

Network Engineers "Get Real" with Training Over the Internet

Mentor Technologies wanted to provide network engineers with just-in-time, remote access to real equipment and educational content for learning at their own pace, in their own time. PowerVision developed a database-driven virtual environment through the Internet that provides hands-on access to real Cisco® equipment in a controlled 24x7 environment. Since its roll-out on May 1st, 1999, over 6,000 students have registered with the vLab® Learning System to learn leading edge skills to help them do their job and also to gain Cisco certification. Organizations that use the vLab System as their preferred training solution can now better assess, train, and retain their engineering staff.

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The Need for Remote Training

Network engineers are busy professionals who do not have time to go off-site for training in a classroom environment. Yet, they still want hands-on training. A simulated environment with text and screen shots just isn't the same. And learning on a production network is too risky.

That's why Mentor Technologies developed the concept of "vLab", a learning environment with direct access to a real working network. To make this vision a reality, Mentor Technologies looked to PowerVision to provide a solution.

Internet Solution

PowerVision's solution integrated the connectivity to live Cisco equipment with training content via the web. Students register for the labs they want to take and schedule for them on-line. The vLab System is a combination of educational content authored by inter-networking experts and direct access to the equipment via Telnet. Students can try out different configurations without the risk of inadvertently impairing a production network and without the heavy

Business Area:

- Network Training

Key Technologies:

- C++
- HTML
- JavaScript
- Sybase SQL Server Anywhere

PowerVision's Role:

- Design
- Development
- Implementation
- Maintenance

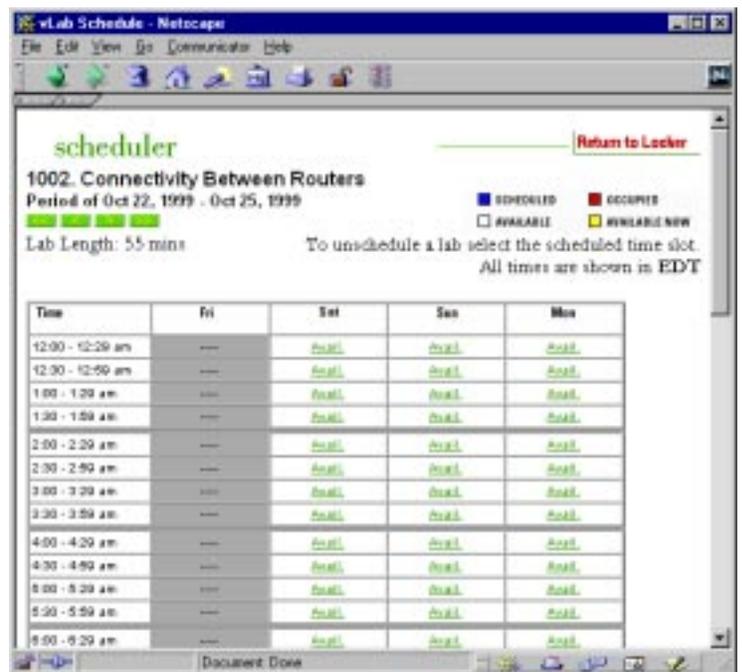


Figure 1: Scheduler. Students schedule labs on-line 24 hours a day, 7 days a week.

investment in test equipment. The vLab System is available 24 hours, 7 days a week so that a student can take a lab at anytime, from anywhere.

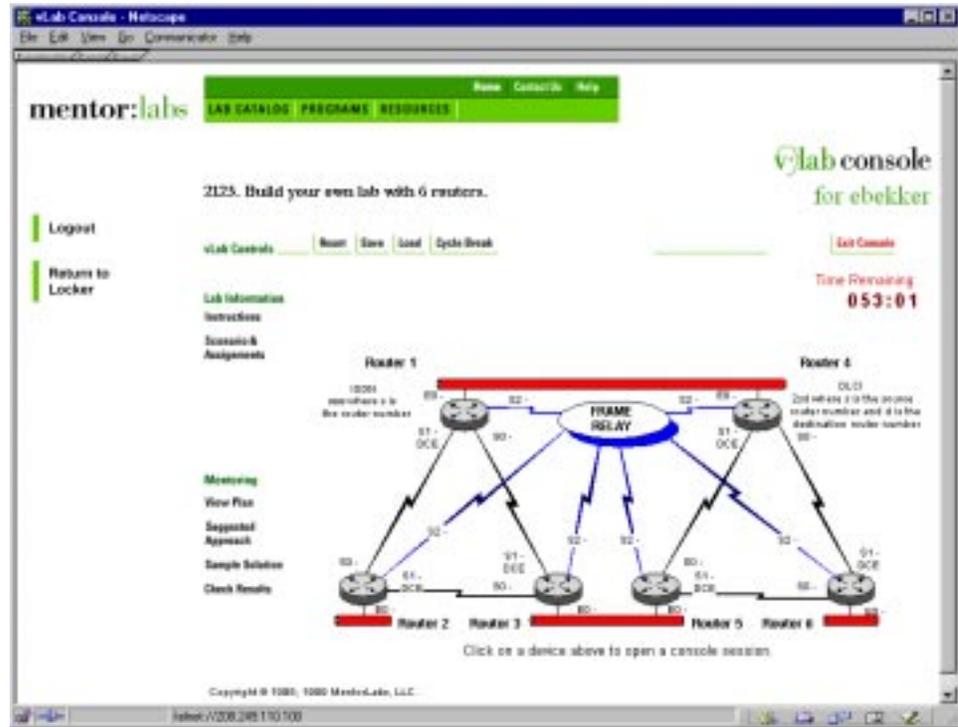


Figure 2: Inside a vLab—Students access content through a friendly web interface

Mentor Technologies wanted a system that could be easily extended and updated "on-the-fly", as new labs were being added all the time. PowerVision introduced a database-driven approach which utilizes templates. The entire web system is comprised of templates which define the look and feel. Templates are shared throughout the system, enforcing strict standards. All of the lab content and templates are stored in the database and the HTML is generated "on-the-fly" when the student accesses a page. Elements are queried from the database and inserted into the template. Templates are reusable and shared throughout the system - several templates can be combined to create one HTML page.

The vLab System is implemented as a collection of intercommunicating, role-based services. Each service is dedicated to providing a specific set of related functionality. Examples of these services include content assembly and generation, database access and connection management, security and session management, purchasing and eCommerce, resource scheduling, and reporting. Internet users use a web client browser to access an HTTP server, and a lightweight, proxy connector routes these requests from the HTTP server to the appropriate service for a response that is based on current user session state as well as query parameters.

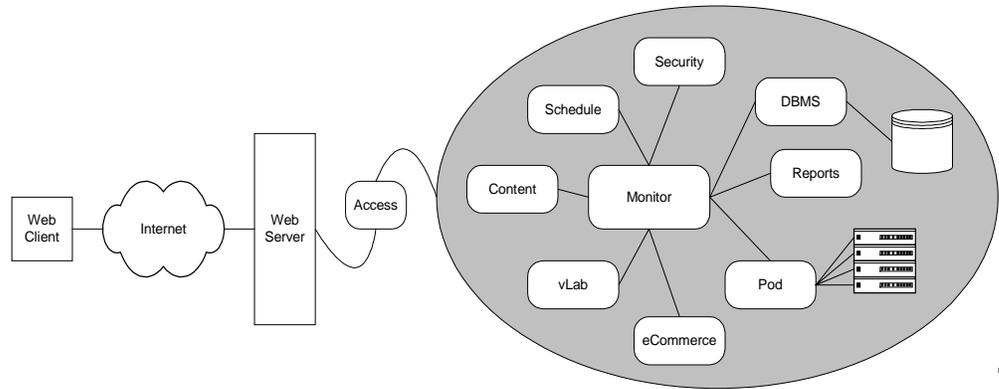


Figure 2: Behind the Scenes—vLab Architecture.

he specific business logic that uniquely identifies the vLab user experience was conveniently encompassed within a vLab module service. The heart of the system, the access to the real networking hardware, is accomplished by the Pod module service which controls, monitors, and mediates access to the logical device groups known as *Pods*.

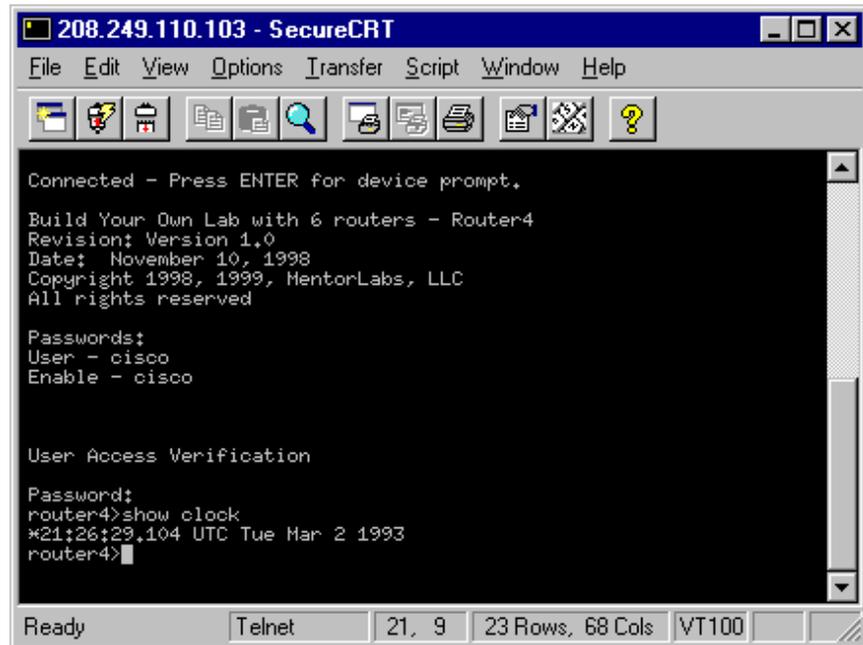


Figure 3: Get Real—Direct access is granted to real Cisco equipment through Telnet.

This collection of module services interoperates through the Monitor daemon which tracks and manages the lifecycle of each service and multiplexes requests among them. In this way, the system can just as easily be deployed on a single server as it can be distributed among a cluster of servers to better load-balance and accommodate client requests.

PowerVision's internet solution has provided Mentor Technologies with a highly-profitable product that is easily extended for future growth. It is the only one of it's kind that offers just-in-time, remote access to real hardware for learning purposes. To experience the vLab System yourself, go to <http://www.mentorlabs.com> and register for a free class.