area at best or the topic was covered in a general MIS class and the details and implementation left to Computer Science and Computer Engineering courses.

Today it seems that the opposite is true. It is rare to find an IS curriculum without a required Computer Networking course. Typically it is a sophomore or junior level course, has general IS introductory classes as prerequisites and it is a required course. The typical approach in this course is to review recent and current Networking technologies and fundamentals of Data Communications at some length and depth and emphasize the use of Networks as one of the major components of Analyzing, Designing and Developing Information Systems applications. The students get a very good understanding of how to include Network design in the overall Business computer application system development process.

However, unlike in programming and database courses where the students actually design and develop live software applications, in a typical networking class it is difficult to involve the students in actually building a network, connecting hardware and configuring network devices. This is typically due to lack of space and funding for hardware in IS programs and the false occasional perception that only in Engineering programs students are supposed to get physically involved with hardware.

In a team effort, with a lot of internal and industry support, we designed a laboratory component to the first IS computer networking class, to give students a hands-on experience in connecting and configuring hardware and network devices. The laboratory is run parallel to the lectures of the class and it complements and supplements the topics covered in the classroom.

This tutorial describes a series of six lab exercises that begin with simple hardware configuration and build up to more complex set-ups that has become an extremely valuable component to the IS computer networking class. A brief synopsis of the topical coverage of the lab module follows. Conference attendees and others will receive a full copy of the lab manual upon request.

The overall goal is to be able to set-up a simple LAN and keep increasing its capabilities and connectivity. This is accomplished in a series of six hands-on exercises as follows:

Lab 1: Deploy a basic PC network by connecting four PCs and a printer together with the use of a Hub.
Lab 2: Add a server to the basic network created in Lab 1. In addition to the introduction of the server, the original network is broken into two connected networks with the introduction of another hub.
Lab 3: Sub networks are created with the use of a switch that connects the server and two hubs in lab 2.
Lab 4: Link two separate networks and simulate an intermediate firewall.
Lab 5: Network administration
Lab 6: Remote access to an intranet.