

## Taking the Classroom to the Web

Mentor Technologies, Inc., the leading provider of skills-based network learning over the Internet, had an idea to create an online version of an instructor-led classroom setting. Mentor Technologies teamed up with PowerVision to develop vLab<sup>®</sup> Classroom: hands-on, real-time, remote access to live networks over the Internet in a remote classroom environment.

*Effective instructor-led online classroom environments, which once took hours to prepare, can now be set up in a matter of minutes simply by connecting a classroom of PCs to the Internet.*

### Business Area:

- eBusiness

### Key Technologies:

- JavaServer Pages™
- Java™ Objects
- Java™ Servlets
- Java™ RMI Servers
- BEA WebLogic<sup>®</sup> Server
- JDBC
- Sybase SQL Anywhere

### PowerVision's Role:

- Analysis & Requirements Gathering
- Design
- Development
- Quality Assurance
- Delivery & Support

### Why a Remote Classroom?

vLab Classroom is the latest creation in the Mentor Technologies' vLab Learning System. vLab Classroom allows students to access real hardware, software, and networks in a controlled environment where they can learn without fear of crashing a production system. vLab Classroom supports a remote classroom model, complimenting Mentor Technologies' flagship product, the vLab<sup>®</sup> Learning System, which offers self-paced, individual training (see *"Network Engineers 'Get Real' with Training Over the Internet"*). Training companies that offer traditional instructor-led classroom training wanted to realize two objectives:

- **Faster, easier set-up of a network equipment environment for classroom training.** The instructor and system administrators used to spend hours preparing an effective classroom environment. What once took hours can now be accomplished in a matter of minutes, simply by connecting a classroom of PCs to the Internet.
- **Remote access for geographically dispersed users.** The high-cost of renting training facilities and equipment, plus travel to and from the classroom, is a thing of the past. vLab Classroom can be accessed through the Internet from anywhere. The students and the instructor log in to the assigned class at the scheduled time and are joined together in a distributed classroom community.

### eBusiness Solution

The Web-enabled vLab Classroom allows a training company to schedule classes for available timeslots ("class segments") and assign instructors to each segment. The instructors log in to manage classes by editing the class roster of student usernames and passwords, and by setting initial configurations for the classroom devices to be loaded at the beginning of the segments.

For each class segment, the assigned instructor provides student usernames, passwords, and the URL to access the class. At the scheduled class time, the students and instructor log in—students have read and write access to their assigned devices, and the instructor has read access to all of the student devices. In addition, the instructor is capable of monitoring each student in real time, and can override selected functions on all devices at any time during the class.

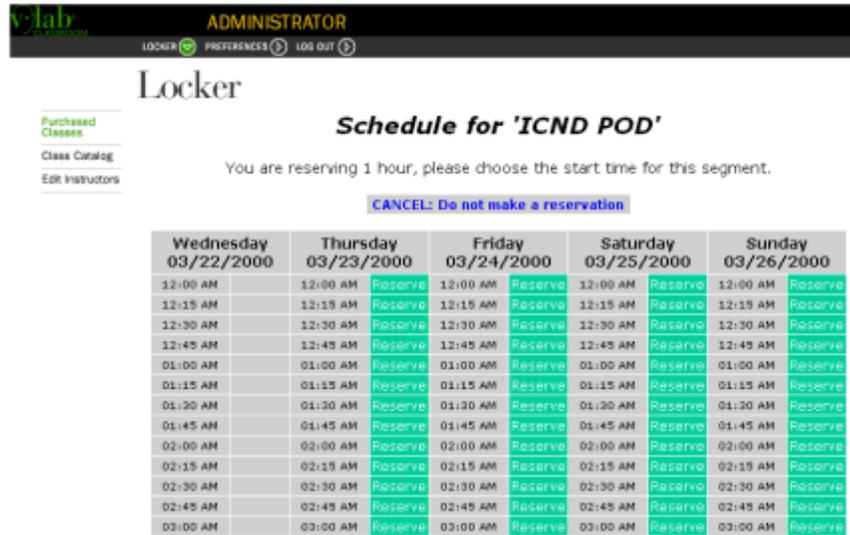


Figure 1: vLab Classroom Scheduler.

Students can save configurations during the class, and later edit, view, or load them. Instructors can save the configurations for the entire classroom. For example, the instructor may save the configurations at the end of one class segment and load them at the beginning of the next class segment in order to continue a particular lesson.

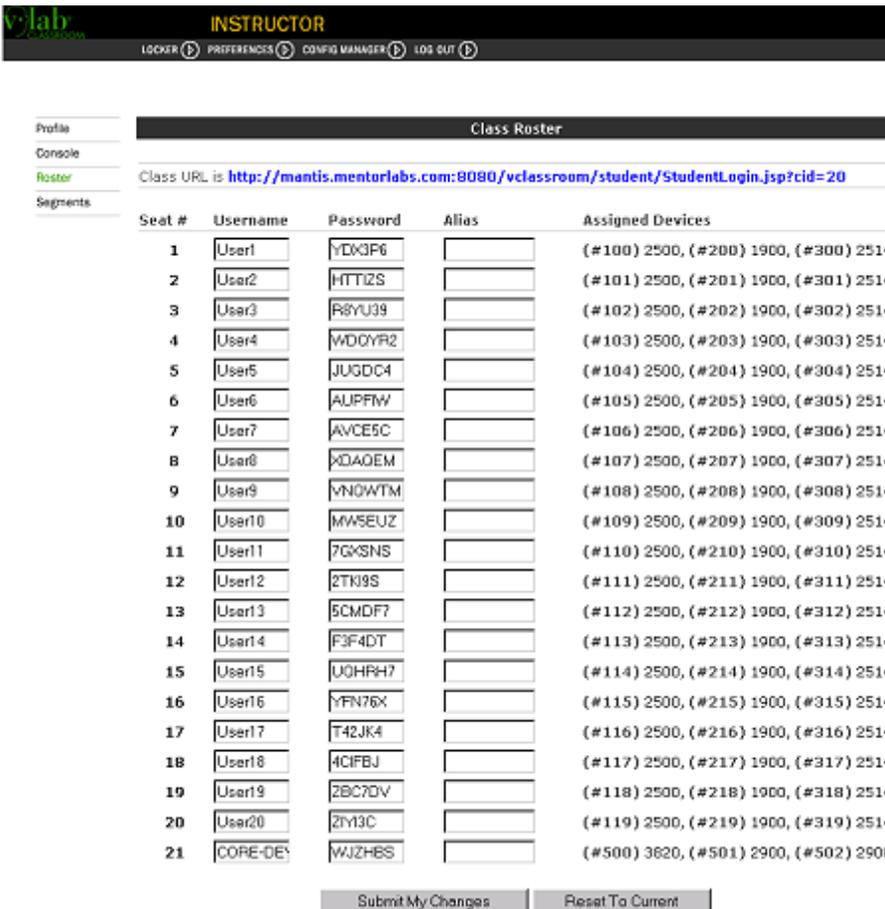


Figure 2: vLab Classroom Roster.

## PowerVision's Solution

PowerVision employed Sun Microsystems's cutting edge Java™ technology to ensure cross platform compatibility and a versatile object oriented architecture. The Internet browser-based user interface was developed using JavaServer Pages™ (JSP). Using the BEA WebLogic Server, JSP combines the power of HTML and Java™ while automatically compiling into a pure Java™ Servlet at run time. The Java™ Servlets interact with pure Java™ objects and remote Java™ servers through Remote Method Invocation (RMI).

Distributed high-performance runtime services were provided using a combination of Sybase SQL Anywhere JDBC connection pooling, RMI status listeners and a multi-threaded RMI timed events and fulfillment server. Hardware interaction was accomplished using Mentor Labs' hardware control server (the *Rack Control Module*), also written using Java™ RMI.

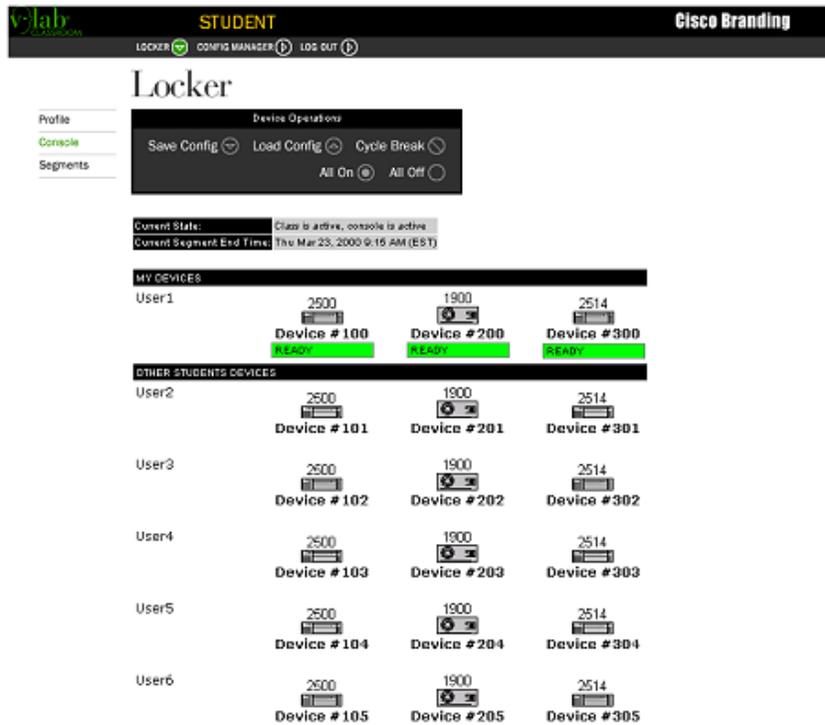


Figure 3: vLab Classroom Console.

If system data or hardware problems exist, administrators are warned of potential system failures by e-mail in real time. RMI technology allows for all of the vLab® Classroom core services to be distributed anywhere on the Internet.

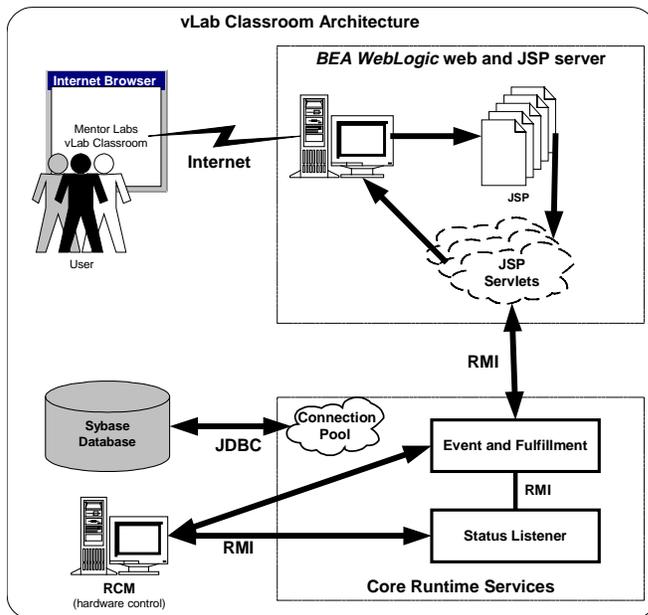


Figure 4: vLab Classroom Architecture.

PowerVision’s vLab Classroom solution enables training providers to offer access to live networks as part of a classroom solution through the Internet.