

The Secure Decisions Simulation-Based Learning Environment for Network Defense (SimBLEND) platform delivers training to entry-level computer network defense analysts in an engaging, fun, and effective way.

# SimBLEND

## The Need

Training computer network defenders is a difficult and lengthy process. It's hard – and often boring – to really learn the material through traditional computer based training (CBT) techniques. Hands-on practice is needed to turn book learning into real skills. Training resources are in demand by personnel seeking to meet DoD Directive 8570's certification requirements for all who conduct Information Assurance (IA) functions in assigned duty positions.

## The Solution

SimBLEND is a web-based platform for delivering training materials to entry-level computer network defense (CND) analysts in a manner that is engaging, fun, and effective. It blends CBT materials (either your own or newly-created content) with interactive visualizations, computer games, and dynamic network simulation to create an environment where learning is fun, and newly-acquired skills can be practiced right away.

Built on Microsoft's SharePoint Learning Portal, SimBLEND's automated scoring of CBT and exercises, progress tracking, and content portability together create a powerful platform for delivering and managing your training. Through SCORM 2004 compliance, SimBLEND can easily add your existing compliant CBT content.

Students learn by doing, in a safe and efficient practice environment, to accelerate skills development. And SimBLEND's distance learning feature provides an efficient method for simultaneously training many defenders at different levels of proficiency.

SimBLEND entices young trainees to participate more enthusiastically in their training, offering practice exercises – in the form of CND-themed games – that require applying what was learned in the CBT.

Integrating SimBLEND with your virtual or simulated network environment provides a safe way to teach the appearance and effects of actual attacks and exploits, as well as practice defense with real-world security and network management tools.

The screenshot shows the SimBLEND web interface. At the top, it says 'Welcome, David D. [Name]' and 'Log Out'. Below this is a 'BROWSE COURSES' section with links for 'Individual course' and 'By course set'. The main area displays a 'Course List' table with columns for Title, Site, Start, and Grade. The table lists several courses, including 'Ports and Services', 'Nmap Basics', 'Nmap Intermediate', and 'Nmap Advanced'. To the right of the table is a 'Practice High Scores' table with columns for Name and Score, listing scores for various users like 'laurela', 'begin', 'laurela', 'dave', 'David O.', 'David D.', and 'Nmap Challenge'. Below the course list is an 'Additional Reading' section with links to 'CERT', 'Internet Storm Center', 'SANS', 'DHS Daily Report', and 'Bugtraq'.

SimBLEND tracks progress through assigned courses

The screenshot shows the SimBLEND web interface during a network simulation game. The top bar indicates 'Nmap Advanced'. The main area features a network diagram with nodes labeled 'Router', 'Firewall', and 'Host'. Below the diagram is a console window displaying Nmap scan results, including '443/tcp open https', '443/tcp open https', and '443/tcp open https'. To the right of the console is a 'Status' section with a 'Send to console' button and a 'Keep Open' button. The bottom right corner shows a score of '845000' and a timer of '07:36'. At the bottom, there are 'Previous' and 'Continue' buttons.

After completing courses, students demonstrate competence through CND-themed games

## Key Features

Single platform blends computer-based training (CBT) with practical exercises, games, and instructive visuals

Interactive exercises allow hands-on practice: learn by doing

Automated scoring of courseware and interactive exercises

Learning management system (LMS) manages student progress and course sequencing

Portability of SCORM 2004 compliant CBT content

Microsoft SharePoint Learning Portal based, but works with any SCORM-compliant LMS

Integrate with any virtual or simulation network



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## Uses

SimBLEND is a versatile system that can be employed in a number of ways:

- ✓ Train on low-level or command-line security and network management tools
- ✓ Improve understanding of TCP/IP networking concepts
- ✓ Learn vulnerability analysis tools such as nmap, nessus, etc.
- ✓ Develop and evaluate Information Security Management strategies
- ✓ Improve operational security by educating general users through interactive, engaging information security awareness training

## Users

Security analysts  
Security practitioners  
Network administrators  
Information security managers  
Security product vendors  
IA training vendors

Other versions of SimBLEND could:

- Provide similar benefits to more experienced CND analysts or other IA practitioners
- Be used by security vendors or integrators to train users on new products and systems
- Act as a screening tool for training by requiring candidates to demonstrate their grasp of prerequisite material, rather than just showing a course certificate

## Key Benefits

**Hands-on practice** To really learn these skills requires practice; games and simulated networks provide that practice in a safe environment

**Engaging** Less boring; more fun; more training time

**Performance analysis** Collects metrics from both quizzes and interactive exercises for instructor review

**Timely** Training is available when it's needed; no need to wait for a scheduled class

**Distance learning** No travel required for classes

**Efficient** One instructor can easily handle several classes, and can train students at different levels of proficiency

## ShortCut – A Complement to SimBLEND

ShortCut speeds the development of serious games and visually-intensive training aids. It is designed to facilitate the initial exchange of information and ideation process that occurs between subject matter experts (SME), game designers, and game developers.

The development of ShortCut stemmed from our experience working with professional game studios to create demonstration training games for SimBLEND.

We found the design process to be difficult, time-consuming, and costly. And we thought that there must be a better way.

A central feature of ShortCut is a web-based questionnaire that guides the SME through the definition of instructional goals and specific subject matter details for their project. This process reduces the level of effort required to develop a project.

## System Specifications

*Learning Management System*

Works with any LMS; tested with Microsoft Windows SharePoint Services 3.0 and SharePoint Learning Kit version 1.3.1

*CBT sources*

Existing CBT (instructional videos, presentations, text) can be used; supports SCORM 2004 standard

*Browser Client*

Microsoft LMS requires Internet Explorer; Adobe Flash required for exercises

*Interactive Exercises*

Supports a variety of exercises, including Flash and 3D games

*Network Simulation*

Connects to virtual networking environment of your choice to provide additional hands-on exercises

## About SimBLEND

SimBLEND was developed under Air Force Research Laboratory (AFRL) Phase II SBIR contract FA8650-08-C-6858. SBIR Data Rights (DFARS 252.227-7018, June 1995) apply.