SANS

THE MOST TRUSTED NAME IN INFORMATION AND SOFTWARE SECURITY TRAINING

2013

Orlando, FL

March 8-15, 2013

Our most comprehensive information security training event of the year...something for everyone!

Security Essentials Bootcamp Style

Hacker Techniques, Exploits, and Incident Handling

Network Penetration Testing and Ethical Hacking

Computer Forensic Investigations - Windows In-Depth

Security Leadership Essentials For Managers with Knowledge Compression™

Web App Penetration Testing and Ethical Hacking

...and 40 more courses in network and software security, forensics, software development, legal, management, and IT audit.

SANS 2013 will be held at the

Orlando World Center Marriott Resort

"SANS has a great reputation and the instructors are incredibly brilliant. The education is top-notch."

-ANTHONY DEVOTO, SANDVIK

GIAC Approved Training

Register at www.sans.org/sans-2013

Dear Colleague,

Stephen Northcutt

I am pleased to invite you to **SANS 2013 on March 8-15 in Orlando, Florida**. At SANS we are serious about training, and we want you to be successful at protecting some of your company's most important assets, your data. Join me to hear some of the top 20 industry experts for SANS unique brand of intensive, immersion training courses designed to help you master the practical steps necessary for defending systems and networks. Register online today at **www.sans.org/event/sans-2013**.

You will receive the best computer security training available anywhere with more than 40 courses that are packed with immediately-useful techniques and tools. A look at our course list will show the following new courses:

- SEC579: Virtualization and Private Cloud Security
- FOR508: Advanced Computer Forensic Analysis and Incident Response
- FOR526: Windows Memory Forensics In-Depth
- AUD444: Auditing Security and Controls of Active Directory and Windows (Three-day)
- AUD445: Auditing Security and Controls of Oracle Databases (Three-day)

Always on the cutting edge, our courses will give you the critical knowledge that you need now.

On the evenings of March 13 and 14, we are once again offering *NetWars-Tournament Play*, an intense interactive, Internet-based environment for computer attacks and defenses. Show off your skills or gain them as you play! You must register, but NetWars is free with a 5-6 day course. At SANS 2013, our *SANS @Night Series* feature presentations that will boost your training as we present the most current topics in information security by some of the best speakers in the industry. Look at our *SANS 2013 Bonus Sessions* page, and I'm sure you will agree that we have a compelling lineup.

Have you considered what *GIAC Certification* can do for you? It's no secret that employers are looking for certified information security personnel, and they know that GIAC cert holders have strong, hands-on skills. Earn your credentials by signing up for a corresponding GIAC certification attempt when registering for your SANS course.

Do you need to meet *DoD Directive 8570* requirements? SANS 2013 offers nine courses that align with the requirements for Baseline IA Certification. See the *DoD Directive 8570 Information* page for detailed information about how SANS courses help to prepare you for your certification.

Have you thought about earning your Master's Degree? See the *SANS Technology Institute Master's Program* page to find out which courses at SANS 2013 can be used for your STI Master's Degree when you apply.

The event campus, the Orlando World Center Marriott Resort, is 1.5 miles from Disney's Walt Disney World, Epcot Center, Animal Kingdom, Downtown Disney, and Hollywood Studios and only a few minutes from SeaWorld, Discovery Cove, Aquatica, and Universal Studios.

At SANS 2013, you'll learn more than you can imagine with countless opportunities to expand your network of security experts and friends. Don't wait until year end. Start making your training and travel plans now and meet us in sunny Orlando this March!

Register today for SANS 2013. I look forward to sharing SANS training with you in Orlando!

Best regards,

Stephen Northcutt
President
The SANS Technology Institute, a postgraduate computer security college

Here is what a few of last year's attendees had to say:

"SANS courses and instructors are the best I have ever experienced."
-Diane Matt, Department of National Defence

"As always, this SANS course offers information I can immediately apply to my organization!"
-Leon Noseworthy, Collect of North Alantic-Qatar

"Great course. This is my first SANS course, and I can't wait to attend more."
-Leonard Crull, MI ANG

SANS IT Security Training and Your Career Roadmap

SECURITY CURRICULUM

Incident Handling

- **SEC504** Hacker Techniques, Exploits, and Incident Handling — *GCIH*
- **SEC501** Advanced Security Essentials – Enterprise Defender — *GCED*
- **FOR508** Advanced Computer Forensic Analysis & Incident Response — *GCFA* — New!

Additional Incident Handling Courses
www.sans.org/security-training/curriculums/security

Penetration Testing

Additional Penetration Testing Courses
http://pen-testing.sans.org

- **SEC504** Hacker Techniques, Exploits, and Incident Handling — *GCIH*
- **SEC560** Network Pen Testing and Ethical Hacking — *GPEN*
- **SEC542** Web App Pen Testing and Ethical Hacking — *GWAPT*
- **SEC575** Mobile Device Security and Ethical Hacking — *GAWN* — New!
- **SEC660** Advanced Pen Testing, Exploits, and Ethical Hacking — *GXPN*
- **SEC642** Advanced Web App Pen Testing and Ethical Hacking — New!
- **SEC617** Wireless Ethical Hacking, Pen Testing, and Defenses — *GAWN*

Beginners

SEC301 NOTE:
If you have experience in the field, please consider our more advanced course - SEC401.

- **SEC301** Intro to Information Security — *GISF*
- **SEC401** SANS Security Essentials Bootcamp Style — *GSEC*

Network Security

- **SEC501** Advanced Security Essentials – Enterprise Defender — *GCED*
- **SEC566** Implementing & Auditing the Twenty Critical Security Controls - In-Depth
- **SEC540** VoIP Security

Additional Network Security Courses
www.sans.org/security-training/curriculums/security

Intrusion Analysis

- **SEC501** Advanced Security Essentials – Enterprise Defender — *GCED*
- **SEC502** Perimeter Protection In-Depth — *GCFW*
- **SEC503** Intrusion Detection In-Depth — *GCIA*
- **FOR508** Advanced Computer Forensic Analysis & Incident Response — *GCFA* — New!

Additional Intrusion Analysis Courses
www.sans.org/security-training/curriculums/security

System Administration

- **SEC501** Advanced Security Essentials – Enterprise Defender — *GCED*
- **SEC505** Securing Windows and Resisting Malware — *GCWN* — New!
- **SEC579** Virtualization and Private Cloud Security — New!
- **SEC506** Securing Linux/Unix — *GCUX*

Additional System Administration Courses
www.sans.org/security-training/curriculums/security

MANAGEMENT CURRICULUM

- **SEC301** Intro to Information Security — *GISF*
- **SEC401** SANS Security Essentials Bootcamp Style — *GSEC*
- **MGT512** SANS Security Leadership Essentials For Managers with Knowledge Compression™ — *GSLC*
- **MGT525** IT Project Management, Effective Communication, and PMP® Exam Prep — *GCPM*
- **MGT414** SANS® +S™ Training Program for the CISSP® Certification Exam — *GISP*
- **MGT433** Securing The Human: Building and Deploying an Effective Security Awareness Program
- **MGT514** IT Security Strategic Planning, Policy and Leadership

Additional Management Courses
www.sans.org/security-training/curriculums/management

FORENSICS CURRICULUM

- **FOR408** Computer Forensic Investigations - Windows In-Depth — *GCFE*
- **FOR508** Advanced Computer Forensic Analysis & Incident Response — *GCFA* — New!
- **FOR526** Windows Memory Forensics In-Depth — New!
- **FOR558** Network Forensics
- **FOR563** Mobile Device Forensics
- **FOR610** REM: Malware Analysis Tools & Techniques — *GREM*

Additional Information on Forensic Courses
http://computer-forensics.sans.org

AUDIT CURRICULUM

- **AUD566** Implementing & Auditing the Twenty Critical Security Controls – In-Depth
- **AUD507** Auditing Networks, Perimeters, and Systems — *GSNA*

Specialized Audit Courses

- **AUD444** Auditing Security and Controls of Active Directory and Windows — New!
- **AUD445** Auditing Security and Controls of Oracle Databases — New!

Additional Audit Courses
http://it-audit.sans.org

LEGAL CURRICULUM

- **SEC301** Intro to Information Security — *GISF*
- **SEC401** SANS Security Essentials Bootcamp Style — *GSEC*
- **LEG523** Law of Data Security and Investigations — *GLEG*

GIAC certification available for courses indicated with GIAC acronyms

SOFTWARE SECURITY CURRICULUM

Defense

Securing the App (STA) Application Security Awareness

11 Modules – 10 minutes each providing awareness-level training for people involved in application development.

- Application Security training for development teams
- Duration = 2 hours
- Delivered = Computer-Based Training (CBT)
- Quizzes included

www.securingtheapp.org

- **DEV522** Defending Web Applications Security Essentials — *GWEB*

Secure Coding

JAVA
- **DEV541** Secure Coding in Java/JEE (4-Day Course) — *GSSP-JAVA*

.NET
- **DEV544** Secure Coding in .NET (4-Day Course) — *GSSP-.NET*

C & C++
- **DEV543** Secure Coding in C & C++

Language Agnostic
- **DEV536** Secure Coding: Developing Defensible Applications

Attack

- **SEC542** Web App Pen Testing and Ethical Hacking — *GWAPT*
- **SEC642** Advanced Web App Pen Testing and Ethical Hacking — New!

Additional Software Security Courses http://software-security.sans.org

Courses-at-a-Glance

Please check the website for an up-to-date course list at www.sans.org/sans-2013

		FRI 3/8	SAT 3/9	SUN 3/10	MON 3/11	TUE 3/12	WED 3/13	THU 3/14	FRI 3/15
AUD444	Auditing Security and Controls of Active Directory and Windows *NEW!*			PAGE 62					
AUD445	Auditing Security and Controls of Oracle Databases *NEW!*						PAGE 62		
AUD507	Auditing Networks, Perimeters, and Systems			PAGE 54					
AUD521	Meeting the Minimum: PCI/DSS 2.0: Becoming and Staying Compliant	PAGE 62							
DEV522	Defending Web Applications Security Essentials			PAGE 56					
DEV541	Secure Coding in Java/JEE: Developing Defensible Applications			PAGE 57					
DEV544	Secure Coding in .NET: Developing Defensible Applications			PAGE 57					
FOR408	Computer Forensic Investigations - Windows In-Depth			PAGE 34					
FOR508	Advanced Computer Forensic Analysis & Incident Response *NEW!*			PAGE 36					
FOR526	Windows Memory Forensics In-Depth *NEW!*			PAGE 38					
FOR558	Network Forensics			PAGE 40					
FOR563	Mobile Device Forensics			PAGE 42					
FOR610	Reverse-Engineering Malware: Malware Analysis Tools and Techniques			PAGE 44					
LEG523	Law of Data Security and Investigations *SIMULCAST*				PAGE 58				
MGT305	Technical Communication and Presentation Skills for Security Pros *SIMULCAST*					PAGE 61			
MGT414	SANS® +S™ Training Program for the CISSP® Cert Exam *SIMULCAST*			PAGE 46					
MGT433	Securing The Human: Building and Deploying an Effective Security Awareness Program *SIMULCAST*	PAGE 61							
MGT512	SANS Security Leadership Essentials for Managers with Knowledge Compression™				PAGE 48				
MGT514	IT Security Strategic Planning, Policy, and Leadership				PAGE 50				
MGT525	IT Project Management, Effective Communication, and PMP® Exam Prep			PAGE 52					
MGT535	Incident Response Team Management		P 61						
SEC301	Intro to Information Security			PAGE 2					
SEC401	SANS Security Essentials Bootcamp Style *SIMULCAST*			PAGE 4					
SEC434	Log Management In-Depth: Compliance, Security, Forensics, and Troubleshooting	PAGE 60							
SEC501	Advanced Security Essentials – Enterprise Defender			PAGE 6					
SEC502	Perimeter Protection In-Depth			PAGE 8					
SEC503	Intrusion Detection In-Depth			PAGE 10					
SEC504	Hacker Techniques, Exploits, and Incident Handling			PAGE 12					
SEC505	Securing Windows and Resisting Malware *NEW!*			PAGE 14					
SEC506	Securing Linux/Unix			PAGE 16					
SEC524	Cloud Security Fundamentals	PAGE 60							
SEC542	Web App Penetration Testing and Ethical Hacking *SIMULCAST*			PAGE 18					
SEC546	IPv6 Essentials	PAGE 60							
SEC560	Network Penetration Testing and Ethical Hacking *SIMULCAST*			PAGE 20					
SEC566	Implementing & Auditing the 20 Critical Security Controls - In-Depth				PAGE 22				
SEC575	Mobile Device Security and Ethical Hacking *NEW!*			PAGE 24					
SEC579	Virtualization and Private Cloud Security *NEW!*			PAGE 26					
SEC617	Wireless Ethical Hacking, Penetration Testing, and Defenses			PAGE 28					
SEC642	Advanced Web App Penetration Testing and Ethical Hacking *NEW!*			PAGE 30					
SEC660	Advanced Penetration Testing, Exploits, and Ethical Hacking			PAGE 32					
HOSTED	(ISC)²® CSSLP® CBK® Education Program			PAGE 63					
HOSTED	RMF for DoD IT Workshop				PAGE 63				
HOSTED	Offensive Countermeasures: Defensive Tactics That Actually Work	PAGE 64							
HOSTED	Physical Penetration Testing - Introduction	PAGE 64							
HOSTED	Total System Compromise	PAGE 64							
	NetWars – Tournament Play						PAGE 70		

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SEC301: Intro to Information Security

This introductory certification course is the fastest way to get up to speed in information security. Written and taught by battle-scarred security veterans, this entry-level course covers a broad spectrum of security topics and is liberally sprinkled with real life examples. A balanced mix of technical and managerial issues makes this course appealing to attendees who need to understand the salient facets of information security basics and the basics of risk management. Organizations often tap someone who has no information security training and say, "Congratulations, you are now a security officer." If you need to get up to speed fast, Security 301 rocks!

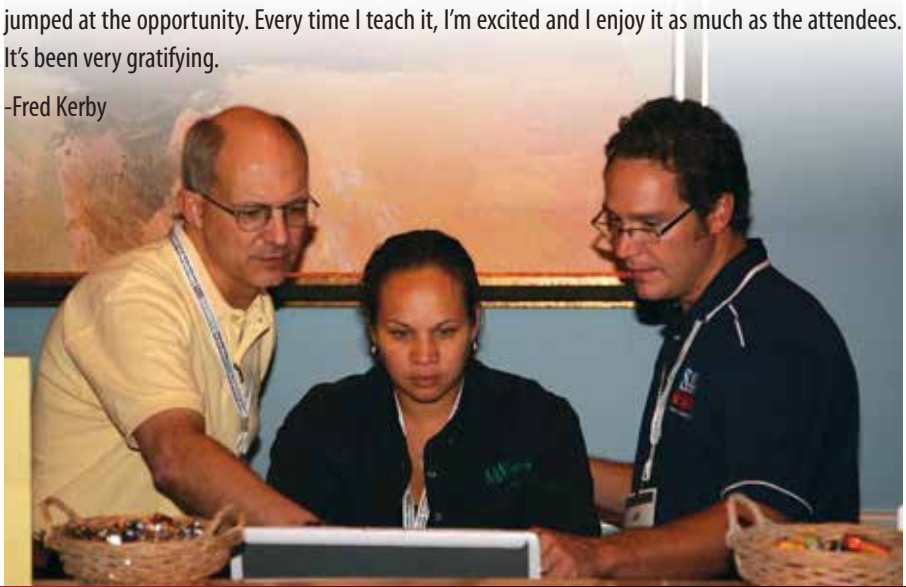
We begin by covering basic terminology and concepts, and then move to the basics of computers and networking as we discuss Internet Protocol, routing, Domain Name Service, and network devices. We cover the basics of cryptography, security management, and wireless networking, then we look at policy as a tool to effect change in your organization. In the final day of the course, we put it all together with an implementation of defense in-depth.

If you're a newcomer to the field of information security, this is the course for you! You will develop the skills to bridge the gap that often exists between managers and system administrators, and learn to communicate effectively with personnel in all departments and at all levels within your organization.

Author Statement

A good friend of mine once said, "A little security is better than no security." If your organization is in either situation (little or no security) and you want to make a difference in a positive way, this course is a great place to start. If your organization has already made an investment in security, this is a great opportunity to compare notes with others and identify how to maximize the return on your investment. Twelve years ago I agreed to fill the position of "number one spear catcher" (the head security guy) for our organization. I asked about training and my predecessor told me that the agency would provide training, but suggested that I work for six months to get some "real-world experience to compare against the theory." It was a long and frustrating six months and the training was less than helpful. A few years later when SANS offered to let me help write and teach this course, I literally jumped at the opportunity. Every time I teach it, I'm excited and I enjoy it as much as the attendees. It's been very gratifying.

-Fred Kerby



Who Should Attend

- Persons new to Information Technology (IT) who need to understand the basics of information assurance, computer networking, cryptography, and risk evaluation
- Managers and Information Security Officers who need a basic understanding of risk management and the tradeoffs between confidentiality, integrity, and availability
- Managers, administrators, and auditors who need to draft, update, implement, or enforce policy

"This class is great for IT professionals looking for their first step towards security awareness. I have been in IT for 17 years and I learned a lot on this first day of class."

-Paul Beninati, EMC

www.giac.org

DoD 8570 Required
www.sans.org/8570

301.1 A Framework for Information Security

Information security is based upon foundational concepts such as asset value, the CIA triad (confidentiality, integrity, and availability), principal of least privilege, access control, and separation. Day one provides a solid understanding of the terms, concepts, and tradeoffs that will enable you to work effectively within the information security landscape. If you have been in security for a while, these chapters will be a refresher, providing new perspectives on some familiar issues.

Topics: Basic Concepts (Value of Assets, Security Responsibilities, IA Pillars and Enablers, IA Challenges, Trust and Security); Principles (Least Privilege, Defense in Depth, Separation of Risk, Kerckhoff's Principle); Security as a Process (Analysis, Protection, Detection, Response)

301.2 Securing the Infrastructure

To appreciate the risks associated with being connected to the Internet one must have a basic understanding of how networks function. Day two covers the basics of networking (including a review of some sample network designs), including encapsulation, hardware and network addresses, name resolution, and address translation. We explore some typical attacks against the networking and computing infrastructure along with appropriate countermeasures.

Topics: Terms (Encapsulation, Ports, Protocols, Addresses, Network Reference Models - stacks); Addressing (Hardware, Network, Resolution, Transport Protocols, TCP, UDP); Other Protocols (ARP, ICMP, Routing Basics, The Local Network, Default Gateway); Network Components (Hubs, Switches, Routers, Firewalls, Component Management - SNMP); Attacks and Countermeasures (Attack Theory, Types of Attacks, Countermeasures)

301.3 Cryptography and Security in the Enterprise

Cryptography can be used to solve a number of security problems. Cryptography and Security in the Enterprise provides an in-depth introduction to a complex tool, (cryptography) using easy to understand examples and avoiding complicated mathematics. Attendees will gain meaningful insights into the benefits of cryptography (along with the pitfalls of a poor implementation of good tools). The day continues with an overview of the security organization in a typical company. Where does security fit in the overall organizational scheme? What is its charter? What other components of the larger organization must it interact with? We conclude the day with a whirlwind overview of wireless networking technology benefits and risks, including a roadmap for reducing risks in a wireless environment.

Topics: Cryptography (Cryptosystem Components, Cryptographic Services, Algorithms, Keys, Cryptographic Applications, Implementation); Security in the Enterprise (Organizational Placement, Making Security Possible, Dealing with Technology, Security Perspectives, Organizational Relationships, Building a Security Program); Wireless Network Security (Wireless Use and Deployments, Wireless Architecture and Protocols, Common Misconceptions, Top 4 Security Risks, Steps to Planning a Secure WLAN)

301.4 Information Security Policy

Day four will empower those with the responsibility for creating, assessing, approving, or implementing security policy with the tools and techniques to develop effective, enforceable, policy. Information Security Policy demonstrates how to bring policy alive by using tools and techniques such as the formidable OODA (Orient, Observe, Decide, Act) model. We also explore risk assessment and management guidelines and sample policies, as well as examples of policy and perimeter assessments.

Topics: The OODA Model; Security Awareness; Risk Management Policy for Security Officers; Developing Security Policy; Assessing Security Policy; Applying What We Have Learned on the Perimeter; Perimeter Policy Assessment

301.5 Defense In-Depth: Lessons Learned

The goal of day five is to enable managers, administrators, and those in the middle to strike a balance between "security" and "getting the job done." We'll explore how risk management deals with more than security and how the ISO-OSI model may have an eighth layer (political) impacting communications and transmission. It is replete with war stories from the trenches that illustrate the TSP protocol (the Tie to Sandal Protocol) used by successful security professionals worldwide.

Topics: The Site Security Plan; Computer Security; Application Security; Incident Handling; Making the Most of Your Opportunities with Others; Measuring Progress

SANS Senior Instructor

Fred Kerby

Fred is an engineer, manager, and security practitioner whose experience spans several generations of networking. He was the Information Assurance Manager at the Naval Surface Warfare Center, Dahlgren Division for more than sixteen years. His team is one of the recipients of the SANS Security Technology Leadership Award as well as the Government Technology Leadership Award. Fred received the Navy Meritorious Civilian Service Award in recognition of his technical and management leadership in computer and network security. A frequent speaker at SANS, Fred's presentations reflect his opinions and are not the opinions of the Department of the Navy.

SEC401: Security Essentials Bootcamp Style

It seems wherever you turn organizations are being broken into and the fundamental question that everyone wants to know is Why? Why do some organizations get broken into and others do not. SEC401 Security Essentials is focused on teaching you the right things that need to be done to keep an organization secure. Organizations are spending millions of dollars on security and are still compromised. The problem is they are doing good things but not the right things. Good things will lay a solid foundation but the right things will stop your organization from being headline news in the Wall Street Journal. SEC401's focus is to teach individuals the essential skills and techniques needed to protect and secure an organization's critical information assets and business systems. We also understand that security is a journey and not a destination. Therefore we will teach you how to build a security roadmap that can scale today and into the future. When you leave our training we promise that you will be given techniques that you can implement today and tomorrow to keep your organization at the cutting edge of cyber security. Most importantly, your organization will be secure.

With the APT (advanced persistent threat) organizations are going to be targeted. Whether the attacker is successful penetrating an organization's network depends on how well they are at the defense. While defending against attacks is an ongoing challenge with new threats emerging all of the time including the next generation of threats, organizations need to understand what works in cyber security. What has worked and will always work is taking a risk based approach to cyber defense. Before your organization spend a dollar of its IT budget or allocate any resources or time on anything in the name of cyber security, three questions must be answered:

1. **What is the risk?**
2. **Is it the highest priority risk?**
3. **Is it the most cost effective way of reducing the risk**

Security is all about making sure you are focusing in on the right areas of defense. By attending SEC401 you will learn the language and underlying theory of computer security. Since all jobs today require an understanding of security, this course will help you understand why security is important and how it applies to your job. In addition, you will learn the essential, up-to-the-minute knowledge and skills required for effective security if you are given the responsibility for securing systems and/or organizations. This course meets both of the key promises SANS makes to our students: (1) You will gain up-to-the-minute knowledge you can put into practice immediately upon returning to work; and, (2) You will be taught by the best security instructors in the industry.

Author Statement

One of the things I love to hear from students after teaching Security 401 is "I have worked in security for many years and after taking this course I realized how much I did not know." With the latest version of Security Essentials and the Bootcamp, we have really captured the critical aspects of security and enhanced those topics with examples to drive home the key points. After attending Security 401, I am confident you will walk away with solutions to problems you have had for a while plus solutions to problems you did not even know you had.

- Eric Cole

Who Should Attend

- Security professionals who want to fill the gaps in their understanding of technical information security
- Managers who want to understand information security beyond simple terminology and concepts
- Operations personnel that do not have security as their primary job function but need an understanding of security to be effective
- IT engineers and supervisors that need to know how to build a defensible network against attacks
- Administrators responsible for building and maintaining systems that are being targeted by attackers
- Forensic, penetration testers, auditors who need a solid foundational of security principles so they can be effective as possible at their jobs
- Anyone new to information security with some background in information systems and networking

BOOTCAMP

This program has extended hours.
Security 401 PARTICIPANTS ONLY
Evening Bootcamp Sessions:
5:15pm - 7:00pm (Days 1-5)

"The quick pace is awesome! Moving forward and actively covering topics is invigorating!"

-Steven Park, Boeing

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast.
More info on page 65.

www.giac.org

DoD 8570 Required
www.sans.org/8570

www.sans.org/cyber-guardian

www.sans.edu

401.1 Hands On: Networking Concepts

Day one teaches you how networks, routers, firewalls, and the related protocols like TCP/IP work so you'll be better prepared to determine hostile traffic and have a foundation for the succeeding days' training.

Topics: Network Fundamentals; IP Concepts; IP Behavior, IOS and Router Filters; Physical Security; Bootcamp

401.2 Hands On: Defense In-Depth

Day two covers security threats and their impact, including information warfare. It also covers sound security policies and password management tools, the six steps of incident handling, and web server security testing.

Topics: Defense in Depth; Security Policy and Contingency Planning; Access Control and Password Management; Incident Response; Information Warfare; Web Communications and Security; Bootcamp

401.3 Hands On: Internet Security Technologies

Day three gives you a roadmap that will help you understand the tools and options available for deploying systems for defense.

Topics: Attack Strategies and Mitigation; Vulnerability Scanning; Intrusion Detection Technologies; Intrusion Prevention Technologies; IT Risk Management; Bootcamp

401.4 Hands On: Secure Communications

Day four covers encryption, wireless security, and operations security.

Topics: Encryption 101; Encryption 102; Applying Cryptography; Wireless Network Security; VoIP; Operations Security; Bootcamp

401.5 Hands On: Windows Security

Day five is all about securing the current batch of Windows operating systems (Windows XP/2003/Vista/2008/Windows 7) and teaches the tools that simplify and automate the process.

Topics: Windows Security Infrastructure; Permissions and User Rights; Security Templates and Group Policy; Service Packs, Hotfixes, and Backups; Securing Windows Network Services; Automation and Auditing; Bootcamp

401.6 Hands On: Linux Security

Based on industry consensus standards, this course provides step-by-step guidance on improving the security of any Linux system. The course combines practical how-to instructions with background information for Linux beginners and security advice and best practices for administrators of all levels of expertise.

Topics: Linux Landscape; Linux Command Line; Linux OS Security; Linux Security Tools; Maintenance, Monitoring, and Auditing Linux

Security Essentials is our most popular training program and requires that you attend the evening bootcamp sessions with hands-on exercises. These extended hours really help to fill in the gaps in your information security knowledge. Everyone, except truly seasoned hands-on information security workers, can benefit from SANS Security Essentials Bootcamp Style. A GSEC Certification can add 6-9% to your bottom line salary.

SANS Faculty Fellow

Dr. Eric Cole

Dr. Cole is an industry-recognized security expert with over 20 years of hands-on experience. Dr. Cole currently performs leading-edge security consulting and works in research and development to advance the state of the art in information systems security. Dr. Cole has experience in information technology with a focus on perimeter defense, secure network design, vulnerability discovery, penetration testing, and intrusion detection systems. Dr. Cole has a master's degree in computer science from NYIT and a doctorate from Pace University with a concentration in information security. Dr. Cole is the author of several books, including *Hackers Beware, Hiding in Plain Site, Network Security Bible*, and *Insider Threat*. He is the inventor of over 20 patents and is a researcher, writer, and speaker. He is also a member of the Commission on Cyber Security for the 44th President and several executive advisory boards. Dr. Cole is founder of Secure Anchor Consulting in which he provides state of the art security services and expert witness work. He also served as CTO of McAfee and Chief Scientist for Lockheed Martin. Dr. Cole is actively involved with the SANS Technology Institute (STI) and SANS working with students, teaching, and maintaining and developing courseware. He is a SANS faculty Fellow and course author. He is a SANS faculty Fellow and course author. Dr. Cole is an executive leader at Secure Anchor Consulting where he provides leading-edge cyber security consulting services and leads research and development initiatives to advance the state-of-the-art in information systems security.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCED | Instructor: Bryce Galbraith

SEC501: Advanced Security Essentials – Enterprise Defender

Cyber security continues to be a critical area for organizations and will continue to increase in importance as attacks become stealthier, have a greater financial impact on an organization, and cause reputational damage. While Security Essentials lays a solid foundation for the security practitioner, there is only so much that can be packed into a six-day course.

A key theme is that prevention is ideal, but detection is a must. We need to be able to ensure that we constantly improve our security to prevent as many attacks as possible. This prevention/protection occurs on two fronts - externally and internally. Attacks will continue to pose a threat to an organization as data becomes more portable and networks continue to be porous. Therefore a key focus needs to be on data protection, securing our critical information no matter whether it resides on a server, in a robust network architecture, or on a portable device.

Despite an organization's best effort at preventing attacks and protecting their critical data, some attacks will still be successful. Therefore we need to be able to detect attacks in a timely fashion. This is accomplished by understanding the traffic that is flowing on your networks and looking for indication of an attack. It also includes performing penetration testing and vulnerability analysis against an organization to identify problems and issues before a compromise occurs.

Finally, once an attack is detected we must react to it in a timely fashion and perform forensics. By understanding how the attacker broke in, this can be fed back into more effective and robust preventive and detective measures, completing the security lifecycle..

Author Statement

It is always a thrill after I finish teaching SEC401 to see students leave with a fire in their eyes and an excitement about them. They walked into class feeling overwhelmed that security is a lost cause, but now they leave class understanding what they need to do and have a focus and drive to do the right thing to secure their organizations. However the next question we receive on a constant basis is, what course should I take next? How do I continue my journey? Well, it depends on what your focus area is. Do you want to get more into perimeter protection, IDS, operating system security, etc? The challenge is that many students have positions that do not allow them to focus on one area they need to understand all of the key areas across security. What students are telling us is that they want a Security Essentials part 2 or a 500-level continuation of Security Essentials covering the next level of technical knowledge. In Security 501, SANS has decided to give students just what they have been asking for, and I am beyond thrilled with the results. We have identified core foundation areas that compliment SEC401 with no overlap and continue to build a solid security foundation for network practitioners.

This is illustrated by one student who after a recent class ran up to me, gave me a big hug (he was a retired football player, so I did not argue), and said, "SANS is awesome. I have been frustrated in my job for over a year and had lost hope that you really could secure an organization and that anything I did made a difference. Just as my light of hope was burning out, I decided to take the Security Essentials course, figuring it was a lost cause. After this class the fire is burning brighter than it ever was. I feel like a kid again and cannot wait to go back to my company and make a difference. However, I think my boss is scared because I called him eight times throughout the week, telling him all of the great information and practical knowledge I learned."

After teaching thousands of students, I am confident you will have similar results and be just as excited. However, just for reference, hugs are optional.

- Eric Cole

Who Should Attend

- Students who have taken Security Essentials and want a more advanced 500-level course similar to SEC401
- People who have foundational knowledge covered in SEC401, do not want to take a specialized 500-level course, and still want a broad, advanced coverage of the core areas to protect their systems
- Anyone looking for detailed technical knowledge on how to protect against, detect, and react to the new threats that will continue to cause harm to an organization

"Great course! I'm disturbed/impressed at how much the instructors know. Top-notch instructors are what makes SANS!"

-Chris Robinson, Sempra Energy

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501.1 Hands On: Defensive Network Infrastructure

Protecting a network from attack starts with designing, building, and implementing a robust network infrastructure. Many aspects to implementing a defense-in-depth network are often overlooked since companies focus on functionality. Achieving the proper balance between business drivers and core protection of information is difficult. On the first day students will learn how to design and implement a functionality-rich, secure network and how to maintain and update it as the threat landscape evolves.

Topics: Introducing Network Infrastructure as Targets for Attack; Implementing the Cisco Gold Standard to Improve Security; Advanced Layer 2 and 3 Controls

501.2 Hands On: Packet Analysis

Packet analysis and intrusion detection are at the core of timely detection. Detecting attacks is becoming more difficult as attacks become stealthier and more difficult to find. Only by understanding the core principles of traffic analysis can one become a skilled analyst and distinguish normal traffic from attack traffic. Security professionals must be able to detect new, advanced zero-day attacks before they compromise a network. Prevention, detection, and reaction must all be closely knit so that once an attack is detected, defensive measures can be adapted, proactive forensics implemented, and the organization can continue to operate.

Topics: Architecture Design & Preparing Filters; Detection Techniques and Measures; Advanced IP Packet Analysis; Intrusion Detection Tools

501.3 Hands On: Pentest

An organization must understand the changing threat landscape and compare that against its own vulnerabilities. On day three students will understand the variety of tests that can be run and how to perform penetration testing in an effective manner. Students will learn about external and internal pen testing and the methods of black, gray, and white box testing. Penetration testing is critical to identify an organization's exposure points, but students will also learn how to prioritize and fix these vulnerabilities to increase the overall security of an organization.

Topics: Variety of Penetration Testing Methods; Vulnerability Analysis; Key Tools and Techniques; Basic Pen Testing; Advanced Pen Testing

501.4 Hands On: First Responder

Any organization connected to the Internet or with employees is going to have attacks launched against it. Security professionals need to understand how to perform incident response, analyze what is occurring, and restore their organization back to a normal state as soon as possible. Day four will equip students with a proven six-step process to follow in response to an attack – prepare, identify, contain, eradicate, recover, and learn from previous incidents. Students will learn how to perform forensic investigation and find indication of an attack. This information will be fed into the incident response process and ensure the attack is prevented from occurring again in the future.

Topics: Incident Handling Process and Analysis; Forensics and Incident Response

501.5 Hands On: Malware

As security professionals continue to build more proactive security measures, attackers' methods will continue to evolve. A common way for attackers to target, control, and break into as many systems as possible is through the use of malware. Therefore it is critical that students understand what type of malware is currently available to attackers and future trends and methods of exploiting systems. With this knowledge students can then learn how to analyze, defend, and detect malware on systems and minimize the impact to the organization.

Topics: Malware; Microsoft Malware; External Tools and Analysis

501.6 Hands On: Data Loss Prevention

Cyber security is all about managing, controlling, and mitigating risk to critical assets, which in almost every organization are composed of data or information. Perimeters are still important, but we are moving away from a fortress model and moving towards a focus on data. This is based on the fact that information no longer solely resides on servers where properly configured access control lists can limit access and protect our information; it can now be copied to laptops and plugged into networks. Data must be protected no matter where it resides.

Topics: Risk Management; Data Classification; Digital Rights Management; Data Loss Prevention (DLP)

SANS Certified Instructor

Bryce Galbraith

As a contributing author of the internationally bestselling book Hacking Exposed: Network Security Secrets & Solutions, Bryce helped bring the secret world of hacking out of the darkness and into the public eye. Bryce has held security positions at global ISPs and Fortune 500 companies, he was a member of Foundstone's renowned penetration testing team and served as a senior instructor and co-author of Foundstone's Ultimate Hacking: Hands-On course series. Bryce is currently the owner of Layered Security where he and his team provide specialized vulnerability assessment and penetration testing services for clients. He teaches several of The SANS Institute's most popular courses and develops curriculum around current topics. He has taught the art of ethical hacking and countermeasures to thousands of IT professionals from a who's who of top companies, financial institutions, and government agencies around the globe. Bryce is an active member of several security-related organizations, he speaks at numerous conferences, and holds several security certifications and blogs about security issues at http://blog.layeredsec.com.

SEC502: Perimeter Protection In-Depth

There is no single fix for securing your network. That's why this course is a comprehensive analysis of a wide breath of technologies. In fact, this is probably the most diverse course in the SANS catalog, as mastery of multiple security techniques is required to defend your network from remote attacks. You cannot just focus on a single OS or security appliance. A proper security posture must be comprised of multiple layers. This course was developed to give you the knowledge and tools necessary at every layer to ensure your network is secure.

The course starts by looking at common problems we need to resolve. Is there traffic passing by my firewall I didn't expect? How did my system get compromised when no one can connect to it from the Internet? Is there a better solution than anti-virus for controlling malware? We'll dig into these questions and more and answer them.

We spend quite a bit of time learning about IP. Sure we all know how to assign an IP address, but to secure your network you really need to understand the idiosyncrasies of the protocol. We'll talk about how IP works and how to spot the abnormal patterns. If you can't hear yourself saying "Hummm, there are no TCP options in that packet. It's probably forged," then you'll gain some real insight from this portion of the material.

Once you have an understanding of the complexities of IP, we'll get into how to control it on the wire. Rather than trying to tell you what are good and bad products, we focus on the underlying technology used by all of them. This is extremely practical information because a side-by-side product comparison is only useful for that specific moment in time. By gaining knowledge of what goes on under the cover, you will be empowered to make good product choices for years to come. Just because two firewalls are stateful inspection, do they really work the same on the wire? Is there really any difference between stateful inspection and network-based intrusion prevention, or is it just marketing? These are the types of questions we address in this portion of the course.

From there, it's a hands-on tour through how to perform a proper wire-level assessment of a potential product, as well as what options and features are available. We'll even get into how to deploy traffic control while avoiding some of the most common mistakes. Feel like your firewall is generating too many daily entries for you to review the logs effectively? We'll address this problem not by reducing the amount of critical data, but by streamlining and automating the backend process of evaluating it.

But you can't do it all on the wire. A proper layered defense needs to include each individual host - not just the hosts exposed to access from the Internet, but hosts that have any kind of direct or indirect Internet communication capability as well. We'll start with OS lockdown techniques and move on to third-party tools that can permit you to do anything from sandbox insecure applications to full-blown application policy enforcement.

Most significantly, I've developed this course material using the following guiding principles:

- **Learn the process, not one specific product.**
- **You learn more by doing, so hands-on problem solving is key.**
- **Always peel back the layers and identify the root cause.**

While technical knowledge is important, what really matters are the skills to properly leverage it. This is why the course is heavily focused on problem solving and root cause analysis. While these are usually considered soft skills, they are vital to being effective in the role of security architect. So along with the technical training, you'll receive risk management capabilities and even a bit of Zen empowerment.

Who Should Attend

- Information security officers
- Intrusion analysts
- IT managers
- Network architects
- Network security engineers
- Network and system administrators
- Security managers
- Security analysts
- Security architects
- Security auditors

Author Statement

One of the most rewarding things I have ever done in my career is author this course material. It is really difficult to find solid, unbiased advice for securing your network. Vendors must watch their bottom line. This need can manifest itself in some interesting ways, like giving you poor advice that focuses more on reducing their support costs than increasing your security posture. Is it any surprise that vendor training has turned into a marketing opportunity rather than a chance to tell you how to work around the problems in their product?

The Internet can also be hit or miss. There are testing centers, news sites, blogs, etc., but most are either owned by a security vendor, do work for them, or sell ad space to them. There are individuals who honestly want to be helpful, but they lack the expertise to do so effectively. For example, post this question to any given security forum or mailing list, "I need a new firewall. Can anyone recommend something?" and watch the product recommendations come pouring in. How helpful can this advice really be when they know nothing about your network or specific needs?

-Chris Brenton

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502.1 Hands On: TCP/IP for Firewalls

This first section is more than an executive overview as we dig down into the bits and bytes of the problem. What can be secured at the network level, and which protection needs to be pushed back to the hosts? What are my packet level control devices really doing on the wire, and when can't I trust them? If you want to control traffic on the wire, you have to understand the IP protocol. It is for this reason a majority of the day is spent doing packet level analysis. While many protocol analyzers will tell you what they think is happening, if you cannot read the decodes for yourself, you will have no idea when the tool is leading you astray.

Topics: Common Threats; Windump/Tcpdump; OSI Layer 2; OSI Layer 3; Fragmentation; OSI Layer 4 through 6

502.2 Hands On: Firewalls, NIDS, and NIPS

The only way to understand if a network traffic control device is going to meet your requirements is to understand the technology underneath the hood. Do all stateful inspection firewalls handle traffic the same way? Is there really any difference between a stateful inspection firewall and a network-based intrusion prevention system (NIPS)? In today's material we will cut through the vendor marketing slicks and look at what their products are really capable of doing.

Topics: Static Packet Filters; Stateful Packet Filters; Stat ful Inspection Filtering; Intrusion Detection and Prevention; Proxies; Cisco IOS; IP Version 6 (IPv6)

502.3 Hands On: Wire Products and Assessment

In today's material we will look at how each vendor has implemented the technology. We'll also discuss how to test these products on the wire so we know exactly how they are impacting traffic. Can the product stop a covert communication channel using ICMP error packets? What about a source route attack? What about application layer attacks? These are the types of questions we'll strive to answer in this material. The number one problem students have with managing their environment is dealing with the firewall logs. Not only will we discuss what to look for, but through practical exercises you will learn how to optimize the log review process into something that takes less time to finish than your morning coffee.

Topics: Traffic Control Products; Building A Firewall Rulebase; Perimeter Assessment; Web Application and Database Firewalls; Firewall Log Analysis

502.4 Hands On: Host-Level Security

In the early days of the Internet it was possible to secure a network right at the perimeter. Modern-day attacks, however, are far more advanced and require a multi-layered approach to security. This does not mean the perimeter no longer serves a useful role; it's just that now it is only part of the equation. So today we focus on the security posture of our individual hosts, look at what the OS and application vendors give us to work with and when we may need to turn to third-party tools. It is not enough to simply configure the hosts. We'll look at vulnerability scanning and audits for the hosts and applications in order to be able to validate continuous integrity. When the worst occurs, we'll talk about performing a forensic analysis as well. Finally, we will talk about security information management. The devices on your network really want to tell you what is going on, but you have to be able to sort through all of the data.

Topics: Securing Hosts and Services; Host-Based Intrusion Detection and Prevention; Vulnerability Assessment and Auditing; Forensics; Security Information Management

502.5 Hands On: Securing the Wire

It's not enough to control traffic flow; we also need to be able to secure the data inside of the packets. We will start with the basics, authentication and encryption, and learn how these technologies are combined into the modern day VPN. We'll discuss which of the technologies have been proved to be mathematically secure and which of them is a leap of faith. Further, we will discuss how to integrate encrypted dataflow into your overall architecture design so you are not blinded to attacks through these encrypted tunnels. Then we turn our attention to securing the internal network structure. We'll cover deploying wireless access points without creating (yet another) point of management. We'll also look at network access control (NAC) and discuss what it can do today as well as its potential in the future.

Topics: Authentication; Encryption; VPNs, Wireless; Network Access Control

502.6 Hands On: Perimeter Wrap-Up

The problems start off easy, like small organizations that need advice in order to make their environment more secure. The complexity quickly escalates to where you need to combine security, functionality, and political issues into the design. A healthy dose of risk assessment is also thrown in for good measure. You will also perform a series of labs that are hostile in nature. A majority of the previous labs were geared towards problem solving. You will be presented with a security issue and then given a hands-on process for resolving it.

Topics: Sizing Up A Network; Cool Tools

SANS Certified Instructor

George Bakos

George Bakos has been interested in computer security since the early 1980s when he discovered the joys of BBSs and corporate databases. These days he is a senior engineer for Northrop Grumman's Cyber Threat Analysis & Intelligence team working to understand what's going on inside the minds and hearts of his adversaries. He was the developer of Tiny Honeypot and the IDABench intrusion analysis system and was one of the researchers behind the Dartmouth Distributed Honeynet System. George developed and taught the U.S. Army National Guard's CERT technical curriculum and ran the NGB's Information Operations Training and Development Center research lab for two years, fielding and supporting Computer Emergency Response Teams nationwide. Outside the lab, George enjoys the beauties of his home state, Vermont, through skiing, ice and rock climbing, and mountain biking.

SEC503: Intrusion Detection In-Depth

Learn practical hands-on intrusion detection and traffic analysis from top practitioners/authors in the field. This challenging track methodically progresses from understanding the theory of TCP/IP, examining packets, using Snort to analyze traffic, becoming familiar with the tools and techniques for traffic and intrusion analysis, to reinforcing what you've learned with a hands-on challenge of investigating an incident. Students should be able to "hit the ground running" once returning to a live environment where traffic analysis it required.

This is a fast-paced course, and students are expected to have a basic working knowledge of TCP/IP in order to fully understand the topics that will be discussed. Although others may benefit from this course, it is most appropriate for students who are or who will become intrusion detection/prevention analysts. Students generally range from novices with some TCP/IP background all the way to seasoned analysts. The challenging hands-on exercises are specially designed to be valuable for all experience levels. We strongly recommend that you spend some time getting familiar with tcpdump before coming to class.

Author Statement

When I was invited to be a member of a computer incident response team in the late 1990's (just after Al Gore invented the Internet), there was no formal cybersecurity training available. Consequently, I learned on the job and made my share, and then some, of mistakes. I was so naive that I tried to report an attack on our network by a host with an IP address in the 192.168 reserved private network, available for use by anyone. Needless to say, I got a very embarrassing enlightenment when someone clued me in.

With the benefit of experience and the passage of time, there are many lessons to be shared with you. This knowledge affords you the opportunity to learn and practice in the classroom to prepare you for the fast-paced always-interesting job of intrusion detection analysts.

-Judy Novak

Who Should Attend

- Intrusion detection analysts (all levels)
- Network engineers
- System, security, and network administrators
- Hands-on security managers

A Sampling of Topics

- TCP/IP
  - Tcpdump Overview and TCP/IP concepts
  - ICMP
  - Fragmentation
  - Stimulus - Response
  - Microsoft Protocols
  - Domain Name System (DNS)
  - IPv6
- Hands-On tcpdump Analysis
  - Mechanics of running tcpdump
  - General network traffic analysis
- Hands-On Snort Usage
  - Various modes of running Snort
  - Writing Snort rules
- Intrusion Analysis
  - Intrusion Detection Architecture
  - Intrusion Detection/Prevention Analysis

"This class heightens your security awareness on protecting your network and provides excellent examples, in detail, on how to accomplish this."

-Laura Freeman, DND

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503.1 TCP/IP for Intrusion Detection

Students will be able to translate native hexadecimal at the IP, transport layers, and some protocols such as DNS. The material presented in this day will give students the knowledge and understanding of TCP/IP and free tools, like tcpdump and wireshark, to assist them in troubleshooting all types of networking complaints from routing problems to firewall and critical server issues.

Topics: Refresher of TCP/IP; TCP/IP Communication Model; IP Fragmentation; Internet Control Message Protocol (ICMP); Stimulus and Response; Microsoft Protocols; Domain Name System (DNS); IPv6

503.2 & 503.3 Hands On: Network Traffic Analysis Using TCPdump – Parts 1 & 2*

In this two-day module, students will learn how to interpret header fields and values in a packet. We will build on that skill to learn traffic analysis with lab exercises to reinforce the theory. Tcpdump is the tool of choice selected to demonstrate the theory and is used in hands-on exercises. The intent of these days is to provide the foundation to enable the analyst perform packet/traffic interpretation.

Topics: Introduction to Tcpdump; Writing Tcpdump Filters; Tcpdump Filters; Examining Datagram Fields with Tcpdump; Analysis of Tcpdump Output; Advanced Analysis; Application Protocols and Detection; SiLK

503.4 Hands On: Hands On: Intrusion Detection Snort Style*

On day four students will install, configure, and use the powerful and versatile freeware intrusion detection system Snort. In addition, they will learn to customize Snort for many special uses. Hands-on exercises that will challenge both the novice and seasoned Snort user are included so that students will feel confident in their ability to effectively utilize Snort for their site's specific needs when they get back to the office.

Topics: Introduction; Modes of Operation; Writing Snort Rules; Configuring Snort as an IDS; Output Analysis; Advanced Topics Hands-On - Part 1

503.5 Hands On: Intrusion Analysis*

This day starts to bring together the knowledge gained on previous days to help the student become a combat-ready analyst. Students will learn how to assess and prioritize the events generated by an IDS/IPS, including how to correlate events across multiple platforms and operating environments. Next students will participate in analyzing network traffic, including performing network traffic forensic analysis.

Topics: Analyst Toolkit; Wireshark; SiLK: Network Traffic Forensics; Network Architecture for Monitoring; Correlation

503.6 Hands On: IDS Challenge*

This day is the culmination and consummation of all the previous days where students use their knowledge for a hands-on exercise to investigate an actual attack. This challenge is a guided approach to discovering the network architecture, profiling traffic, identifying attacks, analyzing possible compromises, characterizing the enemy, tracking the hacker's activities, and correlation. This engaging activity allows students to work as a team, or individually, to reinforce what they've learned and challenges them to think analytically.

**This course is available to Security 503 participants only.*

SANS Senior Instructor

Mike Poor

Mike is a founder and senior security analyst for the DC firm InGuardians, Inc. In the past he has worked for Sourcefire as a research engineer and for SANS leading their intrusion analysis team. As a consultant Mike conducts incident response, breach analysis, penetration tests, vulnerability assessments, security audits, and architecture reviews. His primary job focus, however, is in intrusion detection, response, and mitigation. Mike currently holds the GCIA certification and is an expert in network engineering and systems and network and web administration. Mike is an author of the international best selling *Snort* series of books from Syngress, a member of the Honeynet Project, and a handler for the SANS Internet Storm Center.

SEC504: Hacker Techniques, Exploits, and Incident Handling

If your organization has an Internet connection or one or two disgruntled employees (and whose doesn't!), your computer systems will get attacked. From the five, ten, or even one hundred daily probes against your Internet infrastructure to the malicious insider slowly creeping through your most vital information assets, attackers are targeting your systems with increasing viciousness and stealth.

By helping you understand attackers' tactics and strategies in detail, giving you hands-on experience in finding vulnerabilities and discovering intrusions, and equipping you with a comprehensive incident handling plan, the in-depth information in this course helps you turn the tables on computer attackers. This course addresses the latest cutting-edge insidious attack vectors and the "oldie-but-goodie" attacks that are still so prevalent, and everything in between. Instead of merely teaching a few hack attack tricks, this course includes a time-tested, step-by-step process for responding to computer incidents; a detailed description of how attackers undermine systems so you can prepare, detect, and respond to them; and a hands-on workshop for discovering holes before the bad guys do. Additionally, the course explores the legal issues associated with responding to computer attacks, including employee monitoring, working with law enforcement, and handling evidence.

This challenging course is particularly well suited to individuals who lead or are a part of an incident handling team. Furthermore, general security practitioners, system administrators, and security architects will benefit by understanding how to design, build, and operate their systems to prevent, detect, and respond to attacks.

Author Statement

My favorite part of teaching Hacker Techniques, Exploits, and Incident Handling is watching students when they finally get it. It's usually a two-stage process. First, students begin to realize how truly malicious some of these attacks are. Some students have a very visceral reaction, occasionally shouting out "Oh, shoot!" when they see what the bad guys are really up to. But if I stopped the process at that point, I'd be doing a disservice. The second stage is even more fun. Later in the class, students gradually realize that, even though the attacks are really nasty, they can prevent, detect, and respond to them. Using the knowledge they gain in this track, they know they'll be ready when a bad guy launches an attack against their systems. And being ready to thwart the bad guys is what it's all about.

-Ed Skoudis

Who Should Attend

- Incident handlers
- Penetration testers
- Ethical hackers
- Leaders of incident handling teams
- System administrators who are on the front lines defending their systems and responding to attacks
- Other security personnel who are first responders when systems come under attack

A Sampling of Topics

- The step-by-step approach used by many computer attackers
- The latest computer attack vectors and how you can stop them
- Proactive and reactive defenses for each stage of a computer attack
- Hands-on workshop addressing scanning for, exploiting, and defending systems
- Strategies and tools for detecting each type of attack
- Attacks and defenses for Windows, Unix, switches, routers and other systems
- Application-level vulnerabilities, attacks, and defenses
- Developing an incident handling process and preparing a team for battle
- Legal issues in incident handling
- Recovering from computer attacks and restoring systems for business

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504.1 Incident Handling Step-by-Step and Computer Crime Investigation

This session describes a detailed incident handling process and applies that process to several in-the-trenches case studies. Additionally, in the evening an optional 'Intro to Linux' mini-workshop will be held. This session provides introductory Linux skills you'll need to participate in exercises throughout the rest of SEC504. If you are new to Linux, attending this evening session is crucial.

Topics: Preparation; Identification; Containment; Eradication; Recovery; Special Actions for Responding to Different Types of Incidents; Incident Record Keeping; Incident Follow-Up

504.2 Hands On: Computer and Network Hacker Exploits – Part 1*

It is imperative that system administrators and security professionals know how to control what outsiders can see. Students who take this class and master the material can expect to learn the skills to identify potential targets and be provided tools they need to test their systems effectively for vulnerabilities. This day covers the first two steps of many hacker attacks: reconnaissance and scanning.

Topics: Reconnaissance; Scanning; Intrusion Detection System Evasion; Hands-on Exercises for a List of Tools

504.3 Hands On: Computer and Network Hacker Exploits – Part 2*

Computer attackers are ripping our networks and systems apart in novel ways while constantly improving their techniques. This course covers the third step of many hacker attacks – gaining access. For each attack, the course explains vulnerability categories, how various tools exploit holes, and how to harden systems or applications against each type of attack. Students who sign an ethics and release form are issued a CD-ROM containing the attack tools examined in class.

Topics: Network-Level Attacks; Gathering and Parsing Packets; Operating System and Application-Level Attacks; Netcat: The Attacker's Best Friend; Hands-on Exercises with a List of Tools

504.4 Hands On: Computer and Network Hacker Exploits – Part 3*

Attackers aren't resting on their laurels, and neither can we. They are increasingly targeting our operating systems and applications with ever-more clever and vicious attacks. This session looks at increasingly popular attack avenues as well as the plague of denial of service attacks.

Topics: Password Cracking; Web Application Attacks; Denial of Service Attacks; Hands-on Exercises with a List of Tools

504.5 Hands On: Computer and Network Hacker Exploits – Part 4*

Once intruders have gained access into a system, they want to keep that access by preventing pesky system administrators and security personnel from detecting their presence. To defend against these attacks, you need to understand how attackers manipulate systems to discover the sometimes-subtle hints associated with system compromise. This course arms you with the understanding and tools you need to defend against attackers maintaining access and covering their tracks.

Topics: Maintaining Access; Covering the Courses; Five Methods for Implementing Kernel-Mode RootKits on Windows and Linux; the Rise of Combo Malware; Detecting Backdoors; Hidden File Detection; Log Editing; Covert Channels; Sample Scenarios

504.6 Hands On: Hacker Tools Workshop*

In this workshop you'll apply skills gained throughout the week in penetrating various target hosts while playing Capture the Flag. Your instructor will act as your personal hacking coach, providing hints as you progress through the game and challenging you to break into the laboratory computers to help underscore the lessons learned throughout the week. For your own attacker laptop, do not have any sensitive data stored on the system. SANS is not responsible for your system if someone in the class attacks it in the workshop. Bring the right equipment and prepare it in advance to maximize what you'll learn and the fun you'll have doing it.

Topics: Capture the Flag Contest; Hands-on Analysis; General Exploits; Other Attack Tools and Techniques

**This course is available to Security 504 participants only.*

SANS Senior Instructor

John Strand

John Strand is a senior instructor with the SANS Institute. He teaches SEC504: Hacker Techniques, Exploits, and Incident Handling; SEC560: Network Penetration Testing and Ethical Hacking; SEC580: Metasploit Kung Fu for Enterprise Pen Testing; and SEC464: Hacker Detection for System Administrators. John is the course author for SEC464 and the co-author for SEC580. When not teaching for SANS, John co-hosts PaulDotCom Security Weekly, the world's largest computer security podcast. He also is the owner of Black Hills Information Security, specializing in penetration testing and security architecture services. He has presented for the FBI, NASA, the NSA, and at DefCon. In his spare time he writes loud rock music and makes various futile attempts at fly-fishing.

NEW!

SECURITY 505

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCWN | Instructor: Jason Fossen

SEC505: Securing Windows and Resisting Malware

In April of 2014, Microsoft will stop releasing any new security patches for Windows XP. Like it or not, migrating off Windows XP is no longer optional, the clock is counting down. The Securing Windows and Resisting Malware course is fully updated for Windows Server 2012, Windows 8, Server 2008-R2, and Windows 7.

This course is about the most important things to do to secure Windows and how to minimize the impact on users of these changes. You'll see the instructor demo the important steps live, and, if you bring a laptop, you can follow along too. The manuals are filled with screenshots and step-by-step exercises, so you can do the steps alongside the instructor in seminar or later on your own time if you prefer.

We've all got anti-virus scanners, but what else needs to be done to combat malware and intruders using Advanced Persistent Threat (APT) techniques? Today's weapon of choice for hackers is stealthy malware with remote control channels, preferably with autonomous worm capabilities, installed through client-side exploits. While other courses focus on detection or remediation, the goal of this course is to prevent the infection in the first place (after all, first things first).

Especially in Server 2012 and beyond, PowerShell dominates Windows scripting and automation. It seems everything can be managed through PowerShell now. And if there's a needed skill that will most benefit the career of a Windows specialist, it's being able to write PowerShell scripts because most of your competition will lack scripting skills, so it's a great way to make your resume stand out. This course devotes an entire day to PowerShell scripting, but you don't need any prior scripting experience.

This course will also prepare you for the GIAC Certified Windows Security Administrator (GCWN) certification exam to help prove your security skills and Windows expertise.

Author Statement

I've happily been with SANS for over a decade, and the courses I write are always guided by two questions: 1) What do administrators need to know to secure their networks? and 2) What should administrators learn to advance their careers as IT professionals? I'm not a Microsoft employee or a Microsoft-basher, so you won't get either kind of propaganda here; my concern is with the health of your network and your career. As a security consultant I've seen it all (good, bad, and ugly), and my experience goes into the manuals I write for SANS and the stories I tell in seminars. The Securing Windows course is packed with interesting and useful advice that is hard or impossible to find on the Internet. We always have a good time, so I hope to meet you at the next training event!

-Jason Fossen

Who Should Attend

- Windows security engineers and system administrators
- Anyone who wants to learn PowerShell
- Anyone who wants to implement the SANS Critical Security Controls
- Those who must enforce security policies on Windows hosts
- Anyone who needs a whole drive encryption solution
- Those deploying or managing a PKI or smart cards
- IIS administrators and webmasters with servers at risk

"The course introduced a wide range of technologies and issues I was completely unaware of- great exposure to new ideas. Jason's depth of knowledge and examples are of great value."

-Jeff Ruff, AASKI Technologies

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505.1 Hands On: Windows Operating System and Applications Hardening

On day one, we will quickly get you on top of what you need to know about Active Directory security and delegation of authority. Importantly, this course is not an introduction to AD or an overview of basic administration topics. This is a course for people who already manage AD, need to plan a redeployment, or must lock down what they've got.

Topics: Securing Domain Controllers; Active Directory Access Control Lists; Delegation of Authority; Forest Designs; Secure Dynamic DNS

505.2 Hands On: Dynamic Access Control and Restricting Administrative Compromise

In this course, we'll see how to use Group Policy to lock down desktops and servers, implement many of the SANS 20 Critical Controls, enforce regulatory compliance changes, configure services and applications, and scale our work out to thousands of systems conveniently. If you've never seen Group Policy before, you're in for a shock (a good shock!) and if you've been using Group Policy for years, this course should expand your understanding even more since the emphasis is on security, not Group Policy in general.

Topics: Security Templates; What is Group Policy?; Fine-Tuning Group Policy; Updating Vulnerable Software; Pushing Out Scripts; Enforcing Critical Controls

505.3 Hands On: Windows PKI, BitLocker, and Secure Boot

Planning a PKI or data encryption project isn't easy, and mistakes and redeployments can be costly, so this day is designed in part to assist in the planning process to help avoid these mistakes. If you're not encrypting laptops and portable drives now, you will be soon, and BitLocker/EFS can save your organization money while making the deployment relatively easy. Using Group Policy, you can manage most features of BitLocker and EFS on all your machines without having to configure each of them by hand.

Topics: Why Must I Have A PKI?; How To Install The Windows PKI; How To Manage Your PKI; Deploying Smart Cards; Encrypting File System; BitLocker Drive Encryption

505.4 Hands On: Dangerous Protocols, IPSec, Windows Firewall, and Wireless

Day four is about how to use the Windows Firewall, IPSec, RADIUS, the RRAS VPN gateway service, and WPA2 for 802.11 wireless to secure the network layer in our Windows environments. Virtually all these client settings, including wireless settings, are manageable through Group Policy.

Topics: The New Windows Firewall; Why Use IPSec?; Creating IPSec Policies; RADIUS for Network Security; Virtual Private Networking; Securing Wireless Networks

505.5 Hands On: Securing IIS Web Servers

The demand for IIS security personnel is great because IIS is so widely deployed. This course focuses on IIS 7.5 in Windows Server 2008-R2, but many of the principles discussed will apply to earlier versions of IIS as well. If you're new to IIS, this course will get you up to speed.

Topics: Server Hardening; XML Configuration System; IIS Authentication and Authorization; Web-Based Applications; Logging and Auditing; FTP Over SSL (FTPS)

505.6 Hands On: Windows PowerShell Scripting

You don't have to bring a laptop to attend the course, but if you do, get the latest version of PowerShell from Microsoft (www.microsoft.com/powershell). A CD-ROM will be handed out by the instructor with sample scripts and other files with which to experiment. During the course, we will walk through all the essentials of PowerShell together. The course presumes nothing, you don't have to have any prior scripting experience to attend. And, most importantly, be prepared to have fun: PowerShell is just plain cooooooool.

Topics: What is PowerShell?; Cmdlets; Running Scripts; Namespace Providers; Piping Objects; Parameter Binding; Regular Expressions; Functions and Filters; The .NET Class Library; Using Properties and Methods at the Command Line; Accessing COM Objects: WMI, ADSI, ADO, etc.; Security and Execution Policy; And lots and lots of sample scripts to walk through...

SANS Faculty Fellow

Jason Fossen

Jason Fossen is a principal security consultant at Enclave Consulting LLC, a published author, and a frequent public speaker on Microsoft security issues. He is the sole author of the SANS' week-long Securing Windows course (SEC505), maintains the Windows day of Security Essentials (SEC401.5), and has been involved in numerous other SANS' projects since 1998. He graduated from the University of Virginia, received his master's degree from the University of Texas at Austin, and holds a number of professional certifications. He currently lives in Dallas, Texas. Jason blogs about Windows Security Issues on the SANS Windows Security Blog.

http://blogs.sans.org/windows-security

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCUX | Instructor: Hal Pomeranz

SEC506: Securing Linux/Unix

Experience in-depth coverage of Linux and Unix security issues. Examine how to mitigate or eliminate general problems that apply to all Unix-like operating systems, including vulnerabilities in the password authentication system, file system, virtual memory system, and applications that commonly run on Linux and Unix. This course provides specific configuration guidance and practical, real-world examples, tips, and tricks.

Throughout this course you will become skilled at utilizing freely available tools to handle security issues, including SSH, AIDE, sudo, lsof, and many others. SANS' practical approach with hands-on exercises every day ensures that you can start using these tools as soon as you return to work. We will also put these tools to work in a special section that covers simple forensic techniques for investigating compromised systems.

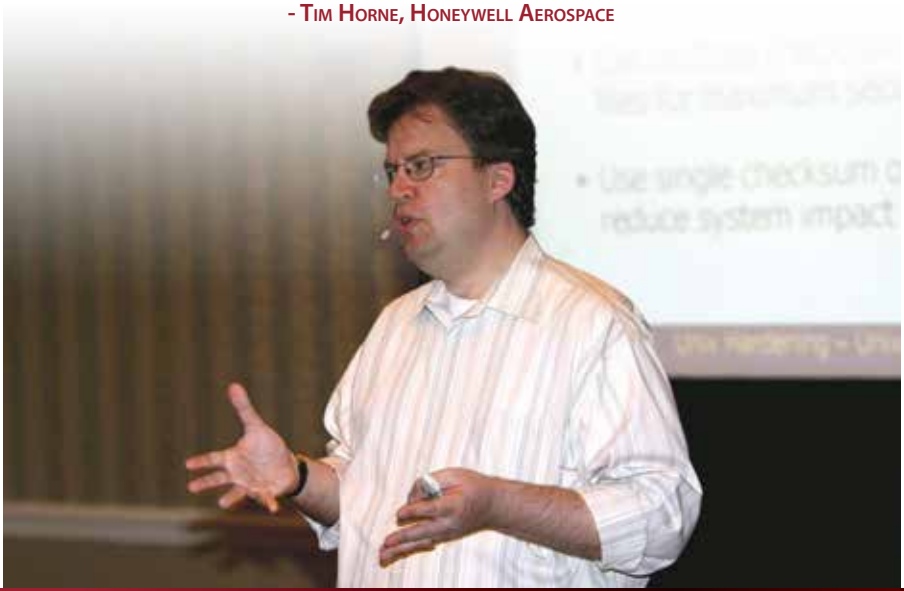
Author Statement

A wise man once said, "How are you going to learn anything if you know everything already?" And yet there seems to be a quiet arrogance in the Unix community that we've figured out all of our security problems, as if to say, "Been there, done that." All I can say is that's what keeps me going in the Unix field, and the security industry in particular, is that there is always something new to learn, discover, or invent. In fifteen plus years on the job, what I've learned is how much more there is that I can learn. I think this is also true for the students in my courses. I regularly get comments back from students that say things like, "I've been using Unix for 20 years, and I still learned a lot in this class." That's really rewarding.

-Hal Pomeranz

"It sparked my interest to get a deeper understanding of how to secure my systems at work and at home. Hal's experience as a forensics examiner is of great interest and a definite plus. Great experience."

- Tim Horne, Honeywell Aerospace



Who Should Attend

- Security professionals looking to learn the basics of securing Unix operating systems
- Experienced administrators looking for in-depth descriptions of attacks on Unix systems and how they can be prevented
- Administrators needing information on how to secure common Internet applications on the Unix platform
- Auditors, incident responders, and InfoSec analysts who need greater visibility into Linux and Unix security tools, procedures, and best practices

A Sampling of Topics:

- Memory Attacks, Buffer Overflows
- File System Attacks, Race Conditions
- Trojan Horse Programs and Rootkits
- Monitoring and Alerting Tools
- Unix Logging and Kernel-Level Auditing
- Building a centralized logging infrastructure
- Network Security Tools
- SSH for Secure Administration
- Server "lockdown" for Linux and Unix
- Controlling root access with sudo
- SELinux and chroot() for application security
- DNSSEC deployment and automation
- mod_security and Web Application Firewalls
- Secure Configuration of BIND, Sendmail, Apache
- Forensic Investigation

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506.1 Hands On: Hardening Linux/Unix Systems – Part 1

This course tackles some of the most important techniques for protecting your Linux/Unix systems from external attacks. But it also covers what those attacks are so that you know what you're defending against. This is a full-disclosure course with in-class demos of actual exploits and hands-on exercises to experiment with various examples of malicious software, as well as different techniques for protecting Linux/Unix systems.

Topics: Memory Attacks and Overflows; Vulnerability Minimization; Boot-Time Configuration; Encrypted Access; Host-Based Firewalls

506.2 Hands On: Hardening Linux/Unix Systems – Part 2

Continuing our exploration of Linux/Unix security issues, this course focuses in on local exploits and access control issues. What do attackers do once they gain access to your systems? How can you detect their presence? How do you protect against attackers with physical access to your systems? What can you do to protect against mistakes (or malicious activity) by your own users?

Topics: Rootkits and Malicious Software; File Integrity Assessment; Physical Attacks and Defenses; User Access Controls; Root Access Control With Sudo; Warning Banners; Kernel Tuning For Security

506.3 Hands On: Hardening Linux/Unix Systems – Part 3

Monitoring your systems is critical for maintaining a secure environment. This course digs into the different logging and monitoring tools available in Linux/Unix, and looks at additional tools for creating a centralized monitoring infrastructure such as Syslog-NG. Along the way, the course introduces a number of useful SSH tips and tricks for automating tasks and tunneling different network protocols in a secure fashion.

Topics: Automating Tasks With SSH; AIDE Via SSH; Linux/Unix Logging Overview; SSH Tunneling; Centralized Logging With Syslog-NG

506.4 Hands On: Application Security – Part 1

This course examines common application security tools and techniques. The SCP-Only Shell will be presented as an example of using an application under chroot() restriction, and as a more secure alternative to file sharing protocols like anonymous FTP. The SELinux application whitelisting mechanism will be examined in depth. Tips for trouble-shooting common SELinux problems will be covered and students will learn how to craft new SELinux policies from scratch for new and locally developed applications. Significant hands-on time will be provided for students to practice these concepts.

Topics: chroot() for Application Security; The SCP-Only Shell; SELinux Basics; SELinux and the Reference Policy; Application Security Challenge Exercise

506.5 Hands On: Application Security – Part 2

This course is a full day of in-depth analysis on how to manage some of the most popular application level services securely on a Linux/Unix platform. We will tackle the practical issues involved with securing the three of the most commonly used Internet servers on Linux and Unix: BIND, Sendmail, and Apache. Beyond basic security configuration information, we will take an in-depth look at topics like DNSSec and Web Application Firewalls with mod_security and the Core Rules.

Topics: BIND; DNSSec; Sendmail; Apache; Web Application Firewalls with mod_security

506.6 Hands On: Digital Forensics for Linux/Unix

This hands-on course is designed to be an information-rich introduction devoted to basic forensic principals and techniques for investigating compromised Linux and Unix systems. At a high level, it introduces the critical forensic concepts and tools that every administrator should know and provides a real-world compromise for students to investigate using the tools and strategies discussed in class.

Topics: Tools Throughout; Forensic Preparation and Best Practices; Incident Response and Evidence Acquisition; Media Analysis; Incident Reporting

SANS Faculty Fellow

Hal Pomeranz

Hal Pomeranz is the founder and technical lead for Deer Run Associates, a consulting company focusing on Digital Forensics and Information Security. He is a SANS Faculty Fellow and the creator of the SANS/GIAC Securing Linux/Unix course (GCUX) as well as being an instructor in the SANS Forensics curriculum. An expert in the analysis of Linux and Unix systems, Hal provides forensic analysis services through his own consulting firm and by special arrangement with MANDIANT. He has consulted on several major cases for both law enforcement and commercial clients. Hal is a regular contributor to the SANS Computer Forensics blog, and co-author of the weekly Command-Line Kung Fu blog.

http://blog.command-linekungfu.com

SEC542: Web App Penetration Testing and Ethical Hacking

Assess Your Web Apps in Depth

Web applications are a major point of vulnerability in organizations today. Web app holes have resulted in the theft of millions of credit cards, major financial and reputational damage for hundreds of enterprises, and even the compromise of thousands of browsing machines that visited Web sites altered by attackers. In this intermediate to advanced level class, you'll learn the art of exploiting Web applications so you can find flaws in your enterprise's web apps before the bad guys do. Through detailed, hands-on exercises and training from a seasoned professional, you will be taught the four-step process for Web application penetration testing. You will inject SQL into back-end databases, learning how attackers exfiltrate sensitive data. You will utilize cross-site scripting attacks to dominate a target infrastructure in our unique hands-on laboratory environment. And you will explore various other web app vulnerabilities in depth with tried-and-true techniques for finding them using a structured testing regimen. You will learn the tools and methods of the attacker, so that you can be a powerful defender.

On day one, we will study the attacker's view of the web as well as learn an attack methodology and how the pen-tester uses JavaScript within the test. On day two, we will study the art of reconnaissance, specifically targeted to web applications. We will also examine the mapping phase as we interact with a real application to determine its internal structure. During day three we will continue our test by starting the discovery phase using the information we gathered on day two. We will focus on application/server-side discovery. On day four we will continue discovery, focusing on client-side portions of the application, such as Flash objects and Java applets. On day five, we will move into the final stage of exploitation. Students will use advanced exploitation methods to gain further access within the application. Day six will be a Capture the Flag event where the students will be able to use the methodology and techniques explored during class to find and exploit the vulnerabilities within an intranet site.

Throughout the class, you will learn the context behind the attacks so that you intuitively understand the real-life applications of our exploitation. In the end, you will be able to assess your own organization's web applications to find some of the most common and damaging Web application vulnerabilities today.

By knowing your enemy, you can defeat your enemy. General security practitioners, as well as website designers, architects, and developers, will benefit from learning the practical art of web application penetration testing in this class.

Who Should Attend

- General security practitioners
- Penetration testers
- Ethical hackers
- Web application vulnerability
- Website designers and architects
- Developers

Author Statement

Testing the security of web applications is not as simple as just knowing what SQL injection and cross-site scripting mean. Successful testers understand that methodical, thorough testing is the best means of finding the vulnerabilities within the applications. This requires a deep understanding of how Web applications work and what attack vectors are available. This course provides that understanding by examining the various parts of a Web application penetration. When teaching the class, I especially enjoy the use of real-world exercises and the in-depth exploration of Web penetration testing.

-Kevin Johnson

"The opportunity to deeply explore specific techniques with the guidance of Kevin's expertise promises to pay back handsomely."

-Mark Geeslin, Citrix

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast. *More info on page 65.*

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542.1 Hands On: The Attacker's View of the Web*

We begin by examining web technology – protocols, languages, clients, and server architectures – from the attacker's perspective. Then we cover the four steps of web application pen tests: reconnaissance, mapping, discovery, and exploitation.

Topics: Overview of the Web from a Penetration Tester's Perspective; Exploring the Various Servers and Clients; Discussion of the Various Web Architectures; Discover How Session State Works; Discussion of the Different Types of Vulnerabilities; Define a Web Application Test Scope and Process; Define Types of Penetration Testing

542.2 Hands On: Reconnaissance and Mapping*

Reconnaissance includes gathering publicly-available information regarding the target application and organization, identifying machines that support our target application, and building a profile of each server. Then we will build a map of the application by identifying the components, analyzing the relationship between them, and determining how they work together.

Topics: Discover the Infrastructure Within the Application; Identify the Machines and Operating Systems; SSL Configurations and Weaknesses; Explore Virtual Hosting and its Impact on Testing; Learn Methods to Identify Load Balancers; Software Configuration Discovery; Explore External Information Sources; Google Hacking; Learn Tools to Spider a Website; Scripting to Automate Web Requests and Spidering; Application Flow Charting; Relationship Analysis Within an Application; JavaScript for the Attacker

542.3 Hands On: Server-Side Discovery*

We will continue with the discovery phase, exploring both manual and automated methods of discovering vulnerabilities within the applications as well as exploring the interactions between the various vulnerabilities and the different user interfaces that web apps expose to clients.

Topics: Learn Methods to Discover Various Vulnerabilities; Explore Differences Between Different Data Back-ends; Explore Fuzzing and Various Fuzzing Tools; Discuss the Different Interfaces Websites Contain; Understand Methods for Attacking Web Services

542.4 Hands On: Client-Side Discovery*

Learning how to discover vulnerabilities within client-side code, such as Java applets and Flash objects, includes use of tools to decompile the objects and applets. We will have a detailed discussion of how AJAX and web service technology enlarges the attack surface that pen testers leverage.

Topics: Learn Methods to Discover Various Vulnerabilities; Learn Methods to Decompile Client-side Code; Explore Malicious Applets and Objects; Discovery Vulnerabilities in Web Application Through Their Client Components; Understand Methods for Attacking Web Services; Understand Methods for Testing Web 2.0 and AJAX-based Sites; Learn How AJAX and Web Services Change Penetration Tests; Learn the Attacker's Perspective on Python and PHP

542.5 Hands On: Exploitation*

Launching exploits against real-world applications includes exploring how they can help in the testing process, gaining access to browser history, port scanning internal networks, and searching for other vulnerable web applications through zombie browsers.

Topics: Explore Methods to Zombify Browsers; Discuss Using Zombies to Port Scan or Attack Internal Networks; Explore Attack Frameworks; Walk Through an Entire Attack Scenario; Exploit the Various Vulnerabilities Discovered; Leverage the Attacks to Gain Access to the System; Learn How to Pivot our Attacks Through a Web Application; Understand Methods of Interacting with a Server Through SQL Injection; Exploit Applications to Steal Cookies; Execute Commands Through Web Application Vulnerabilities

542.6 Hands On: Capture the Flag*

The goal of this event is for students to use the techniques, tools, and methodology learned in class against a realistic intranet application. Students will be able to use a virtual machine with the SamuraiWTF web pen testing environment in class and can apply that experience in their workplace.

Topics: Capture the Flag

**This course is available to Security 542 participants only.*

SANS Senior Instructor

Kevin Johnson

Kevin Johnson is a security consultant and founder of Secure Ideas. Kevin came to security from a development and system administration background. He has many years of experience performing security services for fortune 100 companies, and in his spare time he contributes to a large number of open-source security projects. He is the founder of many different projects and has worked on others. He founded BASE, which is a web front-end for Snort analysis. He also founded and continues to lead the SamuraiWTF live DVD. This is a live environment focused on web penetration testing. He also founded Yokoso! and Laudanum, which are focused on exploit delivery. Kevin is a senior instructor for SANS and the author of Security 542: Web Application Penetration Testing and Ethical Hacking. He also presents at industry events, including DEFCON and ShmooCon, and for various organizations, like Infragard, ISACA, ISSA, and the University of Florida.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GPEN | Instructor: Ed Skoudis

SEC560: Network Penetration Testing and Ethical Hacking

As cyber attacks increase, so does the demand for information security professionals who possess true network penetration testing and ethical hacking skills. There are several ethical hacking courses that claim to teach these skills, but few actually do. SANS SEC560: Network Penetration Testing and Ethical Hacking truly prepares you to conduct successful penetration testing and ethical hacking projects. The course starts with proper planning, scoping and recon, and then dives deep into scanning, target exploitation, password attacks, and wireless and web apps with detailed hands-on exercises and practical tips for doing the job safely and effectively. You will finish up with an intensive, hands-on Capture the Flag exercise in which you'll conduct a penetration test against a sample target organization, demonstrating the knowledge you mastered in this course.

Equipping Security Organizations with Advanced Penetration Testing and Ethical Hacking Know-How

Security vulnerabilities, such as weak configurations, unpatched systems, and botched architectures, continue to plague organizations. Enterprises need people who can find these flaws in a professional manner to help eradicate them from our infrastructures. Lots of people claim to have penetration testing, ethical hacking, and security assessment skills, but precious few can apply these skills in a methodical regimen of professional testing to help make an organization more secure. This class covers the ingredients for successful network penetration testing to help attendees improve their enterprise's security stance.

We address detailed pre-test planning, including setting up an effective penetration testing infrastructure and establishing ground rules with the target organization to avoid surprises and misunderstanding. Then, we discuss a time-tested methodology for penetration and ethical hacking across the network, evaluating the security of network services and the operating systems behind them.

Attendees will learn how to perform detailed reconnaissance, learning about a target's infrastructure by mining blogs, search engines, and social networking sites. We'll then turn our attention to scanning, experimenting with numerous tools in hands-on exercises. Our exploitation phase will include the use of exploitation frameworks, stand-alone exploits, and other valuable tactics, all with hands-on exercises in our lab environment. The class also discusses how to prepare a final report, tailored to maximize the value of the test from both a management and technical perspective. The final portion of the class includes a comprehensive hands-on exercise, conducting a penetration test against a hypothetical target organization, following all of the steps.

The course also describes the limitations of penetration testing techniques and other practices that can be used to augment penetration testing to find vulnerabilities in architecture, policies, and processes. We also address how penetration testing should be integrated as a piece of a comprehensive enterprise information security program.

Who Should Attend

- Penetration testers
- Ethical hackers
- Auditors who need to build deeper technical skills
- Security personnel whose job involves assessing target networks and systems to find security vulnerabilities

Author Statement

Successful penetration testers don't just throw a bunch of hacks against an organization and regurgitate the output of their tools. Instead, they need to understand how these tools work indepth, and conduct their test in a careful, professional manner. This course explains the inner workings of numerous tools and their use in effective network penetration testing and ethical hacking projects. When teaching the class, I particularly enjoy the numerous hands-on exercises culminating with a final pen-testing extravaganza lab.

-Ed Skoudis

"The best course in penetration testing in the industry. Ed's teaching and delivery allow him to shine and stand out from the rest of the crowd."

-Rudy Villalona, HP Enterprise Serivces

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast. ***More info on page 65.***

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560.1 Hands On: Planning, Scoping, and Recon*

This course provides extensive details of penetration testing preparation and methodology, which are immensely useful in meeting the Payment Card Industry (PCI) Data Security Standard (DSS) Requirement 11.3 on penetration testing. We cover building a penetration testing and ethical hacking infrastructure that includes the appropriate hardware, software, network infrastructure, and test tools arsenal, with specific low-cost recommendations. This portion of the course also describes how to plan the specifics of a test, carefully scoping the project and defining the rules of engagement.

Topics: The Mindset of the Professional Pen Tester; Legal Issues; Reporting; Types of Penetration Tests and Ethical Hacking Projects; Detailed Recon; Mining Search Engine Results with Aura/Wikto/EvilAPI

560.2 Hands On: Scanning*

This component of the course focuses on the vital task of scanning a target environment, creating a comprehensive inventory of machines, and then evaluating those systems to find potential vulnerabilities. We'll look at some of the most useful scanning tools freely available today, experimenting with them in our hands-on lab. Because vulnerability-scanning tools inevitably give us false positives, we'll also look at techniques for false-positive reduction with hands-on exercises.

Topics: Overall Scanning Tips; tcpdump for the Pen Tester; Protocol Anomalies; The Nmap Scripting Engine; Version Scanning with Nmap and Amap; False Positive Reduction

560.3 Hands On: Exploitation and Post Exploitation*

In this section we look at the many kinds of exploits that a penetration tester or ethical hacker can use to compromise a target machine. We'll analyze in detail the differences between server-side, client-side, and local privilege escalation exploits, exploring some of the most useful recent exploits in each category. We'll see how these exploits are packaged in frameworks like Metasploit and its mighty Meterpreter. We'll also look at post-exploit analysis of machines and pivoting to find new targets.

Topics: Comprehensive Metasploit Framework Coverage with Exploits/Stagers/Stages; Bypassing the Shell vs. Terminal Dilemma; Installing VNC/RDP/SSH with Only Shell Access; Running Windows Commands Remotely with sc and wmic; Building Port Scanners and Password Guessers at the Command Line

560.4 Hands On: Network Penetration Testing: Password Attacks*

Learning how to discover vulnerabilities within client-side code, such as Java applets and Flash objects, includes use of tools to decompile the objects and applets. We will have a detailed discussion of how AJAX and web service technology enlarges the attack surface that pen testers leverage.

Topics: Learn Methods to Discover Various Vulnerabilities; Learn Methods to Decompile Client-side Code; Explore Malicious Applets and Objects; Discovery Vulnerabilities in Web Application Through Their Client Components; Understand Methods for Attacking Web Services; Understand Methods for Testing Web 2.0 and AJAX-based Sites; Learn How AJAX and Web Services Change Penetration Tests; Learn the Attacker's Perspective on Python and PHP

560.5 Hands On: Wireless and Web Apps*

This section describes methodologies for finding common wireless weaknesses, including misconfigured access points, application of weak security protocols, and the improper configuration of stronger security technologies. The second half focuses on web application pen testing and looking for the flaws that impact commercial and homegrown web apps. Attendees will work hands on with tools that can find cross-site scripting (XSS), cross-site request forgery (XSRF), command injection, and SQL injection flaws, experimenting with each in several exercises.

Topics: Wireless Attacks; Discovering Access Points (Wire-Side and Wireless-Side); Wireless Crypto Flaws; Client-Side Wireless Attacks; Cross-Site Scripting; Cross-Site Request Forgery; SQL Injection; Leveraging SQL Injection to Perform Command Injection

560.6 Hands On: Penetration Testing Workshop and Capture the Flag Event*

This lively session represents the culmination of the network penetration testing and ethical hacking course, where attendees apply the skills mastered in the other sessions in a hands-on workshop. The rest of the course covers the overall process for successful testing with a series of hands-on exercises individually illustrating each point. But in this final workshop, all of the exercises converge in an overall network penetration-testing workout, where attendees will function as part of a pen test team.

Topics: Applying Penetration Testing and Ethical Hacking Practices End-to-end; Scanning; Exploitation; Pivoting; Analyzing Results

**This course is available to Security 560 participants only.*

SANS Faculty Fellow

Ed Skoudis

Ed Skoudis is a founder and senior security consultant with InGuardians. He is also the founder of Counter Hack Challenges, an innovative organization that designs, builds, and operates popular infosec challenges and simulations including NetWars, Cyber Quests, and Cyber Foundations. Ed's expertise includes hacker attacks and defenses, the information security industry, and computer privacy issues, with over fifteen years of experience in information security. Ed authored and regularly teaches the SANS courses on network penetration testing (SEC560) and incident response (SEC504), helping over three thousand information security professionals each year improve their skills and abilities to defend their networks. He has performed numerous security assessments; conducted exhaustive anti-virus, anti-spyware, Virtual Machine, and IPS research; and responded to computer attacks for clients in financial, high technology, healthcare, and other industries. Ed conducted a demonstration of hacker techniques against financial institutions for the United States Senate and is a frequent speaker on issues associated with hacker tools and defenses. He has published numerous articles on these topics as well as the Prentice Hall best sellers *Counter Hack Reloaded* and *Malware: Fighting Malicious Code*. Ed was also awarded 2004-2009 Microsoft MVP awards for Windows Server Security and is an alumnus of the Honeynet Project. Previous to InGuardians, Ed served as a security consultant with International Network Services (INS), Global Integrity, Predictive Systems, SAIC, and Bell Communications Research (Bellcore). Ed also blogs about command line tips. http://blog.commandlinekungfu.com

SEC566: Implementing and Auditing the Twenty Critical Security Controls – In-Depth

In the last couple of years it has become obvious that in the world of information security, the offense is outperforming the defense. Even though budgets increase and management pays more attention to the risks of data loss and system penetration, data is still being lost and systems are still being penetrated. Over and over people are asking, "What can we practically do to protect our information?" The answer has come in the form of 20 information assurance controls known as the Consensus Audit Guidelines (CAG). **www.sans.org/critical-security-controls/guidelines.php**

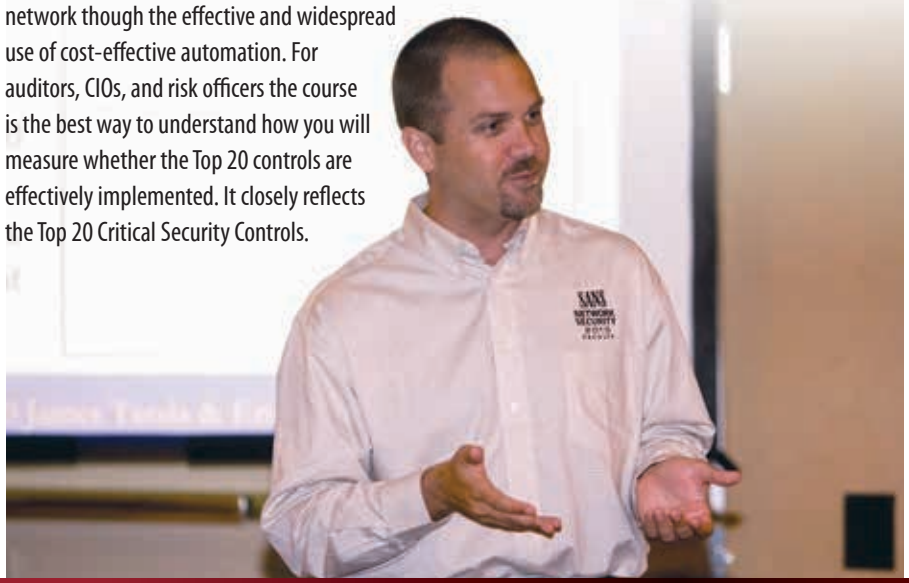
This course has been written to help those implementing or deploying a strategy for information assurance in their agency or organization by enabling them to better understand these guidelines. Specifically the course has been designed in the spirit of the offense teaching the defense to help security practitioners understand not only what to do to stop a threat, but why the threat exists and how later to audit to ensure that the organization is indeed in compliance with their standards.

And in SANS style, this course will not only provide a framework for better understanding, but will give you a hands-on approach to learning these objectives to ensure that what you learn today, you'll be able to put into practice in your organization tomorrow.

This course helps you master specific, proven techniques and tools needed to implement and audit the Top Twenty Most Critical Security Controls. These Top 20 Security Controls, listed below, are rapidly becoming accepted as the highest priority list of what must be done and proven before anything else at nearly all security conscious organizations.

The US military and other government and private organizations, including the National Security Agency (NSA), Department of Homeland Security (DHS), the U.S. Government Accountability Office (GAO) defined these top 20 controls as their consensus for the best way to block the known attacks and help find and mitigate damage from the attacks that get through.

For security professionals, the course enables you to see how to put the controls in place in your existing network though the effective and widespread use of cost-effective automation. For auditors, CIOs, and risk officers the course is the best way to understand how you will measure whether the Top 20 controls are effectively implemented. It closely reflects the Top 20 Critical Security Controls.



Who Should Attend

- Penetration testers
- Ethical hackers
- Auditors who need to build deeper technical skills
- Security personnel whose job involves assessing target networks and systems to find security vulnerabilities

Author Statement

As we've had the opportunity to talk with information assurance engineers, auditors, and managers over the past ten years, we've seen frustration in the eyes of these hardworking individuals who are trying to make a difference in their organizations by better defending their data systems. It has even come to the point where some organizations have decided that it's simply too hard to protect their information, and many have started to wonder, is the fight really worth it? Will we ever succeed? We see companies and agencies making headway, but the offense keeps pushing. The goal of this course is to give direction and a realistic hope to organizations attempting to secure their systems.

The 20 Critical Security Controls: Planning, Implementing, and Auditing offers direction and guidance from those in the industry who think through the eyes of the attacker as to what security controls will make the most impact. What better way to play defense than by understanding the mindset of the offense? By implementing our defense methodically and with the mindset of a hacker, we think organizations have a chance to succeed in this fight. We hope this course helps turn the tide.

- Eric Cole, Ph.D. and James Tarala

"Real-world approach to auditing, a rare thing to find in our current environment."

-Richard Goldberg, Aera Energy, LLC

566.1 Hands On: Introduction and Overview of the 20 Critical Controls*

Day 1 will cover an introduction and overview of the 20 critical controls, laying the foundation for the rest of the class. For each control the following information will be covered and we will follow the same outline for each control:

- Overview of the Control
- How it is Compromised
- Defensive Goals
- Quick Wins
- Visibility & Attribution
- Configuration & Hygiene
- Advanced
- Overview of Evaluating the Control
- Core Evaluation Test(s)
- Testing/Reporting Metrics
- Steps for Root Cause Analysis of Failures
- Audit/Evaluation Methodologies
- Evaluation Tools
- Exercise to Illustrate Implementation or Steps for Auditing a Control

In addition, Critical Controls 1 and 2 will be covered in depth.

Topics: Critical Control 1 - Inventory of Authorized and Unauthorized Devices
Critical Control 2 - Inventory of Authorized and Unauthorized Software

566.2 Hands On: Critical Controls 3,4,5, and 6*

Day 2 will cover Critical Controls 3, 4, 5, and 6.

Topics: Critical Control 3: Secure Configurations for Hardware and Software on Laptops, Workstations, and Servers
Critical Control 4: Continuous Vulnerability Assessment and Remediation
Critical Control 5: Malware Defenses
Critical Control 6: Application Software Security

566.3 Hands On: Critical Controls 7, 8, 9, 10, and 11*

Day 3 will cover Critical Controls 7, 8, 9, 10, and 11.

Topics: Critical Control 7: Wireless Device Control
Critical Control 8: Data Recovery Capability (validated manually)
Critical Control 9: Security Skills Assessment and Appropriate Training to Fill Gaps (validated manually)
Critical Control 10: Secure Configurations for Network Devices such as Firewalls, Routers, and Switches
Critical Control 11: Limitation and Control of Network Ports, Protocols, and Services

566.4 Hands On: Critical Controls 12, 13, 14, and 15*

Day 4 will cover Critical Controls 12, 13, 14, and 15.

Topics: Critical Control 12: Controlled Use of Administrative Privileges
Critical Control 13: Boundary Defense
Critical Control 14: Maintenance, Monitoring, and Analysis of Audit Logs
Critical Control 15: Controlled Access Based On Need to Know

566.5 Hands On: Critical Controls 16, 17, 18, 19, and 20*

Day 5 will cover Critical Controls 16, 17, 18, 19, and 20.

Topics: Critical Control 16: Account Monitoring and Control
Critical Control 17: Data Loss Prevention
Critical Control 18: Incident Response Capability (validated manually)
Critical Control 19: Secure Network Engineering (validated manually)
Critical Control 20: Penetration Tests and Red Team Exercises (validated manually)

**This course is available to Security 566 participants only.*

SANS Senior Instructor

James Tarala

James Tarala is a principal consultant with Enclave Security and is based out of Venice, Florida. He is a regular speaker and senior instructor with the SANS Institute as well as a courseware author and editor for many SANS auditing and security courses. As a consultant, he has spent the past few years architecting large enterprise IT security and infrastructure architectures, specifically working with many Microsoft-based directory services, e-mail, terminal services, and wireless technologies. He has also spent a large amount of time consulting with organizations to assist them in their security management, operational practices, and regulatory compliance issues, and he often times performs independent security audits and assists internal audit groups to develop their internal audit programs. James completed his undergraduate studies at Philadelphia Biblical University and his graduate work at the University of Maryland. He holds numerous professional certifications.

NEW!

SECURITY 575

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | Instructor: Joshua Wright

SEC575: Mobile Device Security and Ethical Hacking

Mobile phones and tablets have become essential to enterprise and government networks, from small organizations to Fortune 500 companies and large-scale agencies. Often, mobile phone deployments grow organically, adopted by multitudes of end-users for convenient email access as well as managers and executives who need access to sensitive organizational resources from their favored personal mobile devices. In other cases, mobile phones and tablets have become critical systems for a wide variety of production applications from ERP to project management. With increased reliance on these devices, organizations are quickly recognizing that mobile phones and tablets need greater security implementations than a simple screen protector and clever password.

The security risks of mobile phone and tablet device use in the workplace

Whether the device is an Apple iPhone or iPad, a Windows Phone, an Android or BlackBerry phone or tablet, the ubiquitous mobile device has become a hugely attractive and vulnerable target for nefarious attackers. The use of mobile devices introduces a vast array of new risks to organizations, including:

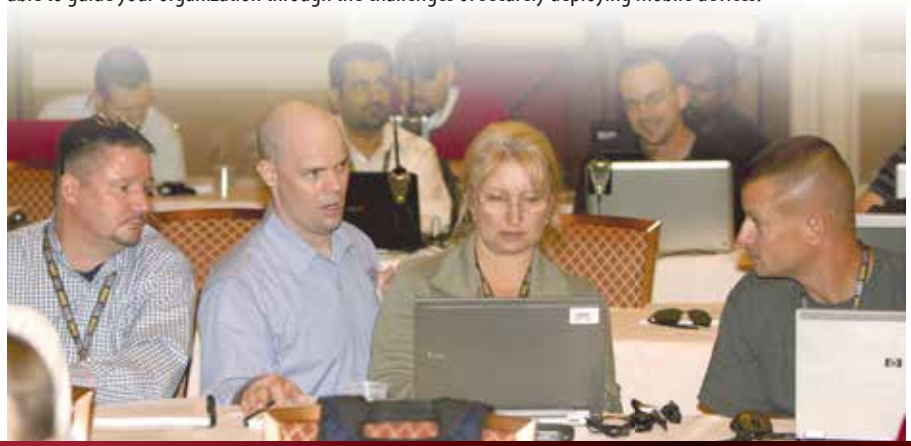
- **distributed sensitive data storage and access mechanisms**
- **lack of consistent patch management and firmware updates**
- **the high probability of device loss or theft, and more.**

Mobile code and apps are also introducing new avenues for malware and data leakage, exposing critical enterprise secrets, intellectual property, and personally identifiable information assets to attackers. To further complicate matters, today there simply are not enough people with the security skills needed to manage mobile phone and tablet deployments.

From mobile device security policy development, to design and deployment, and more

This course was designed to help organizations struggling with mobile device security by equipping personnel with the skills needed to design, deploy, operate, and assess a well-managed secure mobile environment. From practical policy development to network architecture design and deployment, and mobile code analysis to penetration testing and ethical hacking, this course will help you build the critical skills necessary to support the secure deployment and use of mobile phones and tablets in your organization.

You will gain hands-on experience in designing a secure mobile phone network for local and remote users and learn how to make critical decisions to support devices effectively and securely. You will also be able to analyze and evaluate mobile software threats, and learn how attackers exploit mobile phone weaknesses so you can test the security of your own deployment. With these skills, you will be a valued mobile device security analyst, fully able to guide your organization through the challenges of securely deploying mobile devices.



Who Should Attend

- Security personnel whose job involves assessing, deploying, or securing mobile phones and tablets
- Network and system administrators supporting mobile phones and tablets
- Penetration testers
- Ethical hackers
- Auditors who need to build deeper technical skills

Author Statement

I'm not sure exactly when it started, but laptops and PCs are quickly becoming legacy computing devices, replaced with mobile phones and tablets at an ever increasing rate. Just when I thought we were getting a much better handle on the security of Windows, Mac, and other Unix systems, there is an explosion of new devices joining our networks. Mobile device adoption has been so rapid that we're suddenly back in the wild west. Many organizations just don't have the policies, procedures, technical infrastructure, and skilled personnel needed to deal with these new technologies and devices. The devices themselves simply do not have the same security controls that we rely on in modern, secure enterprise and government networks. Even with their weaknesses, mobile phones are here to stay, and we are being called on to support them. Some organizations try to drag their feet on allowing mobile phones, but that ultimately contributes to the problem. If we don't address security, the threats continue to grow uncontrolled and unmonitored. Mobile tablets only exacerbate the problem. To address these concerns, this course will give you the blueprint, technical frameworks, and hard-core analysis skills needed to address these challenges head-on so that your organization's personnel can use their mobile devices more securely. Using the skills shared in this course, you'll have the knowledge to securely deploy, manage, and monitor mobile phones and tablets inside your organization through effective policy and careful network deployment and monitoring. You'll also build essential skills in analyzing the risks of data leakage in mobile code and the applications your end-users want to run from app stores, and we'll show you how to ethically hack your networks to identify the real threat and exposure of mobile phone weaknesses. I created this course to help people build their skills in all these areas, focusing on the topics and concepts that are most important and immediately useful. Every organization needs security professionals with the skills required to secure mobile phone and tablet environments. By taking this course, you'll become an even more valued part of your organization, you'll be prepared to lead your organization's efforts to securely embrace the new world of mobile devices... and we'll have lots of geeky fun in the process. -Joshua Wright

575.1 Hands On: Mobile Device Threats, Policies, and Security Models*

The first part of the course looks at the significant threats affecting mobile phone deployment and how organizations are being attacked through these systems. As a critical component of a secure deployment, we guide you through the process of defining mobile phone and tablet policies with sample policy language and recommendations for various vertical industries, taking into consideration the legal obligations of enterprise organizations. We'll also look at the architecture and technology behind mobile device infrastructure systems for Apple, Android, BlackBerry, and Windows devices, as well as the platform-specific security controls available including device encryption, remote data wipe, application sandboxing, and more.

Topics: Mobile Phone and Tablet Problems and Opportunities; Mobile Devices and Infrastructure; Mobile Phone and Tablet Security Models; Legal Aspects of Mobile; Mobile Device Policy Considerations and Development

575.2 Hands On: Mobile Device Architecture Security & Management*

With an understanding of the threats, architectural components, and desired security methods, we can design and implement mobile device and infrastructure systems to defend against threats. In this part of the course, we examine the design and deployment of network and system infrastructure to support a mobile phone deployment including the selection and deployment of that meet the organization's requirements for administration and security.

Topics: Wireless Network Infrastructure; Remote Access Systems; Certificate Deployment Systems; Mobile Device Management (MDM) System Architecture; Mobile Device Management (MDM) Selection

575.3 Hands On: Mobile Code and Application Analysis*

With the solid analysis skills taught in this section of the course, we can evaluate apps to determine the type of access and information disclosure threats that they represent. Security professionals can use these skills not only to determine which outside applications the organization should allow, but also to evaluate the security of any apps developed by the organization itself for its employees or customers. In this process, we'll use jailbreaking and other techniques to evaluate the data stored on mobile phones.

Topics: Unlocking, Rooting, and Jailbreaking Mobile Devices; Mobile Phone Data Storage and Filesystem Architecture; Filesystem Application Modeling; Network Activity Monitoring; Mobile Code and Application Analysis; Approving or Disapproving Applications in Your Organization

575.4 Hands On: Ethical Hacking Mobile Networks*

Through ethical hacking and penetration testing, we examine the mobile devices and infrastructure from the perspective of an attacker, identifying and exploiting flaws that could allow unauthorized access to data or supporting networks. By identifying and understanding the implications of these flaws, we can evaluate the mobile phone deployment risk to the organization with practical, useful risk metrics.

Topics: Fingerprinting Mobile Devices; WiFi Attacks; Bluetooth Attacks; Network Exploits

SANS Senior Instructor

Joshua Wright

Joshua Wright is an independent information security analyst and senior instructor with the SANS Institute. A widely recognized expert in the wireless security field, Josh has worked with private and government organizations to evaluate the threat surrounding wireless technology and evolving threats. As an open-source enthusiast, Josh has developed a variety of tools that can be leveraged for penetration testing and security analysis. Josh publishes his tools, papers, and techniques for effective security analysis on his website at www.willhackforsushi.com.

575.5 Hands On: Ethical Hacking Mobile Phones, Tablets, and Applications*

Continuing our look at ethical hacking and penetration testing, we turn our focus to exploiting weaknesses on individual mobile devices including iPhones, iPads, Android phones, Windows Phones and BlackBerry phones and tablets. We'll also examine platform-specific application weaknesses and look at the growing use of web framework attacks.

Topics: Mobile Device Exploits; Web Framework Attacks; Application Attacks; Cloud/Remote Data Accessibility Attacks

575.6 Hands On: Secure Mobile Phone Capture the Flag*

On the last day of class, we apply the skills, concepts, and technology covered in the course for a comprehensive Capture the Flag (CtF) event. In this day-long, in-depth final hands-on CtF exercise, you will:

- Have the option to participate in multiple organizational roles related to mobile device security,
- Design a secure infrastructure for the deployment of mobile phones,
- Monitor network activity to identify attacks against mobile devices,
- Extract sensitive data from a compromised iPad, and
- Attack a variety of mobile phones and related network infrastructure components.

In the CtF exercise, you will use the skills built throughout the course to evaluate real-world systems and defend against attackers, simulating the realistic environment you'll face when you get back to the office. You will leave the course armed with the knowledge and skills you'll need to securely integrate and deploy mobile devices in your organization.

**This course is available to Security 575 participants only.*

NEW!

SECURITY 579

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | Instructor: Dave Shackleford

SEC579: Virtualization and Private Cloud Security

One of today's most rapidly evolving and widely deployed technologies is server virtualization. Many organizations are already realizing the cost savings from implementing virtualized servers, and systems administrators love the ease of deployment and management for virtualized systems. There are even security benefits of virtualization - easier business continuity and disaster recovery, single points of control over multiple systems, role-based access, and additional auditing and logging capabilities for large infrastructures.

Server virtualization vulnerabilities

With these benefits comes a dark side, however. Virtualization technology is the focus of many new potential threats and exploits and presents new vulnerabilities that must be managed. In addition, there are a vast number of configuration options that security and system administrators need to understand, with an added layer of complexity that has to be managed by operations teams. Virtualization technologies also connect to network infrastructure and storage networks and require careful planning with regard to access controls, user permissions, and traditional security controls.

In addition, many organizations are evolving virtualized infrastructure into private clouds - internal shared services running on virtualized infrastructure. Security architecture, policies, and processes will need to adapt to work within a cloud infrastructure, as well, and there are many changes that security and operations teams will need to accommodate to ensure assets are protected.

Virtualization and private cloud security architecture and design

The class starts out with two days of architecture and security design for both virtualization and private cloud infrastructure. The entire gamut of components will be covered ranging from hypervisor platforms to virtual networking, storage security to locking down the individual virtual machine files. We'll describe how to secure the management interfaces and servers, delve into Virtual Desktop Infrastructure (VDI), and go in-depth on what to consider when building a private cloud from existing virtualization architecture. Finally, we'll look at integrating virtual firewalls and intrusion detection systems into the new architecture for access control and network monitoring.

Who Should Attend

- Security personnel who are tasked with securing virtualization and private cloud infrastructure
- Network and systems administrators who need to understand how to architect, secure, and maintain virtualization and cloud technologies
- Technical auditors and consultants who need to gain a deeper understanding of VMware virtualization from a security and compliance perspective

Virtualization infrastructure, policy, and auditing

The next two days we'll go into detail on offense and defense - how can we assess virtualized environment using scanning and pen testing tools and techniques, and how do things change when we move to a cloud model? We'll cover a variety of scanners and vulnerability management tools and practices, and then take a hard look at virtualization vulnerabilities, exploits, and toolkits for pen testing that we can put to use in class.

Once we cover the offense, we'll take the opposite approach and go into detail on performing intrusion detection and logging within the virtual environment, as well as covering anti-malware advances and changes within virtual infrastructure. We'll wrap up the session with coverage of incident handling within virtual and cloud environments, as well as adapting forensics processes and tools to ensure we can maintain chain-of-custody and perform detailed analysis of virtualized assets.

Vulnerability management, pen testing, and intrusion detection

During day 5, we will help you adapt your existing security policies and practices to the new virtualized or cloud-based infrastructure. We'll show you how to design a foundational risk assessment program and then build on this with policies, governance, and compliance considerations within your environment. We'll cover auditing and assessment of your virtualized assets, with a session on scripting that will help you put this into practice right away. Then we'll go in-depth into data security within a private cloud environment, discussing encryption and data lifecycle management techniques that will help you keep up with data that is much more mobile than ever before. Identity and Access Management (IAM) within a virtualized/cloud environment will be touched on, and we'll wrap up with a thorough session on disaster recovery and business continuity planning that leverages and benefits from virtualization and cloud-based technology.

On day 6, we'll cover the top virtualization configuration and hardening guides from DISA, CIS, Microsoft, and VMware, and talk about the most important and critical things to take away from these to implement. We culminate with data security and encryption, and Identity and Access Management (IAM) and Disaster Recovery (DR) and Business Continuity Planning (BCP).

579.1 Hands On: Virtualization Security Architecture and Design*

We'll cover the foundations of virtualization infrastructure and clarify the differences between server virtualization, desktop virtualization, application virtualization, and storage virtualization. We'll start with hypervisor platforms, covering the fundamental controls that should be set within VMware ESX and ESXi, Microsoft Hyper-V, and Citrix XenServer. You'll spend time analyzing virtual networks. We'll compare designs for internal networks and DMZs Virtual switch types will be discussed, along with VLANs and PVLANs. We will cover virtual machine settings, with an emphasis on VMware VMX files. Tactics will be covered that help organizations better secure Fibre Channel, iSCSI, and NFS-based NAS technology.

Topics: Virtualization Components and Architecture Designs; Hypervisor Lockdown Controls for VMware; Microsoft Hyper-V, and Citrix Xen, Virtual Network Design Cases, Virtual Switches and Port Groups, Segmentation Techniques

579.2 Hands On: Virtualization & Private Cloud Infrastructure Security*

Today starts with virtualization management. VMware vCenter, Microsoft System Center Virtual Machine Manager (SCVMM), and Citrix XenCenter will be covered. Virtual Desktop Infrastructure (VDI) will be covered with emphasis on security principles. Specific security-focused use cases for VDI, such as remote access and network access control, will be reviewed. We will take an in-depth look at virtual firewalls. Students will build a virtualized intrusion detection model; integrating promiscuous interfaces and traffic capture methods into virtual networks; and then setting up and configuring a virtualized IDS sensor. Attention will be paid to host-based IDS, with considerations for multitenant platforms.

579.3 Hands On: Virtualization Offense and Defense – Part 1*

In this session, we'll delve into the offensive side of security specific to virtualization and cloud technologies. While many key elements of vulnerability management and penetration testing are similar to â€œtraditional environments, there are many differences that we will cover. First, we'll cover a number of specific attack scenarios and models that represent the different risks organizations face in their virtual environments. Then we'll go through the entire penetration testing and vulnerability assessment lifecycle, with an emphasis on virtualization tools and technologies. Students will then learn about monitoring traffic and looking for malicious activity within the virtual network, and numerous network-based and host-based tools will be covered and implemented in class. Finally, students will learn about logs and log management in virtual environments.

579.4 Hands On: Virtualization Offense and Defense – Part 2*

This session is all about defense! We'll start off with an analysis on anti-malware techniques. We'll look at traditional antivirus, whitelisting, and other tools and techniques for combating malware, with a specific eye toward virtualization and cloud environments. New commercial offerings in this area will also be discussed to provide context, as well. The majority of this session will focus on incident response and forensics in a virtualized or cloud-based infrastructure. We'll walk students through the 6-step incident response cycle espoused by NIST and SANS, and highlight exactly how virtualization fits into the "big picture." Students will discuss and analyze incidents at each stage, again with a focus on virtualization and cloud. We'll finish the incident response section with processes and procedures organizations can put to use right away to improve their awareness of virtualization-based incidents.

579.5 Hands On: Virtualization and Cloud Integration: Policy, Operations, and Compliance*

This session will explore how traditional security and IT operations changes with the addition of virtualization and cloud technology in the environment. Our first discussion will be a lesson on contrast! First, we'll present an overview of integrating existing security into virtualization. Then, we'll take a vastly different approach, and outline how virtualization actually creates new security capabilities and functions! This will really provide a solid grounding for students to understand just what a paradigm shift virtualization is, and how security can benefit from it, while still needing to adapt in many ways.

579.6 Hands On: Confidentiality, Integrity, and Availability with Virtualization and Cloud*

Today's session will start off with a lively discussion on virtualization assessment and audit. You may be asking - how will you possibly make a discussion on auditing lively? Trust us! We'll cover the top virtualization configuration and hardening guides from DISA, CIS, Microsoft, and VMware, and talk about the most important and critical things to take away from these to implement. We'll really put our money where our mouth is next - students will learn to implement audit and assessment techniques by scripting with the VI CLI, as well as some Powershell and general shell scripting! Although not intended to be an in-depth class on scripting, some key techniques and ready-made scripts will be discussed to get students prepared for implementing these principles in their environments as soon as they get back to work.

**This course is available to Security 579 participants only.*

SANS Senior Instructor

Dave Shackleford

Dave Shackleford is the owner and principal consultant at Voodoo Security; senior vice president of research and CTO at IANS; and a SANS analyst, instructor, and course author. He has consulted with hundreds of organizations in the areas of security, regulatory compliance, and network architecture and engineering. He is a VMware vExpert and has extensive experience designing and configuring secure virtualized infrastructures. He has previously worked as CSO for Configuresoft; CTO for the Center for Internet Security; and as a security architect, analyst, and manager for several Fortune 500 companies. Dave is a coauthor of *Hands-On Information Security* from Course Technology as well as the Managing Incident Response chapter in the Course Technology book *Readings and Cases in the Management of Information Security*. Recently, Dave coauthored the first published course on virtualization security for the SANS Institute. Dave currently serves on the board of directors at the SANS Technology Institute and helps lead the Atlanta chapter of the Cloud Security Alliance.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GAWN | Instructor: Larry Pesce

SEC617: Wireless Ethical Hacking, Penetration Testing, and Defenses

Despite the security concerns many of us share regarding wireless technology, it is here to stay. In fact, not only is wireless here to stay, but it is growing in deployment and utilization with wireless LAN technology and WiFi as well as with other applications, including cordless telephones, smart homes, embedded devices, and more. Technologies like ZigBee and WiMAX offer new methods of connectivity to devices, while other wireless technology, including WiFi, Bluetooth and DECT, continue their massive growth rate, each introducing their own set of security challenges and attacker opportunities.

To be a wireless security expert, you need to have a comprehensive understanding of the technology, the threats, the exploits, and the defense techniques along with hands-on experience in evaluating and attacking wireless technology. Not limiting your skill-set to WiFi, you'll need to evaluate the threat from other standards-based and proprietary wireless technologies as well. This course takes an in-depth look at the security challenges of many different wireless technologies, exposing you to wireless security threats through the eyes of an attacker. Using readily available and custom-developed tools, you'll navigate your way through the techniques attackers use to exploit WiFi networks, including attacks against WEP, WPA/WPA2, PEAP, TTLS, and other systems, including developing attack techniques leveraging Windows 7 and Mac OS X. We'll also examine the commonly overlooked threats associated with Bluetooth, ZigBee, DECT, and proprietary wireless systems. As part of the course, you'll receive the SWAT Toolkit, which will be used in hands-on labs to back up the course content and reinforce wireless ethical hacking techniques.

Using assessment and analysis techniques, this course will show you how to identify the threats that expose wireless technology and build on this knowledge to implement defensive techniques that can be used to protect wireless systems.

Author Statement

It's been amazing to watch the progression of wireless technology over the past several years. WiFi has grown in maturity and offers strong authentication and encryption options to protect networks, and many organizations have migrated to this technology. At the same time, attackers are becoming more sophisticated, and we've seen significant system breaches netting millions of payment cards that start with a wireless exploit. This pattern has me very concerned, as many organizations, even after deploying WPA2 and related technology, remain vulnerable to a number of attacks that expose their systems and internal networks. In putting this class together, I wanted to help organizations recognize the multi-faceted wireless threat landscape and evaluate their exposure through ethical hacking techniques. Moreover, I wanted my students to learn critical security analysis skills so that, while we focus on evaluating wireless systems, the vulnerabilities and attacks we leverage to exploit these systems can be applied to future technologies as well. In this manner, the skills you build in this class remain valuable for today's wireless technology, tomorrow's technology advancements, and for other complex systems you have to evaluate in the future as well. If you have questions or comments about this course, I would be very happy to hear from you. Please e-mail me at **jwright@sans.org**.

-Joshua Wright

Who Should Attend

- Ethical hackers and penetration testers
- Network security staff
- Network and system administrators
- Incident response teams
- Information security policy decision makers
- Technical auditors
- Information security consultants
- Wireless system engineers
- Embedded wireless system developers

"This was a great in-depth look at every facet down to the protocol layer… great experience!"

-Keith Wilson, Department of Defense

www.giac.org

www.sans.org/cyber-guardian

www.sans.edu

617.1 Wireless Architecture and Analysis*

Students will identify the risks associated with modern wireless deployments as well as the characteristics of physical layer radio frequency systems, including 802.11a/b/g and pre-802.11n systems. Students will leverage open-source tools for analyzing wireless traffic and mapping wireless deployments.

Topics: Wireless Signal Exposure Threats; Identifying Threats in Wireless Networks; RF Signal Propagation and Transmission Characteristics; RF Antenna Gain Types and Concepts; Physical Layer Coding Mechanisms; Leveraging Tools Including Kismet, Wireshark, and gpsmap for Network Mapping and Identification

617.2 Hands On: Wireless Security Exposed – Part 1*

Students will develop an in-depth treatise on the IEEE 802.11 MAC layer and operating characteristics. Using passive and active assessment techniques, students will evaluate deployment and implementation weaknesses, auditing against common implementation requirements, including PCI and the DoD Directive 8100.2. Security threats introduced with rogue networks will be examined from a defensive and penetration-testing perspective. Threats present in wireless hotspot networks will also be examined, identifying techniques attackers can use to manipulate guest or commercial hotspot environment.

Topics: IEEE 802.11 Framing; AP Fingerprinting; Kismet Post-Processing; Assessing Information Disclosure Threats; Auditing Wireless Policy Compliance; Evading WIDS Systems with Custom Rogue APs; "Free Public WiFi" and Ad-Hoc Networks; Wireless Device Triangulation; Webmail Session Hijacking; Defensive Measures for Guest Network Deployment

617.3 Hands On: Wireless Security Exposed – Part 2*

Students will continue their assessment of wireless security mechanisms, such as the identification and compromise of static and dynamic WEP networks and exploiting weak authentication techniques, including the Cisco LEAP protocol. Next-generation wireless threats will be assessed, including attacks against client systems, such as network impersonation attacks and traffic manipulation. Students will evaluate the security and threats associated with common wireless MAN technology, including proprietary and standards-based solutions.

Topics: Introduction to The RC4 Cipher; Understanding Failures in WEP; Leveraging Advanced Tools to Accelerate WEP Cracking; Attacking MS-CHAPv2 Authentication Systems; Attacker Opportunities When Exploiting Client Systems; Manipulating Plaintext Network Traffic; Attacking the Preferred Network List on Client Devices; Network Impersonation Attacks; Risks Associated with WMAN Technology; Assessing WiMAX Flaws

617.4 Hands On: Wireless Security Exposed – Part 3*

Part three covers the evaluation of modern wireless encryption and authentication systems, identifying the benefits and flaws in WPA/WPA2 networks and common authentication systems. Upper-layer encryption strategies for wireless security using IPSec are evaluated with in-depth coverage of denial-of-service attacks and techniques.

Topics: Threats Associated with the WPA/TKIP Protocol; Implementing Offline Wordlist Attacks Against WPA/WPA2-PSK Networks; Understanding the PEAP Authentication Exchange; Exploiting PEAP Through RADIUS Impersonation; Recommendations for Securing Windows XP Supplicants; Exploiting Wireless Firmware for DoS Attack; Wireless Packet Injection and Manipulation Techniques; VPN Network Fingerprinting and Analysis Tools

617.5 Hands On: Wireless Security Exposed – Part 4*

Advanced wireless testing and vulnerability discovery systems will be covered, including 802.11 fuzzing techniques. A look at other wireless technology, including proprietary systems, cellular technology, and an in-depth coverage of Bluetooth risks, will demonstrate the risks associated with other forms of wireless systems and the impact to organizations.

Topics: Wireless Fuzzing Tools and Techniques; Vulnerability Disclosure Strategies; Discovering Unencrypted Video Transmitters; Assessing Proprietary Wireless Devices; Traffic Sniffing in GSM Networks; Attacking SMS Messages and Cellular Calls; Bluetooth Authentication and Pairing Exchange; Attacking Bluetooth Devices; Sniffing Bluetooth Networks; Eavesdropping on Bluetooth Headsets

617.6 Hands On: Wireless Security Strategies and Implementation*

The final day of the course evaluates strategies and techniques for protecting wireless systems. Students will examine the benefits and weaknesses of WLAN IDS systems while gaining insight into the design and deployment of a public key infrastructure (PKI). Students will also examine critical secure network design choices, including the selection of an EAP type, selecting an encryption strategy, and the management of client configuration settings.

Topics: WLAN IDS Signature and Anomaly Analysis Techniques; Understanding PKI Key Management Protocols; Deploying a Private Certificate Authority on Linux and Windows Systems; Configuring Windows IAS for Wireless Authentication; Configuring Windows XP Wireless Settings in Login Scripts

**This course is available to Security 617 participants only.*

SANS Certified Instructor

Larry Pesce

Larry is a Senior Security Consultant with NWN Corporation in Waltham, MA after a long stint in Security and Disaster Recovery in healthcare, performing penetration testing, wireless assessments and hardware hacking. He also diverts a significant portion of his attention co-hosting the PaulDotCom Security Weekly podcast and likes to tinker with all things electronic and wireless, much to the disappointment of his family, friends and warranties. Larry also co-authored "Linksys WRT54G Ultimate Hacking" and "Using Wireshark and Ethereal" from Syngress. Larry is an Extra Class Amateur Radio operator (KB1TNF) and enjoys developing hardware and real-world challenges for the Mid-Atlantic Collegiate Cyber Defense Challenge.

NEW!

SECURITY 642

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm

Laptop Required | 36 CPE/CMU Credits | Instructor: Seth Misenar

SEC642: Advanced Web App Penetration Testing and Ethical Hacking

This course is designed to teach you the advanced skills and techniques required to test web applications today. This advanced pen testing course uses a combination of lecture, real-world experiences, and hands-on exercises to educate the you in the techniques used to test the security of enterprise applications. The final day of the course culminates in a Capture the Flag (CtF) event, which tests the knowledge you will have acquired the previous five days.

We will begin by exploring specific techniques and attacks to which applications are vulnerable. These techniques and attacks use advanced ideas and skills to exploit the system through various controls and protections. This learning will be accomplished through lectures and exercises using real world applications.

We will then explore encryption as it relates to web applications. You will learn how encryption works as well as techniques to identify the type of encryption in use within the application. Additionally, you will learn methods for exploiting or abusing this encryption, again through lecture and labs.

The next day of class will focus on how to identify web application firewalls, filtering, and other protection techniques. You will then learn methods to bypass these controls in order to exploit the system. You'll also gain skills in exploiting the control itself to further the evaluation of the security within the application.

Following these general exploits, you will learn techniques that target specific enterprise applications. You will attack systems such as content management and ticketing systems. We will explore the risks and flaws found within these systems and how to better exploit them. This part of the course will also include web services and mobile applications due to their prevalence within modern organizations.

This information packed advanced pen testing course will wrap up with a full day Capture the Flag (CtF) event. This CtF will target an imaginary organization's web applications and will include both Internet and intranet applications of various technologies. This event is designed to allow you to put the pieces together from the previous five days reinforcing the information and learning you will have gained.

The SANS promise is that you will be able to use these ideas immediately upon returning to the office in order to better perform penetration tests of your web applications and related infrastructure. This course will enhance your exploitation and defense skill sets as well as fulfill a need to teach more advanced techniques than can be covered in the foundational course, Security 542: Web Application Penetration Testing and Ethical Hacking.

Who Should Attend

- Web penetration testers
- Security consultants
- Developers
- QA testers
- System administrators
- IT managers
- System architects

Author Statement

As web applications and their mobile counterparts become more complex and hardened against attack, penetration testers need to adjust the techniques they use to evaluate the security of these systems. This includes understanding how the various targets work, their usage of encryption and web application firewalling, and how to perform vulnerability discovery and exploitation against these items. This course is designed to expand past the methodology and focus on the how when we are presented with the challenges of web penetration testing.

- Kevin Johnson

"Outstanding course!! It is great to have an opportunity to learn the material from someone who is extremely relevant in the field and is able to impart the value of his experiences."

-Bobby Bryant, DoD

642.1 Hands On: Advanced Discovery and Exploitation*

As applications and their vulnerabilities become more complex, penetration testers have to be able to handle these targets. We will begin the class by exploring how Burp Suite works and more advanced ways to use it within your penetration-testing processes. The exploration of Burp Suite will focus on its ability to work within the traditional web penetration testing methodology and assist in manually discovering the flaws within the target applications. Following this discussion, we will move into studying specific vulnerability types. This examination will explore some of the more advanced techniques for finding server-based flaws such as SQL injection. After discovering the flaws, we will then work through various ways to exploit these flaws beyond the typical means exhibited today. These advanced techniques will help penetration testers show the risks the flaws expose an organization to.

Topics: Review of the Testing Methodology; Using Burp Suite in a Web Penetration Test; Examine How to Use Burp Intruder to Effectively Fuzz Requests; Explore Advanced Discovery Techniques for SQL Injection and Other Server-Based Flaws; Learn Advanced Exploitation Techniques

642.2 Hands On: Discovery and Exploitation for Specific Applications*

On day two of 642, we will continue the exploration of advanced discovery and exploitation techniques. We'll start by exploring client-side flaws such as cross-site scripting (XSS) and cross-site request forgery (XSRF). We will explore some of the more advanced methods for discovering these issues. After finding the flaws, you will learn some of the more advanced methods of exploitation, such as scriptless attacks and building web-based worms using XSRF and XSS flaws within an application. During the next part of the day we'll explore various popular applications and frameworks and how they change the discovery techniques within a web penetration test. This section of the class examines applications such as SharePoint and WordPress. These specific targets have unique needs and features that make testing them both more complex and more fruitful for the tester. This section of the class will help you understand these differences and make use of them in your testing.

Topics: Discovering XSRF Flaws Within Complex Applications; Learning About DOM-based XSS Flaws and How to Find Them Within Applications; Exploiting XSS Using Scriptless Injections; Bypassing Anti-XSRF Controls Using XSS/XSRF Worms; Attacking SharePoint Installations; How to Modify Your Test Based on the Target Application

642.3 Hands On: Web Application Encryption*

Cryptographic weaknesses are a common area where flaws are present, yet few penetration testers have the skill to investigate, attack and exploit these flaws. When we investigate web application crypto attacks, we typically target the implementation and use of cryptography in modern web applications. Many popular web programming languages or development frameworks make encryption services available to the developer, but do not inherently protect encrypted data from being attacked, or permit the developer to use cryptography in a weak manner. These implementation mistakes are going to be our focus in this section, as opposed to the exploitation of deficiencies in the cryptographic algorithms themselves. We will also explore the various ways applications use encryption and hashing insecurely. Students will learn how techniques such as identifying what the encryption technique is to how to exploit various flaws within the encryption or hashing.

Topics: Explore How to Identify the Cryptography in Use; Discover How to Attack the Encryption Keys; Learn How to Attack Electronic Codebook (ECB) Mode Ciphers; Exploit Padding Oracles and Cipher Block Chaining (CBC) Bit Flipping

642.4 Hands On: Web Application Firewall and Filter Bypass*

Today, applications are using more security controls to help prevent attacks. These controls, such as Web Application Firewalls and filtering techniques make it more difficult for penetration testers during their testing. These controls block many of the automated tools and simple techniques used to discover flaws today. On day four you will explore techniques used to map the control and how it is configured to block attacks. You'll be able to map out the rule sets and determine the specifics of how it detects attacks. This mapping will then be used to determine attacks that will bypass the control. You'll use HTML5, UNICODE and other encodings that will enable your discovery techniques to work within the protected application.

Topics: Understanding of Web Application Firewalling and Filtering Techniques; Explore How to Determine the Rule Sets Protecting the Application; Learn How HTML5 Injections Work; Discover the Use of UNICODE and Other Encodings

642.5 Hands On: Mobile Applications and Web Services*

Web applications are no longer limited to the traditional HTML based interface. Web services and mobile applications have become more common and are regularly being used to attack client and organizations. As such, it has become very important that penetration testers understand how to evaluate the security of these systems. During day five, you will learn how to build a test environment for mobile applications and web services. We will also explore various techniques to discover flaws within the applications and backend systems. These techniques will make use of tools such as Burp Suite and other automated toolsets.

Topics: Understanding the Mobile Platforms and Architecture; Intercepting Traffic to Web Services and from Mobile Applications; Building a Test Environment; Injecting Malicious Traffic into Web Services

642.6 Hands On: Capture the Flag*

During day six of the class you will be placed on a network and given the opportunity to complete an entire penetration test. The goal of this capture the flag event is for you to explore the techniques, tools, and methodology you will have learned over the last five days. You'll be able to use these ideas and methods against a realistic extranet and intranet. At the end of the day, you will provide a verbal report of the findings and methodology you followed to complete the test. Students will be provided with a virtual machine that contains the Samurai Web Testing Framework web penetration-testing environment. You will be able to use this both in the class and after leaving and returning to your normal jobs.

**This course is available to Security 642 participants only.*

SANS Certified Instructor

Seth Misenar

Seth Misenar is a certified SANS instructor and also serves as lead consultant and founder of Jackson, Mississippi-based Context Security, which provides information security though leadership, independent research, and security training. Seth's background includes network and Web application penetration testing, vulnerability assessment, regulatory compliance efforts, security architecture design, and general security consulting. He has previously served as both physical and network security consultant for Fortune 100 companies as well as the HIPAA and information security officer for a state government agency. Prior to becoming a security geek, Seth received a BS in philosophy from Millsaps College, where he was twice selected for a Ford Teaching Fellowship. Also, Seth is no stranger to certifications and thus far has achieved credentials which include, but are not limited to, the following: CISSP, GPEN, GWAPT, GSEC, GCIA, GCIH, GCWN, GCFA, and MCSE. Beyond his security consulting practice, Seth is a regular instructor for SANS. He teaches numerous SANS classes, including SEC401, SEC504, and SEC542. Seth has also served as both virtual mentor and technical director for SANS OnDemand, the online course delivery arm of the SANS Institute.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 7:00pm (Days 1-5) | 9:00am - 5:00pm (Day 6)
Laptop Required | 48 CPE/CMU Credits | GIAC Cert: GXPN | Instructor: Stephen Sims

SEC660: Advanced Penetration Testing, Exploits, and Ethical Hacking

SEC660: Advanced Penetration Testing, Exploits, and Ethical Hacking is designed as a logical progression point for those who have completed SANS SEC560: Network Penetration Testing and Ethical Hacking, or for those with existing penetration testing experience. Students with the prerequisite knowledge to take this course will walk through dozens of real world attacks used by the most seasoned penetration testers. The methodology of a given attack is discussed, followed by exercises in a real world lab environment to solidify advanced concepts and allow for the immediate application of techniques in the workplace. Each day includes a two-hour evening bootcamp to allow for additional mastery of the techniques discussed and even more hands-on exercises. A sample of topics covered include weaponizing Python for penetration testers, attacks against network access control (NAC) and VLAN manipulation, network device exploitation, breaking out of Linux and Windows restricted environments, IPv6, Linux privilege escalation and exploit-writing, testing cryptographic implementations, fuzzing, defeating modern OS controls such as ASLR and DEP, Return Oriented Programming (ROP), Windows exploit-writing, and much more!

It is well-known that attackers are becoming cleverer and their attacks more complex. In order to keep up with the latest attack methods, one must have a strong desire to learn, the support of others, and the opportunity to practice and build experience. SANS SEC660: Advanced Penetration Testing, Exploits, and Ethical Hacking engages attendees with in-depth knowledge of the most prominent and powerful attack vectors and an environment to perform these attacks in numerous hands-on scenarios. This course goes far beyond simple scanning for low-hanging fruit, and shows penetration testers how to model the abilities of an advanced attacker to find significant flaws in a target environment and demonstrate the business risk associated with these flaws.

SEC660 starts off by introducing advanced penetration concepts, and an overview to help prepare students for what lies ahead. The focus of day one is on network attacks, an area often left untouched by testers. Topics include accessing, manipulating, and exploiting the network. Attacks are performed against NAC, VLANs, OSPF, 802.1X, CDP, IPv6, VOIP, SSL, ARP, SNMP, and others. Day two starts off with a technical module on performing penetration testing against various cryptographic implementations. The rest of the day is spent on network booting attacks, escaping Linux restricted environments such as chroot, and escaping Windows restricted desktop environments. Day three jumps into an introduction of Python for penetration testing, Scapy for packet crafting, product security testing, network and application fuzzing, and code coverage techniques. Days four and five are spent exploiting programs on the Linux and Windows operating systems. You will learn to identify privileged programs, redirect the execution of code, reverse-engineering programs to locate vulnerable code, obtain code execution for administrative shell access, and defeat modern operating system controls such as ASLR, canaries, and DEP using Return Oriented Programming (ROP) and other techniques. Local and remote exploits, as well as client-side exploitation techniques are covered. The final course day is dedicated to numerous penetration testing challenges requiring you to solve complex problems and capture flags.

"Up-to-date hands-on content left me feeling confident I could start to apply my new skills back in the office."
-Rafe Pilling, Dell SecureWorks

Who Should Attend

- Network and Systems Penetration Testers
- Incident Handlers
- Application Developers
- IDS Engineers

BOOTCAMP

This program has extended hours.
Security 660 PARTICIPANTS ONLY
Evening Bootcamp Sessions:
5:15pm - 7:00pm (Days 1-5)

Author Statement

As a perpetual student of information security, I am excited to offer this course on advanced penetration testing. Often, when conducting an in-depth penetration test, we are faced with situations that require unique or complex solutions to successfully pull off an attack, mimicking the activities of increasingly sophisticated real-world attackers. Without the skills to do so, you may miss a major vulnerability or not properly assess its business impact. Target system personnel are relying on you to tell them whether or not an environment is secured. Attackers are almost always one step ahead and are relying on our nature to become complacent with controls we work so hard to deploy. This course was written to keep you from making mistakes others have made, teach you cutting edge tricks to thoroughly evaluate a target, and provide you with the skills to jump into exploit development. Contact me at stephen@deadlisting.com if you have any questions about the course!

-Stephen Sims

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660.1 Hands On: Network Attacks for Penetration Testers*

Day one serves as an advanced network attack module, building on knowledge gained from SEC560: Network Penetration Testing and Ethical Hacking. The focus for day one will be on obtaining access to the network; manipulating the network to gain an attack position for eavesdropping and attacks, and for exploiting network devices; leveraging weaknesses in network infrastructure; and taking advantage of client frailty.

Topics: Bypassing Network Admission Control; Impersonating Devices with Admission Control Policy Exceptions; Exploiting EAP-MD5 Authentication; IEEE 802.1X authentication; Custom Network Protocol Manipulation with Ettercap and Custom Filters; Multiple Techniques for Gaining Man-in-the-Middle Network Access; Exploiting OSPF Authentication to Inject Malicious Routing Updates; Using Evilgrade to Attack Software Updates; Overcoming SSL Transport Encryption Security with Sslstrip; Remote Cisco Router Configuration File Retrieval

660.2 Hands On: Crypto, Network Booting Attacks, and Escaping Restricted Environments*

Day two starts by taking a tactical look at techniques penetration testers can use to investigate and exploit common cryptography mistakes. We begin by building some fundamental knowledge on how ciphers operate without getting bogged down in complex mathematics, and then we move on to techniques for identifying, assessing, and attacking real-world crypto implementations. We finish the module with lab exercises that allow you to practice your new found crypto attack skill set against reproduced real-world application vulnerabilities.

Topics: Low Profile Enumeration of Large Windows Environments Without Heavy Scanning; Strategic Target Selection; Remote Desktop Protocol (RDP) and Man-in-the-Middle Attacks; Windows Network Authentication Attacks (e.g., MS-Kerberos, NTLMv2, NTLMv1, LM); Windows Network Authentication Downgrade; Discovering and Leveraging MS-SQL for Domain Compromise Without Knowing the sa Password; Metasploit Tricks to Attack Fully Patched Systems; Utilize LSA Secrets and Service Accounts to Dominate Windows Targets; Dealing with Unguessable/Uncrackable Passwords; Leveraging Password Histories; Gaining Graphical Access; Expanding Influence to Non-Windows Systems

660.3 Hands On: Python, Scapy, and Fuzzing*

Day three brings together multiple skill sets needed for creative analysis in penetration testing. The day starts with a focus on how to leverage Python as a penetration tester. It is designed to help people unfamiliar with Python start modifying scripts to add their own functionality while helping seasoned Python scripters improve their skills. Once we leverage the Python skills in creative lab exercises, we move on to leveraging Scapy for custom network targeting and protocol manipulation. Using Scapy, we examine techniques for transmitting and receiving network traffic beyond what canned tools can accomplish, including IPv6.

Topics: Becoming Familiar with Python Types; Leveraging Python Modules for Real-World Pen Tester Tasks; Manipulating Stateful Protocols with Scapy; Using Scapy to Create a Custom Wireless Data Leakage Tool; Product Security Testing; Using Taof for Quick Protocol Mutation Fuzzing; IDAPro; Optimizing Your Fuzzing Time with Smart Target Selection; Automating Target Monitoring While Fuzzing with Sulley; Leveraging Microsoft Word Macros for Fuzzing .docx files; Block-Based Code Coverage Techniques Using Paimei

660.4 Hands On: Exploiting Linux for Penetration Testers*

Day Four begins by walking through memory from an exploitation perspective as well as introducing x86 assembler and linking and loading. These topics are important to understand for anyone performing penetration testing at an advanced level. Processor registers are directly manipulated by testers and must be intimately understood. Disassembly is a critical piece of testing and will be used throughout the remainder of the course. We will take a look at the Linux OS from an exploitation perspective and discuss the topic of privilege escalation. We continue by describing how to look for SUID programs and other likely points of vulnerabilities and misconfigurations. The material will focus on techniques that are critical to performing penetration testing on Linux applications.

Topics: Stack and Dynamic Memory Management and Allocation on the Linux OS; Disassembling a Binary and Analyzing x86 Assembly Code; Performing Symbol Resolution on the Linux OS; Identifying Vulnerable Programs; Code Execution Redirection and Memory Leaks; Return Oriented Programming (ROP); Identifying and Analyzing Stack-Based Overflows on the Linux OS; Performing Return-to-libc (ret2libc) Attacks on the Stack; Defeating Stack Protection on the Linux OS; Defeating ASLR on the Linux OS

660.5 Hands On: Exploiting Windows for Penetration Testers*

On day five we start off with covering the OS security features (ALSR, DEP, etc.) added to the Windows OS over the years, as well as Windows specific constructs, such as the process environment block (PEB), structured exception handling (SEH), thread information block (TIB), and the Windows API. Differences between Linux and Windows will be covered. These topics are critical in assessing Windows-based applications. We then focus on stack-based attacks against programs running on the Windows OS. We look at fuzzing skills, which are required to test remote services, such as TFTP and FTP, for faults. Once a fault is discovered, the student will work with Immunity Debugger to turn the fault into an opportunity for code execution and privilege escalation. Advanced stack-based attacks, such as disabling data execution prevention (DEP) and heap spraying for browser-based applications, are covered. Client-side exploitation will be introduced, as it is a highly common area of attack. The day will end with a look at shellcode and the differences between Linux and Windows.

Topics: The State of Windows OS Protections on XP, Vista, 7, Server 2003 and 2008; Understanding Common Windows Constructs; Stack Exploitation on Windows; Defeating OS protections added to Windows; Dynamic and Static Fuzzing on Windows Applications or Processes; Creating a Metasploit Module; Advanced Stack-Smashing on Windows; Return Oriented Programming (ROP); Windows 7 and Windows 8; Porting Metasploit Modules; Client-side Exploitation; Windows and Linux Shellcode

660.6 Hands On: Capture the Flag*

This day will serve as a real-world challenge for students, requiring them to utilize skills obtained throughout the course, think outside the box, and solve simple-to-complex problems. In this offensive exercise, challenges range from local privilege escalation to remote exploitation on both Linux and Windows systems, as well as networking attacks and other challenges related to the course material.

**This course is available to Security 660 participants only.*

SANS Senior Instructor

Stephen Sims

Stephen Sims is an industry expert with over 15 years of experience in information technology and security. Stephen currently works out of San Francisco as a consultant. He has spent many years performing security architecture, exploit development, reverse engineering, and penetration testing. Stephen has an MS in information assurance from Norwich University and is a course author and senior instructor for the SANS Institute. He is the author of SANS' only 700-level course, SEC710: Advanced Exploit Development, which concentrates on complex heap overflows, patch diffing, and client-side exploits. Stephen is also the lead author on SEC660: Advanced Penetration Testing, Exploits, and Ethical Hacking. He holds the GIAC Security Expert (GSE) certification as well as the CISSP, CISA, Immunity NOP, and many other certifications. In his spare time Stephen enjoys snowboarding and writing music.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCFE | Instructor: Chad Tilbury

FOR408: Computer Forensic Investigations – Windows In-Depth

Master computer forensics. Learn critical investigation techniques. With today's ever-changing technologies and environments, it is inevitable that every organization will deal with cybercrime including fraud, insider threat, industrial espionage, and phishing. In addition, government agencies are now performing media exploitation to recover key intelligence kept on adversary systems. In order to help solve these cases, organizations are hiring digital forensic professionals and calling cybercrime law enforcement agents to piece together what happened in these cases.

FOR408: Computer Forensic Investigations - Windows In-Depth focuses on the critical knowledge of the Windows OS that every digital forensic analyst must know to investigate computer incidents successfully. You will learn how computer forensic analysts focus on collecting and analyzing data from computer systems to track user-based activity that could be used internally or in civil/criminal litigation.

This course covers the fundamental steps of the in-depth computer forensic and media exploitation methodology so that each student will have the complete qualifications to work as a computer forensic investigator in the field helping solve and fight crime. In addition to in-depth technical digital forensic knowledge on Windows Digital Forensics (Windows XP through Windows 7 and Server 2008) you will be exposed to well known computer forensic tools so such as Access Data's Forensic Toolkit (FTK), Guidance Software's EnCase, Registry Analyzer, FTK Imager, Prefetch Analyzer, and much more. Many of the tools covered in the course are freeware, comprising a full-featured forensic laboratory that each student can take with them.

FOR408 is the first course in the SANS Computer Forensic Curriculum. If this is your first computer forensics course with SANS we recommend that you start here.

FIGHT CRIME. UNRAVEL INCIDENTS... ONE BYTE AT A TIME.

You will receive with this course:

- **Windows 7 version of the SIFT Workstation Virtual Machine**
- **License to FTK and EnCase for three months**
- **WiebeTech Forensic UltraDock v5: Write-blocked access to bare SATA or IDE/PATA drives – FW800/FW400/eSATA/USB3**
- **Course DVD loaded with case examples, tools, and documentation**

Who Should Attend

- Information technology professionals
- Incident Response Team Members
- Law enforcement officers, federal agents, or detectives
- Media Exploitation Analysts
- Information security managers
- Information technology lawyers and paralegals
- Anyone interested in computer forensic investigations

Author Statement

SANS COMPUTER FORENSICS GRADUATE THWARTS BANK HEIST. Headlines similar to these are now a reality, as former students have emailed me regularly about how they were able to use their digital forensic skills in very real situations. Graduates of Computer Forensics Windows In-Depth are the front line troops deployed when you need accurate digital forensic and media exploitation analysis. From analyzing terrorist laptops to investigating insider intellectual property theft and fraud, SANS digital forensic graduates are battling and winning the war on crime and terror. Graduates have directly contributed to solving some of the toughest cases out there because they learn how to conduct analysis and run investigations properly. Knowing that this course places the correct methodology and knowledge in the hands of responders who thwart the plans of criminals or foreign attacks brings me great comfort. Graduates are doing it. Daily. I am proud that the Computer Forensics Investigations-Windows In-Depth course at SANS helped prepare them to fight and solve crime.

-Rob Lee

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408.1 Digital Forensics Fundamentals and Evidence Acquisition*

Securing or "Bagging and Tagging" digital evidence can be tricky. Each computer forensic examiner should be familiar with different methods of successfully acquiring it maintaining the integrity of the evidence. Starting with the foundations from law enforcement training in proper evidence handling procedures, you will learn firsthand the best methods for acquiring evidence in a case. You will utilize the Tableau T35es write blocker, part of your SIFT Essentials kit, to obtain evidence from a hard drive using the most popular tools utilized in the field. You will learn how to utilize toolkits to obtain memory, encrypted or unencrypted hard disk images, or protected files from a computer system that is running or powered off.

Topics: Purpose of Forensics: Investigative Mindset, Focus on the Fundamentals; Evidence Fundamentals: Admissibility, Authenticity, Threats against Authenticity; Reporting and Presenting Evidence: Taking Notes, Report Writing Essentials, Best Practices for Presenting Evidence: Tableau Write Blocker Utilization, Access Data's FTK Imager, Access Data's FTK Imager Lite; Evidence Acquisition Basics; Preservation of Evidence: Chain of Custody, Evidence Handling, Evidence Integrity

408.2 Hands On: Core Windows Forensics Part I – String Search, Data Carving, and Email Forensics

You will learn how to recover deleted data from the evidence, perform string searches against it using a word list, and begin to piece together the events that shaped the case. Today's course is critical to anyone performing digital forensics to learn the most up-to-date techniques of acquiring and analyzing digital evidence. Email Forensics: Investigations involving email occur every day. However, email examinations require the investigator to pull data locally, from an email server, or even recover web-based email fragments from temporary files left by a web browser. Email has become critical in a case and the investigator will learn the critical steps needed to investigate Outlook, Exchange, Webmail, and even Lotus Notes email cases.

Topics: Recover Deleted Files: Automated Recovery, String Searches, Dirty Word Searches; Email Forensics: How Email Works, Locations, Examination of Email, Types of Email Formats; Microsoft Outlook/Outlook Express; Web-Based Mail; Microsoft Exchange; Lotus Notes; E-mail Analysis, E-mail Searching and Examination

408.3 Hands On: Core Windows Forensics Part II – Registry and USB Device Analysis

Each examiner will learn how to examine the Registry to obtain user profile data and system data. The course will also teach each forensic investigator how to show that a specific user performed key word searches, ran specific programs, opened and saved files, and list the most recent items that were used. Finally, USB Device investigations are becoming more and more a key part of performing computer forensics. We will show you how to perform in-depth USB device examinations on Windows 7, Vista, and Windows XP machines.

Topics: Registry Forensics In-Depth;Registry Basics; Core System Information; User Forensic Data; Evidence of Program Execution; Evidence of File Download; USB Device Forensic Examinations

408.4 Hands On: Core Windows Forensics Part III – Artifact and Log File Analysis

Suspects unknowingly create hundreds of files that link back to their actions on a system. Learn how to examine key files such as link files, the windows prefetch, pagefile/system memory, and more. The latter part of the section will center on examining the Windows log files and the usefulness in both simple and complex cases.

Topics: Memory, Pagefile, and Unallocated Space Analysis; Forensicating Files Containing Critical Digital Forensic Evidence; Windows Event Log Digital Forensic Analysis

408.5 Hands On: Core Windows Forensics Part IV – Web Browser Forensics

Internet Explorer and Firefox Browser Digital Forensics. Learn how to examine exactly what an individual did while surfing via their Web browser. The results will give you pause the next time you use the web.

Topics: Browser Forensics: History, Cache, Searches, Downloads, Understanding of Browser Timestamps, Internet Explorer; Firefox

408.6 Hands On: Digital Forensic Challenge and Mock Trial

Windows Vista/7 Based Digital Forensic Challenge. There has been a murder-suicide and you are the investigator assigned to process the hard drive. This day is a capstone for every artifact discussed in the class. You will use this day to solidify the skills you have learned over the past week.

Topics: Digital Forensic Case; Mock Trial

**This course is available to Forensics 408 participants only.*

SANS Certified Instructor

Chad Tilbury

Chad Tilbury has spent over ten years responding to computer intrusions and conducting forensic investigations. His extensive law enforcement and international experience stems from working with a broad cross-section of Fortune 500 corporations and government agencies around the world. During his service as a Special Agent with the Air Force Office of Special Investigations, he investigated and conducted computer forensics for a variety of crimes, including hacking, abduction, espionage, identity theft, and multi-million dollar fraud cases. He has led international forensic teams and was selected to provide computer forensic support to the United Nations Weapons Inspection Team. Chad has worked as a computer security engineer and forensic lead for a major defense contractor and more recently as the Vice President of Worldwide Internet Enforcement for the Motion Picture Association of America. In that role, he managed Internet anti-piracy operations for the seven major Hollywood studios in over sixty countries. Chad is a graduate of the U.S. Air Force Academy and holds a B.S. and M.S. in Computer Science as well as GCFA, GCIH, and CISSP certifications. He is currently a consultant specializing in incident response, E-Discovery, and computer forensics.

NEW!

FORENSICS 508

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCFA | Instructor: Rob Lee

FOR508: Advanced Computer Forensic Analysis and Incident Response

This course focuses on providing incident responders with the necessary skills to hunt down and counter a wide range of threats within enterprise networks, including economic espionage, hactivism, and financial crime syndicates. The completely updated FOR508 addresses today's incidents by providing real-life, hands-on response tactics. Don't miss the NEW FOR508!

DAY 0: A 3-letter government agency contacts you to say that critical information was stolen from a targeted attack on your organization. Don't ask how they know, but they tell you that there are several breached systems within your enterprise. You are compromised by an Advanced Persistent Threat, aka an APT – the most sophisticated threat you are likely to face in your efforts to defend your systems and data.

Over 90% of all breach victims learn of a compromise from third party notification, not from internal security teams. In most cases, adversaries have been rummaging through your network undetected for months or even years. Gather your team—it's time to go hunting.

FOR508: Advanced Computer Forensic Analysis and Incident Response will help you determine:

- **How did the breach occur?**
- **What systems were compromised?**
- **What did they take? What did they change?**
- **How do we remediate the incident?**

The updated FOR508 trains digital forensic analysts and incident response teams to identify, contain, and remediate sophisticated threats—including APT groups and financial crime syndicates. A hands-on lab—developed from a real-world targeted attack on an enterprise network—leads you through the challenges and solutions. You will identify where the initial targeted attack occurred and which systems an APT group compromised. The course will prepare you to find out which data was stolen and by whom, contain the threat, and provide your organization the capabilities to manage and counter the attack.

During a targeted attack, an organization needs the best incident responders and forensic analysts in the field. FOR508 will train you and your team to be ready to do this work.

Author Statement

"There are people smarter than you, they have more resources than you, and they are coming for you. Good luck with that." Matt Olney said when describing the Advanced Persistent Threat. He was not joking. The results over the past several years clearly indicate that hackers employed by nation states and organized crime are racking up success after success. The Advanced Persistent Threat has compromised hundreds of organizations. Organized crime utilizing botnets are exploiting ACH fraud daily. Similar groups are penetrating banks and merchants stealing credit card data daily. Fortune 500 companies are beginning to detail data breaches and hacks in their annual stockholders reports.

The enemy is getting better, bolder, and their success rate is impressive.

We can stop them. We need to field more sophisticated incident responders and digital forensic investigators. We need lethal digital forensic experts that can detect and eradicate advanced threats immediately. A properly trained incident responder could be the only defense your organization has left in place during a compromise. FOR508 is crucial training for you to become a lethal forensicator to step up to these advanced threats. The enemy is good. We are better. This course will help you become one of the best.

-Rob Lee

Digital Forensics and Incident Response
http://computer-forensics.sans.org

Who Should Attend

- Information Security Professionals
- Incident Response Team Members
- Experienced Digital Forensic Analysts
- Federal Agents and Law Enforcement
- Red Team Members, Penetration Testers, and Exploit Developers
- SANS FOR408 and SEC504 Graduates

You will receive with this course

- SIFT Workstation Virtual Machine used with many of the class hands on exercises
- F-RESPONSE TACTICAL - TACTICAL enables incident responders to access remote systems and physical memory of a remote computer via the network
- Best-selling book "File System Forensic Analysis" by Brian Carrier
- Course DVD loaded with case examples, tools, and documentation

Hands-On APT Enterprise Intrusion Lab

- Detect unknown live, dormant, and custom malware in memory across multiple windows systems in an enterprise environment
- Find malware beaconing outbound to its command and control (C2) channel via memory forensics, registry analysis, and network connection residue
- Identify how the breach occurred by identifying the beach head and spear phishing attack mechanisms
- Target anti-forensics techniques like hidden and time-stomped malware, along with utility-ware that the attackers uses to move in your network and maintain their presence
- Identify lateral movement and pivoted within your enterprise and show how attackers transition from system to system without being detected
- Track data movement as the attackers collect critical data and shift it to exfiltration systems

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508.1 Hands On: Enterprise Incident Response*

Incident responders should be armed with the latest tools, memory analysis techniques, and enterprise scanning methodologies in order to identify, track and contain advanced adversaries, and remediate incidents. Incident response and forensic analysts responding must be able to scale their examinations from the traditional one analyst per system toward one analyst per 1,000 or more systems. Enterprise scanning techniques are a now a requirement to track targeted attacks by an APT group or crime syndicate groups which propagate through thousands of systems.

Topics: SIFT Workstation Overview; Incident Response Methodology; Threat and Adversary Intelligence; Intrusion Digital Forensics Methodology; Remote and Enterprise IR System Analysis; Windows Live Incident Response

508.2 Hands On: Memory Forensics*

Critical to many IR teams detecting advanced threats in the organization, memory forensics has come a long way in just a few years. It can be extraordinarily effective at finding evidence of worms, rootkits, and advanced malware used by an APT group of attackers. While traditionally solely the domain of Windows internals experts, recent tools now make memory analysis feasible for anyone. Better interfaces, documentation, and built-in detection heuristics have greatly leveled the playing field. This section will introduce some of the newest free tools available and give you a solid foundation in adding core and advanced memory forensic skills to your incident response and forensics armory.

Topics: Memory Acquisition and Analysis; Memory Analysis Techniques with Redline; Live Memory Forensics; Advanced Memory Analysis with Volatility

508.3 Hands On: Timeline Analysis*

Timeline Analysis will change the way you approach digital forensics and incident response… forever. Learn advanced analysis techniques uncovered via timeline analysis directly from the developers that pioneered timeline analysis tradecraft. Temporal data is located everywhere on a computer system. Filesystem modified/access/creation/change times, log files, network data, registry data, and, internet history files all contain time data that can be correlated into critical analysis to successfully solve cases. New timeline analysis frameworks provide the means to conduct simultaneous examinations of a multitude of time based artifacts. Analysis that once took days now takes minutes. This section will step you through the two primary methods of creating and analyzing timelines created during advanced incidents and forensic cases.

Topics: Timeline Analysis Overview; Filesystem Timeline Creation and Analysis; Windows Time Rules (File Copies vs. File Moves); Filesystem Timeline Creation using Sleuthkit and fls; Super Timeline Creation and Analysis; Super Timeline Artifact Rules; Timeline Creation with log2timeline; Super Timeline Analysis

508.4 Hands On: Deep Dive Forensics and Anti-Forensics Detection*

A major criticism of digital forensic professionals surrounds that many tools simply require a few mouse clicks to have the tool automatically recover data for evidence. This "push button" mentality has led to inaccurate case results in the past few years in high profile cases such as the Casey Anthony Murder trial. You will stop being reliant on "push button" forensic techniques as we cover how the engines of digital forensic tools really work. To understand how to carve out data, it is best to understand how to accomplish it by-hand and show how automated tools should be able to recover the same data.

Topics: Windows XP Restore Point Analysis; VISTA , Windows 7, Server 2008 Shadow Volume Copy Analysis; Deep Dive Forensics Analysis; Data Layer Analysis; Stream-Based Data Carving; File-Based Data Carving; NTFS Filesystem Analysis; FAT/exFAT Filesystem Overview

508.5 Hands On: Intrusion Forensics – Part 1*

The adversaries are good, we must be better. Over the years, we have observed that many incident responders have a challenging time finding malware without effective indicators of compromise (IOCs) or threat intelligence gathered prior to a breach. This is especially true in APT group intrusions. This advanced session will demonstrate techniques used by first responders to discover malware or forensic artifacts when very little information exists about their capabilities or hidden locations. We will discuss techniques to help funnel possibilities down to the candidates most likely to be evil malware trying to hide on the system.

Topics: Windows XP Restore Point Analysis; VISTA , Windows 7, Server 2008 Shadow Volume Copy Analysis; Deep Dive Forensics Analysis; Data Layer Analysis; Stream-Based Data Carving; File-Based Data Carving; NTFS Filesystem Analysis; FAT/exFAT Filesystem Overview

508.5 Hands On: Computer Investigative Law For Forensic Analysts - Part 2*

Note this is a half day section. Learn to investigate incidents while minimizing the risk for legal trouble. This course is designed not for management, but for the Digital Forensic and Incident Response team leaders in charge of an investigation. The content focuses on challenges that every lead investigator needs to understand before, during, and post investigation. Since most investigations could potentially bring a case to either a criminal or civil courtroom, it is essential for you to understand how to perform a computer-based investigation legally and ethically.

Topics: Who Can Investigate and Investigative Process Laws; Evidence Acquisition/Analysis/Preservation Laws and Guidelines; Laws Investigators Should Know; Forensic Reports and Testimony

508.6 Hands On: The Incident Response & Intrusion Forensic Challenge*

This brand new exercise created in 2012 brings together some of the most exciting techniques learned earlier in the week and tests your newly acquired skills in a case that simulates an attack by an advanced adversary such as an APT. This challenge brings it all together using a simulated intrusion into a real enterprise environment consisting of multiple Windows systems. You will be asked to uncover how the systems were compromised in the initial intrusion, find other systems the adversary moved to laterally, and identify intellectual property stolen via data exfiltration. You will walk out of the course with hands-on experience investigating realistic scenarios, which were put together by a cadre of individuals with many years of experience fighting advanced threats such as an APT group.

**This course is available to Forensics 508 participants only.*

SANS Faculty Fellow

Rob Lee

Rob Lee is an entrepreneur and consultant in the Washington D.C. area and currently the Curriculum Lead and author for digital forensic and incident response training at the SANS Institute in addition to owning his own firm. Rob has more than 15 years' experience in computer forensics, vulnerability and exploit development, intrusion detection/prevention, and incident response. Rob graduated from the U.S. Air Force Academy and earned his MBA from Georgetown University. He served in the U.S. Air Force as a member of the 609th Information Warfare Squadron (IWS), the first U.S. military operational unit focused on information warfare. Later, he was a member of the Air Force Office of Special Investigations (AFOSI) where he led a team computer crime investigations and incident response. Over the next 7 years, he worked directly with a variety of government agencies in the law enforcement, U.S. Department of Defense, and intelligence communities as the technical lead for a vulnerability discovery and an exploit development team, lead for a cyber-forensics branch, and lead for a computer forensic and security software development team. Most recently, Rob was a Director for MANDIANT, a commercial firm focusing on responding to advanced adversaries such as the APT. Rob co-authored the book *Know Your Enemy*, 2nd Edition. Rob is also co-author of the MANDIANT threat intelligence report *M-Trends: The Advanced Persistent Threat*. Rob frequently contributes articles at the SANS Blog **http://computer-forensics.sans.org**.

NEW!

FORENSICS 526

Five-Day Program | Sun, March 10 - Thu, March 14, 2013 | 9:00am - 5:00pm
Laptop Required | 30 CPE/CMU Credits | Instructor: Jesse Kornblum

FOR526: Windows Memory Forensics In-Depth

FOR526 - Memory Analysis In-Depth is a critical course for any serious investigator who wishes to tackle advanced forensic and incident response cases. Memory analysis is now a crucial skill for any investigator who is analyzing intrusions.

Malware can hide, but it must run -- The malware paradox is key to understanding that while intruders are becoming more advanced with anti-forensic tactics and techniques, it is impossible to hide their footprints completely from a skilled incident responder performing memory analysis. Learn how memory analysis works through learning about memory structures and context, memory analysis methods, and the current tools used to parse system ram.

Attackers will use anti-forensic techniques to hide their tracks. They use rootkits, file wiping, timestamp adjustments, privacy cleaners, and complex malware to hide in plain sight avoiding detection by standard host-based security measures. Every action that adversaries make will leave a trace; you merely need to know where to look. Memory analysis will give you the edge that you need in order to discover advanced adversaries in your network.

FOR526 - Memory Analysis In-Depth is one of the most advanced courses in the SANS Digital Forensics and Incident Response Curriculum. This cutting edge course covers everything you need to step through memory analysis like a pro.

FIGHT CRIME. UNRAVEL INCIDENTS... ONE BYTE AT A TIME.

Author Statement

A forensic examiner is defined by their understanding of the technologies they work with. Somebody who understands what is happening under the hood will have an inherent advantage over somebody who does not. Peeking at the underlying data, poking at them manually, and coming to understand what they represent, is what this course is all about. Afterward, there are tools and methods which can automate many of these processes. But the results of those methods are useless if the examiner doesn't understand what they represent. This class will encourage you to try things out and ask questions. The classroom environment is for learning. If you get everything right the first time, you haven't learned anything! Here you will learn by doing, not listening. Memory analysis is the latest frontier in our field and presents opportunities we have not seen in some time. Taking this class is a great way to get started in this exciting new domain. The technologies involved will unlock some valuable doors. We haven't reached the limits of memory analysis by a long shot. In the near future there will be more advanced techniques and available data. It's important to build a strong foundation now!

-- Jesse Kornblum

Who Should Attend

- Incident Response Team Members
- Law Enforcement Officers
- Forensic Examiners
- Malware Analysts
- Information Technology Professionals
- System Administrators
- And anybody who plays a part in the acquisition, preservation,forensics, or analysis of Microsoft Windows computers.

This course will prepare you to:

- Preserve and acquire the memory of Windows systems
- Conduct brute-force searches for valuable artifacts such as full-contentnetwork data and encryption keys
- Identify suspicious behavior on Windows system without any priorknowledge of its nature
- Recover and investigate programs and drivers to determine their truenature
- Begin a detailed analysis of what the machine was truly doing

"SANS sets the bar for providing forensics courses that provide you with the many ways to obtain, preserve and present evidence."

-Eveen Thomas, Intel Corp.

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526.1 Hands On: Unstructured Memory*

Memory forensics is the study of operating systems, and operating systems, in turn, work extensively with the processor and its architecture. Before we can begin a meaningful analysis of the operating system, we must therefore understand how the underlying components work and fit together. This section explains a number of technologies that are used in modern computers and how they have evolved to where they are today. Computer memory is a fantastic resource for the forensic investigator even without considering any operating system structures. There are data in memory that are simply not found anywhere else. Without even knowing which operating system was being used, an examiner can glean information that could be critical to a case. These data are generated by the underlying architecture or standards outside of the operating system. In particular, we focus on encryption keys and network packets. These two resources are not part of traditional forensics, but can provide invaluable data to the memory forensics investigator! While conducting brute force searches for these structures, we are also starting to gather data for examining the operating system later on. Unlike disk forensics, there is no volume header to parse in memory. Instead, we must find values created by the operating system by searching for them manually. There are a number of structures that we can search for which will help us determine what operating system was being used, and the values particular to this execution.

Topics: Computer Architectures; Virtual Memory Models; Implementing the Virtual Memory Model; Process Memory; System Memory; BIOS Keyboard Buffer; Encryption Keys; Network Packets; Traditional Data; Preparing for Structured Analysis; The SIFT Workstation; Pool Memory; Walking vs. Scanning

526.2 Hands On: User Visible Structures*

Most users are familiar with processes on a Windows system, but not necessarily with how they work under the hood. In this section, we will talk about the operating system components that make up a process, how they fit together, and how they can be exploited by malicious software. We will start with the basics of each process, how it was started, where the executable lives, and what command line options were used. Next will be the Dynamic Link Libraries (DLLs) used by a program and how they are found and loaded by the operating system. Finally, we will talk about the operating system structures involved with threads, the actual blocks of executing code that make up the interactive portion of every process.

Topics: Processes; Dynamic-link Libraries (DLLs); Drivers; Sockets; Kernel Objects; Threads

526.3 Hands On: Operating System Internals*

There are a tremendous number of structures used in Microsoft Windows. To understand what the operating system is doing, we have to understand these components. In this section we will begin to explore the complex web of interconnected data structures which make up the operating system. To that end we start with a basic introduction to C structures and how they are put together. From there we talk about which of them are used in Windows and the documentation Microsoft publishes about them. In this section we will explore, in-depth, all of the components which constitute Microsoft Windows operating systems. We will start with processes and all of the data they contain. From there we will discuss DLLs, drivers, sockets, kernel objects, threads, modules, and virtual address descriptors. For each of these areas we will talk about how these systems work, what data the operating system maintains, which of those are relevant for forensics, and how to determine if there is something suspicious occurring.

Topics: Introduction to C Structures; Microsoft Structures; Tools for Structures; Modules; Injected and Unpacked Code; Finding hidden DLLs; Finding Hidden Processes; Driver Hooking

526.4 Hands On: Memory Forensics in the Real World*

Knowing the basics of memory forensics allows us to begin doing it in the real world. First, we must acquire memory images. On any given system there may already be memory images, from the machine's past, which contain highly valuable information. In this section we will discuss how to find and recover such memory images. We'll also cover some of the tools to capture memory images and how to choose the one which is best for you.

Topics: The Windows Registry; Hibernation Files; Crash Dump Files; Memory Imaging; Traditional Imaging Programs; Suspended Virtual Machine; USB; Firewire; Cold Boot Method

526.5 Hands On: Capstone Investigation*

This section will present a number of challenges for the memory forensic examiner. We do not want to spoil all of the surprises by listing them in the outline, but we can give you a sense of what you will be working on. These memory images may contain some kind of malicious software or data of interest. Each challenge will provide a little information to go on. (As with real-world examinations, of course, it's never enough information!) Your job will be to determine if there is anything of interest, and if so, what it is.

**This course is available to Forensics 526 participants only.*

SANS Instructor

Jesse Kornblum

Jesse Kornblum is a Computer Forensics Research Guru for the Kyrus Corporation. Based in the Washington, D.C. area, his research focuses on computer forensics and computer security. He has helped pioneer the field of memory analysis and authored a number of computer forensics tools including the md5deep suite of hashing programs and the ssdeep system for fuzzy hashing similar files. A graduate of the Massachusetts Institute of Technology, Mr. Kornblum previously served as a computer crime investigator for the Air Force and with the Department of Justice.

Five-Day Program | Sun, March 10 - Thu, March 14, 2013 | 9:00am - 6:30pm (Day 1) | 9:00am - 5:00pm (Days 2-5)
Laptop Required | 31 CPE/CMU Credits | Instructor: Jonathan Ham

FOR558: Network Forensics

Enterprises all over the globe are compromised remotely by malicious hackers each day. Credit card numbers, proprietary information, account usernames and passwords, and a wealth of other valuable data are surreptitiously transferred across the network. Insider attacks leverage cutting-edge covert tunneling techniques to export data from highly secured environments. Attackers' fingerprints remain throughout the network, in firewall logs, IDS/IPS, web proxies, traffic captures, and more.

Forensics 558: Network Forensics will teach you to how to follow the attacker's footprints and analyze evidence from the network environment. Every student will receive a VMware SNIFT Virtualized Workstation, which is a fully-loaded, portable forensics virtual workstation, designed by network forensics experts and distributed exclusively to Forensics 558: Network Forensics students.

We will begin by diving right into covert tunnel analysis, DHCP log examination, and sniffing traffic. By day two, you'll be extracting tunneled flow data from DNS NULL records and extracting evidence from firewall logs. On day three, we analyze Snort captures and the web proxy cache. You'll carve out cached web pages and images from the Squid web proxy.

For the last two days, you'll be part of a live hands-on investigation. Working in teams, you'll use network forensics to solve a crime and present your case.

During hands-on exercises, we will use tools such as tcpdump, Snort, ngrep, tcpxtract, and Wireshark to understand attacks and trace suspect activity. Each student will be given a virtual network to analyze, and will have the opportunity to conduct forensic analysis on a variety of devices.

Underlying all of our forensic procedures is a solid forensic methodology. This course complements Forensic and Investigative Essentials (508), using the same fundamental methodology to recover and analyze evidence from network-based devices.

Author Statement

Traditionally, computer forensics has focused on file recovery and filesystem analysis performed against system internals or seized storage devices. However, the hard drive is only a small piece of the story. These days, evidence almost always traverses the network and sometimes is never stored on a hard drive at all.

With network forensics, the entire contents of e-mails, IM conversations, Web surfing activities, and file transfers can be recovered from network equipment and reconstructed to reveal the original transaction. The payload inside the packet at the highest layer may end up on disc, but the envelope that got it there is only captured in the network traffic. The network protocol data that surrounded each conversation is often extremely valuable to the investigator. Network forensics enables investigators to piece together a more complete picture using evidence from the entire network environment.

Who Should Attend

- Incident Response Team Members who are responding to complex security incidents/intrusions and need to utilize network forensics to help solve their cases
- Network and Computer Forensic professionals who want to solidify and expand their understanding of network forensic and incident response related topics
- Law enforcement officers, federal agents, or detectives who want to master network forensics and expand their investigative skill set to include packet captures, IDS/IPS analysis, web proxies, covert channels, and a variety of network-based evidence.
- Information security professionals with some background in hacker exploits, penetration testing, and incident response
- Networking professionals who would like to branch out into forensics in order to understand information security implications and work on investigations
- Anyone with a firm technical background who might be asked to investigate a data breach incident, intrusion case, or investigates individuals that are considered technical savvy

No Hard Drive? No Problem!

A hard drive is just a small part of the picture. Even if an attacker is smart enough to clean up tracks on the victim system, remnants remain in firewall logs, web proxy caches, and other sources. Forensics 558: Network Forensics, you'll learn to track attackers through the network and leverage network evidence to build a strong case.

"If you conduct forensic investigations, this course is very valuable to solve the full puzzle."

-Jibran Ilyas, Trustware

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558.1 Hands On: Covert Tunnels*

On the first morning, we'll investigate a rogue system administrator. His colleagues suspect he may be abusing his privileges. There doesn't seem to be any web surfing activity at all associated with his computers. What could he be up to? To solve the case, we embark together on an extensive analysis of DHCP logs, wireless traffic captures, tcpdump using BPF filters, Wireshark, and the DNS protocol. Along the way, we'll learn about DNS tunneling using iodine, methods of passive evidence acquisition, network taps, hubs, switches, and port mirroring. We'll also use tools, such as ngrep, tcpxtract, and hex editors, to extract the data we need. Underlying all of our forensic procedures is a solid forensic methodology, which includes verification, acquisition, timeline creation, evidence recovery, and reconstruction.

Topics: Case Study: Data Tunneling; The OSI Model for Network Analysis; DHCP & MAC Address Analysis; Passive Evidence Acquisition; Network Evidence Extraction & Analysis

558.2 Hands On: Deep Packet Analysis*

We'll begin with covert ICMP and DNS tunnels. You'll extract tunneled TCP and IP packets from DNS NULL records and use active evidence collection methods to uncover the rogue system administrator's secret plot! By the afternoon we'll conduct hands-on active evidence acquisition. You'll inspect router ARP tables and firewall logs. Volatility and collection methods vary depending on configuration, manufacturer, and the environment. We'll also cover ways that investigators can compensate for less-than-ideal network environments, using publicly available forensic evidence acquisition tools.

Topics: Data Tunneling In-Depth; A Formal Network-Based Investigative Methodology; Active and Interactive Evidence Acquisition

558.3 Hands On: Firewalls, IDS, Proxies, and Data Reconstruction*

Active evidence acquisition is the focus of day three. We'll analyze IDS/IPS, central logging servers, and web proxies such as Squid, during hands-on exercises throughout the day. By the end of day three, students will be using hex editors to carve cached evidence out of web proxies and reconstruct web surfing histories using only the central web proxy logs.

Topics: Network Log Analysis In-Depth; Network Intrusion Detection & Analysis with Snort; Web Proxies, Encryption, & SSL Interception

558.4 Hands On: Network Forensics Unplugged*

At the beginning of the day, we will discuss wireless access point investigations and then learn about techniques for presenting digital evidence in court. After lunch we will begin our Capstone Case Study in which students will work as investigative teams, presented with a realistic scenario and a virtual network. You will identify sources of evidence, collect the evidence, reconstruct content, solve the crime, and present your analysis in "court."

Topics: Wireless Access Point Investigations; Digital Evidence Court Primer; Capstone Case Study: Investigate a Crime and Present the Evidence

558.5 Hands On: Capstone Investigation*

Working in investigative teams, students will use forensic analysis tools to build a coherent picture of the crime. We will investigate by carving files out of raw network traffic and extracting sensitive data hidden in ICMP payloads. We will trace the attack to its source by correlating activity with firewall logs, central server logs, IDS logs, and other network-based evidence. Finally, we will identify one of our suspects by reconstructing cached web content, analyzing DHCP logs, and implementing passive OS fingerprinting techniques. After using this evidence to build a solid case, we will develop a cohesive picture of the crime and discuss techniques for presenting supporting evidence in deposition.

Topics: Capstone Case Study: Investigate a Crime and Present the Evidence, cont.; Trace the Attack to its Source by Correlating: Firewall Logs, Central OS Logs, IDS Logs, and more; Reconstruct Web Histories and Cached Web Content; Analyze DHCP Logs; Fingerprint a Suspect's Computer; Identify the Suspect using Network-based Evidence; Build a Case and Discuss Techniques for Presenting in Court

**This course is available to Forensics 558 participants only.*

SANS Certified Instructor

Jonathan Ham

Jonathan is an independent consultant who specializes in large-scale enterprise security issues, from policy and procedure, through staffing and training, to scalable prevention, detection, and response technology and techniques. With a keen understanding of ROI and TCO (and an emphasis on process over products), he has helped his clients achieve greater success for over 12 years, advising in both the public and private sectors, from small upstarts to the Fortune 500. He's been commissioned to teach NCIS investigators how to use Snort, performed packet analysis from a facility more than 2000 feet underground, and chartered and trained the CIRT for one of the largest U.S. civilian Federal agencies. He currently holds the CISSP, GSEC, GCIA, and GCIH certifications, and is a member of the GIAC Advisory Board. A former combat medic, Jonathan still spends some of his time practicing a different kind of emergency response, volunteering and teaching for both the National Ski Patrol and the American Red Cross.

Five-Day Program | Sun, March 10 - Thu, March 14, 2013 | 9:00am - 5:00pm
Laptop Required | 30 CPE/CMU Credits | Instructor: Heather Mahalik & Terrance Maguire

FOR563: Mobile Device Forensics

Mobile device forensics is a rapidly evolving field, creating exciting opportunities for practitioners in corporate, criminal, and military settings. Designed for students who are both new to and already familiar with mobile device forensics, this hands-on course provides the core knowledge and skills that a Digital Forensic Investigator needs to process cell phones, PDAs, and other mobile devices. Using state-of-the art tools, you will learn how to forensically preserve, acquire and examine data stored on mobile devices and utilize the results for internal investigations or in civil/criminal litigation. This course covers techniques and tools in the context of an overall forensic methodology, providing you with the ability to obtain and utilize digital evidence on mobile devices. In addition, by teaching lessons learned from years of experience, we will help you handle common challenges in the field.

With the increasing prevalence of mobile devices, Digital Forensic Investigators are encountering them in a wide variety of cases. Investigators within organizations can find stolen data and incriminating communications on devices used by rogue employees. In civil and criminal cases, investigators can extract useful evidence from mobile devices, can get a clearer sense of which individuals were in cahoots, and can even show the location of key suspects at times of interest. IT auditors, managers, and lawyers all need to understand the vast potential of mobile device forensics. Because mobile devices can contain details about who was doing what, where and when, their usefulness as a source of information in an investigation should never be underestimated.

Author Statement

Mobile devices are becoming ubiquitous, delivering powerful technology into our pockets, keeping us connected wherever we are. Individuals store personal data on their PDAs, parents use GPS enabled devices to track their children, hospitals use handhelds to access medical data and support patient care, and companies give each employee a Blackberry to support their business. Being so closely tied to an individual's daily movements and activities, these portable devices are creating new security risks while providing valuable sources of evidence.

Corporate spies and data thieves have been caught using their mobile devices. Organized criminal groups have been infiltrated and unraveled through their use of mobile devices. A killer's mobile device showed his whereabouts at the time of the crime, and inadvertently recorded the sounds of his brutal acts. Sex offenders have video taped their crimes using mobile devices. Terrorists have been tracked down using traces of data recovered from cell phones attached to improvised explosive devices. Mobile devices have helped rescue kidnap victims before they came to harm. Many vice officers and courts consider mobile devices as an integral part of drug trafficking and dealing.

Using the proper methodology and tools, you can extract useful evidence from mobile devices and obtain records from network service providers to help avert an attack, further an investigation, or solve a crime.

-Eoghan Casey

Throughout this course, we provide practical, hands-on exercises to give you ample opportunities to explore mobile devices and the data they contain.

Who Should Attend

- Information security professionals
- Law enforcement officers, federal agents, or detectives
- Media exploitation analysts
- Information security managers
- Information technology lawyers and paralegals
- Anyone interested in mobile device forensics
- Information technology auditors

"Awesome course covering all phones and forensics techniques!"

-Benjamin Arnault, HSC

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563.1 Hands On: Fundamentals of Mobile Device Forensics*

Review of technology from a forensic perspective, forensic handling of mobile devices, and forensic acquisition and analysis methods and techniques. Hands-on introduction to leading mobile device forensic tools, including Cellebrite and XRY. Perform logical acquisitions, physical acquisitions and manual examination of mobile devices. Understand about the types of evidence on mobile devices and how to interpret the various data formats. Learn about the strengths and limitations of mobile device forensic tools, and how to overcome in-field challenges.

Topics: Mobile Network Investigations; Mobile Device Forensics; Forensic Handling of Mobile Devices; Forensic Documentation; Interacting with Mobile Devices; Hands-on Exercises

563.2 Hands On: Cell Phone Forensics & SIM Card Examination*

Perform forensic acquisition and examination of SIM cards. Use mobile forensic tools, including BitPim, to acquire and analyze data from a variety of CDMA and GSM devices, including Motorola, Samsung and LG. Recover deleted data by delving into memory contents and extracting data structures on mobile devices. Compare forensic acquisition tools and validate completeness and accuracy of results.

Topics: Accessing Mobile Devices; Mobile Device Operating Systems; Mobile Device File Systems; Forensic Processing of SIM Cards; Forensic Examination of Data; Hands-on Exercises

563.3 Hands On: iOS and Android Forensics*

Smart phones are becoming more widely used and can be a valuable source of evidence in a variety of investigations. These portable devices can contain details about an individual's communications, contacts, calendar, online activities, and whereabouts at specific times. The third day of the course covers current effective practices for acquiring and examining data on iPhone/iPad, Android and Windows Mobile devices using both commercial and open source tools.

Topics: Forensic Acquisition Tools for Mobile Devices; Forensic Examination of Logical Data; Forensic Analysis of Internet Activities on Mobile Devices; Forensic Reconstruction of Activities on Mobile Devices; Hands-on Exercises

563.4 Hands On: Windows Mobile, Blackberry, Nokia, and Forensics*

Apply forensic principles and tools to Blackberry and Nokia systems. Hands-on exploration of Blackberry and Nokia devices and data storage using various utilities and forensic tools. Perform logical and physical acquisitions and examinations of Nokia devices, including the use of Flasher boxes.

Topics: Forensic Acquisition of Physical Memory; Forensic Acquisition of Using Flasher Boxes; Forensic Examination of Physical Memory; Hands-on Exercises

563.5 Hands On: GPS Forensics and Mobile Device Forensic Challenge*

Forensic acquisition and examination of GPS navigation devices, including location information saved on smart phones and EXIF data in multi-media files. Familiarization with other forensic acquisition and analysis techniques. Putting the pieces of a case together and presenting results in reports and testimony. A realistic hands-on investigative scenario bringing together lessons and techniques learned throughout the course.

Topics: Advanced Mobile Device Forensics Overview; Bringing It All Together; The Mobile Device Forensic Challenge; Hands-on Exercise

**This course is available to Forensics 563 participants only.*

SANS Certified Instructor

Heather Mahalik

Heather Mahalik is a senior digital forensics analyst at Basis Technology. As the on-site team lead, she uses her experience to manage the cell phone exploitation team and supports media and cell phone forensics efforts in the US government. Heather has worked in digital forensics for almost ten years and has performed thousands of forensic acquisitions and examinations on hard drives, e-mail and file servers, mobile devices, and portable media. Previously, Heather worked as a forensic examiner for Stroz Friedberg and the U.S. State Department Computer Investigations and Forensics Lab, where she focused her efforts on high profiles cases. She has authored papers, presented at leading conferences, and instructed classes focused on Mac forensics, mobile device forensics, and computer forensics to practitioners in the field. Heather's background is based on media forensics, and she currently specializes in BlackBerry, Nokia, knock-off, and iOS Forensics.

SANS Certified Instructor

Terrance Maguire

Terrance Maguire is a partner at cmdLabs. He has nearly twenty years of experience in physical and digital forensic investigations, has developed and led training programs in varied areas of law enforcement and digital evidence, and has experience implementing counterintelligence intrusion detection programs. His prior experience includes serving as a senior-level forensic computer analyst for the U.S. State Department. As a cyber operations specialist for the Department of Defense, he implemented network surveillance, network packet analysis, wireless surveys, and intrusion detection. In addition, at the Defense Computer Investigations Training Program (DCITP), Terrance developed and presented a broad range of instruction to federal law enforcement in the area of cybercrime. He served as a forensic detective with the Chesterfield County Police Department in Virginia. Subsequently, as a forensic scientist for the Virginia Division of Forensic Science, he conducted bloodstain pattern analysis in criminal cases and testified in court as an expert witness and he was the principal instructor at the Virginia Forensic Science Academy. He is a professorial lecturer at the George Washington University where he teaches graduate-level courses focusing on incident response and computer intrusion investigations involving network-based attacks.

Five-Day Program | Sun, March 10 - Thu, March 14, 2013 | 9:00am - 5:00pm
Laptop Required | 30 CPE/CMU Credits | GIAC Cert: GREM | Instructor: Lenny Zeltser

FOR610: Reverse-Engineering Malware: Malware Analysis Tools & Techniques

This popular malware analysis course has helped forensic investigators, malware specialists, incident responders, and IT administrators assess malware threats. The course teaches a practical approach to examining malicious programs-spyware, bots, trojans, etc.-that target or run on Microsoft Windows. This training also looks at reversing Web-based malware, such as JavaScript and Flash files, as well as malicious document files. By the end of the course, you'll learn how to reverse-engineer malicious software using a variety of system and network monitoring utilities, a disassembler, a debugger, and other tools for turning malware inside-out!

The malware analysis process taught in this class helps incident responders assess the severity and repercussions of a situation that involves malicious software. It also assists in determining how to contain the incident and plan recovery steps. Forensics investigators also learn how to understand key characteristics of malware present on compromised systems, including how to establish indicators of compromise (IOCs) for scoping and containing the intrusion.

A Methodical Approach to Reverse-Engineering

The course begins by covering fundamental aspects of malware analysis. You'll learn how to set up an inexpensive and flexible laboratory for understanding the inner-workings of malicious software and will understand how to use the lab for exploring characteristics of real-world malware. Then you'll learn to examine the program's behavioral patterns and code. Afterwards, you'll experiment with reverse-engineering compiled Windows executables and browser-based malware.

The course continues by discussing essential x86 assembly language concepts. You'll examine malicious code to understand the program's key components and execution flow. Additionally, you'll learn to identify common malware characteristics by looking at Windows API patterns and will examine excerpts from bots, rootkits, keyloggers, and downloaders. You'll understand how to work with PE headers and handle DLL interactions. Furthermore, you'll learn tools and techniques for bypassing anti-analysis capabilities of armored malware, experimenting with packed executables and obfuscated browser scripts.

Towards the end of the course, you'll learn to analyze malicious document files that take the form of Microsoft Office and Adobe PDF documents. Such documents act as a common infection vector and need to be understood by enterprises concerned about both large-scale and targeted attacks. The course also explores memory forensics approaches to examining rootkits. Memory-based analysis techniques also help understand the context of an incident involving malicious software.

Hands-On Training for Malware Analysis and Reversing

Hands-on workshop exercises are a critical aspect of this course and allow you to apply reverse-engineering techniques by examining malware in a controlled environment. When performing the exercises, you'll study the supplied specimen's behavioral patterns and examine key portions of its code. You'll examine malware on a Windows virtual machine that you'll infect during the course and will use the supplied Linux virtual machine (REMnux) that includes tools for examining and interacting with malware.

Complexity of the Course: Formalizing and Expanding Your Malware Analysis Skills

While the field of reverse-engineering malware is in itself advanced, the course begins by covering this topic from an introductory level and quickly progresses to discuss malware analysis tools and techniques of intermediate complexity.

Neither programming experience nor the knowledge of assembly is required to benefit from the course. However, you should have a general idea about core programming concepts, such as variables, loops, and functions. The course spends some time discussing essential aspects of x86 assembly to allow malware analysts navigate through malicious executables using a debugger and a disassembler.

Digital Forensics and Incident Response
http://computer-forensics.sans.org

Who Should Attend

- Individuals who found this course particularly useful often had responsibilities in the areas of incident response, forensic investigation, Windows security, and system administration.
- You'll benefit from this course if you deal with incidents involving malware and would like to learn how to understand key aspects of malicious programs.
- The majority of course participants have a strong understanding of core systems and networking concepts and have had a limited exposure to programming and assembly concepts.
- Some individuals who attended the course have experimented with aspects of malware analysis prior to the course and were looking to formalize and expand their malware forensics expertise.

"It covered material at a very in-depth level, increasing the likelihood that anything you find in the wild, you will have seen."

-Randy Larkin, Lockheed Martin

www.giac.org **www.sans.edu**

610.1 Hands On: Malware Analysis Fundamentals*

Day one lays the groundwork for the course by presenting the key tools and techniques malware analysts use to examine malicious programs. You will learn how to save time by exploring malware in two phases. Behavioral analysis focuses on the specimen's interactions with its environment, such as the registry, the network, and the file system; code analysis focuses on the specimen's code and makes use of a disassembler and a debugger. You will learn how to build a flexible laboratory to perform such analysis in a controlled manner and will set up such a lab on your laptop. Also, we will jointly analyze a malware sample to reinforce the concepts and tools discussed throughout the day.

610.2 Hands On: Additional Malware Analysis Approaches*

Day two builds upon the fundamentals introduced earlier in the course, and discusses techniques for uncovering additional aspects of the malicious program's functionality. You will learn about packers and the analysis approaches that may help bypass their defenses. You will also learn how to patch malicious executables to change their functionality during the analysis without recompiling them. You will also understand how to redirect network traffic in the lab to better interact with malware, such as bots and worms, to understand their capabilities. You will also experiment with the essential tools and techniques for analyzing web-based malware, such as malicious browser scripts and Flash programs.

610.3 Hands On: Malicious Code Analysis*

Day three focuses on examining malicious executables at the assembly level. You will discover approaches for studying inner-workings of a specimen by looking at it through a disassembler and, at times, with the help of a debugger. The day begins with an overview of key code reversing concepts and presents a primer on essential x86 assembly concepts, such as instructions, function calls, variables, and jumps. You will also learn how to examine common assembly constructs, such as functions, loops, and conditional statements. The second half of the day discusses how malware implements common characteristics, such as keylogging, packet spoofing, and DLL injection, at the assembly level. You will learn how to recognize such characteristics in malicious Windows executables.

610.4 Hands On: Self-Defending Malware*

Day four begins by covering several techniques malware authors commonly employ to protect malicious software from being analyzed, often with the help of packers. You will learn how to bypass analysis defenses, such as structured error handling for execution flow, PE header corruption, fake memory breakpoints, tool detection, integrity checks, and timing controls. It's a lot of fun! As with the other topics covered throughout the course, you will be able to experiment with such techniques during hands-on exercises. The course completes by revising the topic of web-based malware, showing additional tools and approaches for analyzing more complex malicious scripts written in VBScript and JavaScript.

610.5 Hands On: Malicious Documents and Memory Forensics*

Day five represents the latest addition to the FOR610 course, discussing the more recent malware reverse-engineering approaches adopted by malware analysts. The topics covered during this day include analyzing malicious Microsoft Office and Adobe PDF document files. Exercises that demonstrate these techniques make use of tools, such as OfficeMalScanner, Offvis, PDF-parser, and PDF StructAzer. Another major topic covered during this day is the reversing of malicious Win32 executables using memory forensics techniques. This topic is explored with the help of tools, such as Volatility, malfind, moddump, and others, and brings us deeper into the world of user- and kernel-mode rootkits.

**This course is available to Forensics 610 participants only.*

REM course on YouTube
http://www.youtube.com/watch?v=5AFdZ0v23YA

SANS Senior Instructor

Lenny Zeltser

Lenny Zeltser is a seasoned IT professional with a strong background in information security and business management. As a director at Radiant Systems (now part of NCR Corporation), he focuses on safeguarding IT environments of small and midsize businesses worldwide. Before Radiant, he led an enterprise security consulting team at a major IT hosting provider. Lenny's most recent work has focused on malware defenses and cloud-based services. He teaches how to analyze and combat malware at the SANS Institute, where he is a senior faculty member. He also participates as a member of the board of directors at the SANS Technology Institute and volunteers as an incident handler at the Internet Storm Center. Lenny frequently speaks on security and related business topics at conferences and industry events, writes articles, and has co-authored books on forensics, network security, and malicious software. He is one of the few individuals in the world who have earned the highly-regarded GIAC Security Expert (GSE) designation. Lenny has an MBA degree from MIT Sloan and a computer science degree from the University of Pennsylvania. Lenny writes at blog.zeltser.com and twitter.com/lennyzeltser. More details about his projects are at www.zeltser.com.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013
9:00am - 7:00pm (Day 1) | 8:00am - 7:00pm (Days 2-5) | 8:00am - 5:00pm (Day 6)
46 CPE/CMU Credits | GIAC Cert: GISP | Instructor: Eric Conrad

MGT414: SANS® +S™ Training Program for the CISSP® Certification Exam

The SANS® +S™ Training Program for the CISSP® Certification Exam will cover the security concepts needed to pass the CISSP® exam. This is an accelerated review course that assumes the student has a basic understanding of networks and operating systems and focuses solely on the 10 domains of knowledge of the CISSP®:

Domain 1: Access Controls
Domain 2: Telecommunications and Network Security
Domain 3: Information Security Governance & Risk Management
Domain 4: Software Development Security
Domain 5: Cryptography
Domain 6: Security Architecture and Design
Domain 7: Security Operations
Domain 8: Business Continuity and Disaster Recovery Planning
Domain 9: Legal, Regulations, Investigations and Compliance
Domain 10: Physical (Environmental) Security

Each domain of knowledge is dissected into its critical components. Every component is discussed in terms of its relationship to other components and other areas of network security. After completion of the course, the student will have a good working knowledge of the 10 domains of knowledge and, with proper preparation, be ready to take and pass the CISSP® exam.

Obtaining your CISSP® certification consists of:

- **Fulfilling minimum requirements for professional work experience**
- **Completing the Candidate Agreement**
- **Review of Resume**
- **Passing the CISSP® 250 multiple-choice question exam with a scaled score of 700 points or greater**
- **Submitting a properly completed and executed Endorsement Form**
- **Period Audit of CPEs to maintain the credential**

"If you're serious about taking a CISSP certification, this is definitely something you need to consider taking. You can't go wrong with Eric Conrad!"

-Roubart Capcap, California Lottery

Author Statement

The CISSP® certification has been around for almost ten years and covers security from a 30,000 foot view. CISSP® covers a lot of theoretical information that is critical for a security professional to understand. However, this material can be dry and since most students do not see the direct applicability to their jobs, they find it boring. The goal of this course is to bring the CISSP® 10 domains of knowledge to life. By explaining important topics with stories, examples, and case studies, the practical workings of this information can be discovered. I challenge you to attend the SANS CISSP® training course and find the exciting aspect of the ten domains of knowledge. -Dr. Eric Cole

Who Should Attend

- Security professionals who are interested in understanding the concepts covered in the CISSP® exam as determined by $(ISC)^2$
- Managers who want to understand the critical areas of network security
- System, security, and network administrators who want to understand the pragmatic applications of the CISSP® 10 Domains
- Security professionals and managers looking for practical ways the 10 domains of knowledge can be applied to the current job
- In short, if you desire a CISSP® or your job requires it, MGT414 is the training for you to get GISP certified. Reinforce what you learned in training and prove your skills and knowledge with a GISP certification.

You Will Receive With This Course:

Free "CISSP® Study Guide" by Eric Conrad, Seth Misenar, and Joshua Feldman.

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast.
More info on page 65.

www.giac.org

DoD 8570 Required
www.sans.org/8570

414.1 Introduction and Access Control*

Learn the specific requirements needed to obtain the CISSP® certification. General security principles needed in order to understand the 10 domains of knowledge are covered in detail with specific examples in each area. The first of 10 domains, Access Control is discussed using real-world scenarios to illustrate the critical points. Access control which includes AAA (authentication, authorization and accountability) will be covered with an emphasis on controlling access to critical systems.

Topics: Overview of Certification; Description of the 10 Domains: Introductory Material; Domain 1: Access Controls

414.2 Telecommunications and Network Security*

Understanding network communications is critical to building a solid foundation for network security. All aspects of network security will be examined to include routing, switches, key protocols and how they can be properly protected on the network. The telecommunications domain covers all aspects of communication and what is required to provide an infrastructure that has embedded security.

Topics: Domain 2: Telecommunications and Network Security

414.3 Information Security Governance & Risk Management and Software Development Security*

In order to secure an organization, it is important to understand the critical components of network security and issues that are needed in order to manage security in an enterprise. Security is all about mitigating risk to an organization. The core areas and methods of calculating risk will be discussed. In order to secure an application it is important to understand system engineering principles and techniques. Software development life cycles are examined, including examples of what types of projects are suited for different life cycles.

Topics: Domain 3: Information Security Governance & Risk Management; Domain 4: Software Development Security

414.4 Cryptography and Security Architecture & Design*

Cryptography plays a critical role in the protection of information. Examples showing the correct and incorrect ways to deploy cryptography, and common mistakes made, will be presented. The three types of crypto systems are examined to show how they work together to accomplish the goals of crypto. A computer consists of both hardware and software. Understanding the components of the hardware, how they interoperate with each other and the software, is critical in order to implement proper security measures. We examine the different hardware components and how they interact to make a functioning computer.

Topics: Domain 5: Cryptography; Domain 6: Security Architecture and Design

414.5 Security Operations and Business Continuity & Disaster Recovery Planning*

Non-technical aspects of security are just as critical as technical aspects. Security operations security focuses on the legal and managerial aspects of security and covers components such as background checks and non-disclosure agreements, which can eliminate problems from occurring down the road. Business continuity planning is examined, comparing the differences between BCP and DRP. A life cycle model for BCP/DRP is covered giving scenarios of how each step should be developed.

Topics: Domain 7: Security Operations; Domain 8: Business Continuity and Disaster Recovery Planning

414.6 Legal, Regulations, Investigations and Compliance & Physical (Environmental) Security*

If you work in network security, understanding the law is critical during incident responses and investigations. The common types of laws are examined, showing how critical ethics are during any type of investigation. If you do not have proper physical security, it doesn't matter how good your network security is; someone can still obtain access to sensitive information. In this section various aspects and controls of physical security are discussed.

Topics: Domain 9: Legal, Regulations, Investigations and Compliance; Domain 10: Physical (Environmental) Security

**This course is available to Management 414 participants only.*

SANS Cerified Instructor

Eric Conrad

Certified SANS instructor Eric Conrad is lead author of the book The CISSP Study Guide. Eric's career began in 1991 as a UNIX systems administrator for a small oceanographic communications company. He gained information security experience in a variety of industries, including research, education, power, Internet, and health care. He is now president of Backshore Communications, a company focusing on intrusion detection, incident handling, information warfare, and penetration testing. He is a graduate of the SANS Technology Institute with a master of science degree in information security engineering. In addition to the CISSP, he holds the prestigious GIAC Security Expert (GSE) certification as well as the GIAC GPEN, GCIH, GCIA, GCFA, GAWN, and GSEC certifications. Eric also blogs about information security at www.ericconrad.com.

Five-Day Program | Mon, March 11 - Fri, March 15, 2013 | 9:00am - 6:00pm (Days 1-4) | 9:00am - 4:00pm (Day 5)
Laptop Not Needed | 33 CPE/CMU Credits | GIAC Cert: GSLC | Instructor: G. Mark Hardy

MGT512: SANS Security Leadership Essentials For Managers with Knowledge Compression™

This completely updated course is designed to empower advancing managers who want to get up to speed quickly on information security issues and terminology. You won't just learn about security, you will learn how to manage security. Lecture sections are intense; the most common student comment is that it's like drinking from a fire hose. The diligent manager will learn vital, up-to-date knowledge and skills required to supervise the security component of any information technology project. Additionally, the course has been engineered to incorporate the NIST Special Publication 800 (series) guidance so that it can be particularly useful to US government managers and supporting contractors.

Essential security topics covered in this management track include: network fundamentals and applications, power, cooling and safety, architectural approaches to defense in depth, cyber attacks, vulnerability assessment and management, security policies, contingency and continuity planning, awareness management, risk management analysis, incident handling, Web application security, offensive and defensive information warfare, culminating with our management practicum. The material uses Knowledge Compression™, special charts, and other proprietary SANS techniques to help convey the key points of critical slides and keep the information flow rate at a pace senior executives demand every teaching hour of the course. The course has been evaluated and approved by CompTIA's CAQC program for Security + 2008 to ensure that managers and their direct reports have a common baseline for security terminology and concepts. You will be able to put what you learn into practice the day you get back into the office.

Author Statement

When SANS designed the Security Leadership for Managers course, we chose to emulate the format utilized by many executive MBA programs. While core source material is derived from our highly regarded SANS Security Essentials program, we decided to focus this program on the big picture of securing the enterprise: network fundamentals, security technologies, using cryptography, defense-in-depth, policy development, and management practicum. This course includes executive briefings designed to present a distilled summary of vitally important information security topics like operating system security and security threat forecasts. Ultimately, the goal of this program is to ensure that managers charged with the responsibility for information security can make informed choices and decisions that will improve their organization's security.

-Stephen Northcutt

Who Should Attend

- All newly appointed information security officers
- Technically skilled administrators that have recently been given leadership responsibilities
- Seasoned managers that want to understand what your technical people are telling you

"Excellent 'capstone' for those managing IT/IS staff or for those assigned responsibility for evaluating scope of coverage for senior execs."

-Bruce Cox,
Federal Reserve Information Technology

There are three goals for this course and certification:

- Establish a minimum standard for IT security knowledge, skills, and abilities. In a nutshell, this course covers all of the non-operating system topics that are in SANS Security Essentials, though not to the same depth. The goal is to enable managers and auditors to speak the same language as system, security, and network administrators.
- Establish a minimum standard for IT management knowledge, skills, and abilities. I keep running into managers that don't know TCP/IP, and that is OK; but then they don't know how to calculate total cost of ownership (TCO), leaving me quietly wondering what they do know.
- Save the up-and-coming generation of senior and rapidly advancing managers a world of pain by sharing the things we wish someone had shared with us. As the saying goes, it is OK to make mistakes, just make new ones.

GSLC
www.giac.org

DoD 8570 Required
www.sans.org/8570

SANS INSTITUTE
www.sans.edu

512.1 Managing the Plant, Network, and Information Architecture*

The course starts with a whirlwind tour of the information an effective IT security manager must know to function in today's environment. We will cover safety, physical security, and how networks and the related protocols, like TCP/IP, work and equip you to review network designs for performance, security, vulnerability scanning, and return on investment. You will learn more about secure IT operations in a single day than you ever thought possible.

Topics: Budget Awareness and Project Management; The Network Infrastructure; Computer and Network Addressing; IP Terminology and Concepts; Vulnerability Management; Managing Physical Safety, Security & the Procurement Process

512.2 IP Concepts, Attacks Against the Enterprise, and Defense-in-Depth*

Learn information assurance foundations, which are presented in the context of both current and historical computer security threats, and how they have impacted confidentiality, integrity, and availability. You will learn the methods of attack and the importance of managing attack surface.

Topics: Attacks Against the Enterprise; Defense in Depth; Managing Security Policy; Access Control and Password Management

512.3 Secure Communications*

Examine various cryptographic tools and technologies and how they can be used to secure a company's assets. A related area called steganography, or information hiding, is also covered. Learn how malware and viruses often employ cryptographic techniques in an attempt to evade detection. We will learn about managing privacy issues in communications and investigate web application security.

Topics: Cryptography; Wireless Network Security; Steganography; Managing Privacy; Web Communications and Security; Operations Security, Defensive and Offensive Methods

512.4 The Value of Information*

On this day we consider the most valuable resource an organization has: its information. You will learn about intellectual property, incident handling, and to identify and better protect the information that is the real value of your organization. We will then formally consider how to apply everything we have learned, as well as practice briefing management on our risk architecture.

Topics: Managing Intellectual Property; Incident Handling Foundations; Information Warfare; Disaster Recovery/Contingency Planning; Managing Ethics; IT Risk Management

512.5 Management Practicum*

In the fifth and final day we pull it all together and apply the technical knowledge to the art of management. The management practicum covers a number of specific applications and topics concerning information security. We'll explore proven techniques for successful and effective management, empowering you to immediately apply what you have learned your first day back at the office.

Topics: The Mission; Globalization; IT Business and Program Growth; Security and Organizational Structure; The Total Cost of Ownership; Negotiations; Fraud; Legal Liability; Technical People

**This course is available to Management 512 participants only.*

Security Leaders and Managers earn the highest salaries (well over six figures) in information security and are near the top of IT. Needless to say, to work at that compensation level, excellence is demanded. These days, security managers are expected to have domain expertise as well as the classic project management, risk assessment, and policy review and development skills.

SANS Instructor

G. Mark Hardy

G. Mark Hardy is founder and President of National Security Corporation. He has been providing cyber security expertise to government, military, and commercial clients for over 30 years, and is an internationally recognized expert who has spoken at over 250 events worldwide. G. Mark serves on the Advisory Board of CyberWATCH, an Information Assurance/Information Security Advanced Technology Education Center of the National Science Foundation. A retired U.S. Navy Captain, he was privileged to serve in command nine times, including responsibility for leadership training for 70,000 Sailors. He also served as wartime Director, Joint Operations Center for US Pacific Command, and Assistant Director of Technology and Information Management for Naval Logistics in the Pentagon, with responsibility for INFOSEC, Public Key Infrastructure, and Internet security. Captain Hardy was awarded the Defense Superior Service Medal, the Legion of Merit, five Meritorious Service Medals, and 24 other medals and decorations. A graduate of Northwestern University, he holds a BS in Computer Science, a BA in Mathematics, a Masters in Business Administration, a Masters in Strategic Studies, and holds the GSLC, CISSP, CISM and CISA certifications.

Five-Day Program | Mon, March 11 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Recommended | 30 CPE/CMU Credits | Instructor: Stephen Northcutt

MGT514: IT Security Strategic Planning, Policy and Leadership

Mastering the Strategic Planning Process

Strategic planning is hard for people in IT and IT Security because we spend so much time responding and reacting. Some of us have been exposed to a SWOT or something similar in an MBA course, but we almost never get to practice until we get promoted to a senior position, and then we are not equipped with the skills we need to run with the pack.

In this course you will learn the entire strategic planning process: what it is and how to do it; what lends itself to virtual teams, and what needs to be done face to face. We will practice building those skills in class. Topics covered in depth include how to plan the plan, horizon analysis, visioning, environmental scans (SWOT, PEST, Porter's etc.), historical analysis, mission, vision, and value statements. We will also discuss the planning process core, candidate initiatives, the prioritization process, resource and IT change management in planning, how to build the roadmap, setting up assessments, and revising the plan.

We will see examples and hear stories from businesses, especially IT and security oriented businesses, and then work together on labs. Business needs change, the environment changes, new risks are always on the horizon, and critical systems are continually exposed to new vulnerabilities. Strategic planning is a never-ending process. The planning section is hands-on and there is exercise-intensive work on writing, implementing, and assessing strategic plans.

Creating Effective Information Security Policy

Policy is a manager's opportunity to express expectations for the workforce, to set the boundaries of acceptable behavior and empower people to do what they ought to be doing. It is easy to get wrong. Have you ever seen a policy and your response was, "No way, I am not going to do that?" Policy must be aligned with an organization's culture. We will break down the steps to policy development so that you have the ability to develop and assess policy successfully.

Developing Management and Leadership Skills

The third focus of the course is on management and leadership competencies. Leadership is a capability that must be learned, exercised and developed to better ensure organizational success. Strong leadership is brought about primarily through selfless devotion to the organization and staff, tireless effort in setting the example, and the vision to see and effectively use available resources toward the end goal. However, leaders and followers influence each other toward the goal; it is a two-way street where all parties perform their functions to reach a common objective.

Effective leadership entails persuading team members to accomplish their objectives while removing obstacles and maintaining the well-being of the team in support of the organization's mission. Grooming effective leaders is critical to all types of organizations, as the most effective teams are cohesive units that work together toward common goals with camaraderie and a can-do spirit!

Leadership tends to be a bit "squishy" and courses covering the topic are often based upon the opinions of people who were successful in the marketplace. However, success can be as much a factor of luck as skill, so we base this part of the course on five decades of the research of social scientists and their experiments going as far back as Maslow and on research as current as Sunstein and Thaler. We discuss leadership skills that apply to commercial business, non-profit, not-for-profit, or other organizations. This course is designed to develop existing and new supervisors and managers who aspire to go beyond being the boss. It will help you build leadership skills to enhance the organization's climate and team-building skills to support the organization's mission, its growth in productivity, workplace attitude/satisfaction, and staff and customer relationships.

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www.sans.edu

Who Should Attend

This course is designed and taught for existing, recently appointed, and aspiring IT and IT Security managers and supervisors who desire to enhance their leadership and governance skills to develop their staff into a more productive and cohesive team.

Author Statement

This is the course I wish I had taken 30 years ago. Colleagues, it doesn't make sense to wait till you are in a management position to focus on your governance, management, and leadership skills. If one can improve by one or two percent each year, it is a major achievement. Leadership is a race of endurance, not a sprint; start early and be persistent. This course will set you on the path. It is a solid blend of tons of research as well as personal experience from a number of leaders in information security. I had read about SWOTs for years, but was shocked by how difficult it was to create a strategic plan and get it approved. Some executives or auditors would say it doesn't look out far enough, others would say it isn't realistic to look out so far, some would say you are too bold, others you are too tame. One strategic plan I did the heavy lift on went through 18 revisions and still had only mixed approval. I was reading everything I could on planning and looking at published plans, and finally I saw the key - "plan the plan." It is the same basic notion as "plan the dive, dive the plan." Since senior management generally signs off on policy, you want to write balanced, defendable policy that gets approved the first time. The goal of both the planning and policy sections is simple: to give you the tools to create repeatable, successful products. The final section will help you build management and leadership skills to enhance the organization's climate as well as team-building skills to support the organization's mission and its growth in productivity.

- Stephen Northcutt

514.1 An Approach to Strategic Planning*

Our approach to strategic planning is that there are activities that can be done virtually in advance of a retreat, and then other activities are best done in a retreat setting. On the first day, we will talk about some of the activities that can be done virtually.

Topics: How to plan the plan; Historical analysis; Horizon analysis; Visioning; Environmental scans (SWOT, PEST, Porters etc.); Mission, vision, and value statements

514.2 Planning To Ensure Institutional Effectiveness*

This will include the retreat section of the course where we do the core planning activities of candidate selection, prioritization, and development of the roadmap.

514.3 Security Policy Development*

You will experience the most in-depth coverage of security policy ever developed. By the end of the course your head will be spinning. Students and other SANS instructors who have seen the scope of the material have the same comment, "I never realized there is so much to know about security policy." Any security manager, anyone assigned to review, write, assess or support security policy and procedure, can benefit from Policy in Depth. You will learn what policy is, positive and negative tone, consistency of policy bullets, how to balance the level of specificity to the problem at hand, the role of policy, awareness and training, and the SMART approach to policy development and assessment. We cover different levels of policy from Information Security Management System (ISMS) governing policy to detailed issue-specific policies like acceptable use, approved encryption and end of life disposal of IT assets.

Topics: Policy establishes bounds for behavior; Policy empowers users to do the right thing; Should and shall, guidelines and policy; ISMS as governing policy; Policy versus procedure; Policy needs assessment process; Organizational Assumptions, Beliefs and Values (ABVs); Relationship of mission statement to policy; Organizational culture

514.4 Comprehensive Security Policy Assessment*

In the policy section of the course, you will be exposed to over 100 different policies through an instructional delivery methodology that balances lecture, labs, and in-class discussion. We will emphasize techniques to create successful policy that users will read and follow; policy that will be accepted by the business units because it is sensitive to the organizational culture; and policy that uses the psychology of information security to guide implementation.

Topics: Using the principles of psychology to implement policy; Applying the SMART Method to policy; How policy protects people, organizations and information; Case study, the process to handle a new risk (Sexting); Policy header components and how to use them; Issue-specific policies; Behavior related polices, acceptable use, ethics; Warning banners; Policy development process; Policy review and assessment process; Wrap-up, the six golden nuggets of policy

514.5 Leadership and Management Competencies*

Essential leadership topics covered here include: leadership development, coaching and training, employee involvement, conflict resolution, change management, vision development, motivation, communication skills, self-direction, brainstorming techniques, benefits, and the ten core leadership competencies. In a nutshell, you'll learn the critical processes that should be employed to develop the skills and techniques to select, train, equip, and develop a team into a single cohesive unit with defined roles that operate together in harmony toward team-objective accomplishment.

Topics: Leadership building blocks; Coaching & training; Change management; Team development; Motivating; Developing the vision; Leadership development; Building competencies; Importance of communication; Self-direction; Brainstorming; Relationship building; Teamwork concepts; Leader qualities; Leadership benefits

**This course is available to Management 514 participants only.*

SANS Faculty Fellow

Stephen Northcutt

Stephen Northcutt founded the GIAC certification and currently serves as president of the SANS Technology Institute, a postgraduate level IT security college (www.sans.edu). Stephen is author/coauthor of *Incident Handling Step-by-Step, Intrusion Signatures and Analysis, Inside Network Perimeter Security* 2nd Edition, *IT Ethics Handbook, SANS Security Essentials, SANS Security Leadership Essentials*, and *Network Intrusion Detection* 3rd edition. He was the original author of the Shadow Intrusion Detection system before accepting the position of chief for information warfare at the Ballistic Missile Defense Organization. Stephen is a graduate of Mary Washington College. Before entering the field of computer security, he worked as a Navy helicopter search and rescue crewman, white water raft guide, chef, martial arts instructor, cartographer, and network designer.

Since 2007 Stephen has conducted over 34 in-depth interviews with leaders in the security industry, from CEOs of security product companies to the most well-known practitioners in order to research the competencies required to be a successful leader in the security field. He maintains the SANS Leadership Laboratory, where research on these competencies is posted as well as SANS Security Musings. He is the lead author for Execubytes, a monthly newsletter that covers both technical and pragmatic information for security managers. He leads the MGT512 Alumni forum, where hundreds of security managers post questions. He is the lead author/instructor for MGT512, a prep course for the GSLC certification that meets all levels of requirements for DoD Security Managers per DoD 8570. He also is the lead author/instructor for MGT514: IT Security Strategic Planning, Policy, and Leadership. Stephen also blogs at the SANS Security Leadership blog. **www.sans.edu/research/leadership-laboratory**

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GCPM | Instructor: Jeff Frisk

MGT525: IT Project Management, Effective Communication, and PMP® Exam Prep

Updated course contents to help you prepare for the 2011 PMP® ExamThe SANS MGT525: IT Project Management, Effective Communication, and PMP® Exam Prep course is a PMI Registered Education Provider (R.E.P.). R.E.P.s provide the training necessary to earn and maintain the Project Management Professional (PMP®) and other professional credentials. This course has been recently updated to fully prepare you for the 2011 PMP® exam changes.During this class you will learn how to improve your project planning methodology and project task scheduling to get the most out of your critical IT resources. We will utilize project case studies that highlight information technology services as deliverables. MGT525 follows the basic project management structure from the PMBOK® Guide 4th edition and also provides specific techniques for success with information assurance initiatives.Throughout the week, we will cover all aspects of IT project management - from initiating and planning projects through managing cost, time, and quality while your project is active, to completing, closing, and documenting as your project finishes.A copy of the PMBOK® Guide (Fourth Edition) is provided to all participants. You can reference the PMBOK® Guide and use your course material along with the knowledge you gain in class to prepare for the 2011 updated Project Management Professional (PMP®) Exam and the GIAC Certified Project Manager Exam.

The project management process is broken down into core process groups that can be applied across multiple areas of any project, in any industry. Although our primary focus is the application to the InfoSec industry, our approach is transferable to any projects that create and maintain services as well as general product development. We cover in-depth how cost, time, quality, and risks affect the services we provide to others. We will also address practical human resource management as well as effective communication and conflict resolution. You will learn specific tools to bridge the communications gap between managers and technical staff.

Following the SANS promise, participants leave this course with specific tools that can be applied the day you get back to the office!

"Jeff is very knowledgeable – he brings real-life examples which help explain material. Material is set up perfectly."

-Maria Saggiomo, DLA Information Operations Philadelphia

Who Should Attend

- Security professionals who are interested in understanding the concepts of IT project management
- Managers who want to understand the critical areas of making projects successful
- Individuals working with time, cost, quality, and risk sensitive projects and applications
- Anyone who would like to utilize effective communication techniques and proven methods to relate better to people
- Anyone in a key or lead engineering/design position who works regularly with project management staff.
- Individuals interested in preparing for the Project Management Professional (PMP®) Exam

Author Statement

Managing projects to completion, with an alert eye on quality, cost, and time, is something most of us need to do on an ongoing basis. In this course, we break down project management into its fundamental components and galvanize your understanding of the key concepts with an emphasis on practical application and execution of service-based IT and InfoSec projects. Since project managers spend the vast majority of their time communicating with others, throughout the week we focus on traits and techniques that enable effective technical communication. As people are the most critical asset in the project management process, effective and thorough communication is essential.

-Jeff Frisk

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525.1 Project Management Structure & Framework*

This course offers insight and specific techniques that both beginner and experienced project managers can utilize. The structure and framework section lays out the basic architecture and organization of project management. We will cover the common project management group processes, the difference between projects and operations, project life cycles, and managing project stakeholders.

Topics: Definition of Terms and Process Concepts; Group Processes; Project Life Cycle; Types of Organizations; PDCA Cycle

525.2 Project Charter and Scope Management*

During day two, we will go over techniques used to develop the project charter and formally initiate a project. The scope portion defines the important input parameters of project management and gives you the tools to ensure that from the onset your project is well defined. We cover tools and techniques that will help you define your project's deliverables and develop milestones to gauge performance and manage change requests.

Topics: Formally Initiating Projects; Project Charters; Project Scope Development; Work Breakdown Structures; Scope Verification and Control

525.3 Time and Cost Management*

Our third day details the time and cost aspects of managing a project. We will cover the importance of correctly defining project activities, project activity sequence, and resource constraints. We will use milestones to set project timelines and task dependencies along with learning methods of resource allocation and scheduling. We introduce the difference between resource and product-related costs and go into detail on estimating, budgeting, and controlling costs. You will learn techniques for estimating project cost and rates as well as budgeting and the process for developing a project cost baseline.

Topics: Process Flow; Task Lead and Lag Dependencies; Resource Breakdown Structures; Task Duration Estimating; Critical Path Scheduling; Cost Estimating Tools; Cost vs. Quality; Cost Base Lining; Earned Value Analysis and Forecasting

525.4 Communications and Human Resources*

During day four we cover methods for identifying, acquiring, developing, and managing your project team. Performance appraisal tools are offered as well as conflict management techniques. You will learn management methods to help keep people motivated and provide great leadership. The effective communication portion of the day covers identifying and developing key interpersonal skills. We cover organizational communication and the different levels of communication as well as common communication barriers and tools to overcome these barriers.

Topics: Acquiring and Developing Your Project Team; Organizational Dependencies and Charts; Roles and Responsibilities; Team Building; Conflict Management; Interpersonal Communication Skills; Communication Models and Effective Listening

525.5 Quality and Risk Management*

On day five you will become familiar with quality planning, quality assurance, and quality control methodologies as well as learning the cost of quality concept and its parameters. We define quality metrics and cover tools for establishing and benchmarking quality control programs. We go into quality assurance and auditing as well as using and understanding quality control charts. The risk section goes over known versus unknown risks and how to identify, assess, and categorize risk. We use quantitative risk analysis and modeling techniques so that you can fully understand how specific risks affect your project. You will learn ways to plan for and mitigate risk by reducing your exposure as well as how to take advantage of risks that could have a positive effect on your project.

Topics: Cost of Quality; Quality Metrics; Continual Process Improvement; Quality Baselines; Quality Control; Change Control; Risk Identification; Risk Assessment; Time and Cost Risks; Risk Probability and Impact Matrices; Risk Modeling and Response

525.6 Procurement and Project Integration*

We close out the week with the procurement aspects of project management and then integrate all of the concepts presented into a solid, broad-reaching approach. We cover contract basics and different types of contracts and then the make-versus-buy decision process. We go over ways to initiate strong request for quotations (RFQ) and develop evaluation criteria, then qualify and select the best partners for your project. The final session integrates everything we have learned by bringing all the topics together with the common process groups. Using detailed project management methodology, we learn how to finalize the project management plan and then execute and monitor the progress of your project to ensure success.

Topics: Contract Types; Make vs. Buy Analysis; Vendor Weighting Systems; Contract Negotiations; Project Execution; Monitoring Your Projects Progress; Finalizing Deliverables; Forecasting and Integrated Change Control

**This course is available to Management 525 participants only.*

SANS Certified Instructor

Jeff Frisk

Jeff Frisk currently serves as the director of the GIAC certification program and is a member of the STI Curriculum Committee. Jeff holds the PMP certification from the Project Management Institute and GIAC GSEC credentials. He also is a certified SANS instructor and course author for MGT525. He has worked on many projects for SANS and GIAC, including courseware, certification, and exam development. Jeff has an engineering degree from The Rochester Institute of Technology and more than 15 years of IT project management experience with computer systems, high tech consumer products, and business development initiatives. Jeff has held various positions including managing operations, product development, electronic systems/computer engineering. He has many years of international and high-tech business experience working with both big and small companies to develop computer hardware/software products and services.

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GSNA | Instructor: David Hoelzer

AUD507: Auditing Networks, Perimeters, and Systems

One of the most significant obstacles facing many auditors today is how exactly to go about auditing the security of an enterprise. What systems really matter? How should the firewall and routers be configured? What settings should be checked on the various systems under scrutiny? Is there a set of processes that can be put into place to allow an auditor to focus on the business processes rather than the security settings? All of these questions and more will be answered by the material covered in this course.

This course is organized specifically to provide a risk-driven method for tackling the enormous task of designing an enterprise security validation program. After covering a variety of high-level audit issues and general audit best practices, the students will have the opportunity to dive deep into the technical how-to for determining the key controls that can be used to provide a level of assurance to an organization. Tips on how to repeatedly verify these controls and techniques for automatic compliance validation will be given from real-world examples.

One of the struggles that IT auditors face today is assisting management to understand the relationship between the technical controls and the risks to the business that these affect. In this course these threats and vulnerabilities are explained based on validated information from real-world situations. The instructor will take the time to explain how this can be used to raise the awareness of management and others within the organization to build an understanding of why these controls specifically and auditing in general is important. From these threats and vulnerabilities, we will explain how to build the ongoing compliance monitoring systems and how to automatically validate defenses through instrumentation and automation of audit checklists.

You'll be able to use what you learn immediately. Five of the six days in the course will either produce or provide you directly with a general checklist that can be customized for your audit practice. Each of these days includes hands-on exercises with a variety of tools discussed during the lecture sections so that you will leave knowing how to verify each and every control described in the class. Each of the five hands-on days gives you the chance to perform a thorough technical audit of the technology being considered by applying the checklists provided in class to sample audit problems in a virtualized environment. Each student is invited to bring a Windows XP Professional or higher laptop for use during class. Macintosh computers running OS X may also be used with VMWare Fusion.

A great audit is more than marks on a checklist; it is the understanding of what the underlying controls are, what the best practices are, and why. Sign up for this course and experience the mix of theory, hands-on, and practical knowledge.

Who Should Attend

- Auditors seeking to identify key controls in IT systems
- Audit professionals looking for technical details on auditing
- Managers responsible for overseeing the work of an audit or security team
- Security professionals newly tasked with audit responsibilities
- System and network administrators looking to better understand what an auditor is trying to achieve, how they think, and how to better prepare for an audit
- System and network administrators seeking to create strong change control management and detection systems for the enterprise

Author Statement

This advanced systems audit course stands alone in the information assurance arena as the only comprehensive source for hands-on audit how-to. Past students have included long-time auditors and those new to the field, both of whom have found significant benefit from the refresher material. One individual, a vice president with the Institute of Internal Auditors, said, I've been auditing systems for a very long time, and no one ever actually gave me a formal process that I can apply to conducting technical audits. Thank you! While we don't require a high level of technical experience as a prerequisite to this course, we have worked hard to make sure that anyone who comes to the course walks away with a wealth of material that they can go back to their office and apply tomorrow. We realistically address the problem, How do I get there from here? by offering short-term goal solutions, which, when combined, will allow you to achieve your goal: identify, report on, and reduce risk in your enterprise.

- David Hoelzer

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DoD 8570 Required
www.sans.org/8570

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507.1 Audit Principles, Risk Assessment, and Effective Reporting

In addition to filling in any foundational gaps that you might have in auditing principles, this day's material will give you two extremely useful risk assessment methods that are effective in measuring the security of a system and identifying weak or non-existent controls. Following this discussion, you will be able to analyze an existing set of controls, a business process, an audit exception, or a security incident, identify any missing or ineffective controls, and identify what corrective actions will eliminate the problem in the future.

Topics: Auditor's Role in Relation to Policy Creation, Policy Conformance, and Incident Handling; Benefits of Various Auditing Standards and Certifications; Basic Auditing and Assessing Strategies, Risk Assessment; The Six-step Audit Process

507.2 Hands On: Auditing the Perimeter

Focus on some of the most sensitive and important parts of our information technology infrastructure: routers and firewalls. In order to properly audit a firewall or router, we need to clearly understand the total information flow that is expected for the device. Diagrams will allow the auditor to identify what objectives the routers and firewalls are seeking to meet, thus allowing controls to be implemented that can be audited. Overall, this course will teach the student everything needed to audit routers, switches, and firewalls in the real world.

Topics: Overview; Detailed Audit of a Router; Auditing Switches; Testing the Firewall; Testing the Firewall Rulebase; Testing Third-Party Software; Reviewing Logs and Alerts; The Tools Used

507.3 Hands On: Network Auditing Essentials

This day continues where day two left off, extending network and perimeter auditing to internal system validation and vulnerability testing, helping network security professionals to see how to use the tools and techniques described to audit, assess, and secure a network in record time. Following a defense-in-depth approach, learn how to audit perimeter devices, create maps of active hosts and services, and assess the vulnerability of those services. Hands-on exercises are conducted throughout the day so students have the opportunity to use the tools.

Topics: Cloud Computing; Cloud architecture and deployments; Provider and Tenant responsibility considerations; Audit considerations for Iaas, Paas, and SaaS; Audit risk considerations and questions

507.4 Hands On: Web Application Auditing

We'll start with the underlying principles of web technology and introduce a set of tools that can be used to validate the security of these applications. Then we will build and work through a checklist for validating the existence and proper implementation of controls to mitigate the primary threats found in web applications.

Topics: Identify Controls Against Information Gathering Attacks; Process Controls to Prevent Hidden Information Disclosures; Control Validation of the User Sign-on Process; Examining Controls Against User Name Harvesting; Validating Protections Against Password Harvesting; Best Practices for OS and Web Server Configuration; How to Verify Session Tracking and Management Controls; Identification of Controls to Handle Unexpected User Input; Server-side Techniques for Protecting Your Customers and Their Sensitive Data

507.5 Hands On: Advanced Windows Auditing

Systems based on the Windows NT line (XP, 2003, Vista, 2008 and Windows 7) make up a large part of the typical IT infrastructure. Quite often, these systems are also the most difficult to effectively secure and control. This class gives you the keys, techniques, and tools to build an effective long term audit program for your Microsoft Windows environment.

Topics: Progressive Construction of a Comprehensive Audit Program; Automating the Audit Process; Windows Security Tips and Tricks; Maintaining a Secure Enterprise

507.6 Hands On: Auditing Unix Systems

Students will gain a deeper understanding of the inner workings and fundamentals of the Unix operating system as applied to the major Unix environments in use in business today. Students will get to explore, assess, and audit Unix systems hands-on. Neither Unix nor scripting experience is required for this day.

Topics: Auditing to Create a Secure Configuration; Auditing to Maintain a Secure Configuration; Auditing to Determine What Went Wrong

SANS Faculty Fellow

David Hoelzer

David Hoelzer is a high-scoring certified SANS instructor and author of more than twenty sections of SANS courseware. He is an expert in a variety of information security fields, having served in most major roles in the IT and security industries over the past twenty-five years. Recently, David was called upon to serve as an expert witness for the Federal Trade Commission for ground-breaking GLBA Privacy Rule litigation. David has been highly involved in governance at SANS Technology Institute, serving as a member of the Curriculum Committee as well as Audit Curriculum Lead. Currently, David serves as the principal examiner and director of research for Enclave Forensics, a New York/Las Vegas based incident response and forensics company. He also serves as the chief information security officer for Cyber-Defense, an open source security software solution provider. In the past, David served as the director of the GIAC Certification program, bringing the GIAC Security Expert certification to life. David holds a BS in IT, Summa Cum Laude, having spent time either attending or consulting for Stony Brook University, Binghamton University, and American Intercontinental University. David blogs about IT Audit issues at **https://blogs.sans.org/it-audit**

Six-Day Program | Sun, March 10 - Fri, March 15, 2013 | 9:00am - 5:00pm
Laptop Required | 36 CPE/CMU Credits | GIAC Cert: GWEB | Instructor: Dr. Johannes Ullrich

DEV522: Defending Web Applications Security Essentials

This is the course to take if you have to defend web applications!

Traditional network defenses, such as firewalls, fail to secure web applications. The quantity and importance of data entrusted to web applications is growing, and defenders need to learn how to secure it. DEV522 covers the OWASP Top 10 and will help you to better understand web application vulnerabilities, thus enabling you to properly defend your organization's web assets.

Mitigation strategies from an infrastructure, architecture, and coding perspective will be discussed alongside real-world implementations that really work. The testing aspect of vulnerabilities will also be covered so you can ensure your application is tested for the vulnerabilities discussed in class.

To maximize the benefit for a wider range of audiences, the discussions in this course will be programming language agnostic. Focus will be maintained on security strategies rather than coding level implementation.

DEV522: Defending Web Applications Security Essentials is intended for anyone tasked with implementing, managing, or protecting Web applications. It is particularly well suited to application security analysts, developers, application architects, pen testers, and auditors who are interested in recommending proper mitigations to web security issues and infrastructure security professionals who have an interest in better defending their web applications.

The course will cover the topics outlined by OWASP's Top 10 risks document as well as additional issues the authors found of importance in their day-to-day web application development practice. The topics that will be covered include:

- **Infrastructure Security**
- **Server Configuration**
- **Authentication mechanisms**
- **Application language configuration**
- **Application coding errors like SQL Injection and Cross-Site Scripting**
- **Cross-Site Request Forging**
- **Authentication Bypass**
- **Web services and related flaws**
- **Web 2.0 and its use of web services**
- **XPATH and XQUERY languages and injection**
- **Business logic flaws**
- **Protective HTTP Headers**

The course will make heavy use of hands-on exercises. It will conclude with a large defensive exercise, reinforcing the lessons learned throughout the week.

Dr. Johannes Ullrich *SANS Senior Instructor*

Dr. Johannes Ullrich is the Dean of Research and a faculty member of the SANS Technology Institute. In November of 2000, Johannes started the DShield.org project, which he later integrated into the Internet Storm Center. His work with the Internet Storm Center has been widely recognized. In 2004, Network World named him one of the 50 most powerful people in the networking industry. Secure Computing Magazine named him in 2005 one of the Top 5 influential IT security thinkers. His research interests include IPv6, Network Traffic Analysis and Secure Software Development. Johannes is regularly invited to speak at conferences and has been interviewed by major publications, radio as well as TV stations. He is a member of the SANS Technology Institute's Faculty and Administration as well as Curriculum and Long Range Planning Committee.

As chief research officer for the SANS Institute, Johannes is currently responsible for the GIAC Gold program. Prior to working for SANS, Johannes worked as a lead support engineer for a Web development company and as a research physicist. Johannes holds a PhD in Physics from SUNY Albany and is located in Jacksonville, Florida. He also maintains a daily security news summary podcast and enjoys blogging about application security.

Who Should Attend

- Application developers
- Application security analysts or managers
- Application architects
- Penetration testers who are interested in learning about defensive strategies
- Security professionals who are interested in learning about web application security
- Auditors who need to understand defensive mechanisms in web applications
- Employees of PCI compliant organizations who need to be trained to comply with PCI requirements

"This is the class every web app developer should take to open their eyes to web security."

-Masatomo Noborikawa, University of Nothern Iowa

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DEVELOPER 541

Four-Day Program | Sun, March 10 - Wed, March 13, 2013 | 9:00am - 5:00pm
24 CPE/CMU Credits | Laptop Required | GIAC Cert: GSSP-JAVA | Instructor: Frank Kim

DEV541: Secure Coding in Java/JEE: Developing Defensible Applications

Great programmers have traditionally distinguished themselves by the elegance, effectiveness, and reliability of their code. That's still true, but elegance, effectiveness, and reliability have now been joined by security. Major financial institutions and government agencies have informed their internal development teams and outsourcers that programmers must demonstrate mastery of secure coding skills and knowledge through reliable third-party testing or lose their right to work on assignments for those organizations. More software buyers are joining the movement every week.

Such buyer and management demands create an immediate response from programmers, "Where can I learn what is meant by secure coding?" This unique SANS course allows you to bone up on the skills and knowledge required to prevent your applications from getting hacked.

This is a comprehensive course covering a huge set of skills and knowledge. It's not a high-level theory course. It's about real programming. In this course you will examine actual code, work with real tools, build applications, and gain confidence in the resources you need for the journey to improving the security of Java applications.

Rather than teaching students to use a set of tools, we're teaching students concepts of secure programming. This involves looking at a specific piece of code, identifying a security flaw, and implementing a fix for flaws found on the Top 10 and CWE/SANS Top 25 Most Dangerous Programming Errors.

The class culminates in a Secure Development Challenge where you perform a security review of a real-world open source application. You will conduct a code review, perform security testing to actually exploit real vulnerabilities, and finally, using the secure coding techniques that you have learned in class, implement fixes for these issues.

Who Should Attend

- Developers who want to build more secure applications
- Java EE programmers
- Software engineers
- Software architects
- Application security auditors
- Technical project managers
- Senior software QA specialists
- Penetration testers who want a deeper understanding of target applications or who want to provide more detailed vulnerability remediation options

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DEVELOPER 544

Four-Day Program | Mon, March 10 - Thu, March 13, 2013 | 9:00am - 5:00pm
24 CPE/CMU Credits | Laptop Required | GIAC Cert: GSSP-NET | Instructor: James Jardine

DEV544: Secure Coding in .NET: Developing Defensible Applications

ASP.NET and the .NET framework have provided web developers with tools that allow them an unprecedented degree of flexibility and productivity. On the other hand, these sophisticated tools make it easier than ever to miss the little details that allow security vulnerabilities to creep into an application. Since ASP.NET, 2.0 Microsoft has done a fantastic job of integrating security into the ASP.NET framework, but the onus is still on application developers to understand the limitations of the framework and ensure that their own code is secure.

During this four-day course we will analyze the defensive strategies and technical underpinnings of the ASP.NET framework and learn where, as a developer, you can leverage defensive technologies in the framework, where you need to build security in by hand. We'll also examine strategies for building applications that will be secure both today and in the future.

Rather than focusing on traditional web attacks from the attacker's perspective, this class will show developers first how to think like an attacker, and will then focus on the latest defensive techniques specific to the ASP.NET environment. The emphasis of the class is a hands-on examination of the practical aspects of securing .NET applications during development.

Have you ever wondered if ASP.NET Request Validation is effective? Have you been concerned that XML web services might be introducing unexamined security issues into your application? Should you feel un-easy relying solely only on the security controls built into the ASP.NET framework? Secure Coding in ASP.NET will answer these questions and far more.

Who Should Attend

This class is focused specifically on software development but is accessible enough for anyone who's comfortable working with code and has an interest in understanding the developer's perspective:

- Software developers and architects
- Senior software QA specialists
- System and security administrators
- Penetration Testers

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Five-Day Program | Mon, March 11 - Fri, March 15, 2013 | 9:00am - 5:00pm
30 CPE/CMU Credits | GIAC Cert: GLEG | Instructor: Benjamin Wright

LEG523: Law of Data Security & Investigations

New law on privacy, e-discovery, and data security is creating an urgent need for professionals who can bridge the gap between the legal department and the IT department. The needed professional training is uniquely available in SANS' LEG523 series of courses, including skills in the analysis and use of contracts, policies, and records management procedures.

GIAC certification under LEG523 demonstrates to employers that a professional has not only attended classes, but studied and absorbed the sophisticated content of these courses. Certification distinguishes any professional, whether an IT expert, an auditor, a paralegal, or a lawyer, and the value of certification will grow in the years to come as law and security issues become even more interlocked.

This course covers the law of business, contracts, fraud, crime, IT security, IT liability and IT policy — all with a focus on electronically stored and transmitted records. The course also teaches investigators how to prepare credible, defensible reports, whether for cyber, forensics, incident response, human resources or other investigations.

Day 1: Fundamentals of IT Security Law and Policy

Day 2: E-Records, E-Discovery and Business Law

Day 3: Contracting for Data Security & Other Technology

Day 4: The Law of IT Compliance: How to Conduct Investigations

- Lessons from day 4 will be invaluable to the effective and credible execution of any kind of investigation — internal, government, consultant, security incidents and the like. These lessons integrate with other tips on investigations introduced in other days of the LEGAL 523 course series.

Day 5: Applying Law to Emerging Dangers: Cyber Defense

- In-depth review of legal response to the major security breach at TJX.
- Learn how to incorporate effective public communications into your cyber security program.

These five days of integrated education — where each successive day builds upon lessons from the earlier day(s) – will help any enterprise (public or private sector) cope with such problems as hackers, botnets, malware, phishing, unruly vendors, data leakage, industrial spies, rogue or uncooperative employees and bad publicity connected with IT security.

Recent updates to the courses address hot topics such as risk, investigations and business records retention connected with cloud computing and social networks like Facebook and Twitter. Updates also teach students how to analyze and respond to the risks and opportunities surrounding OSINT (open source intelligence gathering).

This course adopts an increasingly global perspective. Non-US professionals attend the Legal-523 course because there is no training like it anywhere else in the world. A lawyer from a European police agency recently attended and expressed high praise for the course when it was over. Although as a US attorney Mr. Wright does not know every law in the world, students like this European lawyer help him improve the course and include more non-US content each time he teaches it.

The Legal 523 course is complementary to SANS' rigorous digital forensics program. Together, Legal 523 and the SANS' digital forensics program provide professional investigators an unparalleled suite of training resources.

Legal 523 is tied to the coveted GLEG certification. GLEG can help a forensics investigator appear more credible as a witness in court, and help a forensics consultant win more business.

Who Should Attend

- Investigators
- Security and IT professionals
- Lawyers
- Paralegals
- Auditors
- Accountants
- Technology Managers
- Vendors
- Compliance officers
- Law enforcement
- Privacy Officers
- Penetration Testers

Author Statement

These are five intense days covering the rapid development of law at the intersection of IT and security. Be prepared for insights and tips you've not heard before.

- Benjamin Wright

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast. ***More info on page 65.***

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523.1 Fundamentals of IT Security Law and Policy

This course day number 1 is an introduction to Law and IT, serving as the foundation for the discussion in later course days. Students survey the general legal issues that must be addressed in establishing best InfoSec practices. This course day number 1 canvasses the many new laws on data security, and evaluates InfoSec as a field of growing legal liability. It covers computer crime and intellectual property laws when a network is compromised, as well as emerging topics like honeypots, and active defenses, i.e., enterprises hacking back against hackers. This course day considers the impact of future technologies on law and investigations. A key goal is to help professionals factor in legal concerns when they draft enterprise IT security policies.

Day 1 includes a lab on the drafting of IT security policies from a legal perspective. Students will debate what the words of an enterprise policy would mean in a courtroom. It also includes a case study on the drafting of policy to comply with the Payment Card Industry Data Security Standard (PCI).

523.2 E-Records, E-Discovery and Business Law

IT professionals can advance their careers by upgrading their expertise in the hot fields of e-discovery and cyber investigations. Critical facets of those fields come forward in this course day number 2. This day number 2 emphasizes the use of computer records in disputes and litigation, with a view to teaching students how to manage requests to turn over e-records to adversaries (i.e., e-discovery), how to manage implementation of a "legal hold" over some records to prevent their destruction and how to coordinate with legal counsel to develop workable strategies to legal challenges.

This course day number 2 is chock full of actual court case studies dealing with privacy, computer records, digital evidence, electronic contracts, regulatory investigations and liability for shortfalls in security. The purpose of the case studies is to draw practical lessons that students can take back to their jobs.

523.3 Contracting for Data Security & Other Technology

This course day number 3 is focused on the essentials of contract law sensitive to the current legislative requirements for security. Compliance with many of the new data security laws requires contracts. Because IT pulls together the products and services of many vendors, consultants and outsourcers, enterprises need appropriate contracts to comply with Sarbanes-Oxley, Gramm-Leach-Bliley, HIPAA, EU Data Directive, California Senate Bill 1386 and others.

When appropriate, this course day 3 leaves the student with practical steps and tools to be applied in his or her enterprise. It includes a lab at the end of the day to help students learn about writing contract-related documents relevant to their professional responsibility. Students will learn the language of common IT contract clauses. They will learn the meaning of and issues surrounding those clauses and become familiar with specific legal cases to show how different disputes have resolved in litigation.

523.4 The Law of IT Compliance: How to Conduct Investigations

InfoSec professionals and cyber investigators operate in a world of ambiguity, rapid change and legal uncertainty. To address these challenges, this course day number 4 presents methods for analyzing a situation and then acting in a way that is ethical and defensible and that reduces risk.

Lessons from this course day number 4 will be invaluable to the effective and credible execution of any kind of investigation – internal, government, consultant, security incident and the like. These lessons integrate with other tips on investigations introduced in other days of the LEGAL 523 course series.

This course day number 4 surveys white collar fraud, with an emphasis on the role of technology in the commission and prevention of that fraud. It teaches IT managers practical, case-study driven, lessons about the monitoring of employees and employee privacy.

523.5 Applying Law to Emerging Dangers: Cyber Defense

Knowing some rules of law is not the same as knowing how to deal strategically with real-world legal problems. This course Day Number 5 is organized around extended case studies in security law – break-ins, investigations, piracy, extortion, rootkits, phishing, botnets, espionage, defamation. The studies lay out the chronology of events and critique what the good guys did right and what they did wrong. The goal is to learn to apply principles and skills for addressing incidents in your day-to-day work. In addition to case studies, the core material will include tutorials on relevant legislation and judicial decisions in such areas as privacy, negligence, contracts, e-investigations and computer crime.

SANS Senior Instructor

Benjamin Wright

Benjamin Wright is the author of several technology law books, including *Business Law and Computer Security*, published by the SANS Institute. With 26 years in private law practice, he has advised many organizations, large and small, on privacy, e-commerce, computer security, and e-mail discovery and has been quoted in publications around the globe, from the Wall Street Journal to the Sydney Morning Herald. Mr. Wright is known for spotting and evaluating trends, such as the rise of whistleblowers wielding small video cameras. In 2010, Russian banking authorities tapped him for experience and advice on the law of cyber investigations and electronic payments. Wright maintains a popular blog at http://legal-beagle.typepad.com.

"There is no other course like this. Many eye-opening revelations about the ever changing landscape for information security legal risks."

-Bill Ardern, Mecklenburg County

SEC434: Log Management In-Depth: Compliance, Security, Forensics, and Troubleshooting

Two-Day Program | Fri, Mar 8 - Sat, Mar 9, 2013 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: Dr. Eric Cole

This first-ever dedicated log management class teaches system, network, and security logs, their analysis and management and covers the complete lifecycle of dealing with logs: the whys, hows and whats.

You will learn how to enable logging and then how to deal with the resulting data deluge by managing data retention, analyzing data using search, filtering and correlation as well as how to apply what you learned to key business and security problems. The class also teaches applications of logging to forensics, incident response and regulatory compliance.

In the beginning, you will learn what to do with various log types and provide brief configuration guidance for common information systems. Next, you will learn a phased approach to implementing a company-wide log management program, and go into specific log-related tasks that needs to be done on a daily, weekly, and monthly basis in regards to log review and monitoring.

Everyone is looking for a path through the PCI DSS and other regulatory compliance maze and that is what you will learn in the next section of the course. Logs are essential for resolving compliance challenges; this class will teach you what you need to concentrate on and how to make your log management compliance-friendly. And people who are already using log management for compliance will learn how to expand the benefits of you log management tools beyond compliance.

You will learn to leverage logs for critical tasks related to incident response, forensics, and operational monitoring. Logs provide one of the key information sources while responding to an incident and this class will teach you how to utilize various log types in the frenzy of an incident investigation.

Finally, the class author, Dr. Anton Chuvakin, probably has more experience in the application of logs to IT and IT security than anyone else in the industry. This means he and the other instructors chosen to teach this course have made a lot of mistakes along the way. You can save yourself a lot of pain and your organization a lot of money by learning about the common mistakes people make working with logs.

SEC524: Cloud Security Fundamentals

Two-Day Program | Fri, Mar 8 - Sat, Mar 9, 2013 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: Dave Shackleford

The SANS Cloud Security Fundamentals course starts out with a detailed introduction to the various delivery models of cloud computing ranging from Software as a Service (SaaS) to Infrastructure as a Service (IaaS) and everything in between. Each of these delivery models represents an entirely separate set of security conditions to consider, especially when coupled with various cloud types including: public, private, and hybrid. An overview of security issues within each of these models will be covered with in-depth discussions of risks to consider. Attendees will go in-depth on architecture and infrastructure fundamentals for private, public, and hybrid clouds. A wide range of topics will be covered including: patch and configuration management, virtualization security, application security, and change management. Policy, risk assessment, and governance within cloud environments will be covered with recommendations for both internal policies and contract provisions to consider. This path leads to a discussion of compliance and legal concerns. The first day will wrap-up with several fundamental scenarios for students to evaluate.

Attendees will start off the second day with coverage of audits and assessments for cloud environments. The day will include hands-on exercises for students to learn about new models and approaches for performing assessments, as well as evaluating audit and monitoring controls. Next the class will turn to protecting the data itself! New approaches for data encryption, network encryption, key management, and data lifecycle concerns will be covered in-depth. The challenges of identity and access management in cloud environments will be covered. The course will move into disaster recovery and business continuity planning using cloud models and architecture. Intrusion detection and incident response in cloud environments will be covered along with how best to manage these critical security processes and technologies that support them given that most controls are managed by the CSP.

SEC546: IPv6 Essentials

Two-Day Program | Fri, Mar 8 - Sat, Mar 9, 2013 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: Eric Conrad

We are out of IPv4 addresses. ISPs worldwide will have to rapidly adopt IPv6 over the next years to grow, in particular as mobile devices require more and more address space. Already, modern operating systems implement IPv6 by default. Windows 7, for example, ships with Teredo enabled by default. This course is designed not just for implementers of IPv6, but also for those who just need to learn how to detect IPv6 and defend against threats unintentional IPv6 use may bring.

IPv6 is currently being implemented at a rapid pace in Asia in response to the exhaustion of IPv4 address space, which is most urgently felt in rapidly growing networks in China and India. Even if you do not feel the same urgency of IP address exhaustion, you may have to connect to these IPv6 resources as they become more and more important to global commerce.

Implementing IPv6 should not happen without carefully considering the security impact of the new protocol. Even if you haven't implemented it yet, the ubiquitous IPv6 support in modern operating systems easily leads to unintentional IPv6 implementation, which may put your network at risk. In this course, we will start out by introducing the IPv6 protocol, explaining in detail many of its features like the IPv6 header, extension headers and auto configuration. Only by understanding the design of the protocols in depth will it be possible to appreciate the various attacks and mitigation techniques. The course will address how to take advantage of IPv6 to re-think how to assign addresses in your network and how to cope with what some suggest is the biggest security problem in IPv6: no more NAT! IPv6 doesn't stop at the network layer. Many application layer protocols change in order to support IPv6, and we will take a close look at protocols like DNS, DHCPv6 and more.

MGT305: Technical Communication and Presentation Skills for Security Professionals

Two-Day Program | Tue, Mar 12 - Wed, Mar 13, 2013 | 6:30pm - 9:30pm | 6 CPE/CMU Credits | Laptop Required | Instructor: G. Mark Hardy

This course is designed for every IT professional in your organization. In this course we cover the top techniques that will show any attendee how to research and write professional quality reports, how to create outstanding presentation materials, and as an added bonus, how to write expert witness reports. Attendees will also get a crash course on advanced public speaking skills.

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast.
More info on page 65.

Writing reports is a task that many IT professionals struggle with, sometimes from the perspective of writing the report and other times from the perspective of having to read someone else's report! In the morning material we cover step by step how to work through the process of identifying critical ideas, how to properly research them, how to develop a strong argument in written form, and how to put it all down on paper. We also discuss some of the most common mistakes that can negatively impact the reception of your work and show how to avoid them. Attendees can expect to see the overall quality of their reports improve significantly as a result of this material.

After writing a meaningful report, it is not uncommon to find that we must present the key findings from that report before an audience, whether that audience is our department, upper management, or perhaps even the entire organization. How do you transform an excellent report into a powerful presentation? We will work through a process that works to either condense a report into a presentation or can even be used to write a presentation from scratch that communicates your important thoughts in a meaningful and interesting way.

Writing the presentation is only half of the battle, though. How do you stand up in front of a group of five or even five thousand and speak? In the afternoon we will share tips and techniques of top presenters that you can apply to give the best presentation of your career. Additionally, students will have the opportunity to work up and deliver a short presentation to the class followed by some personal feedback from one of SANS' top speakers.

MGT433: Securing The Human: Building and Deploying an Effective Security Awareness Program

Two-Day Program | Fri, Mar 8 - Sat, Mar 9, 2013 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Instructor: Lance Spitzner

Organizations have invested in information security for years now. Unfortunately, almost all of this effort has been focused on technology with little, if any, effort on the human factor. As a result, the human is now the weakest link. From RSA and Epsilon to Oak Ridge National Labs and Google, the simplest way for cyber attackers to bypass security is to target your employees. One of the most effective ways to secure the human is an active awareness and education program that goes beyond compliance and changes to behaviors. In this challenging course you will learn the key concepts and skills to plan, implement, and maintain an effective security awareness program that makes your organization both more secure and compliant. In addition, you will develop metrics to measure the impact of your program and demonstrate value. Finally, through a series of labs and exercises, you will develop your own project and execution plan, so you can immediately implement your customized awareness program upon returning to your organization.

SANS SIMULCAST

If you are unable to attend this event, this course is also available in SANS Simulcast.
More info on page 65.

MGT535: Incident Response Team Management

One-Day Program | Sat, Mar 9, 2013 | 9:00am - 5:00pm | 6 CPE/CMU Credits | Instructor: SANS Staff

This course will take you to the next level of managing an incident response team. Given the frequency and complexity of today's attacks, incident response has become a critical function for organizations. Detecting and efficiently responding to incidents, especially those where critical resources are exposed to elevated risks, has become paramount, and to be effective, incident response efforts must have strong management processes to facilitate and guide them. Managing an incident response team requires special skills and knowledge. A background in information security management or security engineering is not sufficient for managing incidents. Furthermore, incident responders with strong technical skills do not necessarily become effective incident response managers. Special training is necessary.

This course was developed by an information security professional with over 26 years of experience, much of it in incident response. He was the founder of the first U.S. government incident response team. Students will learn by applying course content through hands-on skill-building exercises. These exercises range from: writing and evaluating incident response procedures, to the table-top validation of procedures, incident response management role playing in hypothetical scenarios, and hands-on experience in tracking incident status in hypothetical scenarios.

NEW! AUD444: Auditing Security and Controls of Active Directory and Windows

Three-Day Program | Sun, Mar 10 - Tue, Mar 12, 2013 | 9:00am - 5:00pm | 18 CPE/CMU Credits | Laptop Required | Instructor: Tanya Baccam

Auditors need to be able to understand how Active Directory operates and the key business risks that are present. This course was written to teach auditors how to identify and assess those business risks. Active Directory and Windows systems are typically well known and utilized within organizational infrastructures. However, they can be difficult to audit since there are a large number of settings on the end system. This course provides the tools and techniques to effectively conduct an Active Directory and Windows audit, and while doing so identify key business process controls that may be missing. Students have the opportunity to look at the business process controls and then how those can be verified by looking at Active Directory and the Windows systems that exist. Plus, students are given the knowledge to be able to add additional value as part of their audits by being able to identify the technology risks that may have been over looked. The hands-on exercises reinforce the topics discussed in order to give students the opportunity to conduct an audit on their own Windows systems, as well as understand the different security options that Windows provides.

Who Should Attend

- Internal Auditors
- IT Specialist Auditors
- IT Auditors
- IT Audit Manager
- Information System Auditor
- Information Technology Auditor
- Information Security Officer

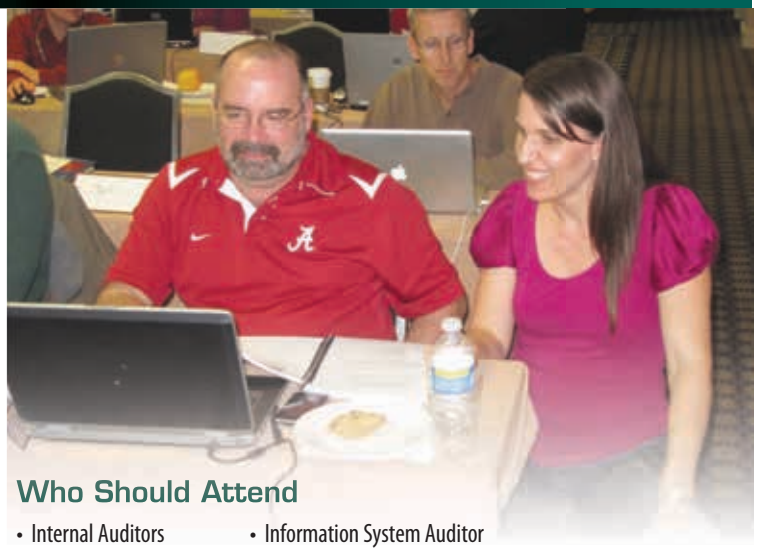
NEW! AUD445: Auditing Security and Controls of Oracle Databases

Three-Day Program | Wed, Mar 13 - Fri, Mar 15, 2013 | 9:00am - 5:00pm | 18 CPE/CMU Credits | Laptop Required | Instructor: Tanya Baccam

Over the past few years we have seen attackers target data since there is a financial incentive to being able to compromise valuable data. The media seems to be reporting new data compromises constantly. That means auditors need to be effectively auditing the controls that should exist to protect this valuable organizational asset.

Oracle Databases often store the data that's being targeted. Oracle Databases are very complex and challenging to audit! Auditors need to be able to effectively audit the processes and controls in place around the database to ensure the asset is being properly protected and the risks properly managed.

This course provides all of the details, including the IT process, procedural and technical controls, that you as an auditor should look for when conducting an Oracle database audit. Even better, you have the opportunity to get firsthand experience extracting and interpreting data from a live Oracle Database which allows you to be able to return and immediately conduct an Oracle Database audit. By getting hands-on experience, you get a better understanding of exactly how an Oracle Database operates and what data is available for audit purposes. The course is also put together in such a way that you can add additional value to the business and provide further security recommendations and benefits for the database being audited.



Who Should Attend

- Internal Auditors
- IT Specialist Auditors
- IT Auditors
- IT Audit Manager
- Information System Auditor
- Information Technology Auditor
- Information Security Officer

AUD521: Meeting the Minimum: PCI/DSS 2.0: Becoming and Staying Compliant

Two-Day Program | Fri, Mar 8 - Sat, Mar 9, 2013 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: David Hoelzer

The payment card industry has been working over the past several years to formalize a standard for security practices that are required for organizations who process or handle payment card transactions. The fruit of this labor is the Payment Card Industry Data Security Standard (currently at version 2.0).

This standard, which started life as the Visa Digital Dozen, is a set of focused comprehensive controls for managing the risks surrounding payment card transactions, particularly over the Internet. Of course, compliance validation is one of the requirements. This course was created to allow organizations to exercise due care by performing internal validations through a repeatable, objective process. While the course will cover all of the requirements of the standard, the primary focus is on the technical controls and how they can be measured. Every student will leave the class with a toolkit that can be used to validate any PCI/DSS environment technically and the knowledge of how to use it.

HOSTED: (ISC)²® Certified Secure Software Lifecycle Professional (CSSLP®) CBK® Education Program

Five-Day Program | Sun, March 10 - Thu, March 14 | 9:00am - 5:00pm | 35 CPE/CMU Credits | Instructor: (ISC)² Instructor

This course will ensure you're properly prepared to take on the constantly evolving vulnerabilities exposed in software development. Each software stakeholder is responsible for certain phase(s) of the SLC, but all phases must have security built into them. CSSLP® is for all the stakeholders involved in the process. Each of the seven CSSLP® Domains covers how to build security into the different phases.

The comprehensive (ISC)² CSSLP CBK Education program covers the following domains:

- **Secure Software Concepts – security implications in software development**
- **Secure Software Requirements – capturing security requirements in the requirements gathering phase**
- **Secure Software Design – translating security requirements into application design elements**
- **Secure Software Implementation/Coding – unit testing for security functionality and resiliency to attack and developing secure code and exploit mitigation**
- **Secure Software Testing – integrated QA testing for security functionality and resiliency to attack**
- **Software Acceptance – security implication in the software acceptance phase**
- **Software Deployment, Operations, Maintenance, and Disposal – security issues around steady state operations and management of software**

Who Should Attend

- Software Architects
- Software Engineers/Designers
- Software Development Managers
- Requirements Analysts
- Project Managers
- Business and IT Managers
- Auditors
- Developers and Coders
- Security Specialists
- Auditors and Quality Assurance Managers
- Application Owners

Download a brochure to learn more about the CSSLP.
www.isc2.org/csslpedu

Please note that the price of tuition does NOT include the CSSLP exam.

HOSTED: RMF for DoD IT Workshop

Five-Day Program | Mon, Mar 11 - Fri, Mar 15 | 9:00am - 5:00pm | 40 CPE/CMU Credits | Laptop Required | Instructor: Scott Byers

SecureInfo is pleased to announce the release of the Risk Management Framework for DoD Information Technology (RMF for DoD IT or RDIT) Workshop. This intense Cybersecurity-based workshop blends lecture, discussion, and hands-on exercises to educate students on the new RDIT methodology. This workshop will prepare students to implement the Risk Management Framework for their IT systems as prescribed in the updated DoD series of publications, as well as the related NIST and CNSS publications. The workshop compares and contrasts numerous aspects of the current DoD C&A process (DIACAP), to the new methodology for categorizing information systems, selecting and implementing applicable security controls, and establishing a Continuous Monitoring program. This workshop breaks down the RDIT methodology (into steps, tasks, outputs, and responsible entities) and includes informative lectures, discussions, and exercises which provide a functional understanding of Cybersecurity, Risk Management, and the proper selection, implementation, and validation of the new Security Controls as outlined on the DIACAP Knowledge Service and complimented by NIST Special Publications.

Background

The Department of Defense has adopted and will transition to a new Cybersecurity Risk Management Framework (RMF) methodology [RDIT] as the replacement for DIACAP. The direction for this transformation comes from the latest set of both DoD and Committee for National Security Systems (CNSS) document replacements for DoDD 8500.1, DoDI 8500.2, DoDI 8510.01, CNSSP 22, and CNSSI 1253. The RDIT is supported and complimented through a suite of standards and guidelines: National Institute of Standards and Technology (NIST) Special Publications (SP) 800-37, 800-30, 800-39, 800-53, 800-53A, and 800-137.

Who Should Attend

- Individuals with information system and security management and oversight responsibilities. (e.g., authorizing official representatives, chief information officers, senior information assurance officers, information system owners, or certifying authorities)
- Individuals with information system and information assurance control assessment and monitoring responsibilities. (e.g., system evaluators, assessors/assessment teams, independent verification and validation assessors, auditors, Inspectors General, or program managers)
- Individuals with information assurance implementation and operational responsibilities. (e.g., information system owners, information owners/stewards, mission/business owners, information system security managers/officers, security managers, or system administrators)

HOSTED: Offensive Countermeasures: Defensive Tactics That Actually Work

Two-Day Program | Fri, Mar 8 - Sat, Mar 9 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: John Strand

One of the big questions we get is why Offensive Countermeasures are so important. Well, to be honest, you will need it someday. The current threat landscape is shifting. We need to develop new strategies to defend ourselves. Even more importantly, we need to better understand who is attacking us and why. Some of the things we talk about you may implement immediately, others may take you a while to implement. Either way, consider what we discuss as a collection of tools at your disposal when you need them to annoy attackers, attribute who is attacking you and, finally, attack the attackers.

More to the point, the old strategies of security have failed us and will continue to fail us unless we start becoming more offensive in our defensive tactics.

Topics:

- Why Offensive Countermeasures?
- Legal Issues
- Core Security Concepts most People are Missing
- Why Current Security Strategies are Failing
- Layers of Defense for the Bad Guy
- Observe Orient Decide Act
- The Three A's of Offensive Countermeasures (Annoyance, Attribution and Attack)
- Fuzzing Attack Tools
- DOM-Hanoi
- SpiderTrap
- Web Labyrinth
- DNS Servers from Hell
- Honeypots
- Dynamic Blacklists from the Command Line for Windows and for Linux
- Dealing with Attackers using TOR
- Proxychains and TORProxy
- How Nmap Really Works with TOR
- Metasploit Decloak
- Word Web Bugs
- Web Application Street Fighting
- Browser Exploitation Framework
- Evil Java Applications
- Social Engineering Toolkit and OCM
- Bypassing AV... To Attack the Attackers
- Honey Claymores (or, Why did I open that file?)

HOSTED: Physical Penetration Testing - Introduction

Two-Day Program | Fri, Mar 8 - Sat, Mar 9 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: Deviant Ollam

Physical security is an oft-overlooked component of data and system security in the technology world. While frequently forgotten, it is no less critical than timely patches, appropriate password policies, and proper user permissions. You can have the most hardened servers and network but that doesn't make the slightest difference if someone can gain direct access to a keyboard or, worse yet, march your hardware right out the door.

Those who attend this session will leave with a full awareness of how to best protect buildings and grounds from unauthorized access, as well as how to compromise most existing physical security in order to gain access themselves. Attendees will not only learn how to distinguish good locks and access control from poor ones, but will also become well-versed in picking and bypassing many of the most common locks used in North America in order to assess their own company's security posture or to augment their career as a penetration tester.

Topics:

- Why Physical Security Matters
- Pin Tumbler Locks
- Common Tools, Basic Opening Techniques
- Pin Tumbler Locks (Tubular, Cross, Dimple)
- Wafer Locks
- Raking & Jiggling
- Combination Locks (Shimming, Decoding)
- Warded Locks
- Lever Locks
- Barrel Locks
- Handcuffs & Gun Locks
- Lock Bumping
- Pick Resistant Locks (keyways, pins)
- Shim Resistant Locks
- Side Pins
- Side Bars (Medeco, Smart Key)
- Mul-T-Lock overview
- Rotating Disk overview
- Magnetic Lock overview
- Impressioning intro (filing, foil, casting)
- Bump Countermeasures
- Corporate Concerns (key control, master keying, fire access, elevators)
- Electronic Locks (Cliq attacks, RFID cloning, access control sniffing)
- Quick Bypassing for Pen Testers
- Social Engineering for Pen Testers
- Lockpicking Forensics
- Legal Concerns
- Details of Equipment and Tools

HOSTED: Total System Compromise

Two-Day Program | Fri, Mar 8 - Sat, Mar 9 | 9:00am - 5:00pm | 12 CPE/CMU Credits | Laptop Required | Instructor: Dr. Engebretson & Dr. Pauli

Total System Compromise (TSC) takes participants with no or little previous offensive security (hacking) skills and turns them into competent ethical hackers to target networks, web applications, software packages, and end users. The course focuses on the proper use of tools and techniques that provide the student with a comprehensive overview of offensive security. The class make no assumption of prior knowledge but moves quickly from the proper use of fundamental tools to advanced hacking techniques including fuzzing, shellcode creation, and manual exploitation through discovery and weaponization of buffer overflows.

TSC teaches current hacking techniques through a series of intense hands-on exercises, group discussions, tool exploration, and guided walk-throughs. The class covers modern attacks for both network and web systems. Given the "zero entry" starting point and amount of material covered, TSC can be taken as a comprehensive standalone course or utilized as a solid foundation for any advanced security training.

TSC utilizes a structured approach to assessing the security by employing a three phase, tool-driven methodology composed of: 1) Information Gathering; 2) Scanning; and 3) Exploitation. Each phase will include best practices and detailed instructions covering the seminal tools required to complete the attack. Utilizing this methodology to explore both network and web-based attacks students are armed with the knowledge required for Total System Compromise.

Presented Pauli Consulting

Topics:

- Information Gathering with Google Fu, MetaGooFil, the Harvester and Maltego
- Network Port Scanning with Nmap including advanced techniques utilizing the Nmap Scripting Engine
- Network Vulnerability Scanning with Nessus
- Local and remote password cracking with John the Ripper, Hydra, Medusa, and Rainbow tables
- Network Exploitation with Metasploit and the ExploitDB
- Web Application Scanning with Zed Attack Proxy (ZAP)
- Web Application Exploitation with Burp Suite, sqlmap, and cURL
- Software exploitation and buffer overflow weaponization with fuzzing, shellcode, and payload delivery
- End user hacking with the Social Engineering Toolkit (SET)

SANS Simulcast

You don't have to miss out on SANS' top-rated training. Attend select SANS 2013 courses remotely via SANS Simulcast!

How SANS Simulcast Works

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You can save thousands of dollars on travel costs, making Simulcast an ideal solution for students working with limited training budgets or travel bans.

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Simulcast classes are live and interactive, allowing you to ask questions and share experiences with your instructor and classmates.

CONDENSED

Complete your course quickly; Event Simulcast classes run all day in real time with select courses being held at our live training events. Custom Simulcast classes are just that, classes that can be customized to your training requirements.

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Simulcast classes are recorded and placed in an online archive in case you have to miss part of the class or just wish to view the material again at a later date.

COMPLETE

You will receive the same books and course materials that conference students receive, and you will see and hear the same material presented to students at the events.

"I was surprised how much I liked this format, (live virtual delivery) since I have attended other SANS classes in person. I was skeptical, but I loved it."
- Jon Truan, Oak Ridge National Laboratory

The following SANS 2013 courses will be available via SANS Simulcast:

Short Courses:	*Long Courses:*
MGT305	LEG523
MGT433	MGT414
	SEC401
	SEC542
	SEC560

To register for a SANS 2013 Simulcast course, please visit www.sans.org/simulcast

SANS 2013 Bonus Sessions

Enrich your SANS training experience! Evening talks given by our instructors and selected subject matter experts help you broaden your knowledge, get the most for your training dollar, and hear from the voices that matter in computer security.

Introduction to Windows Kernel Exploitation

Stephen Sims

In this presentation Stephen will discuss the basics of Kernel debugging and exploitation on the Windows 7 and Windows 8 operating systems. Demonstrations will be performed showing Kernel crashes and the associated vulnerability. We will also take a look at some examples of exploit mitigation controls being added to protect the Windows Kernel from being exploitable when a vulnerability exists. Note that this is a technical talk.

Hacking Your Friends and Neighbors For Fun

Joshua Wright

I regularly see my neighbors trying to connect to open wireless APs I run in my house. A while back, I setup a special open AP to give them Internet access. The cost? My entertainment.

My neighbor-hack AP is setup to manipulate the web traffic of its users, randomly redirecting people to websites of my choosing, manipulating the format and content of pictures they download and more. All it takes is an inexpensive AP, a Linux box and an Internet connection.

In this talk, I'll show you how to setup your own neighbor-hack AP and, in the process, you'll learn just how scary (or fun) an open wireless AP can be.

Social Zombies: Rise of the Mobile Dead

Kevin Johnson

Just when you thought "bath salts" were turning innocent humans into flesh eating Zombies in Florida, mobile devices have begun taking over the world like an infectious Zombie virus outbreak. Tablets and mobile phones are being used by everyone today and are more powerful than ever before. The technology implemented in these devices is truly bleeding edge. From new wireless technology like NFC (Near Field Communication) to social networks being integrated directly into mobile operating systems, the times are rapidly changing. These new technology advancements also introduce new privacy and physical security concerns not seen before as well. In addition, with new technology come new responsibilities and challenges for security professionals and consumers alike especially in a world of BYOD.

In this presentation Kevin Johnson explores and exploits the new technology being implemented by these mobile platforms. Kevin has discovered interesting security and privacy issues with Android Jelly Bean, Apple iOS 6, OS X Mountain Lion, NFC and many popular mobile applications. New tools and exploits will be discussed that can be used by penetration testers to exploit these new technologies. Kevin will also discuss strategies to combat the ensuing mobile device onslaught into the enterprise. This information alone will help you to survive the "Rise of the Mobile Dead."

Who's Watching the Watchers?

Mike Poor

We have instrumented our networks to the Nth degree. We have firewalls, IDS, IPS, Next Gen Firewalls, Log correlation and aggregation... but do we know if we have it right? Will we detect the NextGen™ attackers?

In this talk we will explore ways that we improve the signal/noise ratio in our favor, and help identify the needle in the needlestack.

Securing the Kids

Lance Spitzner

Technology is an amazing tool. It allows our kids to access a tremendous amount of information, meet new people, and communicate with friends around the world. In addition, for them to be successful in the 21st century they have to know and understand how to leverage these new tools. However, with all these capabilities come a variety of new risks, risks that as parents you may not understand or even be aware of. In this one hour presentation we cover the top three risks to kids online and the top five steps you can take to protect them. This course is based on the experiences and lessons learned from a variety of SANS top instructors who not only specialize in security, but are parents just like you. This talk is sponsored and delivered by SANS Securing The Human program.

Tales from the Crypt: TrueCrypt Analysis

Hal Pomeranz

What if you suspect a device you are investigating may contain TrueCrypt volumes? What if you have no passwords or memory image to analyze and cannot access the volumes? Is all hope lost? Based on real-world investigations, this talk starts by covering techniques for detecting TrueCrypt volumes on Windows systems using a combination of specialized tools, registry forensics, and application-specific configuration files Next we'll look at the information that is available to the investigator about the contents of a TrueCrypt volume, even when the volume itself cannot be decrypted.

Over-Zealous Social Media Investigations: Beware the Privacy Monster

Ben Wright

Social media are bursting with open-source intelligence, valuable for all kinds of investigations. This public treasure trove of evidence is inspiring powerful new tools for collecting it. But are there privacy limits to what an investigator can collect from "public" sources? Will the evidence collected by the investigator be admissible in court?

Human Nature and Information Security: Irrational and Extraneous Factors That Matter

Lenny Zeltser

I'd like to believe that the information security discipline is grounded in fact, rationality and sound judgment. However, a surprising number of infosec decisions are based on seemingly irrational and extraneous factors that include the person's physiological state, contradictory logic, and subjective perception. This session discusses lots of examples of such situations, including:

- The way in which a data breach might help the affected brand or how making security policies harder to read might improve comprehension
- The power of social engineering scams that use persuasion techniques such as the scarcity principle and emotional state mirroring
- The importance of not only being secure, but also feeling secure, as well as the difference between fear and anxiety

By looking at information security from slightly uncommon perspectives, this talk just might change how you think about the relationship between infosec decisions and human nature.

Top 07 Human Errors

Lance Spitzner

It is well know that humans continue to be one of the weakest links in any organization's defenses. But why is that? What makes people so vulnerable, why do people continue to be the root cause of so many incidents? By understanding these top 07 errors you will quickly identify the top human risks to your organization and how you can mitigate them.

Why Our Defenses Are Failing Us. One Click Is All It Takes…

Bryce Galbraith

Organizations are spending unprecedented amounts of money in an attempt to defend their assets, yet all too often, one click is all it takes for it all to come toppling down around them. Every day we read in the news about national secrets, intellectual property, financial records & personal details being exfiltrated from the largest organizations on Earth. How is this being done? How are they bypassing our defenses (e.g. strong passwords, non-privileged accounts, anti-virus, firewalls/proxies, IDS/IPS, logging, etc.) And most importantly, what can we do about it? A keen understanding of the true risks we face in today's threatscape is paramount to our success.

Vendor Expo

Monday, March 11, 2013
12:00pm - 1:30pm and 5:00pm - 7:00pm

Given that virtually everything in security is accomplished with a tool, exposure to those tools is a very important part of the SANS Training Event learning experience. Leading solutions providers will be on hand for a two-day vendor expo, an added bonus to registered training event attendees.

Vendor-Sponsored Lunch Sessions

Monday, March 11, 2013 | 12:00pm - 1:30pm

Join these sponsoring vendors and others on the expo floor for an introduction to leading solutions and services that showcase the best options in information security.

Vendor-Sponsored Lunch & Learn Presentations

Throughout SANS 2013, vendors will provide sponsored lunch presentations where attendees can interact with peers and receive education on vendor solutions. Take a break and get up-to-date on security technologies!

Vendor Welcome Reception

Monday, March 11, 2013 | 5:00pm - 7:00pm

This informal reception allows you to visit exhibits and participate in some exciting activities. This is a great time to mingle with your peers and experience first-hand the latest in information security tools and solutions with interactive demonstrations. Enjoy appetizers and beverages while comparing experiences with other attendees regarding the solutions they are using to address security threats in their organization. Attendees can visit sponsors to receive raffle tickets and enter to win exciting prizes. Prize drawings occur throughout the expo.

How Are You Protecting Your

- **Data**
- **Network**
- **Systems**
- **Critical Infrastructure**

Risk management is a top priority. The security of these assets depends on the skills and knowledge of your security team. Don't take chances with a one-size fits all security certification. **Get GIAC certified!**

GIAC offers over 20 specialized certifications in security, forensics, penetration testing, web application security, audit, and management.

"GIAC is the only certification that proves you have hands-on technical skills."
-Christina Ford, Department of Commerce

Learn more about GIAC and how to *Get Certified* at **www.giac.org**

Department of Defense

Come to SANS and take the training with the highest pass rate on 8570 required certifications.

www.sans.org/8570

DoD Baseline IA Certifications

IAT Level I	IAT Level II	IAT Level III
A+-CE	GSEC	GCIH
Network+CE	Security+CE	GSE
SSCP	SSCP	CISA
		CISSP (or Associate)

IAM Level I	IAM Level II	IAM Level III
GISF	GSLC	GSLC
GSLC	CAP	CISM
CAP	CISM	CISSP (or Associate)
Security+CE	CISSP (or Associate)	

IASAE I	IASAE II	IASAE III
CISSP (or Associate)	CISSP (or Associate)	CISSP - ISSEP
		CISSP - ISSAP

CNDSP Analyst	CNDSP Infrastructure Support
GCIA	SSCP
GCIH	CEH
CEH	

CNDSP Incident Responder	CNDSP Infrastructure Support
GCIH	GSNA
CSIH	CSIA
CEH	CEH

CNDSP Incident Responder
CISSP - ISSMP
CISM

SANS Training Courses for DoD Approved Certifications

SANS TRAINING COURSE	DoD APPROVED CERT
SEC301: Intro to Information Security	GISF
SEC401: SANS Security Essentials Bootcamp Style	GSEC
SEC503: Intrusion Detection In-Depth	GCIA
SEC504: Hacker Techniques, Exploits & Incident Handling	GCIH

SANS TRAINING COURSE	DoD APPROVED CERT
AUD507: Auditing Networks, Perimeters and Systems	GSNA
MGT414: SANS® +S™ Training Program for the CISSP® Certification Exam	CISSP
MGT512: SANS Security Essentials for Managers with Knowledge Compression™	GSLC

DoD 8570 certification requirements are subject to change, please visit http://iase.disa.mil/eta/iawip for the most updated version.

For more information, contact us at 8570@sans.org or visit www.sans.org/8570

NETWARS

A True Hands-On Interactive Security Challenge!

NetWars is a computer and network security challenge designed to test participant's experience and skills in a safe, controlled environment while having a little fun with your fellow IT security professionals.

- Vulnerability Assessments
- System Hardening
- Malware Analysis
- Digital Forensics
- Incident Response
- Packet Analysis
- Penetration Testing
- Intrusion Detection

The NetWars competition will be played over two evenings: March 13-14.
Prizes will be awarded at the conclusion of the games.
REGISTRATION IS LIMITED AND IS FREE for students attending any long course at SANS 2013 *(NON-STUDENTS ENTRANCE FEE IS $999)*.

Register at www.sans.org/sans-2013

How NetWars Works

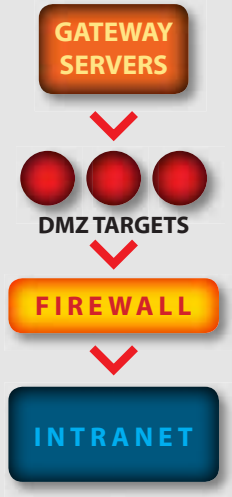
At the outset of the challenge, each player must find hidden keys within a special image downloaded from the Internet and then use those keys to enter an online environment where knowledge of security vulnerabilities, their exploits, and their associated defenses can be turned into points.

NetWars has five separate levels, so players may quickly advance through earlier levels to their level of expertise. The entire challenge involves all five levels.

Levels:

1) **Played on CD image (Lin or Win), no superuser privs granted**
2) **Played on CD image (Lin or Win) with superuser**

3) **Played across the Internet, attacking DMZ**
4) **Played across the Internet, attacking internal network from DMZ**



5) **Played across the Internet, attacking other player's castles and defending your own**

Scoring

A comprehensive score card is generated for each player at the conclusion of the NetWars challenge. This detailed assessment illustrates the areas where participants have demonstrated skills and highlights other areas where skills can be refined or built.

Scoreboard

- Scoreboard shows progress in real-time
- Great challenge at-a-glance view, depicting:
  - Challenges conquered
  - Territory still available
  - Momentum and rank
  - Time since last score

Scoreboard Stats

- Scoreboard animation reveals other player stats
  - Accuracy
  - Speed
  - Percentage complete ***(Rank and momentum always remain on the screen)***

Benefits for Individuals

If you are a self-motivated security professional who really wants to put your knowledge to the test, then NetWars is an excellent opportunity for you to have fun and learn in a competition with other security professionals, practicing real-world tactics that could happen at any time.

- **The detailed score card is an incomparable opportunity for you to analyze your security knowledge and decide in what other areas you would like to learn new skills or refine your existing ones.**
- **Demonstrate your experience to other security professionals.**
- **Stay on top of the latest attacks and see what your competition is doing.**
- **Participants that reach level three of NetWars will be eligible to receive 12 CMU credits towards GIAC certification renewal.**

Benefits for Organizations

How would your security team handle a real attack? Do they have the right skills and knowledge to defend vital systems? The NetWars simulation lets you see how your organization would react during an attack, but without the consequences.

- **Test the experience and skills of your current security team and assess areas where further training is needed.**
- **Evaluate the experience of potential new hires.**
- **Use the score card to create a customized training program for your security personnel.**

What's Your Next Career Move?

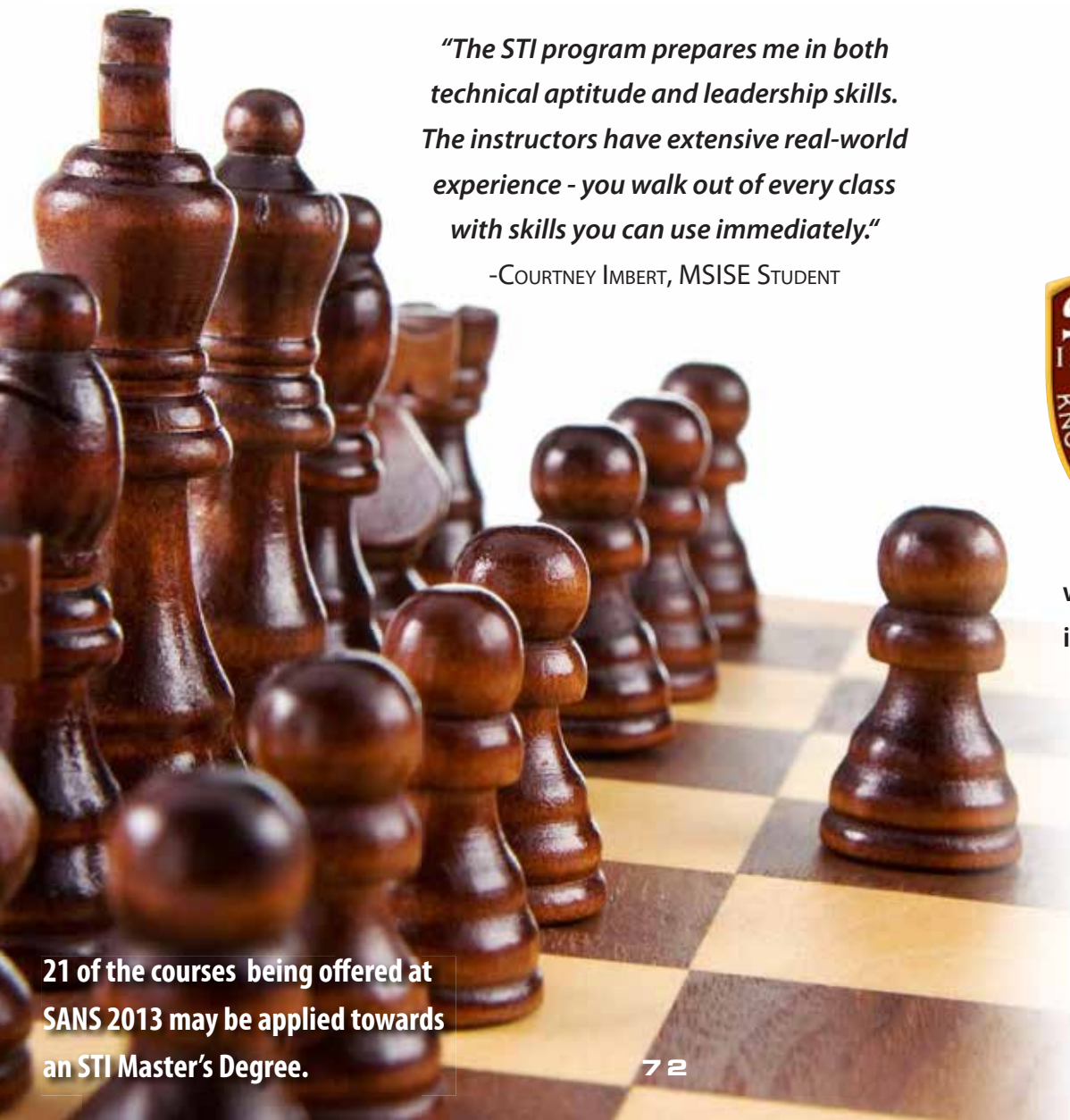
The information security field is growing and maturing rapidly; are you positioned to win?
A Master's Degree in Information Security from the SANS Technology Institute
will help you build knowledge and skills in management or technical engineering.

STI offers two master's degree programs:

Master of Science in Information Security Engineering

Master of Science in Information Security Management

STI Cohort 2013-02 starts at Network Security 2013.
Enroll by August 16, 2013 to be eligible for a scholarship of up to 30% of your first year's tuition.



"The STI program prepares me in both technical aptitude and leadership skills. The instructors have extensive real-world experience - you walk out of every class with skills you can use immediately."

-Courtney Imbert, MSISE Student

SANS TECHNOLOGY INSTITUTE
KNOWLEDGE FOR PEACE
SCIENTIA PRO PACE

www.sans.edu
info@sans.edu
720.941.4932

21 of the courses being offered at SANS 2013 may be applied towards an STI Master's Degree.

SANS CYBER GUARDIAN PROGRAM

www.sans.org/cyber-guardian

Stay ahead of cyber threats!

Join the SANS Cyber Guardian program today.

How the Program Works

This program begins with hands-on core courses that will build and increase your knowledge and skills. These skills will be reinforced by taking and passing the associated GIAC certification exam. After completing the core courses, you will choose a course and certification from either the Red or Blue Team. The program concludes with participants taking and passing the GIAC Security Expert (GSE) certification.

Contact us at **onsite@sans.org** to get started!

Program Prerequisites

- Five years of industry-related experience
- A GSEC certification (with a score of 80 or above)
  or
  CISSP certification

Core Courses

SEC503 Intrusion Detection In-Depth (GCIA)
SEC504 Hacker Techniques, Exploits, and Incident Handling (GCIH)
SEC560 Network Penetration Testing and Ethical Hacking (GPEN)
FOR508 Advanced Computer Forensic Analysis & Incident Response (GCFA)

After completing the core courses, students must choose one course and certification from either the Blue or Red Team

Blue Team Courses

SEC502 Perimeter Protection In-Depth (GCFW)
SEC505 Securing Windows & Resisting Malware (GCWN)
SEC506 Securing Linux/Unix (GCUX)

Red Team Courses

SEC542 Web App Penetration Testing & Ethical Hacking (GWAPT)
SEC617 Wireless Ethical Hacking, Penetration Testing, and Defenses (GAWN)
SEC660 Advanced Penetration Testing, Exploits, and Ethical Hacking (GXPN)

The SANS Cyber Guardian program is a unique opportunity for information security individuals or organizational teams to develop specialized skills in incident handling, perimeter protection, forensics, and penetration testing.

SECURITY AWARENESS

FOR THE 21st CENTURY

- Go beyond compliance and focus on changing behaviors.
- Training is mapped against the 20 Critical Controls framework.
- Create your own program by choosing from 30 different training modules.
- Meets mandated compliance requirements.
- Offered in 20 languages.
- Host on SANS VLE or on your own LMS.
- For a free trial, visit us at www.securingthehuman.org or email us at info@securingthehuman.org

SANS SECURING THE HUMAN

www.securingthehuman.org

SANS Training Options

Multi-Course Training Events

Live instruction from SANS' top faculty, vendor showcase, bonus evening sessions, and networking with your peers

www.sans.org/security-training/bylocation/index_all.php

Community SANS

Live Training in Your Local Region with Smaller Class Sizes

www.sans.org/community

OnSite

Live Training at Your Office Location

www.sans.org/onsite

Mentor

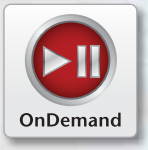
Live Multi-Week Training with a Mentor

www.sans.org/mentor

Summit

Live IT Security Summits and Training

www.sans.org/summit



OnDemand

All the Course Content at Your Own Pace

www.sans.org/ondemand

vLive

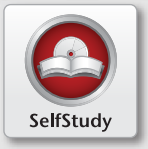
Virtual Live Training from Your Home or Office

www.sans.org/vlive

Simulcast

Attend Event Training From Your Location

www.sans.org/simulcast



SelfStudy

Independent Study with Books and MP3s

www.sans.org/selfstudy

Future SANS Training Events

SANS **Mobile Device Security** Summit 2013

Anaheim, CA | January 7-14, 2013

www.sans.org/event/mobile-device-security-summit-2013

SANS **Virtualization and Cloud Computing** Summit 2013

Anaheim, CA | January 7-14, 2013

www.sans.org/event/virtualization-cloud-summit-2013

SANS **Security East** 2013

New Orleans, LA

January 16-23, 2013

www.sans.org/event/security-east-2013

SANS **North American SCADA and Process Control** Summit 2013

Lake Buena Vista, FL | February 6-15, 2013

www.sans.org/event/north-american-scada-2013

SANS **Scottsdale** 2013

Scottsdale, AZ

February 17-23, 2013

www.sans.org/event/scottsdale-2013

SANS **Monterey** 2013

Monterey, CA

March 22-27, 2013

www.sans.org/event/monterey-2013

SANS **Austin** 2013

Austin, TX

April 21-26, 2013

www.sans.org/event/austin-2013

SANS **Northern Virginia** 2013

Reston, VA

April 8-13, 2013

www.sans.org/event/northern-virginia-2013

Future SANS Training Events

SANS **Cyber Guardian** 2013
Baltimore, MD
April 15-20, 2013
www.sans.org/event/cyber-guardian-2013

SANS **Security West** 2013
San Diego, CA
May 8-16, 2013
www.sans.org/event/security-west-2013

SANSFIRE 2013
Washington, DC
June 13-23, 2013
www.sans.org/event/sansfire-2013

SANS **Rocky Mountain** 2013
Denver, CO
July 15-22, 2013
www.sans.org/event/rocky-mountain-2013

SANS **San Francisco** 2013
San Francisco, CA
July 29 - August 4, 2013
www.sans.org/event/san-francisco-2013

SANS **Boston** 2013
Boston, MA
August 12-17, 2013
www.sans.org/event/boston-2013

SANS **Network Security** 2013
Las Vegas, NV
September 18-25, 2013
www.sans.org/event/network-security-2013

SANS **Cyber Defense Initiative** 2013
Washington, DC
December 8-16, 2013
www.sans.org/event/cyber-defense-initiative-2013

SANS 2013 Hotel & Travel Information

SANS 2013 will be located at

Orlando World Center Marriott Hotel

8701 World Center Drive
Orlando , FL 32821 US
Phone: 407-239-4200
www.marriottworldcenter.com

The Orlando World Center Marriott towers above more than 200 prime Central Florida acres - lush, green and beautifully landscaped and is close to all of the area's major attractions. This Florida resort offers everything guests could possibly want - an 18-hole championship golf course, a full service spa and 10 restaurants with a variety of cuisines. The tropical pools are in a lagoon-like setting with 6 pools, waterfalls, waterslide and whirlpools. The hotel also has a huge video arcade and a children's activity center, as well as tennis, basketball and sand volleyball courts. Located just 1.5 miles to Disney and only minutes from SeaWorld, Discovery Cove, Aquatica, and Universal Studios.

Top-five reasons to stay at the Orlando World Center Marriott

1. All SANS attendees receive complimentary high-speed Internet when booking in the SANS Block.
2. No need to factor in daily cab fees, parking expense and the time associated with travel to alternate hotels.
3. By staying at Orlando World Center Marriott, you gain the opportunity to further network with your industry peers and remain in the center of the activity surrounding the conference.
4. SANS schedules morning and evening events at Orlando World Center Marriott that you won't want to miss!
5. Everything is in one convenient location!

Special Rates Available

A special discounted rate of $194.00 S/D will be honored based on space availability. Government per diem rooms are available with proper ID; you will need to call reservations and ask for the SANS government rate. These rates include high speed Internet in your room and are only available through February 14, 2013. To make reservations please call (800) 564-3181 and ask for the SANS group rate.

Avis is proud to offer special rates for SANS 2012. Make your reservations now and don't forget to use your special discount code: **J945620**
www.avis.com

Weather Conditions

March in Orlando is pleasant with highs around 79° and lows near 56°. For the latest weather conditions and forecast, please consult **www.weather.com.**

Come to Orlando!

Dear Colleagues and Friends,

We are back in sunny Orlando this March for SANS 2013! What a perfect time to visit this magical city at the tail end of winter to enjoy the best cyber security training in the industry! We are back at the Marriott World Center offering complimentary transportation for students staying in the hotel to Walt Disney World, Universal Studios, and Sea World. Simply make a reservation with the concierge two hours prior to your selected outing and departure.

The Marriott World Center (**www.marriottworldcenter.com**) offers one of the largest swimming pools in all of Orlando along with a championship golf course right outside the front door. The fitness facility is complimentary and always open with free internet access in the guest rooms. The Marriott World Center also offers a variety of popular restaurants including a high-end steakhouse and a casual food court for a quick bite.

Walt Disney World features four memorable theme parks and two exciting water parks. This spring, SANS 2013 coincides with the EPCOT Flower and Garden Festival, featuring special flower and garden displays, presentations, and concerts. The Magic Kingdom has recently doubled the size of Fantasyland with brand new attractions based on the Little Mermaid and Beauty and the Beast. The Disney Studio also has a new 3-D version of Star Tours, showcasing multiple versions of the ride based on the Star Wars series.

The biggest buzz at Universal Studios (**www.universalstudios.com**) is the newly created "Wizarding World of Harry Potter" located on the Universal Island of Adventure. The popular addition at Harry Potter is the "Flight of the Forbidden Journey", a state-of-the-art attraction, which literally recreates the movie series to include familiar passageways, classrooms and corridors. Sea World Orlando (**www.seaworld.com**) has an exciting new Shamu show, while at Discovery Cove (**www.discoverycove.com**) you can actually swim with the dolphins.

Since the class days are so intense, take advantage of the SANS hotel rate and enjoy a day or two before or after your training to experience everything that Orlando has to offer. Your family members are also invited to all of our SANS receptions. For tips on the Disney parks and Orlando attractions check out my favorite site (**www.allearsnet.com**) where you will find helpful reviews, restaurant menus with prices, and park updates.

For more information on all of the attractions in Orlando go to Visit Orlando at **www.visitorlando.com**. You will also want to check out the SANS 2013 program guide for all of the action-packed presentations, receptions, and engaging events as well as the social board for student gatherings around the city. If you are interested in additional recommendations, please feel free to e-mail me at **Brian@sans.org**.

See ya real soon at SANS 2013!

Brian Correia

Brian Correia
Director, Business Development & Venue Planning

Five Reasons to Register

1. ***The best career move you will ever make!***
   That's how one SANS alumnus described the IT security education and networking opportunities offered by SANS. Attending SANS 2013 is a way of investing in your career. To reap the maximum benefit, read the course descriptions carefully. Check out the five- and six-day courses plus a wide variety of one- to four-day skill-based short courses.

2. ***Why settle for second best?***
   If you want to increase your understanding of information security and become more effective in your job, you need to be trained by the best. "SANS provides by far the most in-depth security training with the true experts in the field as instructors," says Mark Smith, Costco Wholesale.

3. ***Challenge yourself!***
   Consider attempting GIAC (Global Information Assurance Certification), the industry's most respected technical security certification. GIAC is the only information security certification for advanced technical subject areas, including audit, intrusion detection, incident handling, firewalls and perimeter protection, forensics, hacker techniques, and Windows and Unix operating system security.

4. ***Become part of an elite group.***
   We're referring to the group of technical, security-savvy professionals who have had hands-on training through SANS. Material taught in the SANS courses directly applies to real-world challenges in your IT environment. "Six days of training gave me six months of work to do," says Steven Marscovetra of Norinchukin Bank. "It is amazing how much of the training I can apply immediately at work."

5. ***Don't miss out on a good opportunity!***
   This is your chance to make a great career move, be taught by the cream of the crop, challenge yourself, and become part of an elite group during a full week of IT security education and networking opportunities. Come prepared to learn; we will come prepared to teach.

Registration Information

Register online at
www.sans.org/sans-2013

How to Register

1. To register, go to www.sans.org/sans-2013.

Select your course or courses and indicate whether you plan to test for GIAC certification. If the course is still open, the secure, online registration server will accept your registration. Sold-out courses will be removed from the online registration. We do not take registrations by phone.

2. Provide payment information.

Even if you do not want to submit your payment information online, still complete the online form! There is an option to submit credit card information for payment by fax or phone once the online form is completed and you have your invoice number.

SANS ACCEPTS ONLY US and CANADIAN FEDERAL GOVERNMENT PURCHASE ORDERS

If you normally use a PO and are not part of the federal government, please see our additional PO information on the tuition information page: www.sans.org/network-security-2012/tuition.php

3. Print your invoice.

If you need one, you must print YOUR OWN INVOICE at the end of the online registration process. The invoice will pop up automatically when the registration is successfully submitted. You may also access your invoice at https://portal.sans.org/history.

4. E-mail confirmation will arrive soon after you register.

To register for a SANS 2013 Simulcast course, please visit www.sans.org/virtual-training/event-simulcast

Register Early and Save

	DATE	DISCOUNT	DATE	DISCOUNT
Register & pay by	1/23/13	$500.00	2/6/13	$250.00

Discount applies to 5- or 6-day courses only.

Group Savings (Applies to tuition only)

15% discount if 12 or more people from the same organization register at the same time

10% discount if 8 - 11 people from the same organization register at the same time

5% discount if 4 - 7 people from the same organization register at the same time

To obtain a group discount, complete the discount code request form at www.sans.org/security-training/discounts.php prior to registering.

Get GIAC Certified!

- Only $579 when combined with SANS training
- Deadline to register is the last day of SANS 2013
- Price goes to $799 after deadline
- Register today at registration@sans.org

Frequently Asked Questions

Frequently asked questions about SANS Training and GIAC Certification – the industry standard for security knowledge – are posted at www.giac.org/overview/faq.php.

Cancellation

You may subsitute another person in your place at any time by sending an e-mail request to registration@sans.org or a fax request to 301-951-0140. There is a $300 cancellation fee per registration. Cancellation requests must be received by Wednesday, February 13, 2013, by fax or mail-in order to receive a refund.

SANS 2013 Registration Fees

Register online at **www.sans.org/event/sans-2013/courses**

If you don't wish to register online,
please call 301-654-SANS(7267) 9:00am - 8:00pm (Mon-Fri) EST and we will fax or mail you an order form.

Job-Based Long Courses

		Paid by 1/23/13	Paid by 2/6/13	Paid after 2/6/13	Add GIAC Cert	Add OnDemand
☐ AUD507	Auditing Networks, Perimeters, and Systems	$3,945	$4,195	$4,445	☐ $579	☐ $449
☐ DEV522	Defending Web Applications Security Essentials	$3,945	$4,195	$4,445	Included	☐ $449
☐ FOR408	Computer Forensic Investigations - Windows In-Depth	$4,345	$4,595	$4,845	☐ $579	☐ $449
☐ FOR508	Advanced Computer Forensic Analysis and Incident Response ***NEW!***	$4,345	$4,595	$4,845	☐ $579	☐ $449
☐ FOR526	Windows Memory Forensics In-Depth ***NEW!***	$3,675	$3,925	$4,175		
☐ FOR558	Network Forensics	$3,975	$4,225	$4,475		
☐ FOR563	Mobile Device Forensics	$3,975	$4,225	$4,475		
☐ FOR610	Reverse-Engineering Malware: Malware Analysis Tools and Techniques	$3,675	$3,925	$4,175	☐ $579	☐ $449
☐ LEG523	Law of Data Security and Investigations	$3,675	$3,925	$4,175	☐ $579	☐ $449
☐ MGT414	SANS® +S™ Training Program for the CISSP® Certification Exam	$3,495	$3,745	$3,995	☐ $579	☐ $449
☐ MGT512	SANS Security Leadership Essentials For Managers with Knowledge Compression™	$4,245	$4,495	$4,745	☐ $579	☐ $449
☐ MGT514	IT Security Strategic Planning, Policy and Leadership	$3,675	$3,925	$4,175		
☐ MGT525	IT Project Management, Effective Communication, and PMP® Exam Prep	$3,945	$4,195	$4,445	☐ $579	
☐ SEC301	Intro to Information Security	$3,675	$3,925	$4,175	☐ $579	☐ $449
☐ SEC401	SANS Security Essentials Bootcamp Style	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC501	Advanced Security Essentials – Enterprise Defender	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC502	Perimeter Protection In-Depth	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC503	Intrusion Detection In-Depth	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC504	Hacker Techniques, Exploits, and Incident Handling	$4,345	$4,595	$4,845	☐ $579	☐ $449
☐ SEC505	Securing Windows and Resisting Malware ***NEW!***	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC506	Securing Linux/Unix	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC542	Web Application Penetration Testing and Ethical Hacking	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC560	Network Penetration Testing and Ethical Hacking	$4,345	$4,595	$4,845	☐ $579	☐ $449
☐ SEC566	Implementing & Auditing the Twenty Critical Security Controls - In-Depth	$3,675	$3,925	$4,175		☐ $449
☐ SEC575	Mobile Device Security and Ethical Hacking ***NEW!***	$4,345	$4,595	$4,845		
☐ SEC579	Virtualization and Private Cloud Security ***NEW!***	$4,345	$4,595	$4,845		
☐ SEC617	Wireless Ethical Hacking, Penetration Testing, and Defenses	$4,145	$4,395	$4,645	☐ $579	☐ $449
☐ SEC642	Advanced Web App Penetration Testing and Ethical Hacking ***NEW!***	$4,145	$4,395	$4,645		
☐ SEC660	Advanced Penetration Testing, Exploits, and Ethical Hacking	$4,345	$4,595	$4,845	☐ $579	☐ $449
☐ HOSTED	(ISC)²® CSSLP® CBK® Education Program	$2,645	$2,895	$3,145		
☐ HOSTED	RMF for DoD IT Workshop Workshop	$3,745	$3,995	$4,245		

Skill-Based Short Courses

		If taking a 5-6 day course				
☐ AUD444	Auditing Security and Controls of Active Directory and Windows ***NEW!***	N/A	$2,400	$2,400	$2,400	
☐ AUD445	Auditing Security and Controls of Oracle Databases ***NEW!***	N/A	$2,400	$2,400	$2,400	
☐ AUD521	Meeting the Minimum: PCI/DSS 2.0: Becoming and Staying Compliant	$1,250	$1,800	$1,800	$1,800	
☐ DEV541	Secure Coding in Java/JEE: Developing Defensible Applications	N/A	$3,145	$3,395	$3,645	Included	☐ $239
☐ DEV544	Secure Coding in .NET: Developing Defensible Applications	N/A	$3,145	$3,395	$3,645	Included	☐ $239
☐ MGT305	Technical Communication and Presentation Skills for Security Professionals	$575	$1,045	$1,045	$1,045		
☐ MGT433	Securing The Human: Building and Deploying an Effective Security Awareness Program	$1,250	$1,800	$1,800	$1,800		
☐ MGT535	Incident Response Team Management	$575	$1,045	$1,045	$1,045		☐ $129
☐ SEC434	Log Management In-Depth: Compliance, Security, Forensics, and Troubleshooting	$1,250	$1,900	$1,900	$1,900		
☐ SEC524	Cloud Security Fundamentals	$1,250	$1,800	$1,800	$1,800		
☐ SEC546	IPv6 Essentials	$1,250	$1,800	$1,800	$1,800		
☐ HOSTED	Offensive Countermeasures: Defensive Tactics That Actually Work	$1,150	$1,700	$1,700	$1,700		
☐ HOSTED	Physical Penetration Testing	N/A	$1,900	$1,900	$1,900		
☐ HOSTED	Total System Compromise	N/A	$1,700	$1,700	$1,700		
☐ SPECIAL	NetWars – Interactive Security Challenge Entrance Fee	FREE	$999	$999	$999		

Individual Courses Available

	SUN 3/10	MON 3/11	TUE 3/12	WED 3/13	THU 3/14	FRI 3/15
AUD507	☐ 507.1	☐ 507.2 & 507.3		☐ 507.4	☐ 507.5	☐ 507.6
LEG523		☐ 523.1	☐ 523.2	☐ 523.3	☐ 523.4	☐ 523.5
SEC301	☐ 301.1	☐ 301.2	☐ 301.3	☐ 301.4	☐ 301.5	
SEC401	☐ 401.1	☐ 401.2	☐ 401.3	☐ 401.4	☐ 401.5	☐ 401.6
SEC501	☐ 501.1	☐ 501.2	☐ 501.3	☐ 501.4	☐ 501.5	☐ 501.6
SEC502	☐ 502.1	☐ 502.2	☐ 502.3	☐ 502.4	☐ 502.5	☐ 502.6
SEC503	☐ 503.1					
SEC504	☐ 504.1					
SEC505	☐ 505.1	☐ 505.2	☐ 505.3	☐ 505.4	☐ 505.5	☐ 505.6

Individual Course Day Rates If Not Taking a Full Course

☐ One Full Day	$1,350
☐ Two Full Days	$2,075
☐ Three Full Days	$3,025
☐ Four Full Days	$3,775
☐ Five Full Days	$4,575
☐ Six Full Days	$4,875
☐ Seven Full Days	$5,475
☐ Eight Full Days	$5,995

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1. EXPLORE

- Read this brochure and note the courses that will enhance your role at your organization.
- Use the *Career Roadmap* (inside cover) to arm yourself with all the necessary materials to make a good case for attending a SANS training event.
- Note that the core, job-based courses can be complemented by short, skill-based courses of one or two days. We also offer deep discounts for bundled course packages. Consider a *GIAC Certification*, which will show the world that you have achieved proven expertise in your chosen field.

2. RELATE

- Show how recent problems or issues will be solved with the knowledge you gain from the SANS course.
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3. SAVE

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- Explain how you will be able to get and share great ideas on improving your IT productivity and efficiency.
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