Virtual Laboratories has been accomplished as an economic support in educational institutions. Active participatory experiments are essential for computer network security education. Existing laboratory solutions usually require significant effort to build, configure, and maintain and often do not support reconfiguring ability, flexibility, and scalability. Using emerging technology such as cloud computing, Virtual laboratories are becoming popular in the educational as well as in business organizations [1]. The major constraints on the learning system are time and place. A cloud -based virtual laboratory education platform called V-Lab provides a contained experimental environment for hands-on experiments using virtualization technologies (such as
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Xen Cloud Platform) and Open Flow switches [4]. The system can be securely accessed through OpenVPN, and students can remotely control the virtual machines (VMs) and perform the experimental tasks. The V-Lab platform also offers an interactive Web GUI for resource management and a social site for knowledge sharing and contribution. The evaluation demonstrates that the platform and curriculum have produced excellent results and helped students understand and build up computer security knowledge to solve real-world problems.

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Index Terms

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Keywords

Virtual Laboratory Xen Cloud Platform Network Security Education Virtual Machines Interactive Learning.