MOBILE – A MOBILE Instructional Laboratory Environment for Hands-On Computer Science Education

Project Summary

This is a project by Paul Wagner, with Jason Wudi, Tom Paine, Daren Bauer, and Jamison Schmidt, at the University of Wisconsin-Eau Claire to develop a mobile/portable software system for delivering hands-on computer intensive educational workshops in the areas of computer security and information assurance as well as in other areas of computer science education. This project builds on a prior NSF CCLI Phase 1 grant and supplemental grant to develop a laptop-based computer security workshop for computer science instructors. The three major goals of this project are to (1) further develop a mobile wireless computer network management system that can be used in a variety of computer science education workshops scenarios and can be quickly installed on participants’ laptop computers from a portable storage device (such as a USB drive) given a minimal subset of memory, disk and software requirements, (2) package this functionality with an easy-to-use interface that can be used by content developers and presenters, and (3) demonstrate the value of this system to educators by presenting a mobile hands-on computer security workshop to educators and presenting workshops to teach educators how to use this system for their own computer science education workshops.

The intellectual merit of this project will be the contribution of an easy-to-use software system that allows for custom configuration and real-time management of a computer network of virtual computer systems for educational training, workshops and laboratories. While a variety of tools are currently available for laboratory configuration and management, none has been created which allows the custom configuration and real-time service and activity control of virtual computers on a mobile network used in an educational setting. The availability of this system will increase the capability for hands-on instruction in computer security/information assurance.

The broader impact of this project is that the computer network management software will be made available to educators across the country for their use in training workshops and classrooms, primarily in the areas of computer security and information assurance but also in other fields of computer science. This system will promote better teaching, learning, and training by allowing more realistic and dynamic scenarios involving hands-on computer activities using flexible computer network environments. This system will be made freely available to educators for use in their own environments, allowing them to develop their own content and further spread the value of this type of environment.