Web Hacking Tools

David Epler
Software Architect
depler@aboutweb.com

About Me

- Application Developer
- Web Application Security Enthusiast
  - Security Certifications shortly
- Adobe Community Professional
- Contributor to Learn CF In a Week
- OWASP Individual Member
- Created Unofficial Updater 2 to patch Adobe ColdFusion 8.0.1 & 9.0.x

About the Session

- What will **NOT** be covered
  - How to fix your code
  - How to secure your OS, Web Server, Application Server
    - Both of those are covered in other sessions at cf.Objective()

About the Session

- What will be covered
  - Recent events in security and hacking
  - Demonstration of various hacking tools used against web applications
  - Quick overview of Web Application Firewalls and Web Vulnerability Scanners

About the Demos

- Virtual Machines, not live servers
  - BackTrack 5^{r3}
  - OWASP Broken Web Apps
  - Windows 7 & Server 2008 R2

DO NOT perform any activities shown on any network/system or on a network connected device without proper permission!

243

Average number of days a network is compromised by a hacker before discovery

Down from 416 days in 2012 as reported by Mandiant M-Trends Report

Things you'll never see in logs

- Internet search engines used for passive reconnaissance
  - Google Hacks
  - Internet Archive
  - Netcraft
  - Alexa
  - Shodan
- Not quite passive but can be hard to spot
  - Web Crawler/Spider/Mirroring

South Carolina Department of Revenue

- Compromised ~45 days, starting August 27, 2012
  - Notified by U.S. Secret Service

- Mandiant's findings
  - 44 systems effected
  - 30+ unique pieces of malicious software & utilities
  - 74.7GB of data stolen
    - 3.3 million bank account numbers
    - 3.8 million tax returns
    - 1.9 million Social Security Numbers

South Carolina Department of Revenue

Mandiant Services	$500,000
1 year Experian Credit Monitoring for those effected	$12,000,000
Improved Information Security Capabilities	$800,000
Outside Legal Help	$100,000
Public Relations Campaign	$150,000
Notification of Breach	$740,000
Cost	$14,290,000

And the cost is still going up

OWASP Top Ten (2013)

A1: Injection

A2: Broken Authentication and Session Management

A3: Cross-Site Scripting (XSS)

A4: Insecure Direct Object References

A5: Security Misconfiguration

A6: Sensitive Data Exposure

A7: Missing Function Level Access Controls

A8: Cross Site Request Forgery (CSRF)

A9: Using Components with Known Vulnerabilities

A10: Unvalidated Redirects and Forwards

ColdFusion Vulnerability Prevalence from VeraCode

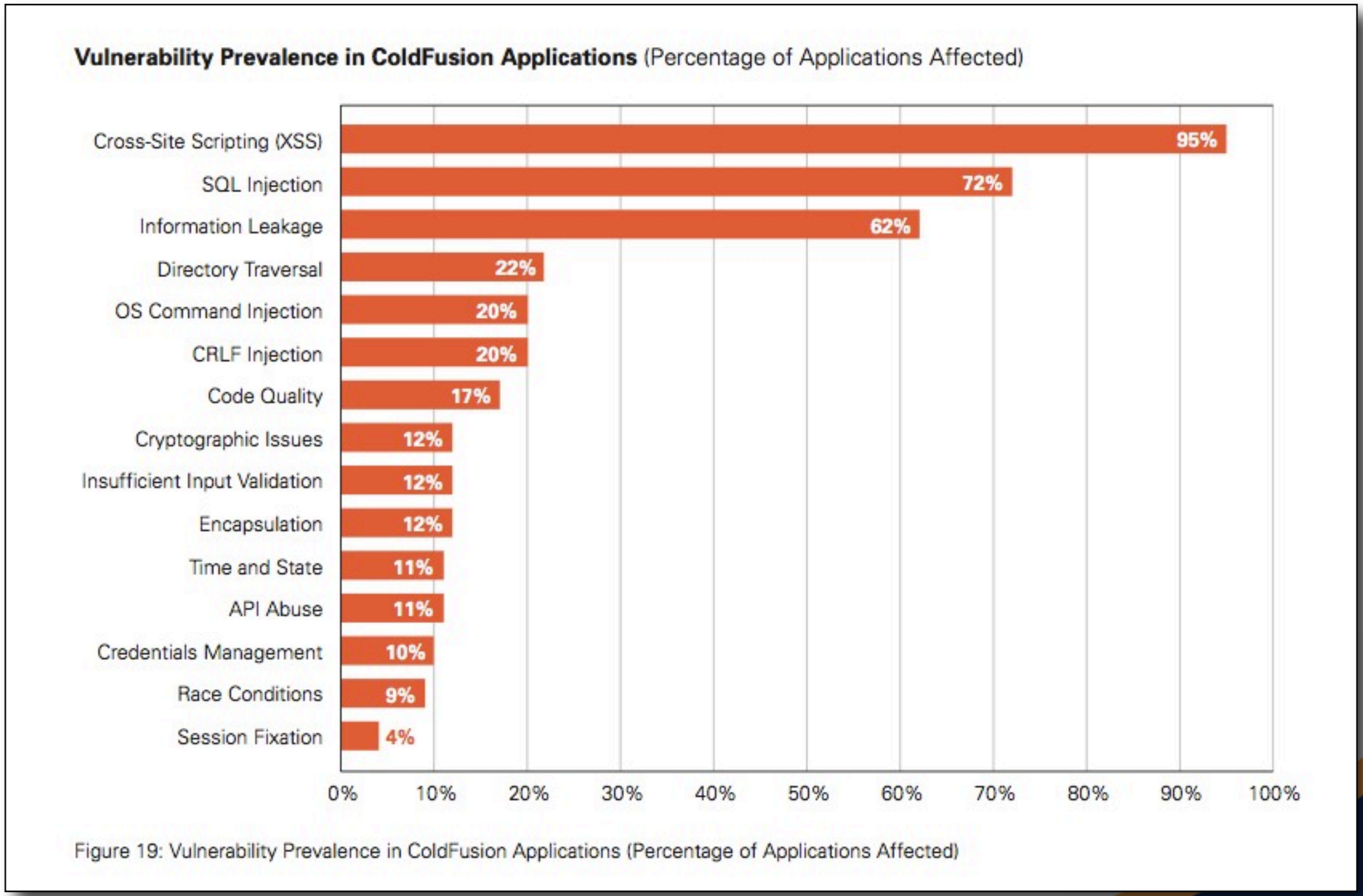

Figure 19: Vulnerability Prevalence in ColdFusion Applications (Percentage of Applications Affected)

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LinkedIn

eHarmony®

ZOOSK

livingsocial

twitter

EVERNOTE®

SQL Injection (SQLi)

- Stacked Queries
  - http://www.victim.com/products.asp?id=1;exec +master..xp_cmdshell+'dir'
- Tautology
  - http://www.victim.com/logon.aspx? username=admin' or 1=1;--
- UNION Statements
  - http://www.victim.com/products.asp?id=12+UNION +SELECT +userid,first_name,second_name,password+FROM +customers
- Blind

Demo

- Tool
  - sqlmap
- Target
  - OWASP Broken Web Apps
    - Apache 2.2.14 + PHP 5.3.2
    - MySQL 5.1.41

- Recorded Demo

Password Cracking

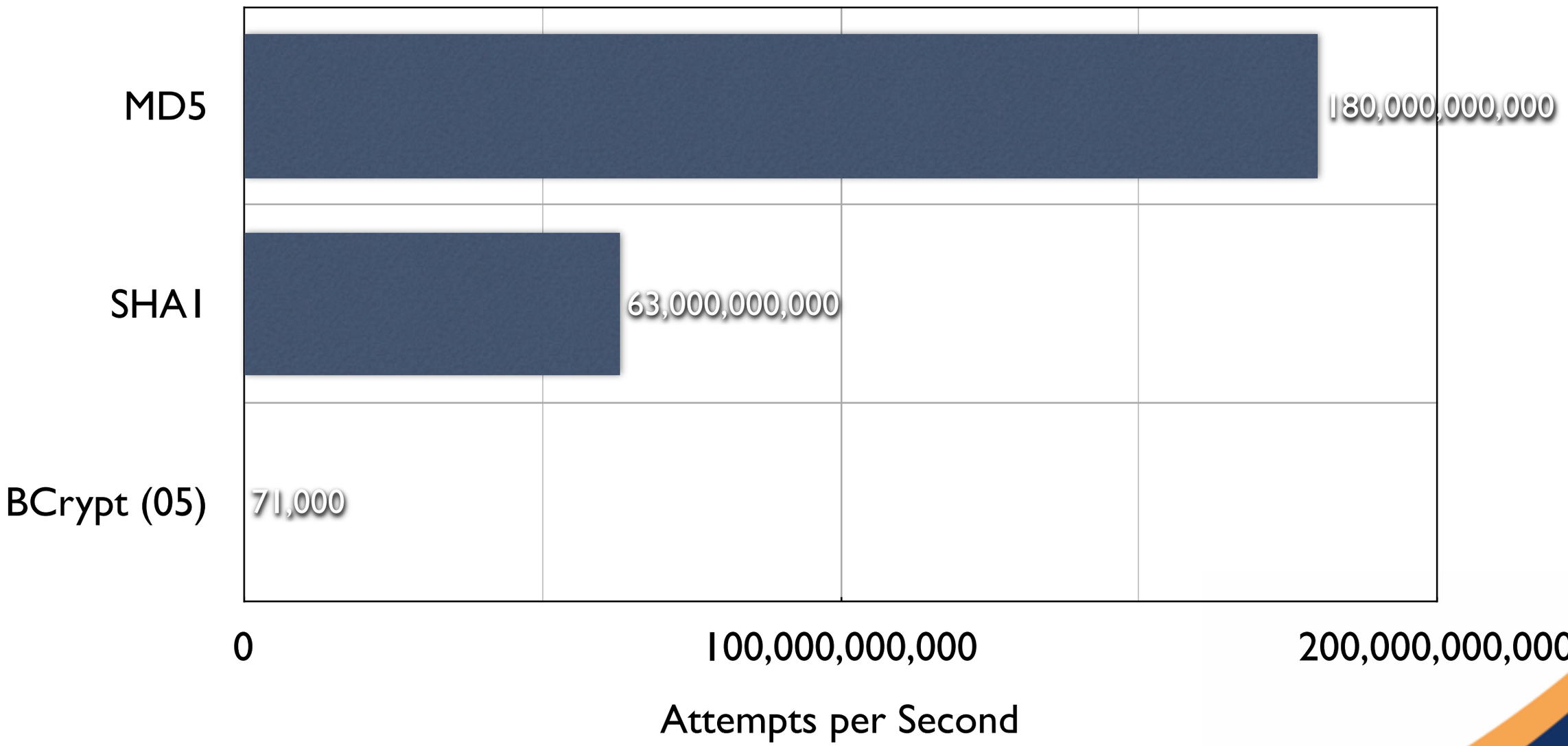
- Techniques
  - Rainbow Tables
  - Brute Force
  - Dictionary/Word Lists
  - Hybrid

- RockYou.com (Dec 2009)
  - 14.3 million unique clear text passwords

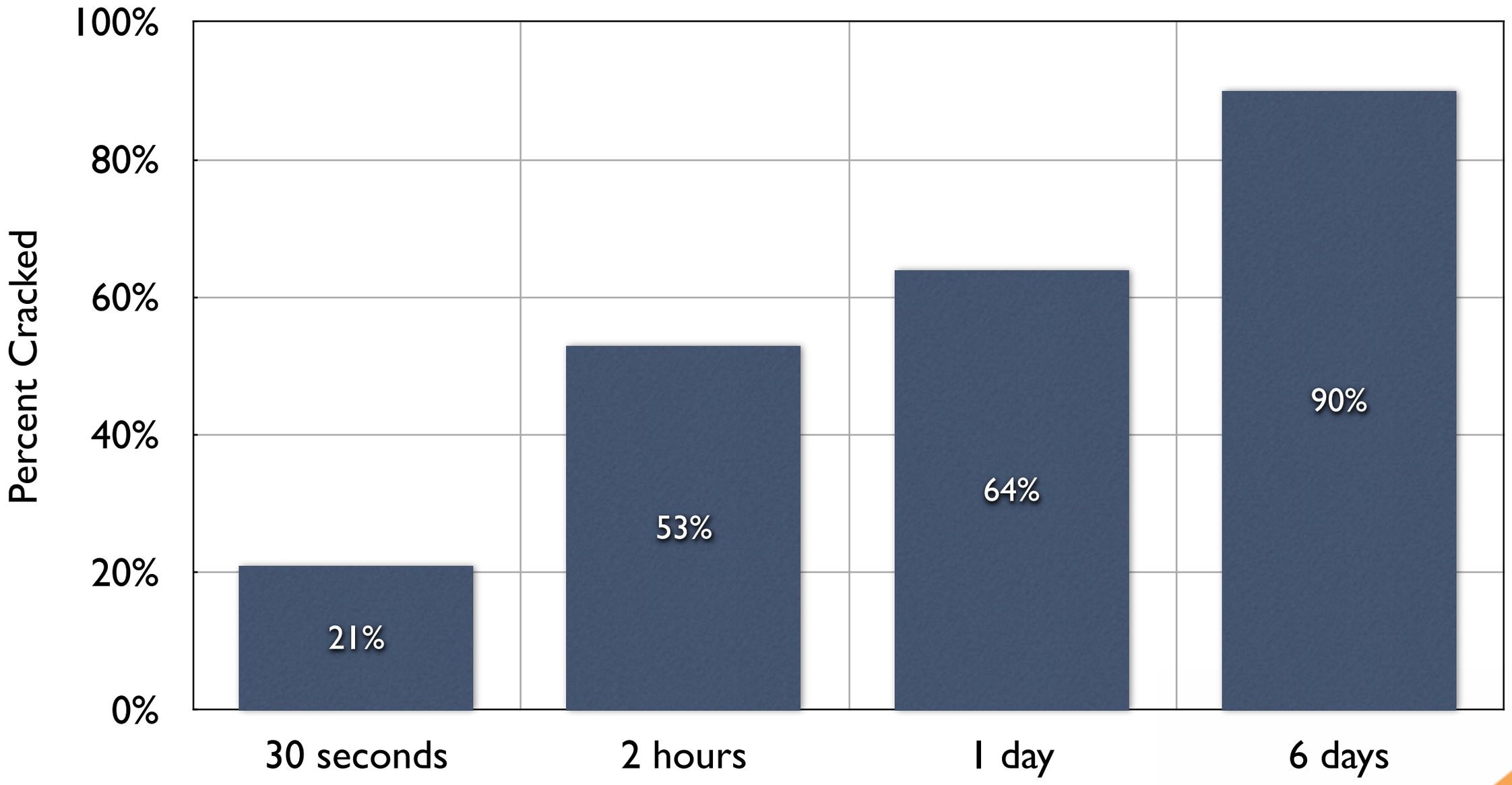
25 GPU HPC Cluster

- Presented by Jeremi Gosney at Passwords^12 Conference
  - 5 - 4U Servers
  - 25 Radeon GPUs
  - Hashcat

Reported Benchmarks of 25 GPU HPC cluster



Gosney vs LinkedIn Password Hashes



1, 2, 3, 4, 5?

That's amazing!
I have the same password on LinkedIn, Evernote, and Yahoo!

OWASP Top Ten (2013)

A1: Injection	A2: Broken Authentication and Session Management	**A3: Cross-Site Scripting (XSS)**	A4: Insecure Direct Object References
A5: Security Misconfiguration	A6: Sensitive Data Exposure	A7: Missing Function Level Access Controls	A8: Cross Site Request Forgery (CSRF)
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Cross-Site Scripting (XSS)

- Stored
  - Attacker's script is stored on the server (e.g. blog comments, forums) and later displayed in HTML pages, without proper filtering
- Reflected
  - HTML page reflects user input data back to the browser, without sanitizing the response
- DOM Based

Demo

- Tools
  - BeEF (Browser Exploitation Framework)
  - Metasploit
- Target
  - OWASP Broken Web Apps
    - Apache 2.2.14 + PHP 5.3.2
- Victim
  - Windows 7
    - IE 9 + Java 7 Plugin

- Recorded Demo

OWASP Top Ten (2013)

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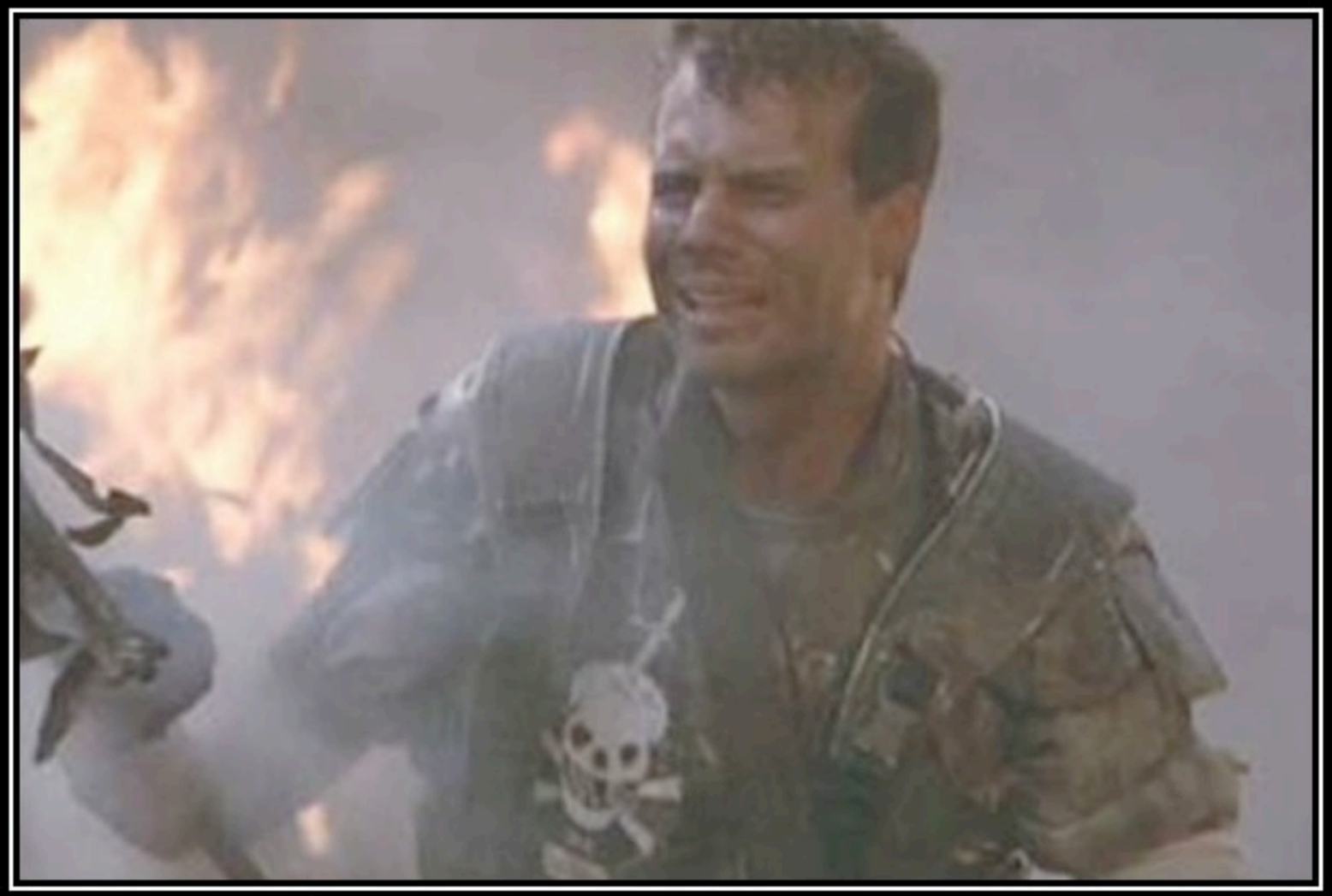
Recent ColdFusion Hacks

- Stolen Data Headers from the Federal Reserve Hack (Feb 2013)
- Downed US vuln catalog infected for at least TWO MONTHS (March 2013)
- Web host Linode, hackers clash over credit-card raid claim (April 2013)
- Washington Court Data Breach Exposes 160K SSNs (May 2013)

Demo

- Tool
  - Chrome Web Browser
- Target
  - Windows Server 2008 R2
    - IIS 7.5 + ColdFusion 9.0.2

- Recorded Demo



GAME OVER, MAN!

If you don't secure ColdFusion, you are just making it easy for hackers
and they DON'T mostly come at night.

So should you just turn everything off and unplug it?

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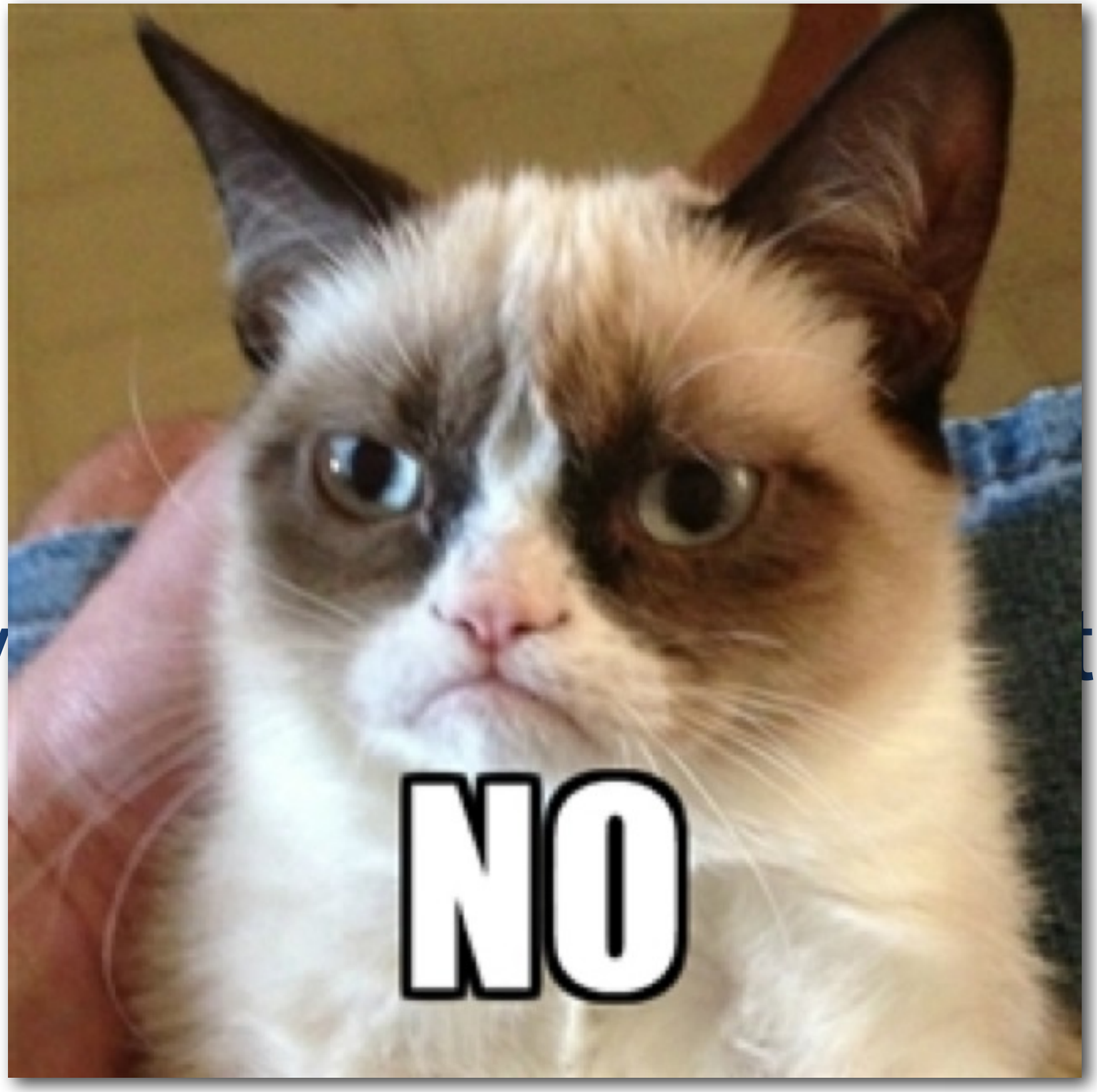


Web Application Firewall

- Web application firewall (WAF) are used to protect web applications without the need to modify them
- Can be an appliance, server plugin, or filter
- Provide an additional layer of security
- Can react faster than changing application code
- More common in front of legacy applications

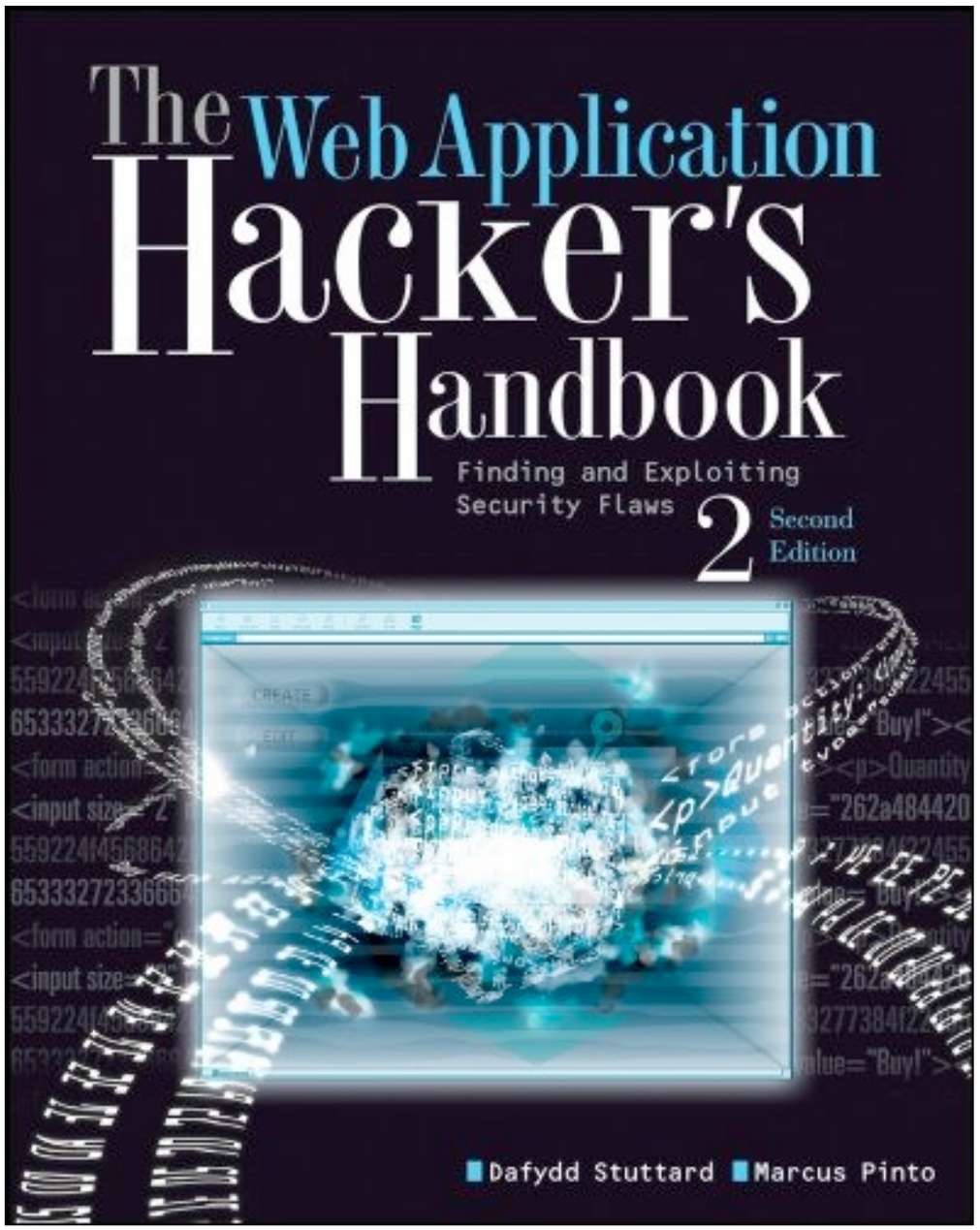
ModSecurity

- Open source, free web application firewall
  - Apache, IIS 7, Nginx, reverse proxy
- Security Models
  - Negative Security Model
  - Positive Security Model
  - Virtual Patching
  - Extrusion Detection Model
- OWASP ModSecurity Core Rule Set Project

Web Vulnerability Scanners

- Provide automated way to test web application for vulnerabilities
  - Static vs Dynamic Analysis
  - Can be challenging to setup authentication and session management
  - Can’t improvise, every web application is unique
- Usually integrated as part of Secure Software Development Life Cycle (SSDLC)

Book



The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws, Second Edition

by Dafydd Stuttard and Marcus Pinto

John Wiley & Sons © 2012 (912 pages)
ISBN: 9781118026472

Q&A - Thanks

- Please be sure to fill out evaluations
- Blog: http://www.dcepler.net
- Email: depler@aboutweb.com
- Twitter: @dcepler
- RIACon 2013
  - http://www.riacon.com

Resources

- Tools
  - sqlmap
  - BeEF
  - Metasploit

- Virtual Machines/Live CDs
  - BackTrack
  - Samurai Web Testing Framework
  - OWASP Broken Web Apps

Resources

- OWASP Top Ten 2013
- Shodan: The scariest search engine on the Internet
- Google Hacking Database (GHDB)

Resources

- Security Benchmarks/Guides
  - CIS Benchmarks
  - DISA STIG
  - Microsoft Security Compliance Manager

- Securing/Patching ColdFusion
  - ColdFusion 9 Server Lockdown Guide (pdf)
  - ColdFusion 10 Server Lockdown Guide (pdf)
  - Unofficial Updater 2

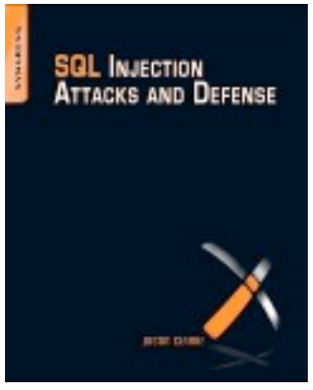
Resources

- Web Application Firewalls
  - Commercial
    - Trustwave - WebDefend Web Application Firewall
    - Cisco - ACE Web Application Firewall
    - Citrix - NetScaler App Firewall
    - F5 - BIG-IP Application Security Manager
    - Privacyware - ThreatSentry IIS Web Application Firewall
    - Fuseguard - Foundeo
  - Free
    - Trustwave - ModSecurity
    - Microsoft - URLScan 3.1

Resources

- Web Vulnerability Scanners
  - Dynamic Scanner
    - Cenzic Hailstorm
    - HP WebInspect
    - IBM Security AppScan
  - Static Scanner
    - HP Fortify Static Code Analyzer
    - VeraCode Static
  - Intercepting Proxies
    - Burp Suite
    - OWASP Zed Attack Proxy (ZAP)

Books



SQL Injection Attacks and Defense, Second Edition
by Justin Clarke
Syngress Publishing © 2012 (576 pages)
ISBN: 9781597499637

XSS Attacks: Cross Site Scripting Exploits and Defense
by Jeremiah Grossman, Robert "RSnake" Hansen, Petko "pdp" D. Petkov and Anton Rager
Syngress Publishing © 2007 (479 pages)
ISBN: 9781597491549

Penetration Tester's Open Source Toolkit, Third Edition
by Jeremy Faircloth
Syngress Publishing © 2011 (465 pages)
ISBN: 9781597496278

Web Application Obfuscation: '-/WAFs..dEvasion..dFilters//alert (/Obfuscation/)-'
by Mario Heiderich, Eduardo Alberto Vela Nava, Gareth Heyes and David Lindsay
Syngress Publishing © 2011 (290 pages)
ISBN: 9781597496049

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  - Jens Steube - Exploiting a SHA1 Weakness in Password Cracking - Passwords^12 Presentation (pdf)
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- Oh great: New attack makes some password cracking faster, easier than ever
- Why passwords have never been weaker—and crackers have never been stronger
- The Final Word on the LinkedIn Leak
- How I became a password cracker

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  - Why LivingSocial's 50-million password breach is graver than you may think (April 2013)
  - Yahoo! Blind SQL Injection could lead to data leakage (April 2013)

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  - Dev site behind Apple, Facebook hacks didn't know it was booby-trapped (Feb 2013)
  - IE 8 Zero Day Found as DoL Watering Hole Attack Spreads to Nine Other Sites (May 2013)