Course Description

Building Secure Software

Foundstone® Services Training Course

Software insecurity has become one of the biggest security concerns facing organizations today. As hackers turn their attention to the software and applications that make up an organization's IT infrastructure, people are realizing that the best way to protect that infrastructure is to build secure software at the onset. Learn the practical techniques and technologies that are needed to design and build secure software. This course discusses a variety of software models with a special focus on web applications. Students will learn how to secure each stage of the software development lifecycle (SDLC) by understanding the foundational concepts for securing software.

Course Goals

- Process and techniques of building secure software.
- Data protection in storage and transit.
- Client-side security.
- Secure user management systems.
- Data validation strategies.
- Error handling and exception.

Agenda At A Glance

- Introduction
- Threat Modeling
- Cryptography Basics
- Cryptography Applied
- Authentication
- Authorization
- User Management
- Data Validation
- Error Handling and Exception Management
- Event Logging
- Configuration Management
- Post-Threat Modeling Activities
- Client-Side Security
- Web Services Security

Audience

- Software professionals who define, design, and architect solutions, as well as those who manage software development projects and teams, and those that audit the security of applications.

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Recommended Pre-Work

It is recommended that students have a working knowledge of Microsoft Windows administration, system administration concepts, a basic understanding of computer security concepts, and a general understanding of Internet services.

Course Outline

Module 1—Introduction

- Introduction/Purpose
- Software Security Overview

Module 2—Threat Modeling

- Choosing a Methodology
- Identify Countermeasures
- Threat Modeling Tools and Resources
- Evaluating Risk
- Identify Security Requirements
- Understand the System

Module 3—Cryptography Basics

- Definitions and Properties
- Hashing
- Symmetric Algorithms
- Key Management
- Asymmetric Algorithms
- Common Mistakes

Module 4—Cryptography Applied

- Message Authentication Codes
- Secure Socket Layer
- Digital Signatures
- XML Encryption
- Digital Certificates
- XML Signatures
- Public Key Infrastructure

Module 5—Authentication

- Definitions
- Advanced User Authentication
- Identification vs. Authentication
- Single Sign On
- Authentication Protocols
- Federated Authentication
- Code Signing

Module 6—Authorization

- Definitions
- Role Based Access Control
- Access Control Models
- Modeling Authorization
- Least Privilege
- Other Authorization Concepts
- Discretionary Access Control
- Common Mistakes

Module 7—User Management

- User Management Fundamentals
- Dual Password Schemes that Weaken Security
- Account Management
- Bad Password Reminder Schemes
- Password Management
- Bad Account Lockout Policies
- Insecure Password Storage

Module 8—Data Validation

- Data Validation Design
- Where and What to Validate
- Validation Strategies and Tactics
- Lack of Centralized Data Validation
- Common Data Validation Attacks
- Canonicalization Bugs
- Validating Non-Textual Data
- Not Being Thorough

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Module 9—Error Handling and Exception Management

- Secure Error Handling
- Common Mistakes

Module 10—Event Logging

- The Need for Logging
- Designing Security Monitoring
- Capturing Security Events
- Common Mistakes

Module 11—Configuration Management

- Thinking Strategically
- Securing the Infrastructure

Module 12—Post-Threat Modeling Activities

- Incremental Threat Modeling
- Testing Techniques
- Attack Libraries

Module 13—Client-Side Security

- Client-Side (In)Security
- Common Mistakes
- Mitigation Strategies

Module 14—Web Services Security

- Introduction
- Web Services Security

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2821 Mission College Boulevard
Santa Clara, CA 95054
888 847 8766
www.intelsecurity.com