Workshop Title: Hands-on Teaching Modules for Secure Web Application Development

Presenters:

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Abstract: This workshop will discuss security issues in web application development and demonstrate a set of teaching modules in this area through hands-on exercises, developed by a NSF-funded project called SWEET (Secure WEb dEvelopment Teaching). The workshop will guide the participants to run through a couple of web security hands-on exercises, such as web server threat assessment, security testing, and secure web transactions. All exercises are pre-configured in Linux virtual machines. The workshop will also discuss examples of incorporating SWEET in computing curriculum. Further information is available at http://csis.pace.edu/~lchen/sweet/.

Intended Audience: This workshop is designed for CS educators who are interested in web security or network security. This workshop is also suitable for educators who are intended to incorporate hands-on security labs in their related courses. It is preferable that the participants have some basic concepts on HTTP and HTML although this background is not required.

Presenter Biographies:

Li-Chiou Chen has conducted extensive research on information and web security. Her research has been focused on the impacts of policy and managerial decisions to counter computer attacks on the Internet. She has published papers in top academic journals, including Computer & Security, Decision Support Systems and IEEE Transactions. Li-Chiou has taught numerous courses on the theory and practice of information security and developed hands-on information security laboratory modules. She is also the principle investigator for NSF's Scholarship for Service Program in Information Assurance at Pace University.

Lixin Tao is an experienced ABET national evaluator for computer science programs. He is an international pioneer in the application-service-provider (ASP) model of computing and service-oriented computing. He has conducted extensive research and education experience on parallel and distributed computing, grid computing, Internet and web computing, security, and software engineering. Lixin has published over 150 original research papers on refereed international journals and conference proceedings, has a sustained research funding track record, and has experience in managing collaborated research.

Materials Provided: Each participant will receive hard copies of lab exercises and a lab DVD. The hard copies will include detail lab instructions for web security hands-on exercises. The lab DVD will contain the teaching materials and software needed to run through the lab exercises, developed by the SWEET project. The teaching materials include tutorials, hands-on teaching modules, and course project ideas. The software includes VMware player and Ubuntu Linux virtual machines preconfigured with web security tools and exercises.

Rough Agenda:

1. Virtualization technology (*10 minutes*)
2. Hands-on Exercise: Starting a web server on Linux virtual machine (20 minutes)
3. Introduction of the SWEET project and teaching modules (*10 minutes*)
4. Security issues and practices in web application development (*10 minutes*)
5. Hands-on Exercises: Web server threat assessment (*30 minutes*)
6. Web application security testing (*10 minutes*)
7. Hands-on Exercises: Security testing (*30 minutes*)
8. Digital certificate, HTTPS & SSL (10 minutes)
9. Hands-on Exercises: Secure web transactions (*30 minutes*)
10. Course adoption in computing curriculum (*10 minutes*)
11. Wrap up & discussions (*10 minutes*)

Total time: 180 minutes.

Audio/Visual and Computer Requirements: Internet access is not needed for this workshop. Windows laptops are supported and the required software will be provided by the presenters. Mac laptops will be supported only if the participants have installed their own VMware Fusion on the laptops. Linux laptops will not be needed since the Linux environment will be provided through the virtual machines. Attendees' laptops must have 15 GB available disk space for installing the required software and have at least 2GB memory to run the virtual machine smoothly.

Laptop Required: all participants will need a laptop for hands-on exercises.

Space and Enrollment Restrictions: We do not have a restriction on the enrollment and the default cap of 30 participants will work fine although more is acceptable. The room should have laptop power outlets close to participants' seats and have desks for putting laptops. We will also need a digital projector for our presentation.

Other Critical Information: Previous versions of this workshop have been presented to participants of the 16th Americas Conference of Information Systems at Peru in August 2010 and to the students in Pace University's computer security classes. The workshop has been revised based on their feedback. We are confident to offer a smooth experience for SIGCSE participants.