Christian Folini / @ChrFolini
Introducing the OWASP ModSecurity Core Rule Set 3.0

Seat Belts

Defense in Depth • 1st Line of Defense

The Plan for Today

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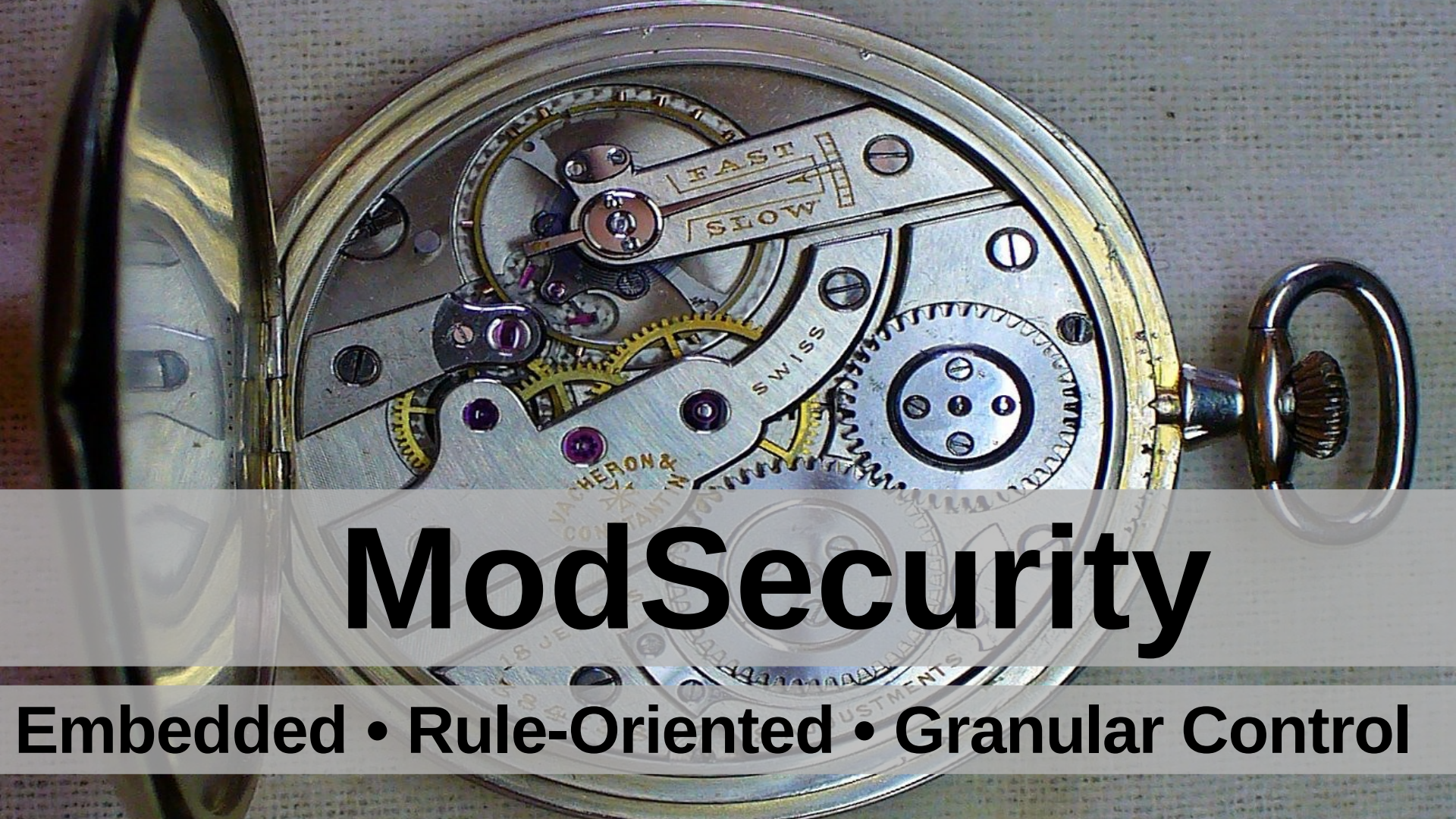
- What is a WAF / what is ModSecurity?
- What is the Core Rule Set 3.0 (CRS3)
- Installation (Demo)
- Burp Research Results

- Important Groups of Rules
- Anomaly Scoring / Thresholds
- Paranoia Levels / Stricter Siblings

- Sampling Mode
- Handling of False Positives
- Predefined Rule Exclusions


WAF SETUPS
Naïve • Overwhelmed • Functional



ModSecurity

Embedded • Rule-Oriented • Granular Control


INCLUDES DR. FOLINI'S PARANOIA MODE
OWASP ModSecurity Core Rule Set
v3.0
BASED UPON A TRUE STORY!
CRS3
OWASP ModSecurity Core Rule Set v3.0
DIRECTED BY
CHAIM SANDERS
STARRING
WALTER HOP AS REGEX WIZARD, CHAIM SANDERS
ORIGINAL IDEA BY OFER SHEZAF AND RYAN BARNETT ALSO STARRING CHRISTIAN FOLINI, FRANZISKA BÜHLER, @EMPHAZER, RYAN BARNETT, FELIPE 'ZIMMERLE' MANUEL LEOS, VLADIMIR IVANOV, CHRISTIAN PERON, @YGREK, @TOBY78, @JAMUSE, MATT KOCH, ACHIM HOFFMANN, MAZIN AHMED, NOËL ZINDEL
Trustwave Smart security on demand
COMING SOON TO A SERVER NEAR YOU!
OWASP Open Web Application Security Project

Installation

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Clone the repository:

$> git clone
https://github.com/SpiderLabs/owasp-modsecurity-crs

Copy the example config:

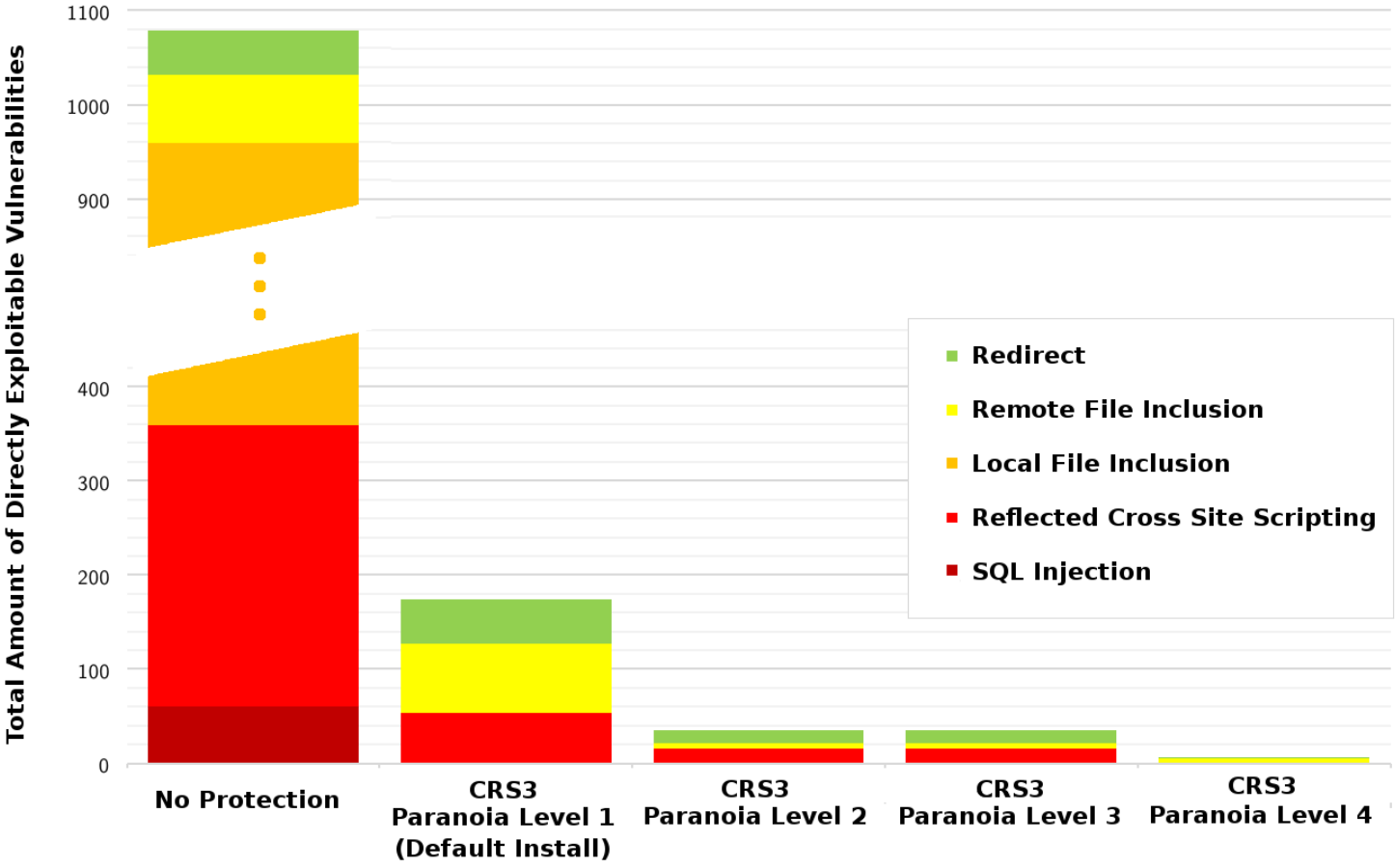
$> cp crs-setup.conf.example crs-setup.conf

Include in server config (depending on path):

Include /etc/httpd/modsec.d/owasp-modsecurity-crs/crs-setup.conf

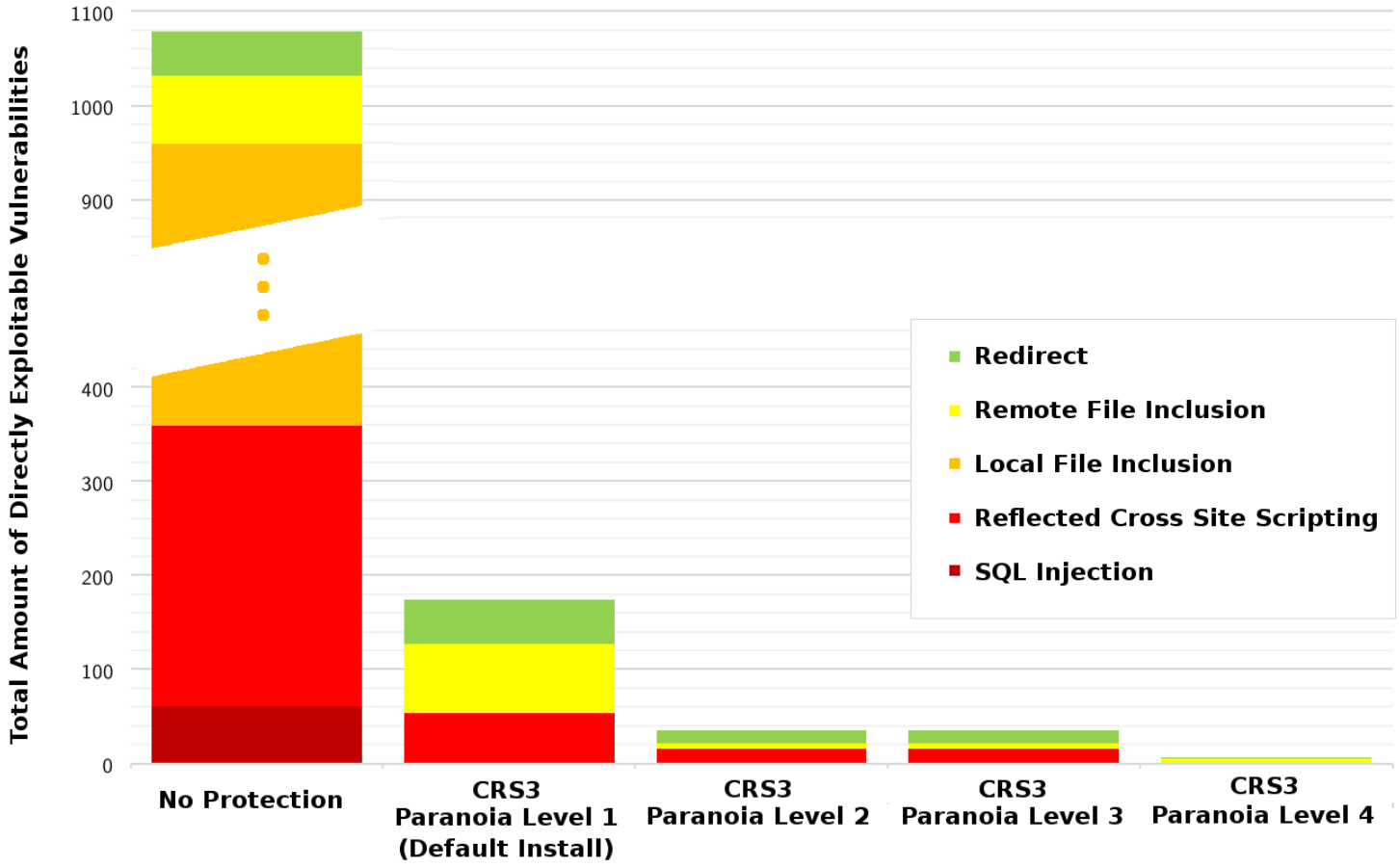
Include /etc/httpd/modsec.d/owasp-modsecurity-crs/rules/*.conf

Burp vs. OWASP ModSecurity Core Rule Set 3.0



Research based on 4.5M Burp requests.

Burp vs. OWASP ModSecurity Core Rule Set 3.0



CRS3
Default Install

Redir.:	0%
RFI:	0%
LFI:	**-100%**
XSS:	**-82%**
SQLi:	**-100%**

Research based on
4.5M Burp requests.

Important Groups of Rules

Rules Targetting the Request

REQUEST-910-IP-REPUTATION.conf
REQUEST-911-METHOD-ENFORCEMENT.conf
REQUEST-912-DOS-PROTECTION.conf
REQUEST-913-SCANNER-DETECTION.conf
REQUEST-920-PROTOCOL-ENFORCEMENT.conf
REQUEST-921-PROTOCOL-ATTACK.conf

REQUEST-930-APPLICATION-ATTACK-LFI.conf
REQUEST-931-APPLICATION-ATTACK-RFI.conf
REQUEST-932-APPLICATION-ATTACK-RCE.conf
REQUEST-933-APPLICATION-ATTACK-PHP.conf
REQUEST-941-APPLICATION-ATTACK-XSS.conf
REQUEST-942-APPLICATION-ATTACK-SQLI.conf
REQUEST-943-APPLICATION-ATTACK-SESS-FIX.conf

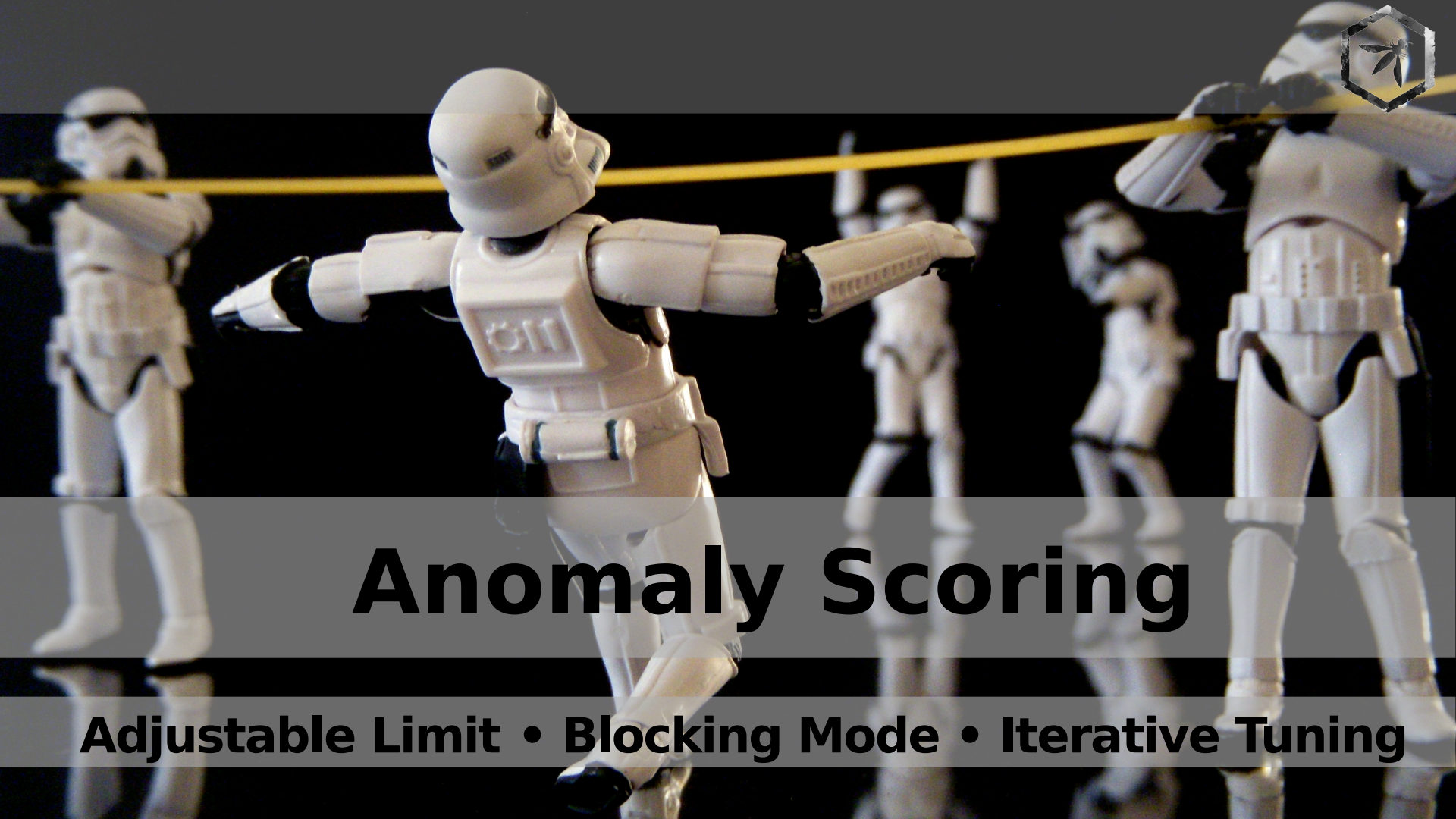
REQUEST-949-BLOCKING-EVALUATION.conf

Important Groups of Rules

Rules Targetting the Response

RESPONSE-950-DATA-LEAKAGES.conf
RESPONSE-951-DATA-LEAKAGES-SQL.conf
RESPONSE-952-DATA-LEAKAGES-JAVA.conf
RESPONSE-953-DATA-LEAKAGES-PHP.conf
RESPONSE-954-DATA-LEAKAGES-IIS.conf

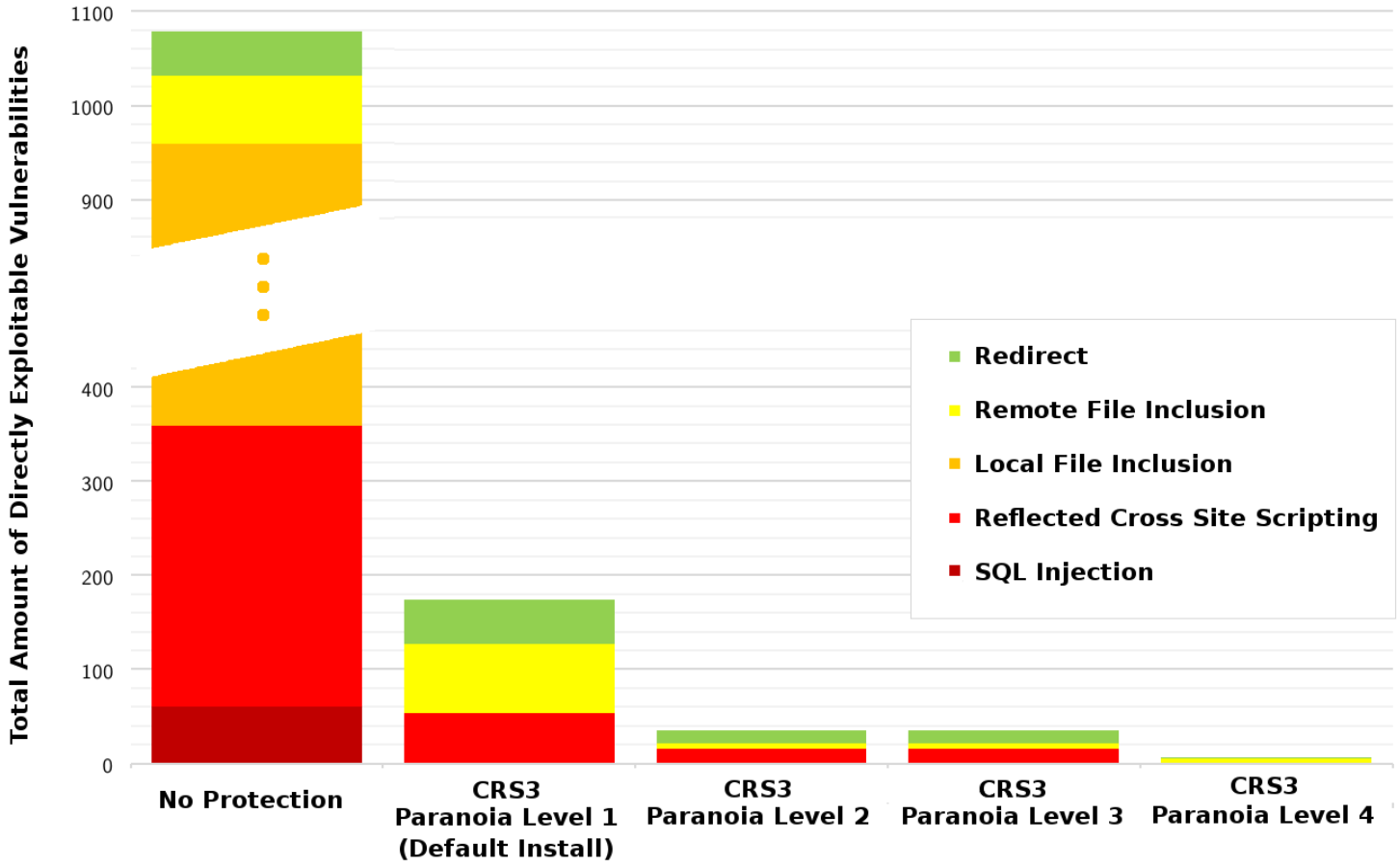
RESPONSE-959-BLOCKING-EVALUATION.conf



Anomaly Scoring

Adjustable Limit • Blocking Mode • Iterative Tuning

Burp vs. OWASP ModSecurity Core Rule Set 3.0



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Research based on
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Paranoia Levels

Paranoia Level 1: Minimal amount of False Positives
Basic security

Paranoia Level 2: More rules, fair amount of FPs
Elevated security level

Paranoia Level 3: Specialised rules, more FPs
Online banking level security

Paranoia Level 4: Insane rules, lots of FPs
Nuclear power plant level security

Paranoia Levels

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Example: Protocol Enforcement Rules

Paranoia Level 1: 31 rules

Paranoia Level 2: 7 rules

Paranoia Level 3: 1 rule

Paranoia Level 4: 4 rules

Stricter Siblings

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Example: Byte Range Enforcement

Paranoia Level 1:
Rule 920270: Full ASCII range without null character

Paranoia Level 2:
Rule 920271: Full visible ASCII range, tab, newline

Paranoia Level 3:
Rule 920272: Visible lower ASCII range without %

Paranoia Level 4:
Rule 920273: A-Z a-z 0-9 = - _ . , : &

Sampling Mode

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Limit CRS Impact During Proof of Concept

- Define sampling percentage n
- Only n% of requests are funnelled into CRS3
- 100%-n% of requests are unaffected by CRS3

False Positives

False Positives will haunt you from PL2

- Fight FPs with Rule Exclusions
- Follow Tutorials at https://www.netnea.com
- Download Cheetsheet from Netnea

Predefined Rule Exclusions

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Enable Rule Exclusions for Specific Applications

Currently Supported:

- Wordpress (Default install)
- Drupal (Core)

In the Queue:

- Typo3 (Default Install)
- Piwik (Default Install)

… contributions welcome!

Roundup CRS3

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- 1st Line of Defense against web attacks
- Generic set of blacklisting rules for WAFs
- Prevents 80% of web attacks with minimal FPs
- Gives you granular control on indiv. parameters

Q&A CRS3

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@ChrFolini

ModSecurity / CRS Tutorials: https://www.netnea.com

ModSecurity / CRS Courses: https://feistyduck.co.uk

ModSecurity Handbook: https://feistyduck.co.uk

Voucher for book (40% of release price): AppSecEU