A computer network laboratory based on the concept of virtual machines

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ABSTRACT: Courses in computer networks require dedicated laboratories that are equipped with all the basic networking components: servers, workstations, cables, switches, routers, bridges, etc. An important element of a laboratory’s infrastructure is a variety of network configurations for specific experiments. A possible method of disseminating network configurations is a dedicated server. The server stores appropriate disk images, which can then be downloaded to student computers. An interesting and cost-effective alternative is the concept of virtual machines. Students do not waste time on reinstalling operating systems or rebooting computers and gain fast access to a selection of network configurations from local computers. In addition, complex experiments, such as analysing network protocols and services, securing confidential information transmitted over the Internet and testing redundant disk systems, can be implemented on a single computer without the need for the usual hardware components, such as cables, network cards, switches or multiple disk drives. Virtual machines are an ideal solution in distance education, as well as for universities and colleges with limited financial recourses.