AGIL ABER SICHER!

ANDREAS FALK

https://andifalk.github.io/
agil-aber-sicher/ presentation/index.html

ANDREAS FALK

NOVATEC CONSULTING GMBH

andreas.falk@novatec-gmbh.de
@NT_AQE, @andifalk

UNSERE SOFTWARE IST DOCH SICHER!?

Troy Hunt
@troyhunt

Folge ich

Germany not mucking around with spying toys "Germany Issues Kill Order for a Domestic Spy—Cayla the Toy Doll"

Data from connected CloudPets teddy bears leaked and ransomed, exposing kids' voice messages

28 FEBRUARY 2017

Germany Issues Kill Order for a Domestic Spy—Cayla the Toy Doll

On a campaign to promote digital privacy, authorities warn that "My Friend Cayla" makes children vulnerable to malicious surveillance. They've ordered parents to d...

wsj.com

Quelle: troyhunt.com

MeltdownPrime & SpectrePrime: Neue Software automatisiert CPU-Angriffe

15.02.2018 16:14 Uhr – Fabian A. Scherschel

vorlesen

(Bild: Pixabay)

Nach Meltdown und Spectre hatten Experten prognostiziert, dass das Zuschneiden auf spezifische Chips eine Weile dauern würde. Dieser Prozess lässt sich nun durch Automatisierung beschleunigen. Dabei wurden auch neue Variationen der Angriffe gefunden.

Quelle: heise.de

Equifax-Hack: Angreifer über Apache-Struts-Lücke eingestiegen

14.09.2017 13:29 Uhr – Dennis Schirrmacher

vorlesen

(Bild: medithIT, CC BY 2.0)

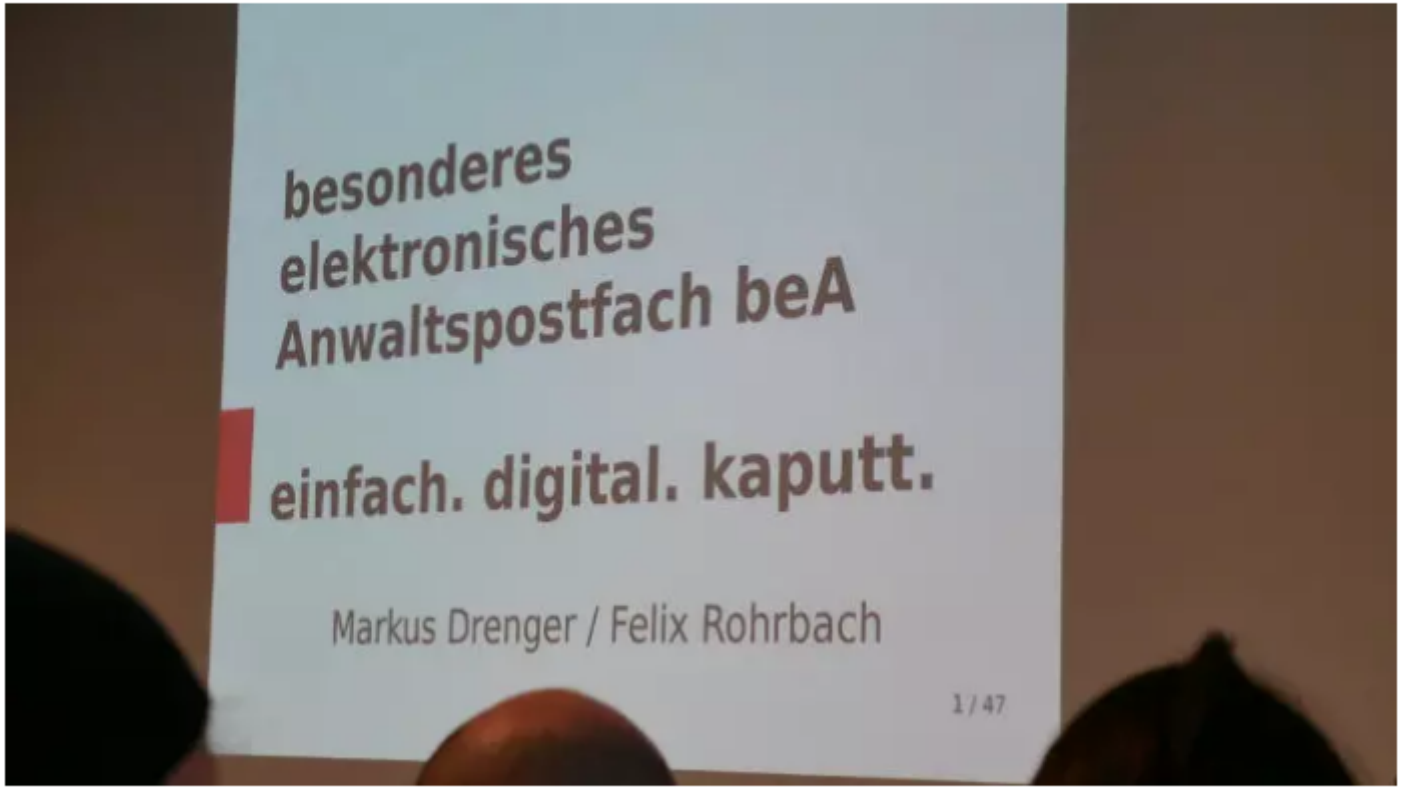
Untersuchungen zeigen, dass Equifax es offensichtlich versäumt hat, Sicherheitsupdates für eine kritische Lücke zu installieren. Darüber hinaus ist es zu einem weiteren Datenleck gekommen.

Quelle: heise.de

34C3: Das besondere Anwaltspostfach beA als besondere Stümperei

28.12.2017 16:09 Uhr – Detlef Borchers

vorlesen



Darmstädter Hacker zeigen, dass das besondere elektronische Anwaltspostfach, kurz beA, mit veralteter Software und einem veralteten Anwendungskonzept entwickelt wurde.

Quelle: heise.de

Schwere Sicherheitslücke: root ohne Passwort mit macOS High Sierra UPDATE

29.11.2017 06:34 Uhr – Ben Schwan

vorlesen

macOS High Sierra ist seit September verfügbar. (Bild: Apple)

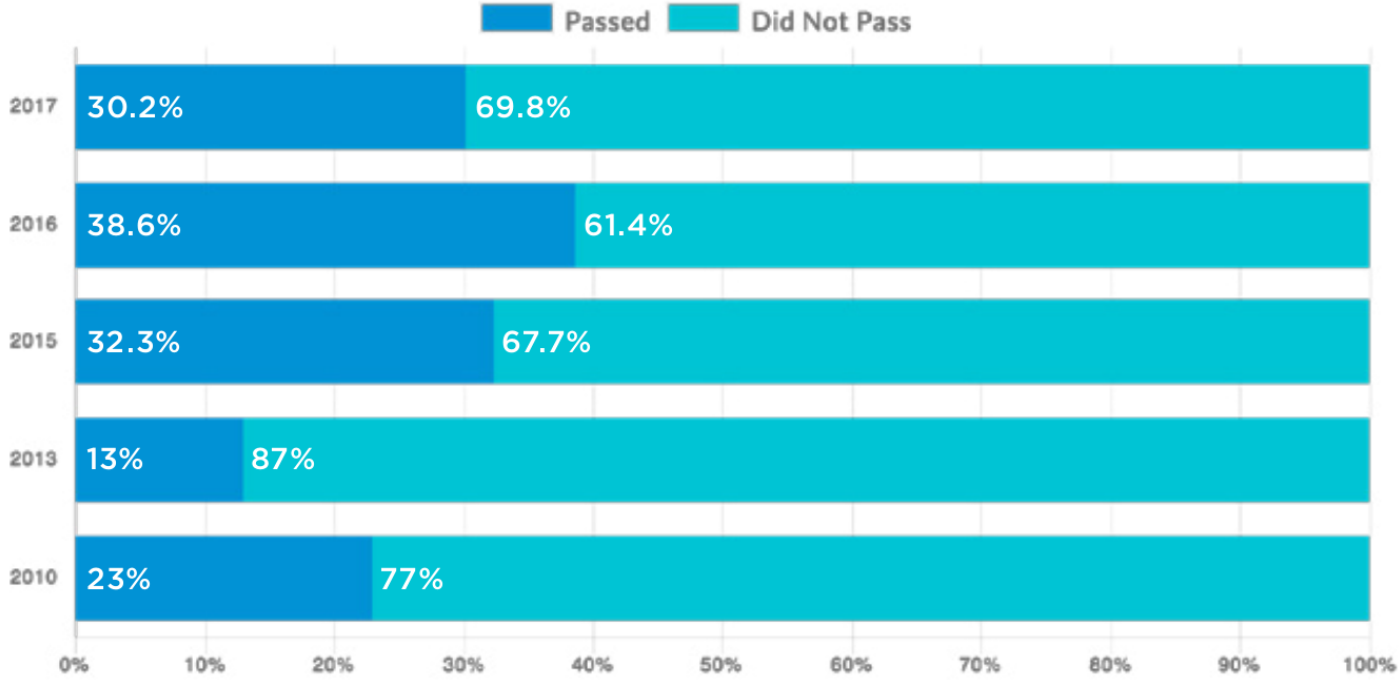
Mit ein paar Klicks können sich eingeloggte Nutzer in macOS 10.13 root-Rechte besorgen. Apple lässt eine extrem einfache Privilege Escalation zu.

Quelle: heise.de

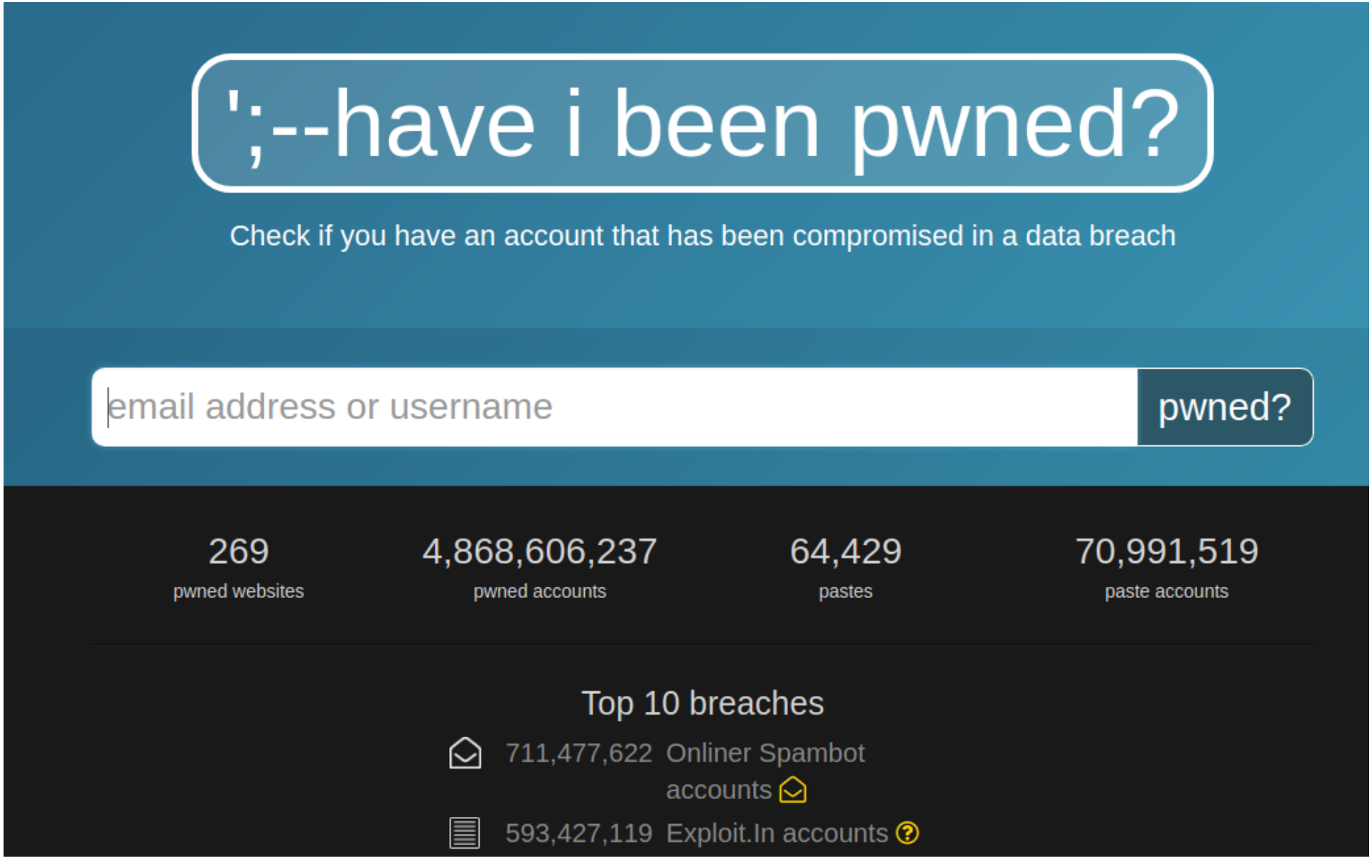
STATE OF SOFTWARE SECURITY REPORT 2017 (VERACODE)

OWASP TOP 10 POLICY PASS RATE

Percentage of Applications Passing on First Scan



Quelle: veracode.com

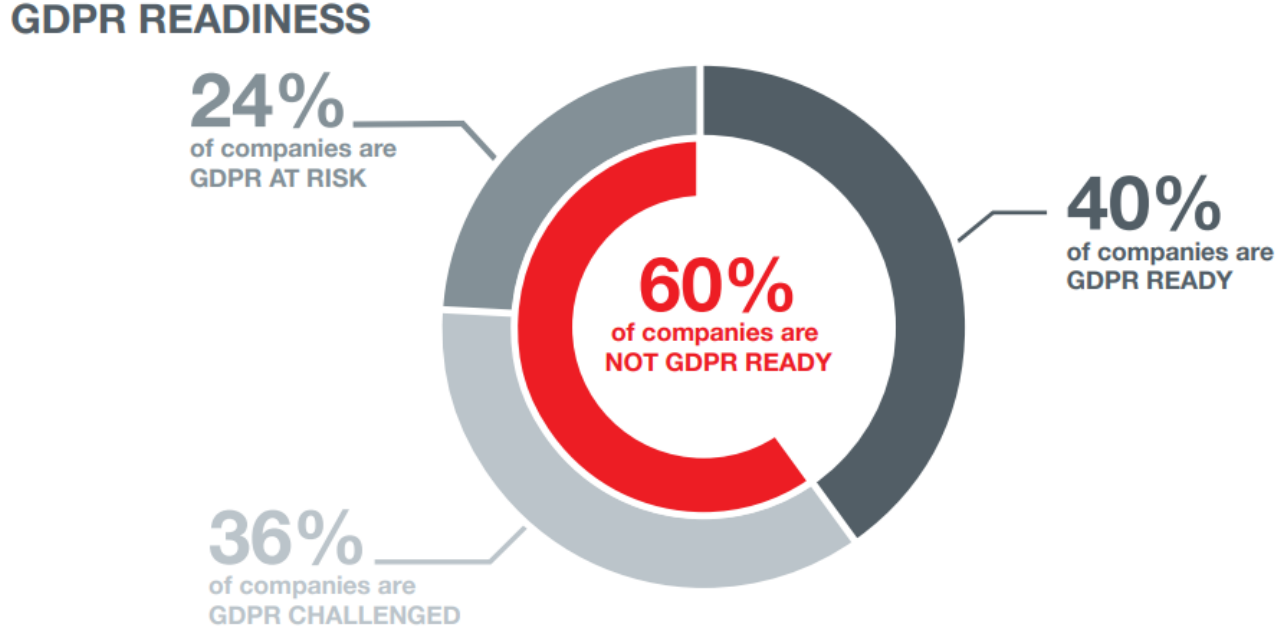


Quelle: haveibeenpwned.com

SECURITY IST NICHT MEIN JOB!?

EU DATENSCHUTZ GRUNDVERORDNUNG (EU-DSGVO)

Ab Mai 2018 geltendes Recht!



Quelle: GDPR's Missing Link Report (senzing.com/gdpr)

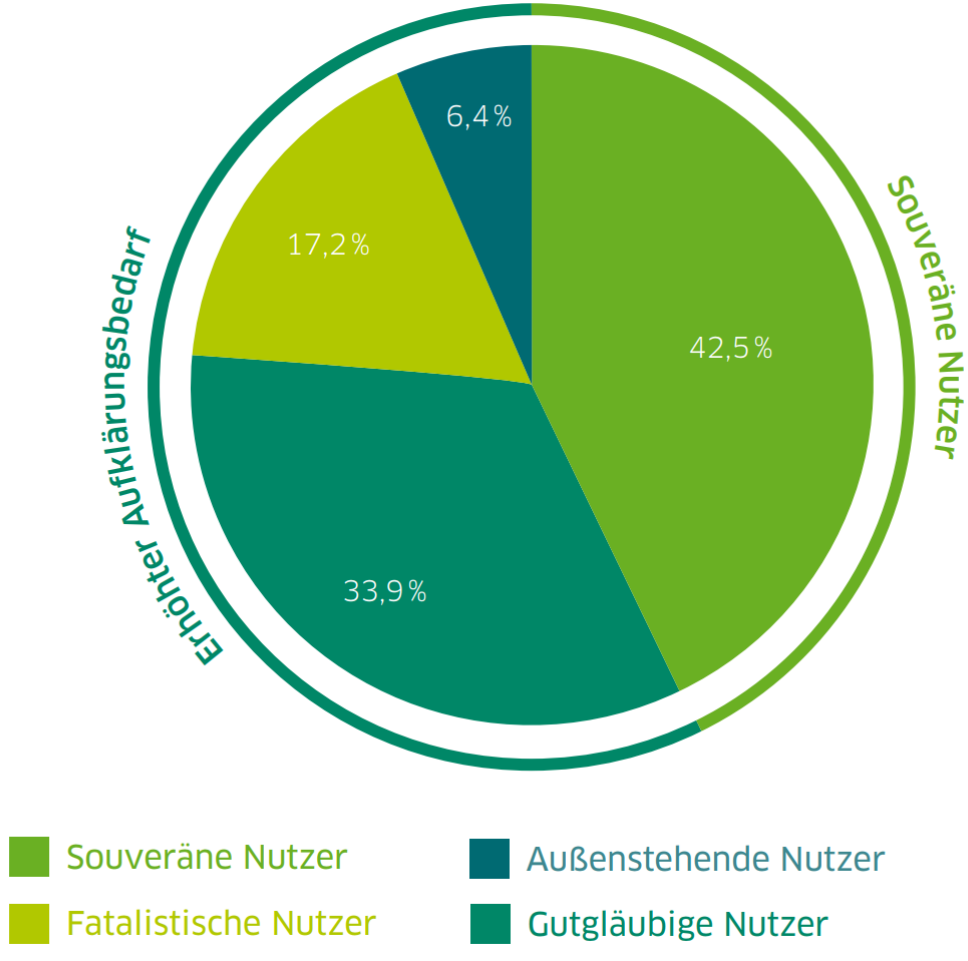
ARTIKEL 32

(SICHERHEIT DER VERARBEITUNG)

“ Unter Berücksichtigung des Stands der Technik, ... treffen der Verantwortliche ...geeignete technische und organisatorische Maßnahmen, um ein dem Risiko angemessenes Schutzniveau zu gewährleisten; diese Maßnahmen schließen unter anderem Folgendes ein: a) die Pseudonymisierung und Verschlüsselung personenbezogener Daten... ”

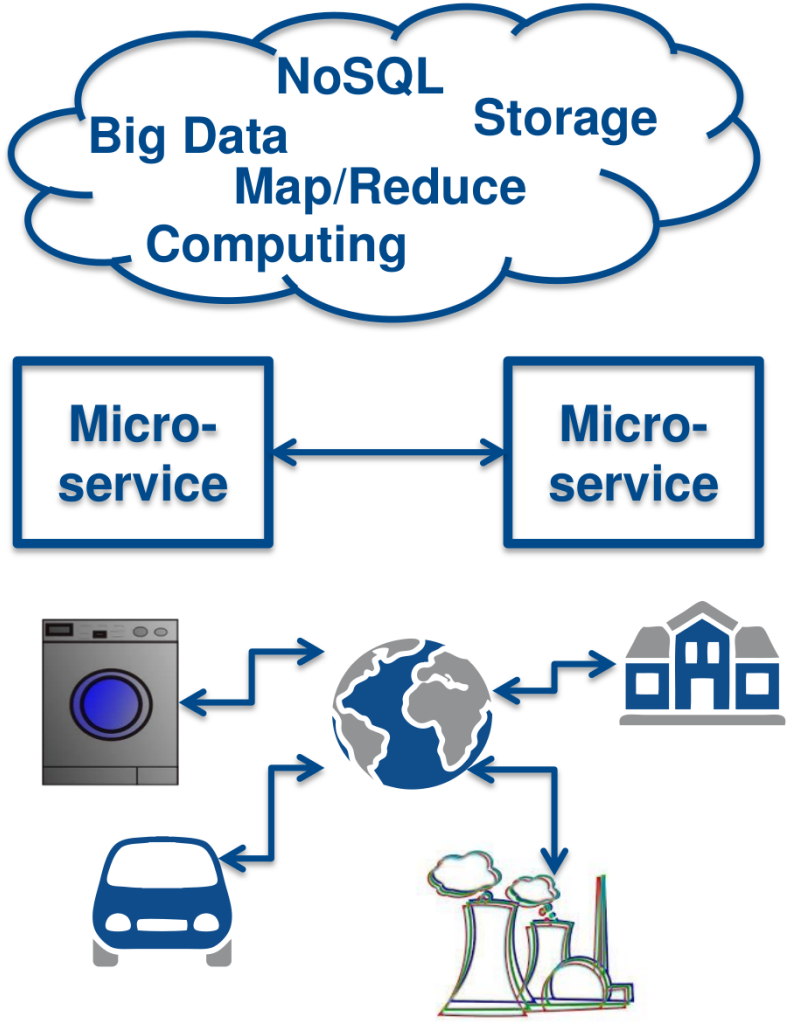
Quelle: eur-lex.europa.eu

NUTZERVERHALTEN

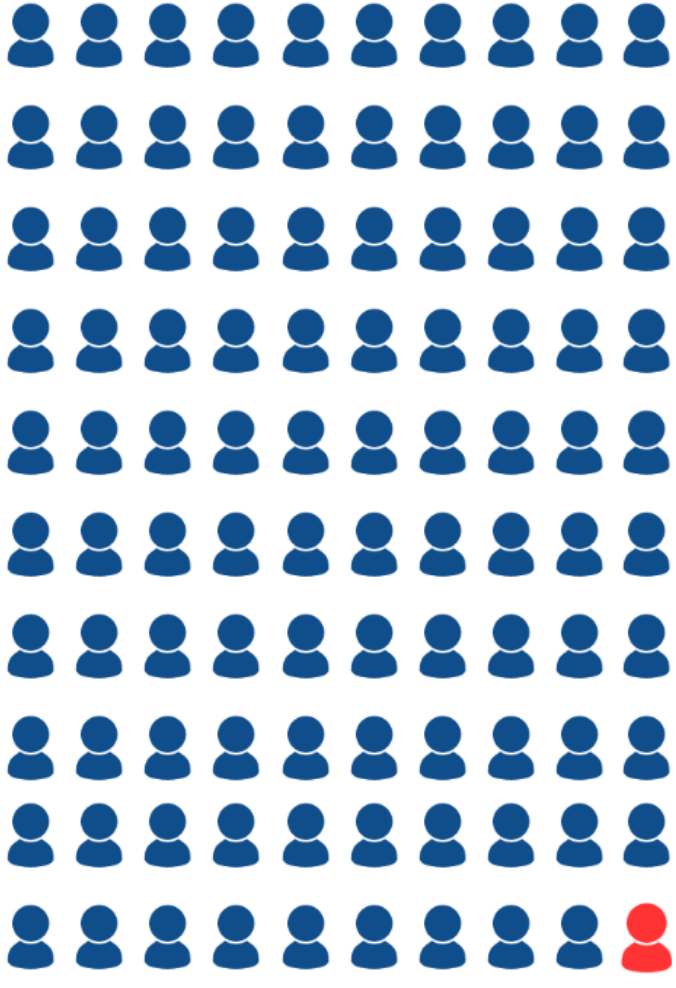


Quelle: Deutschland sicher im Netz (DsiN): Sicherheitsindex 2017

NEUE HERAUSFORDERUNGEN



1 SECURITY-PROFESSIONAL FÜR 100 ENTWICKLER

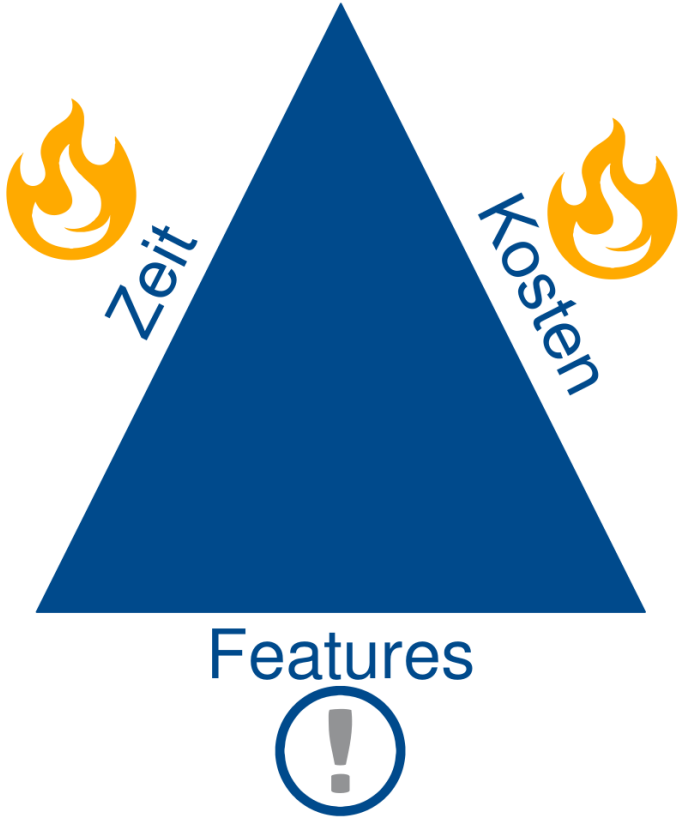


Quelle: sonatype.com/devops-survey-report

SICHERHEIT

IM PROJEKTALLTAG

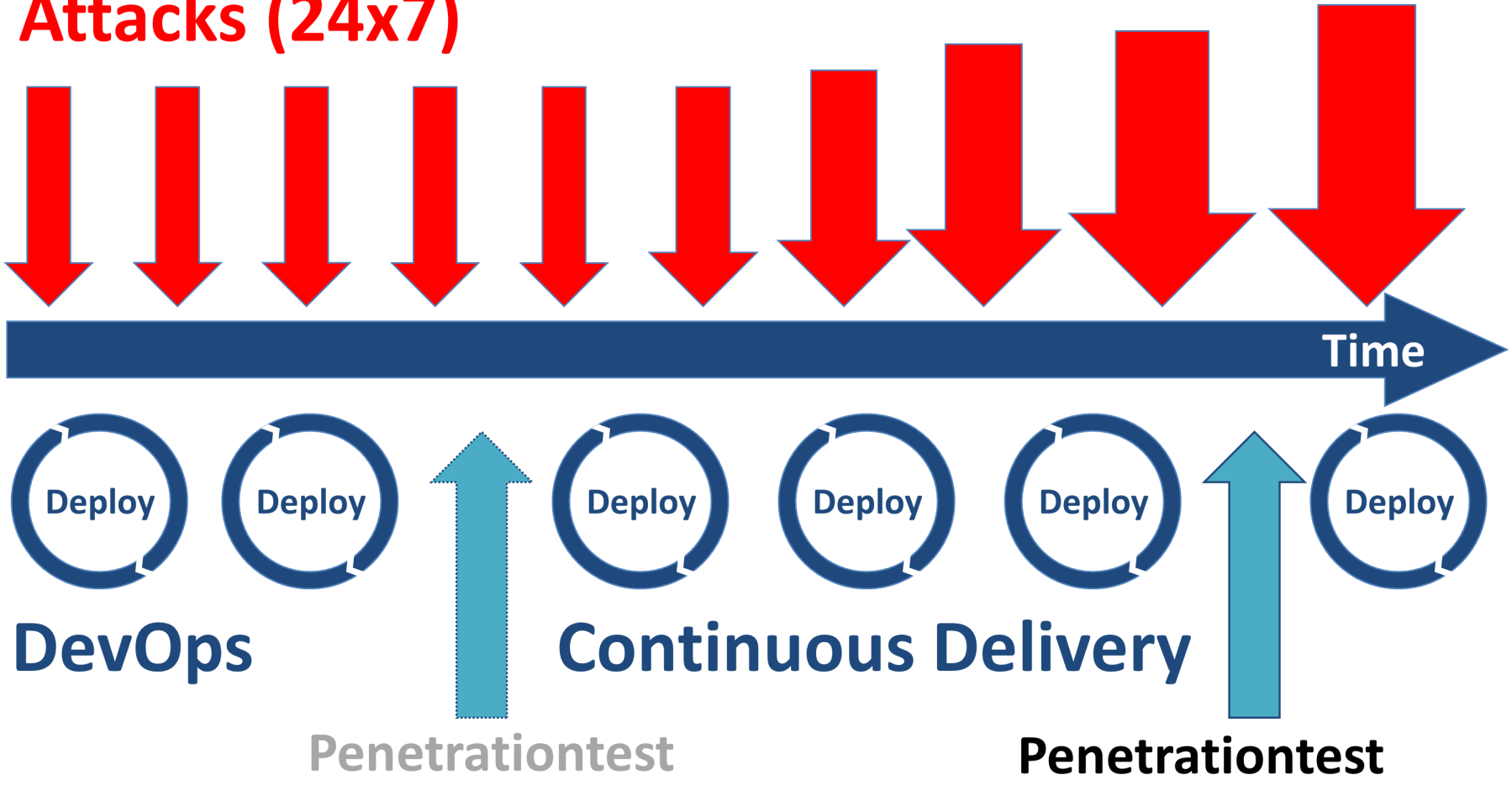
WIR HABEN DOCH KEINE ZEIT



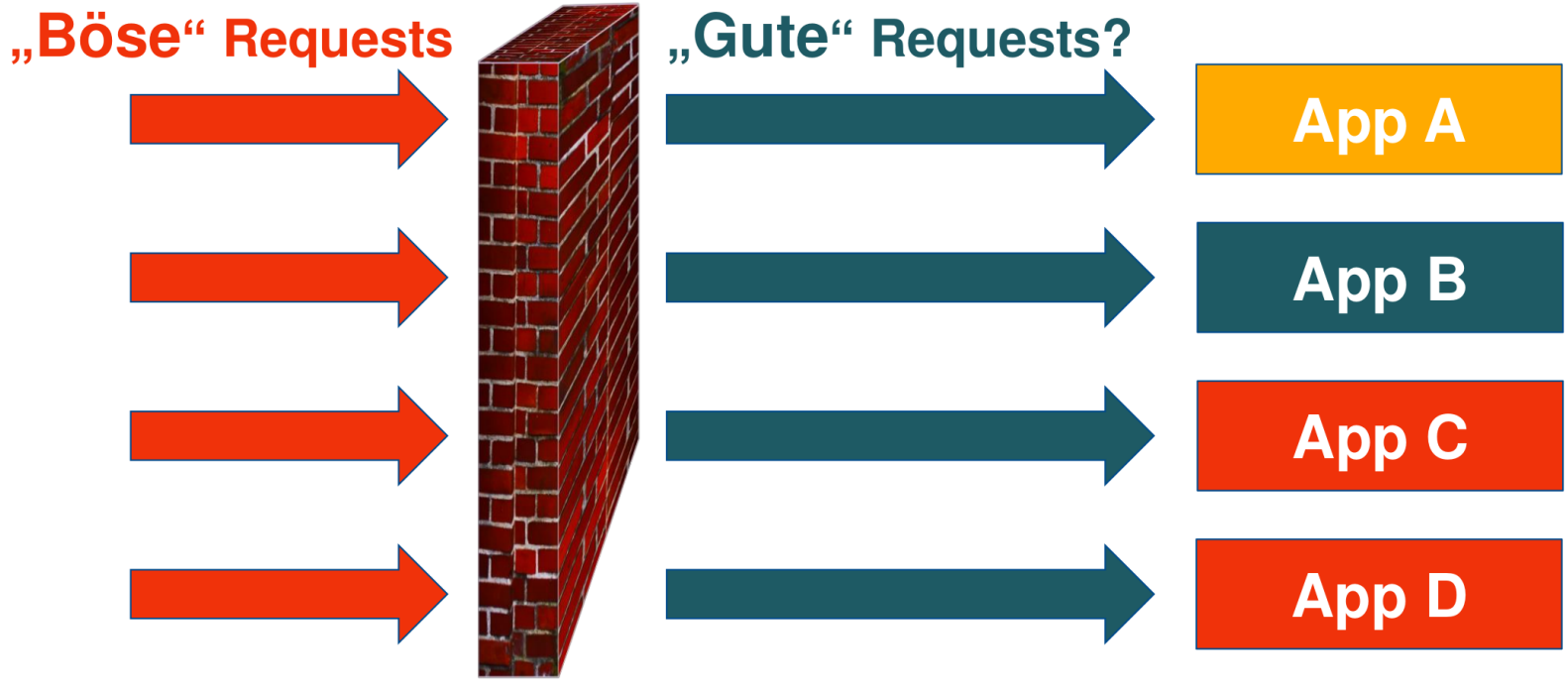
- ~~Dokumentation~~
- ~~Security / Tests~~
- Features!

HACKER FINDEN UNS NICHT (INTERESSANT)

Quelle: shodan.io


Attacks (24x7)
Time
Deploy
Deploy
Deploy
Deploy
Deploy
Deploy
DevOps
Continuous Delivery
Penetrationtest
Penetrationtest

WIR HABEN DOCH EINE FIREWALL



AUSBILDUNG DER ENTWICKLER?

Entwicklung (Kopieren) aus stackoverflow.com

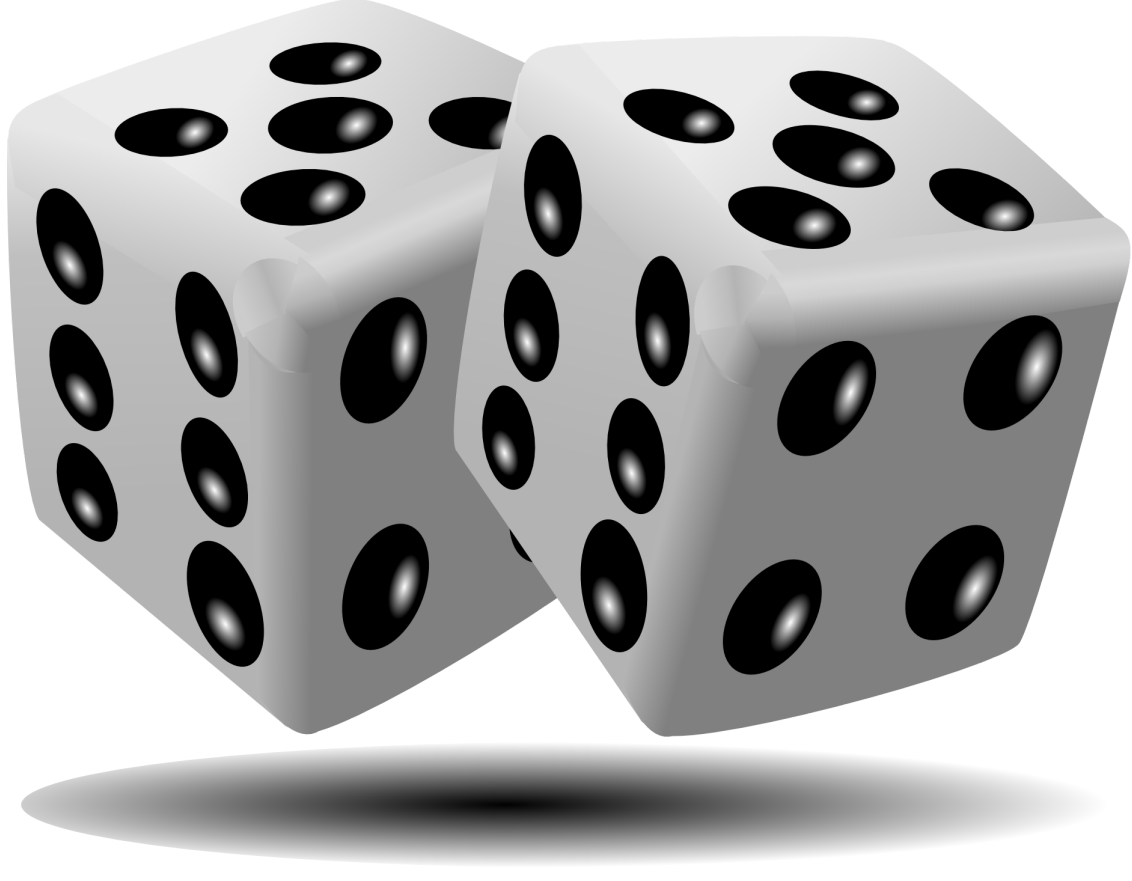
This is some what simple

```
string inp = "hai";
StringBuilder strb = new StringBuilder();
foreach (char s in inp)
{
    int sin = s + 5;
    char newch = (char)sin;
    strb.Append(newch);
}
string output = strb.ToString();
```

Now the output contains the encrypted string "mfn" (ie., 5 letters away from the original)in it....

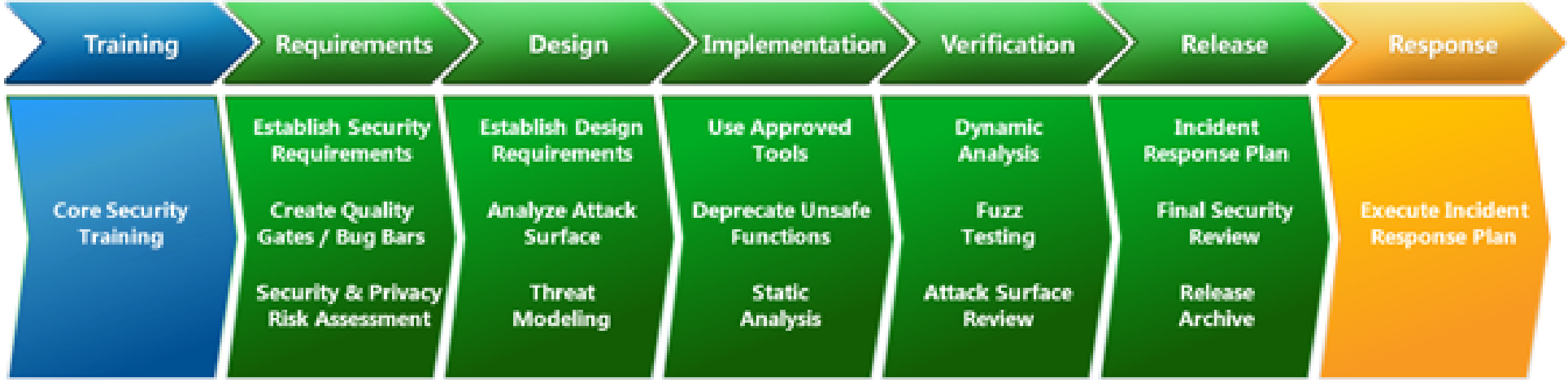
Quelle: stackoverflow.com

WEITER SO?



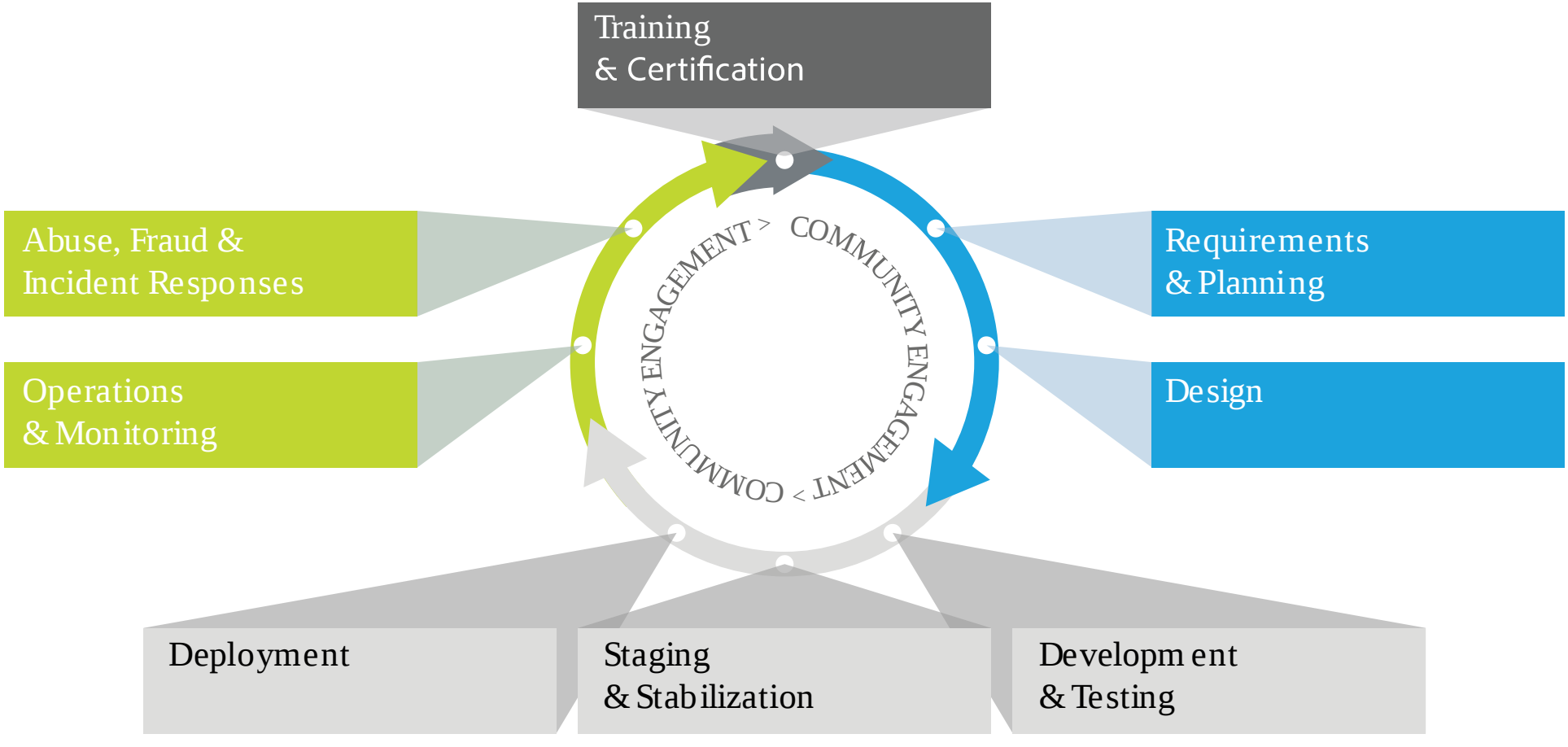
SICHERE ENTWICKLUNGS-PROZESSE ?

MICROSOFT SECURITY DEVELOPMENT LIFECYCLE

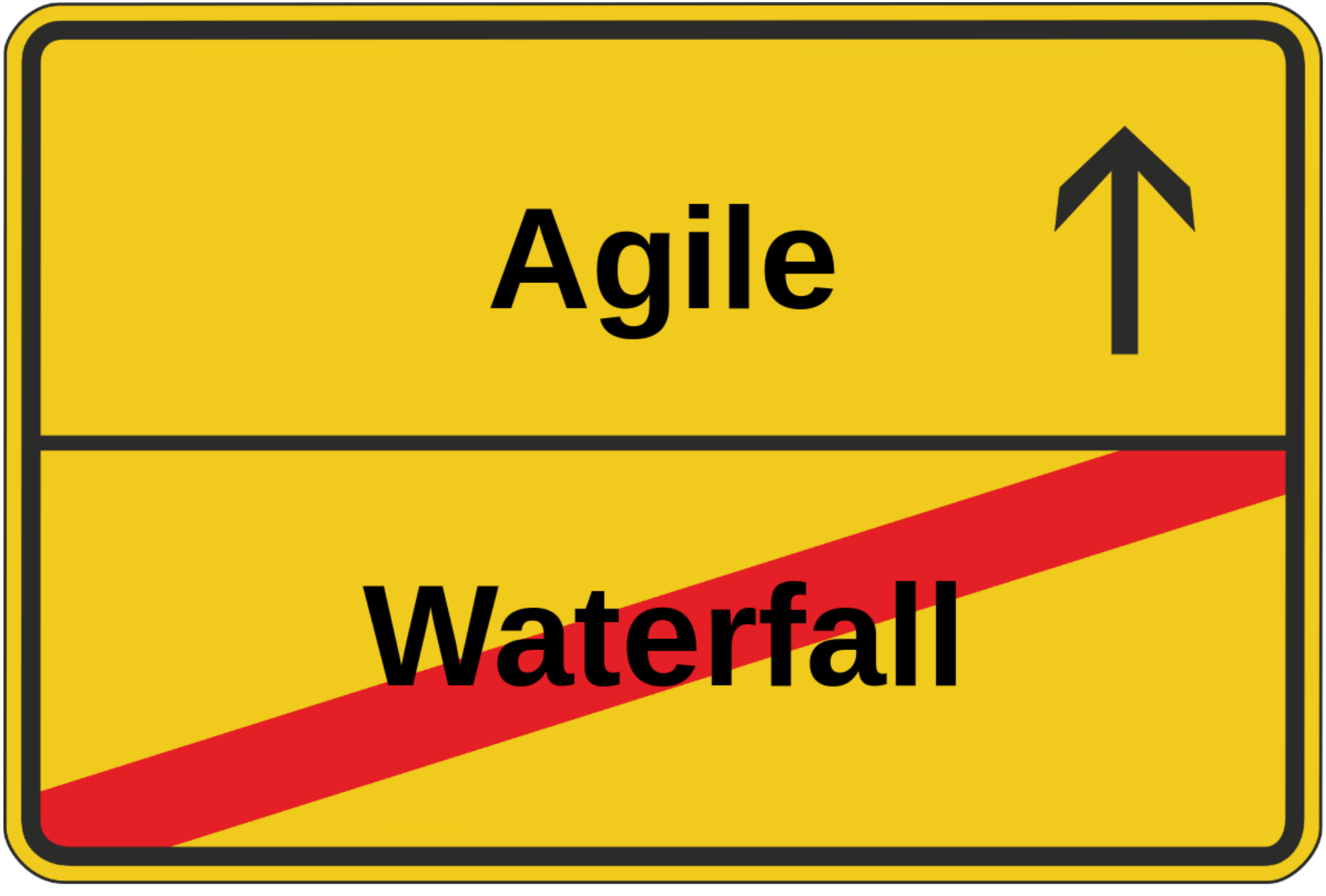


Quelle: microsoft.com/en-us/sdl

ADOBE SECURE PRODUCT LIFECYCLE



Quelle: adobe.com/security/engineering.html

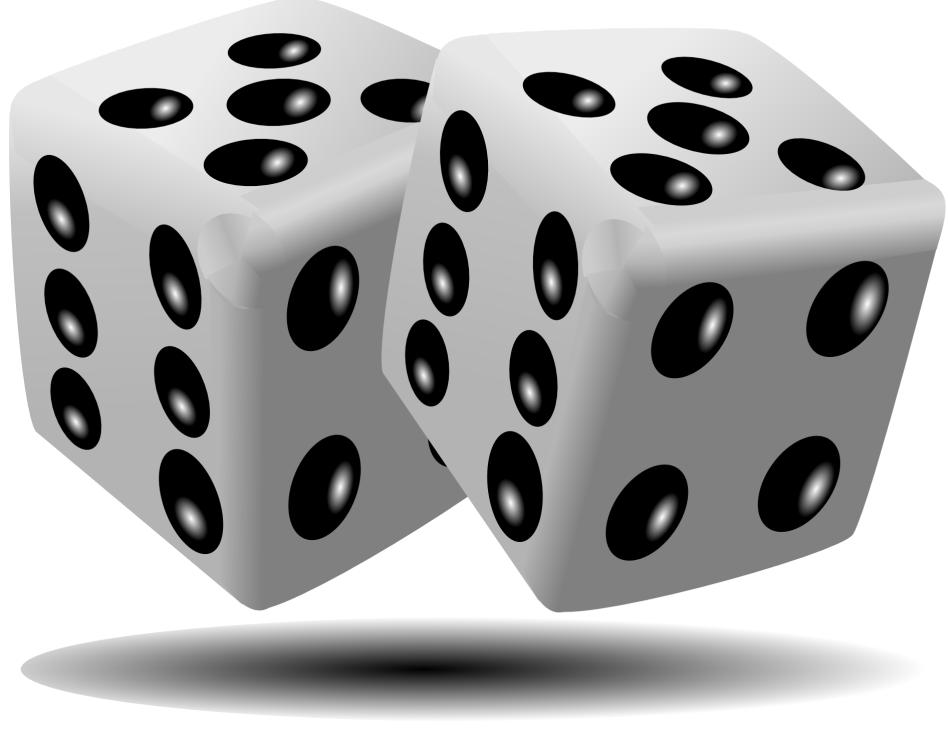

Agile
Waterfall

SCRUM GUIDE

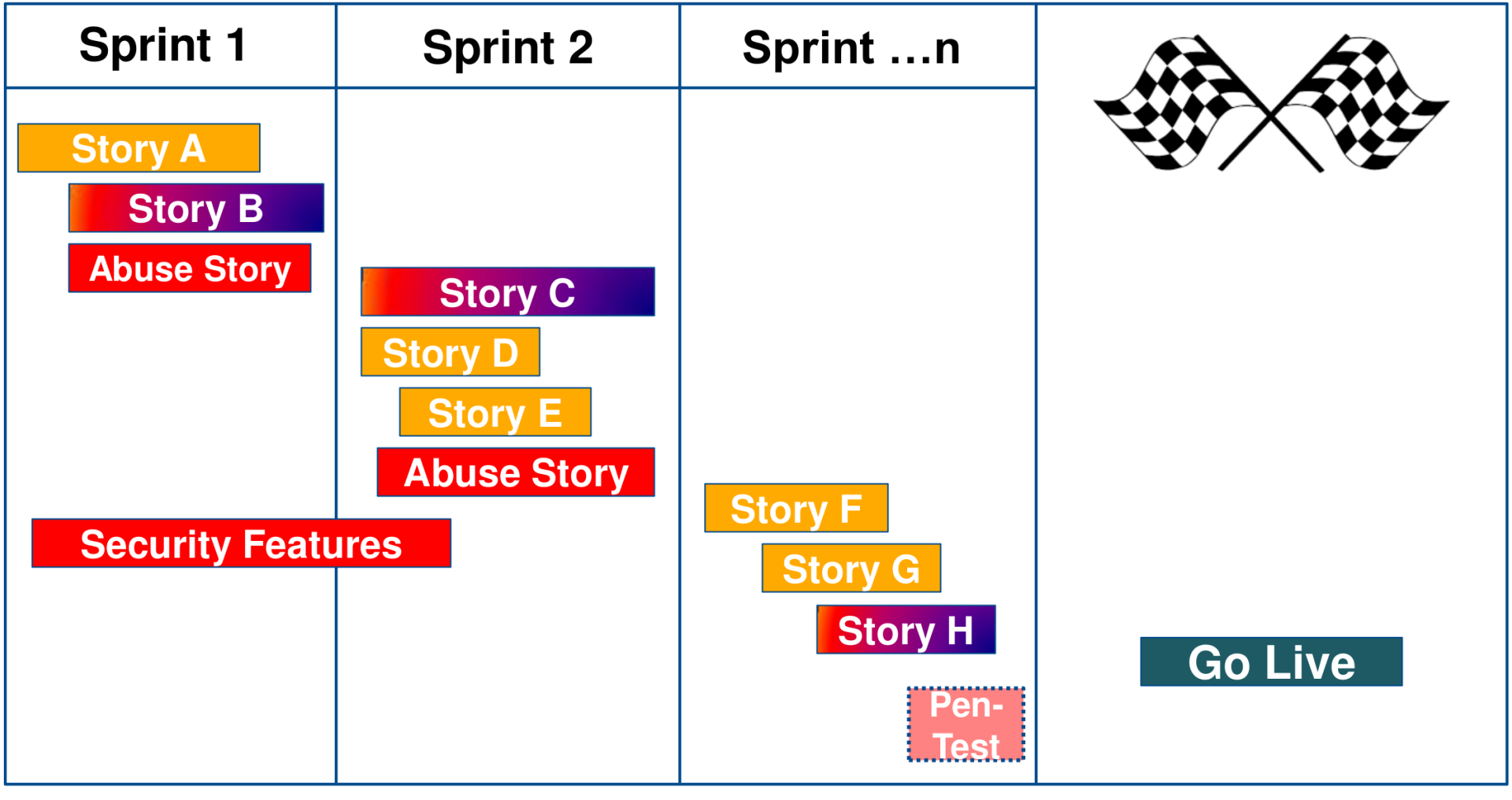
“Das Entwicklungsteam besteht aus Profis, die am Ende eines jeden Sprints ein fertiges (*Done*) Inkrement übergeben, welches potenziell auslieferbar ist. ”

Quelle: www.scrumguides.org

POTENTIELL UNSICHER AUSLIEFERN ?



AUSGANGSLAGE: SECURITY != AGIL!



Agile Entwicklung	Penetration-Testing
Inkrementell mit schnellem Feedback	Punktuell und Aufwendig
Innerhalb von Sprints	Abseits von Sprints
“Working software over comprehensive documentation”	Umfassende Reports
Business Value	Nicht-Funktional

UNVERSTÄNDLICHE PEN-TEST REPORTS

CVE-2003-1418 Detail

MODIFIED

This vulnerability has been modified since it was last analyzed by the NVD. It is awaiting reanalysis which may result in further changes to the information provided.

Description

Apache HTTP Server 1.3.22 through 1.3.27 on O
ETag header, which reveals the inode number, c

Etag header is presented in application response.

Threat:

Etag header allows remote attackers to obtain sensitive information, which include the inode number or may reveal child process IDs (PID).

Screenshot:

CVSS Base Score: 3.7 (Low) (CVSS:3.0/AV:N/AC:H/PR:N/UI:N/S:U/C:L/I:N/A:N)

Possible remediation:

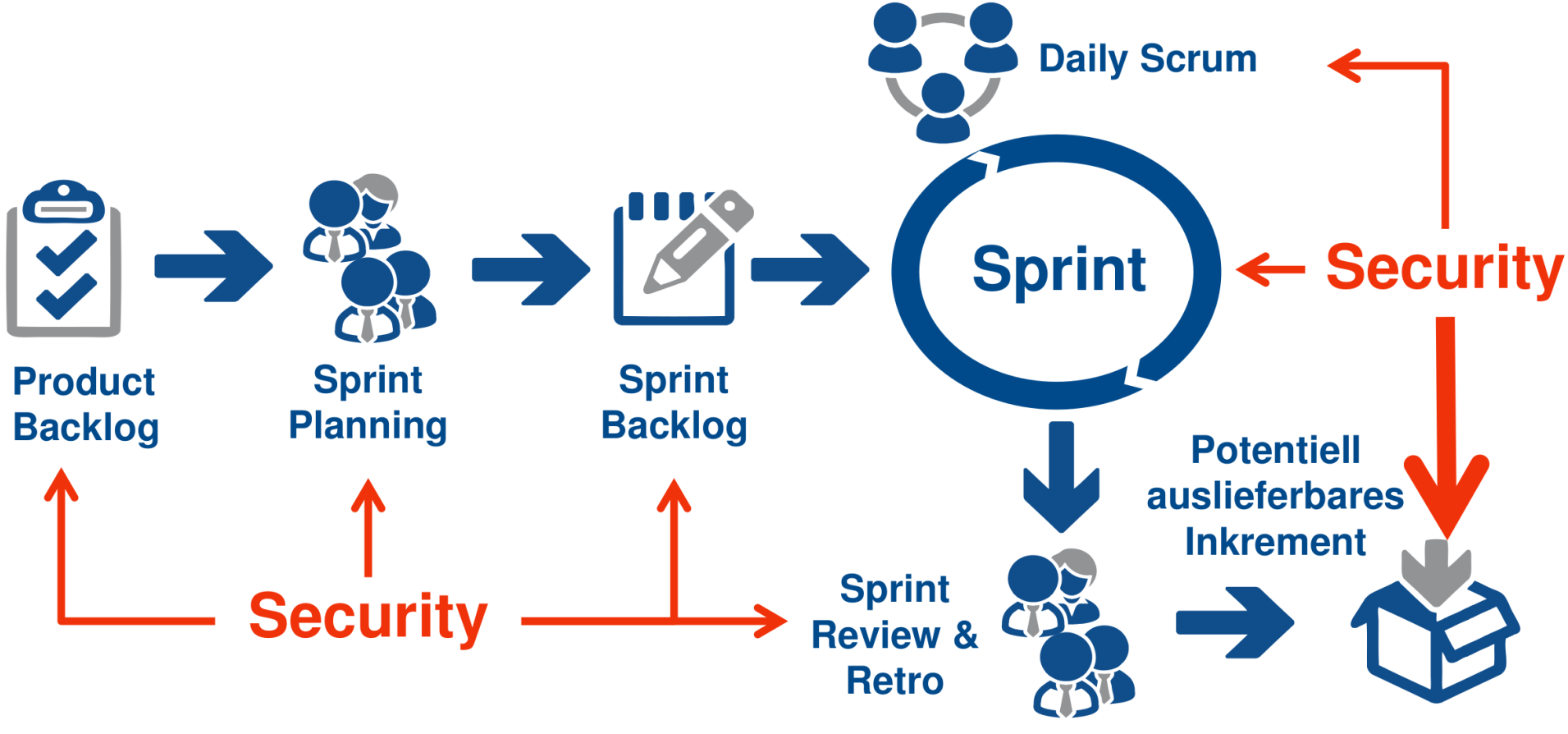
Disable Etag header in webserver configuration.

Reference:

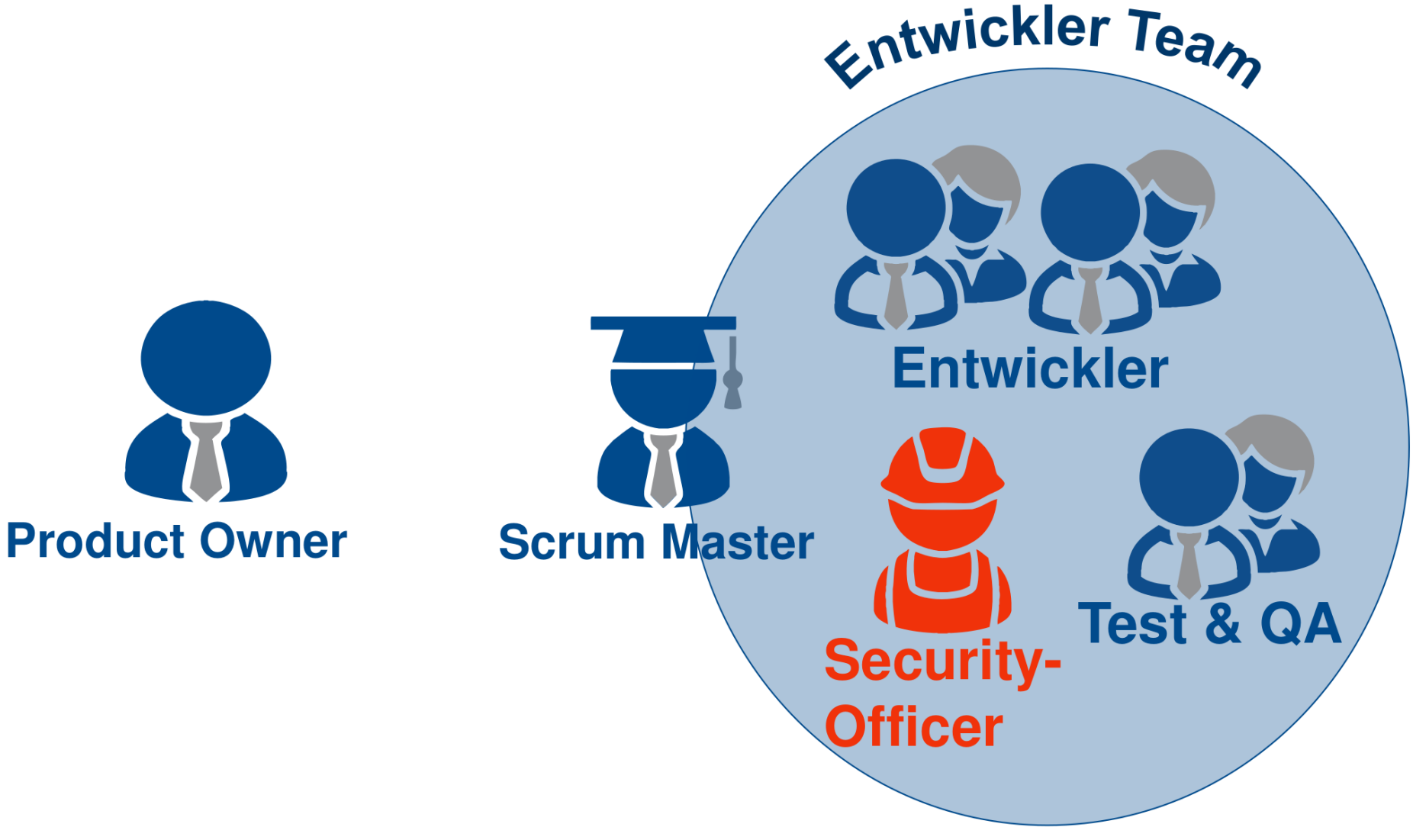
https://nvd.nist.gov/vuln/detail/CVE-2003-1418

But we use NGINX and **NOT** Apache??

SECURITY IN SCRUM



SECURITY OFFICER/CHAMPION



SECURITY TRAININGS

SECURITY TRAININGS

Product Owner

- Sicherheits-Risiken
- Datenschutz-Risiken
- Threat Modeling
- AbUser Stories (*Evil* Stories)

SECURITY TRAININGS

Development Team

- Threat Modeling
- Secure Design Patterns
- Security Code Reviews
- Security Testing
- Security Dojos

OPEN ~~WEB~~ APPLICATION SECURITY PROJECT

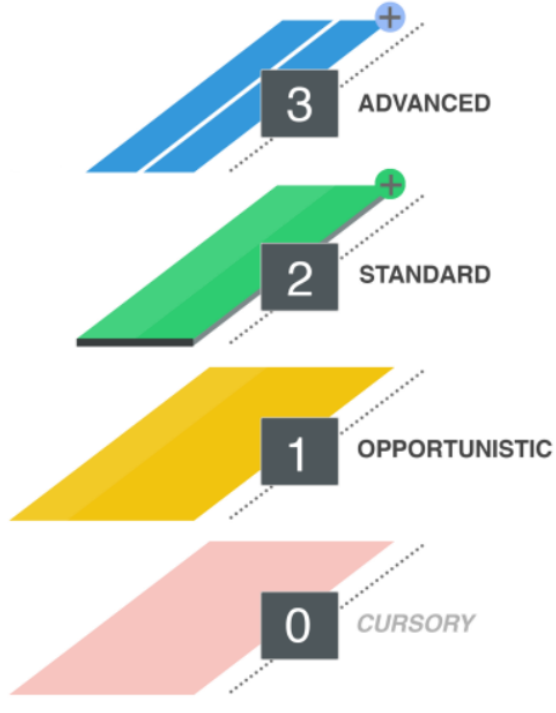
https://www.owasp.org

OWASP Top 10 - 2013		OWASP Top 10 - 2017
A1 – Injection	→	A1:2017-Injection
A2 – Broken Authentication and Session Management	→	A2:2017-Broken Authentication
A3 – Cross-Site Scripting (XSS)	↘	A3:2017-Sensitive Data Exposure
A4 – Insecure Direct Object References [Merged+A7]	∪	A4:2017-XML External Entities (XXE) [NEW]
A5 – Security Misconfiguration	↘	A5:2017-Broken Access Control [Merged]
A6 – Sensitive Data Exposure	↗	A6:2017-Security Misconfiguration
A7 – Missing Function Level Access Contr [Merged+A4]	∪	A7:2017-Cross-Site Scripting (XSS)
A8 – Cross-Site Request Forgery (CSRF)	☒	A8:2017-Insecure Deserialization [NEW, Community]
A9 – Using Components with Known Vulnerabilities	→	A9:2017-Using Components with Known Vulnerabilities
A10 – Unvalidated Redirects and Forwards	☒	A10:2017-Insufficient Logging&Monitoring [NEW,Comm.]

https://github.com/OWASP/Top10

APPLICATION SECURITY VERIFICATION STANDARD

ANFORDERUNGEN UND TESTS



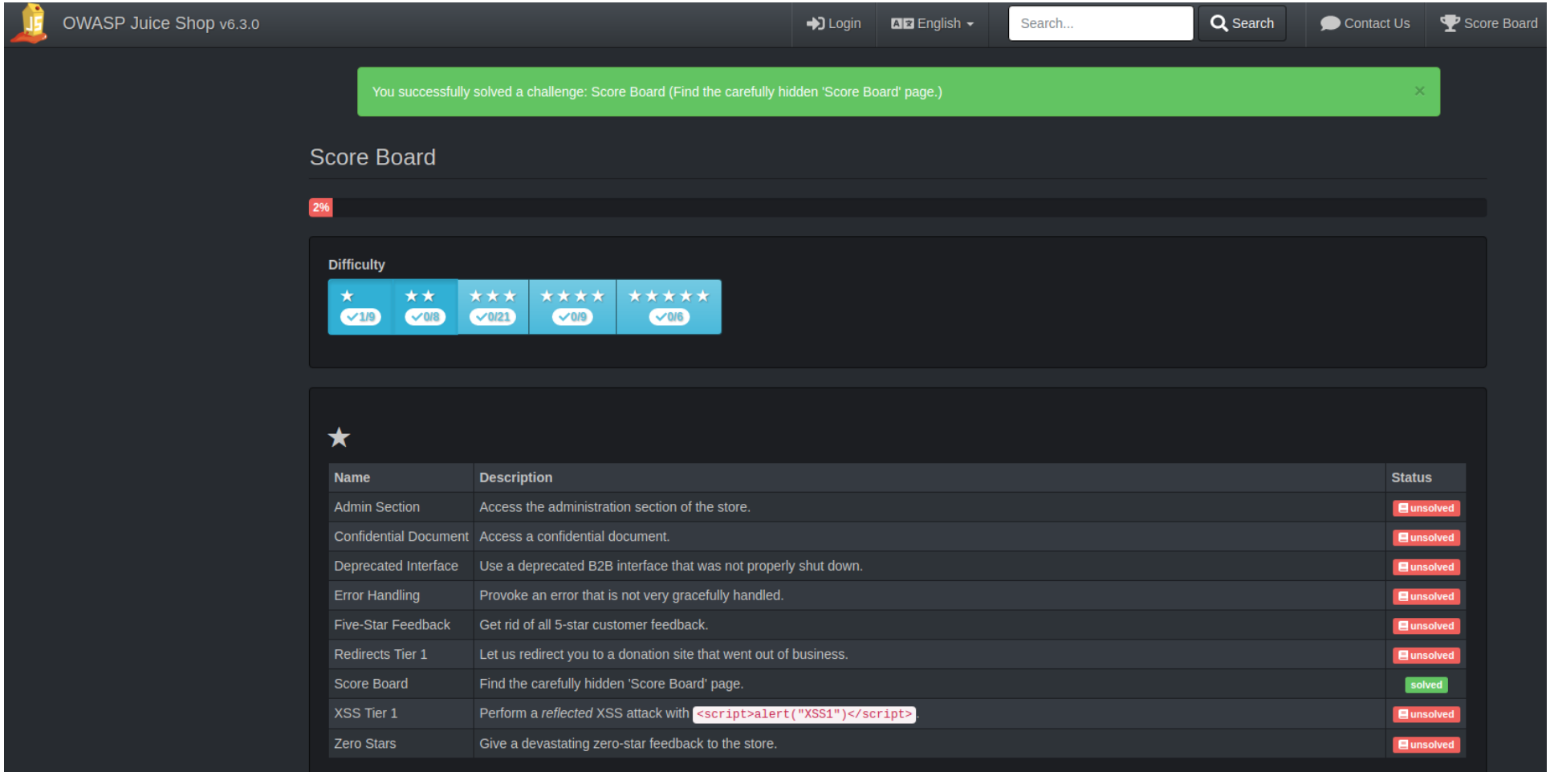
https://github.com/OWASP/ASVS

PRO ACTIVE CONTROLS

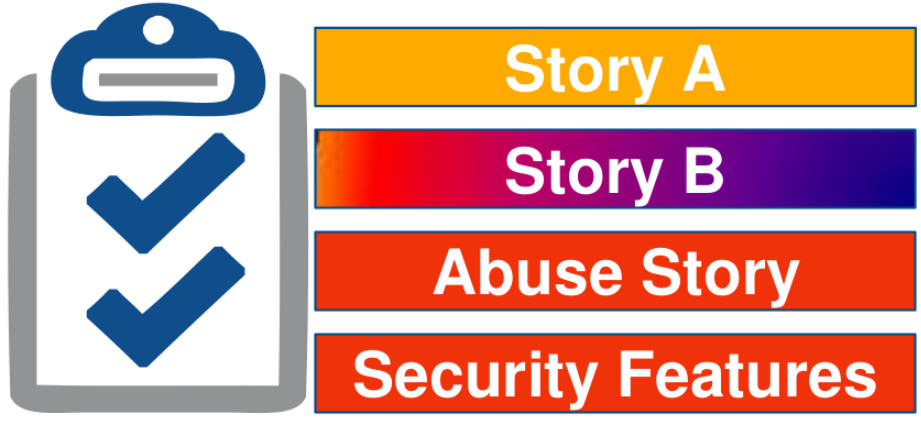
PATTERNS FÜR SICHERE ENTWICKLUNG

https://www.owasp.org/index.php/ OWASP_Proactive_Controls

JUICE SHOP



https://github.com/bkimminich/juice-shop



Product Backlog

- Threat Model Refinement
- AbUser Stories erstellen
- Security Features mit hoher Prio
- Akzeptanzkriterien für Sicherheit

THREAT MODELING IST AUCH AGIL

Produktiv Code erstellen

Security-Tests → **Grün**!

Test Driven Development (TDD)

Zuerst die Security Tests

Security Testfälle und AbUser Stories

Absicherung gegen Bedrohungen

Festlegung Software-Architektur

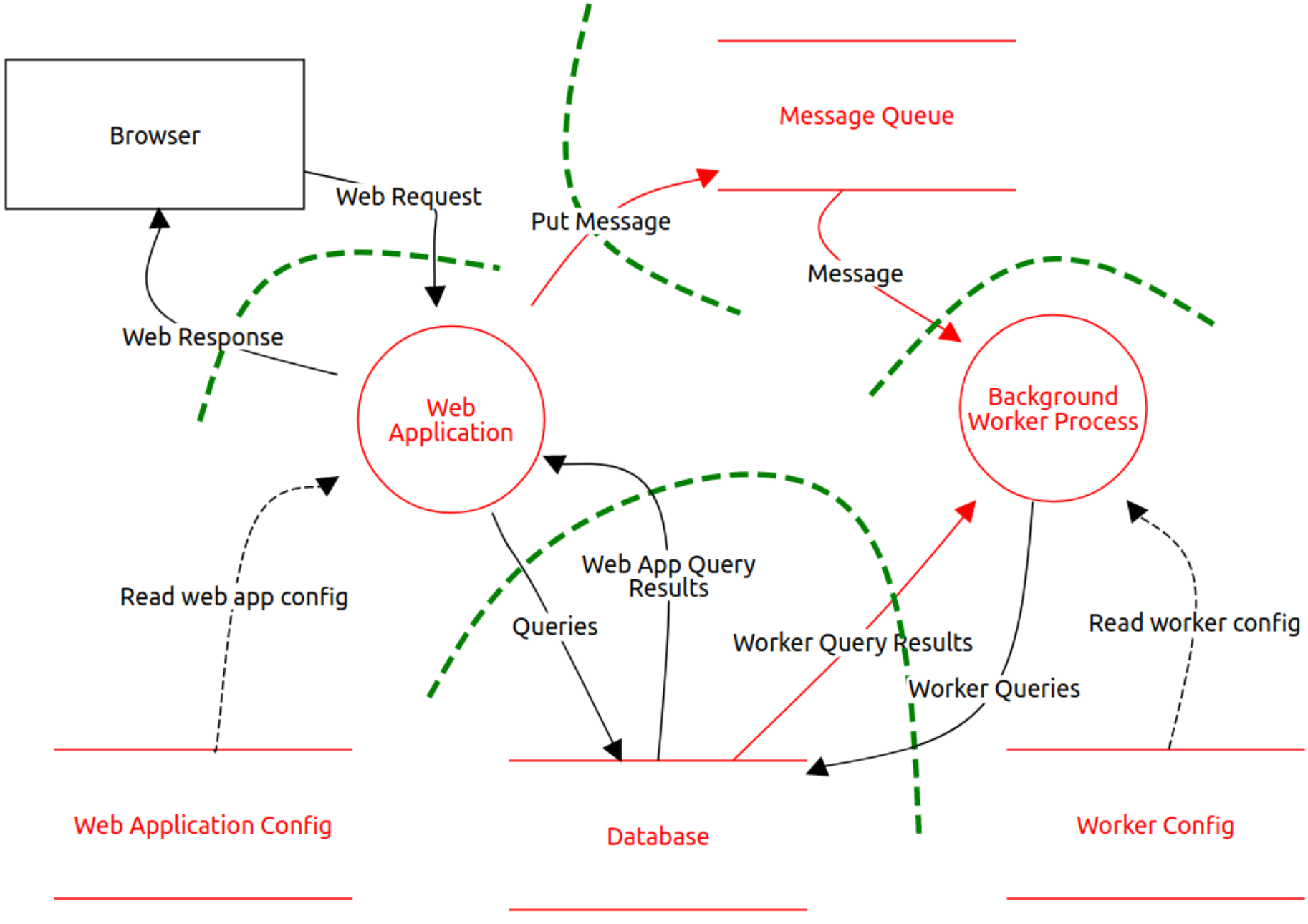
User Stories, UML Diagramme

Threat Model

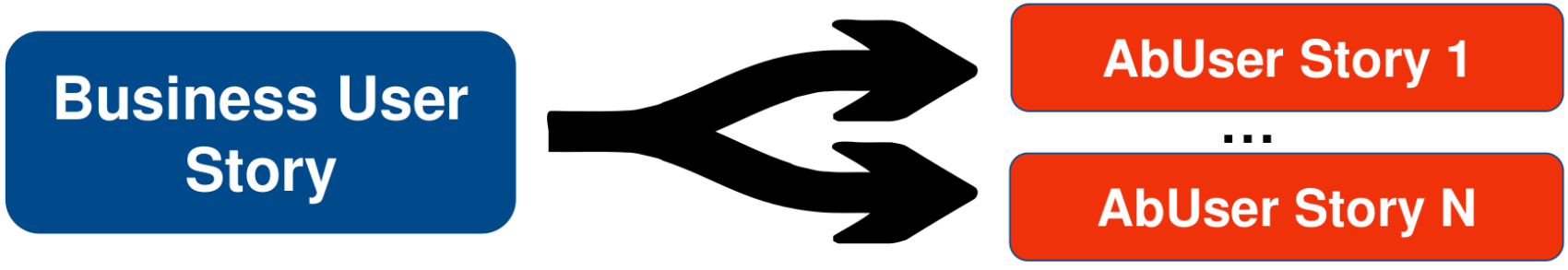
Als Diskussions-Basis

Identifikation und Vermeidung von Bedrohungen

„Elevation of privilege“ Spiel


Browser
Web Request
Web Response
Message Queue
Put Message
Message
Web Application
Background Worker Process
Read web app config
Web App Query Results
Queries
Worker Query Results
Worker Queries
Read worker config
Web Application Config
Database
Worker Config

ABUSER STORIES



Als Kunde möchte ich Produkte auswählen und zum Warenkorb hinzufügen um diese zu kaufen.

Als Angreifer möchte ich Anfragen so manipulieren um Preise der Produkte im Warenkorb zu ändern.

ABUSER UND SECURITY STORIES

TODO-5

Als Benutzer möchte ich mich an der ToDo Anwendung anmelden um neue ToDo's anzuzeigen/anzulegen

Security Feature 5

TODO-6

Als Administrator möchte ich mich an der ToDo Anwendung anmelden um Kategorien und Benutzer zu verwalten

Security Feature 5

TODO-10

Als Script-Kiddie möchte ich mich mit administrativen Rechten anmelden um Spam als ToDo's einzutragen

Abuse Story 2

TODO-8

Als Benutzer möchte ich eine Liste meiner aktuellen ToDo's anzeigen

Business Feature 3

Sprint Planning

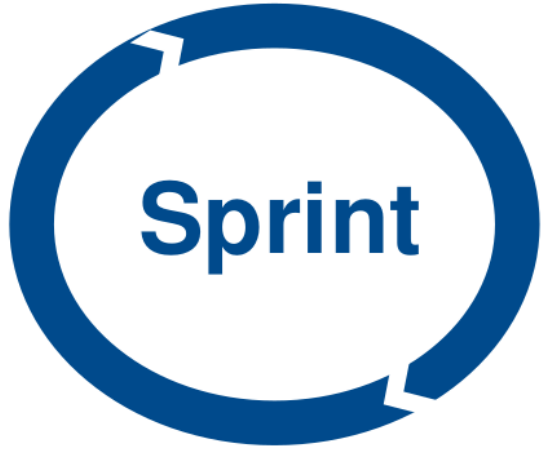
- Detaillierung Threat Model
- Akzeptanzkriterien für Sicherheit
- Security Patterns diskutieren
- Security Testfälle

ABUSER STORY TASKS

To Do	In Progress	Done
› TODO-11 TO DO 6 sub-tasks Als Administrator möchte ich Benutzer verwalten um diese für die Anwendung zu autorisieren		
⌄ TODO-10 TO DO 4 sub-tasks Als Script-Kiddie möchte ich mich mit administrativen Rechten anmelden um Spam als ToDo's einzutragen		
TODO-20 ↑ Test auf Session-Fixation (neue JSESSIONID nach Anmeldung)	TODO-18 ↑ Verwundbarkeit der Eingabefelder für XSS-Injections testen	
TODO-21 ↑ Prüfung, ob Passwort in Klartext ersichtlich ist (UI, Logs, DB, HTTP)		
TODO-22 ↑ Alle Webseiten auf unauthorisierten Zugriff prüfen (Umgehung von Login möglich?)		

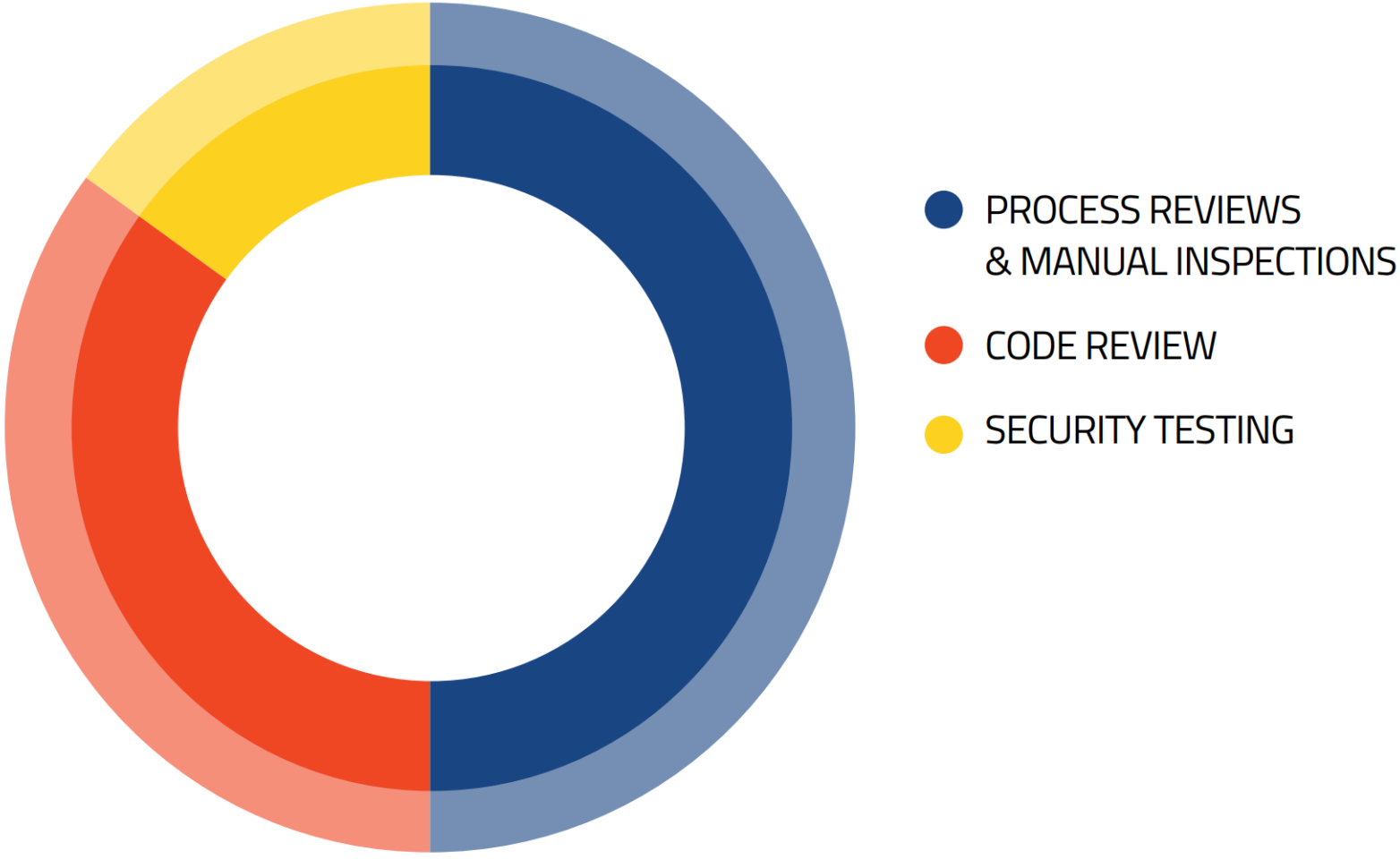
Daily Scrum

- Neue Security-Risiken diskutieren
- Security Tasks ggf. neu planen



- Secure Design / Coding
- Pairing mit Security-Officer/Champion
- Security-Aware DoD
- Security Code Reviews
- CI Pipeline mit Security

AGILES SECURITY TESTING



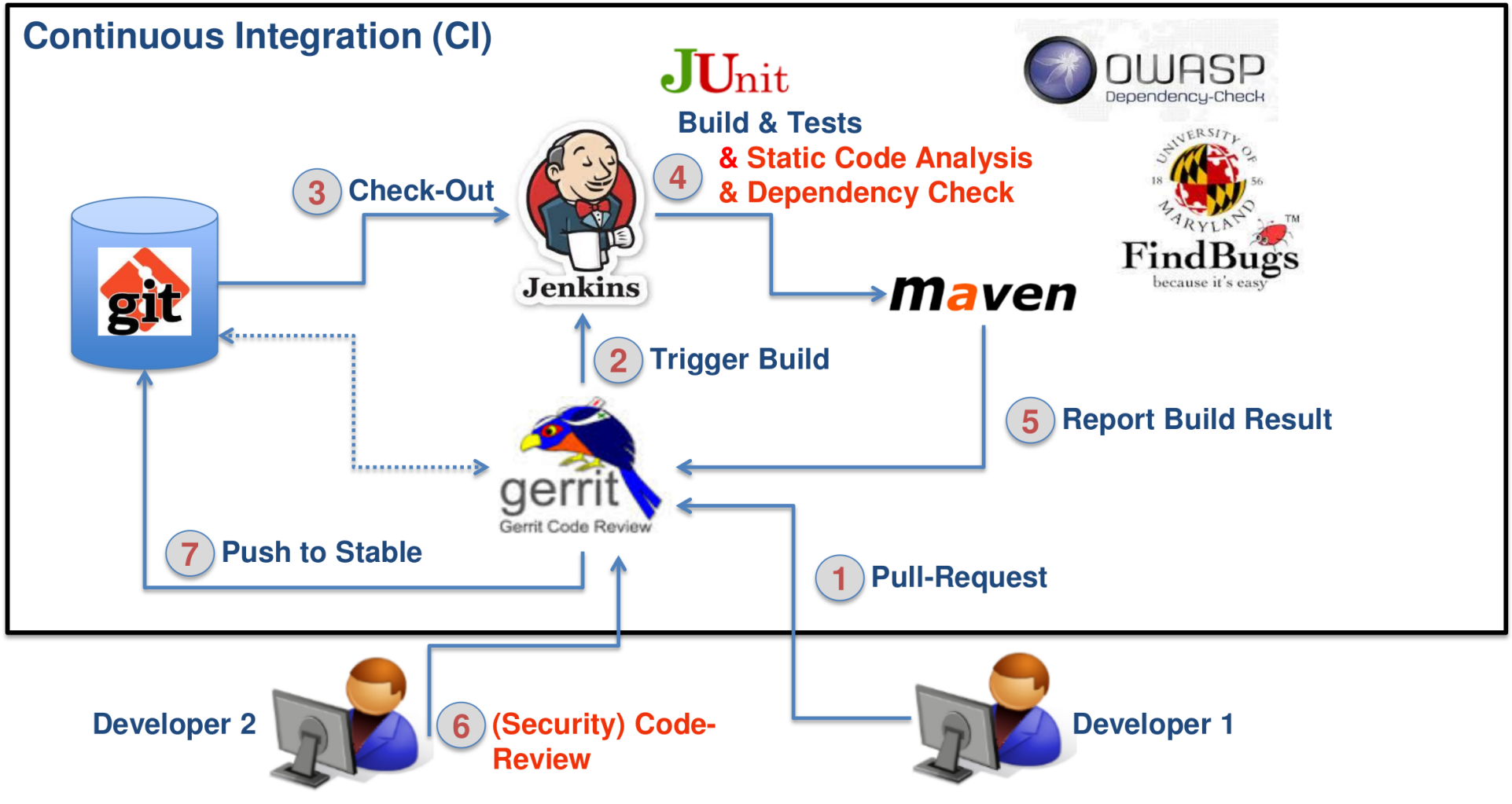
Quelle: www.owasp.org/index.php/OWASP_Testing_Project

ENTWICKLER SECURITY TESTS

BEVOR EIN ANGREIFER “TESTET”

- Security Unit/Integrationstests
- OWASP ZAP
- Burp Suite Free Edition
- SQLMap

CI COMMIT-STAGE MIT STATISCHER ANALYSE (SAST)



OWASP DEPENDENCY CHECK

- Prüft Projektabhängigkeiten auf Sicherheitsprobleme
- Unterstützt Java und .NET Anwendungen
- Command line, Ant, Maven, Gradle, Jenkins, SBT

https://github.com/jeremylong/DependencyCheck

OWASP DEPENDENCY CHECK REPORT

DEPENDENCY-CHECK

How to read the report | Suppressing false positives | Getting Help: google group | github issues

Project: root project 'dependency-check-demo'

Scan Information (show all):

- *dependency-check version*: 3.0.2
- *Report Generated On*: Nov 24, 2017 at 10:48:37 +01:00
- *Dependencies Scanned*: 12 (12 unique)
- *Vulnerable Dependencies*: 4
- *Vulnerabilities Found*: 13
- *Vulnerabilities Suppressed*: 0
- ...

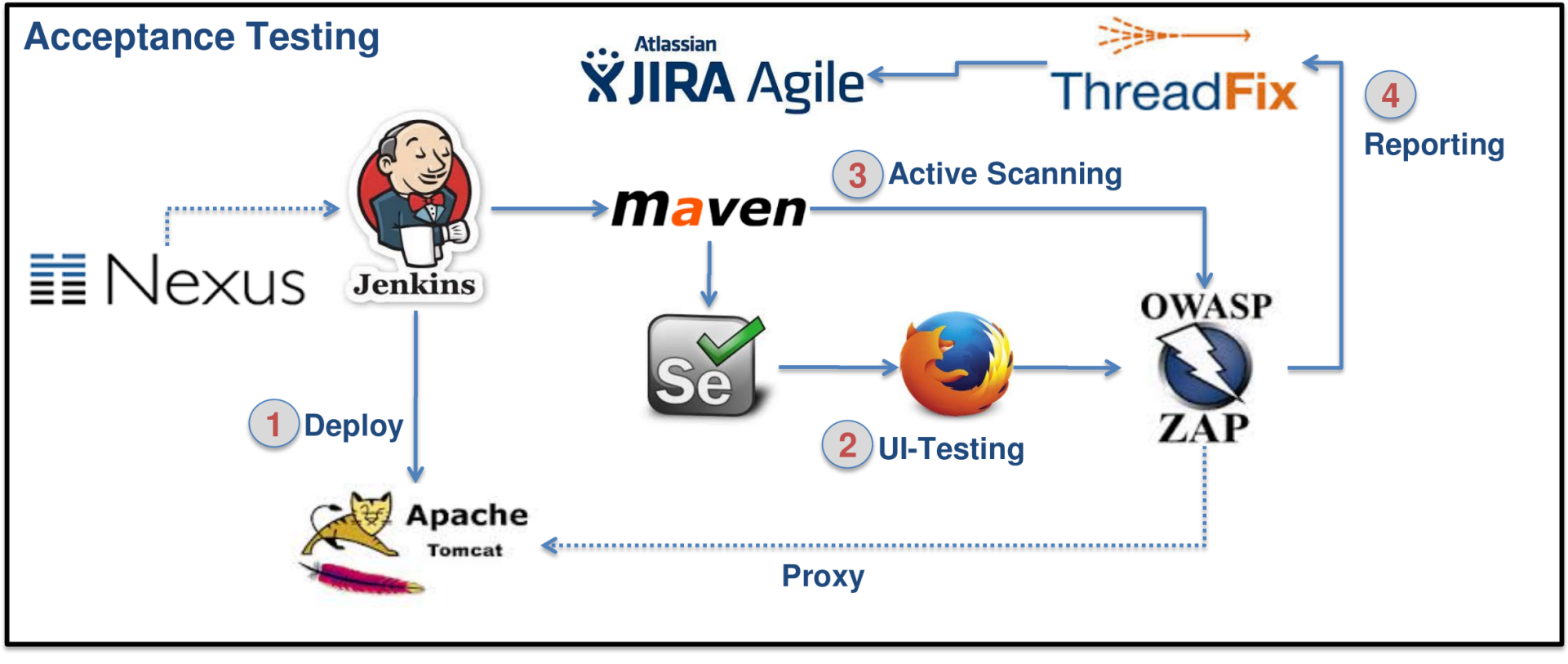
Display: Showing Vulnerable Dependencies (click to show all)

Dependency	CPE	GAV	Highest Severity	CVE Count	CPE Confidence	Evidence Count
struts2-core-2.5.jar	cpe:/a:apache:struts:2.5	org.apache.struts:struts2-core:2.5 ✓	High	9	Highest	32
commons-collections-3.2.jar	cpe:/a:apache:commons_collections:3.2.1	commons-collections:commons-collections:3.2 ✓	High	1	Low	36
log4j-api-2.5.jar	cpe:/a:apache:log4j:2.5	org.apache.logging.log4j:log4j-api:2.5 ✓	High	1	Highest	38
commons-fileupload-1.3.1.jar	cpe:/a:apache:commons_fileupload:1.3.1	commons-fileupload:commons-fileupload:1.3.1 ✓	High	2	Highest	38

Dependencies

struts2-core-2.5.jar

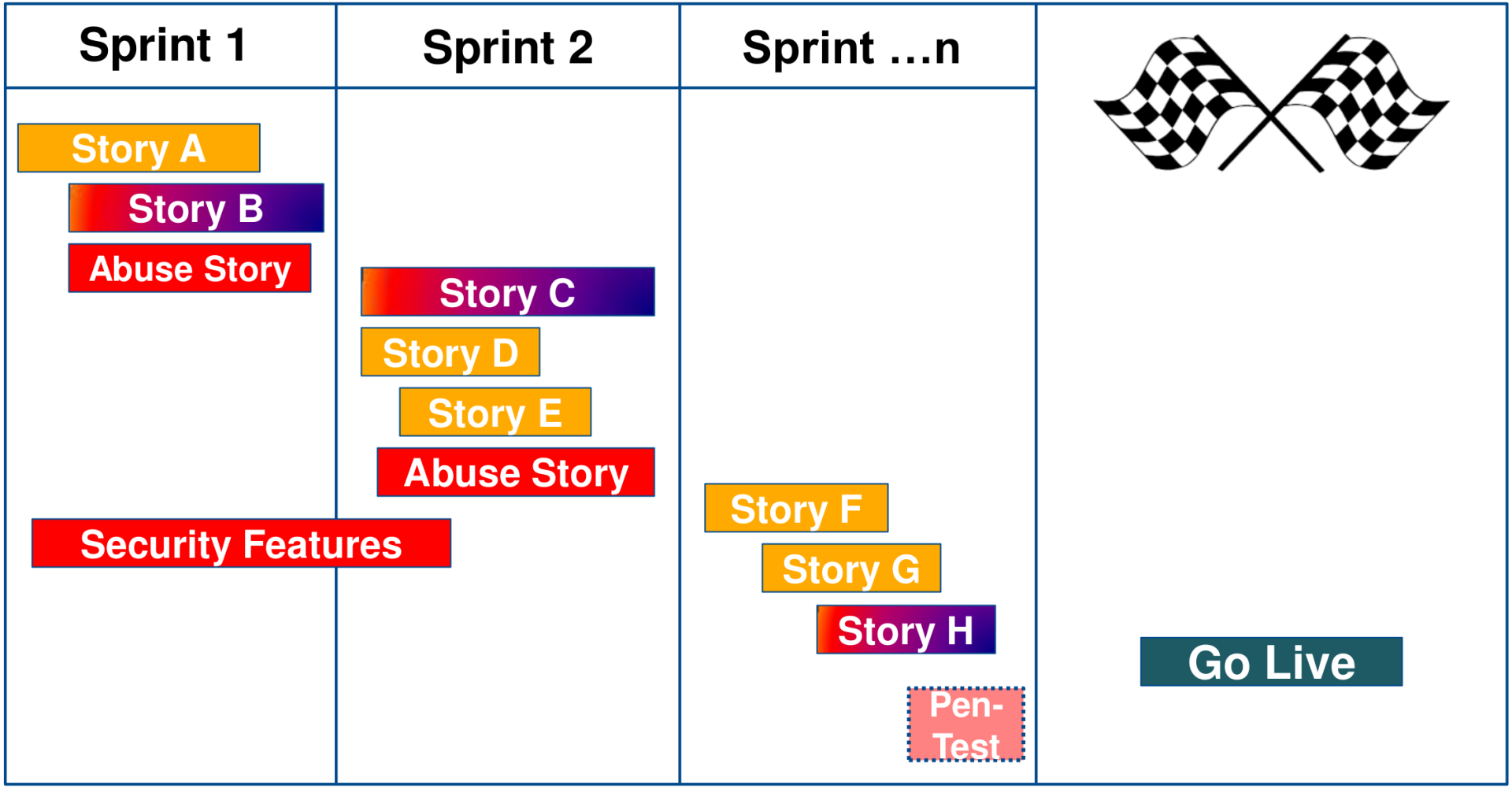
CI SECURITY-STAGE MIT DYNAMISCHER ANALYSE (DAST)



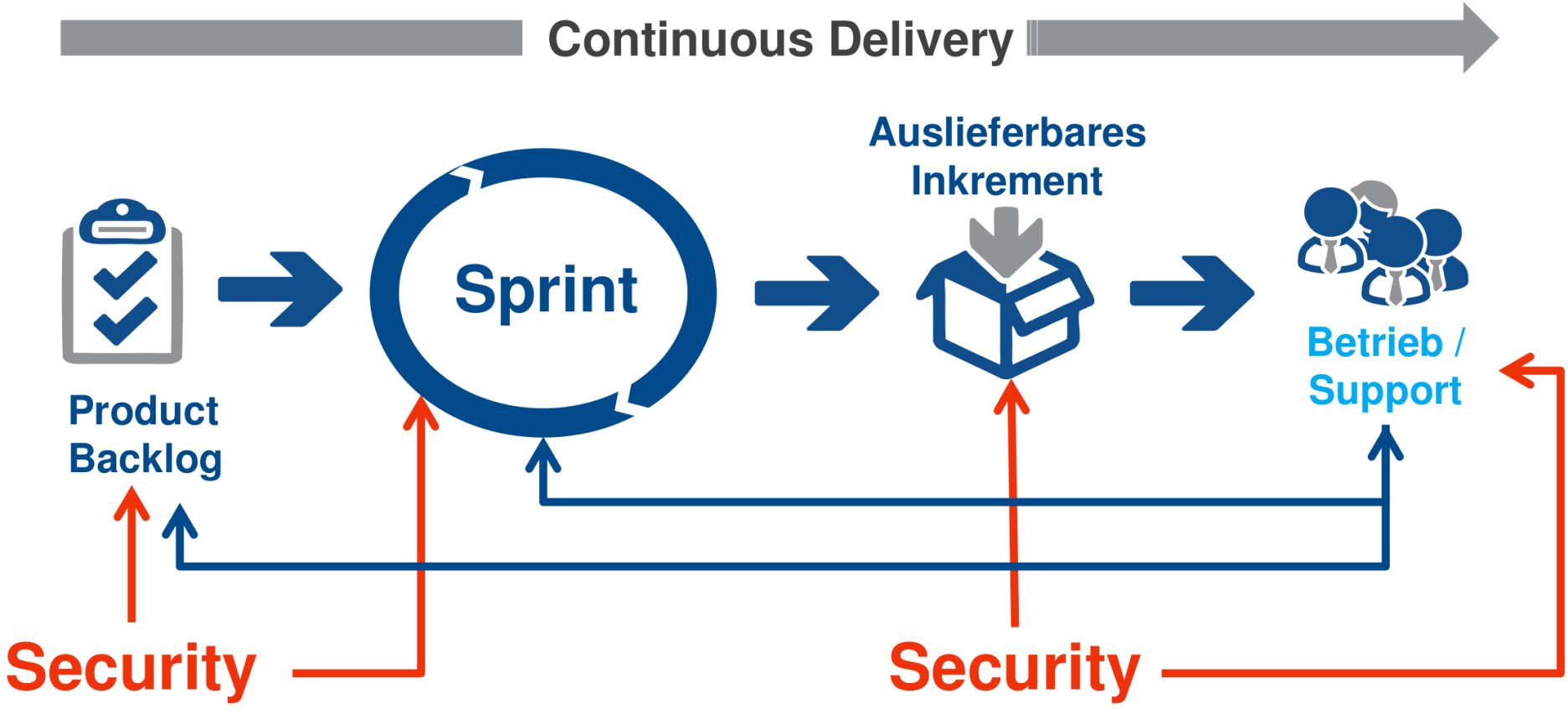
Sprint Review & Retro

- Transparenz der Security gegenüber Stakeholdern
- Inspect & Adapt aller Security-Aktivitäten

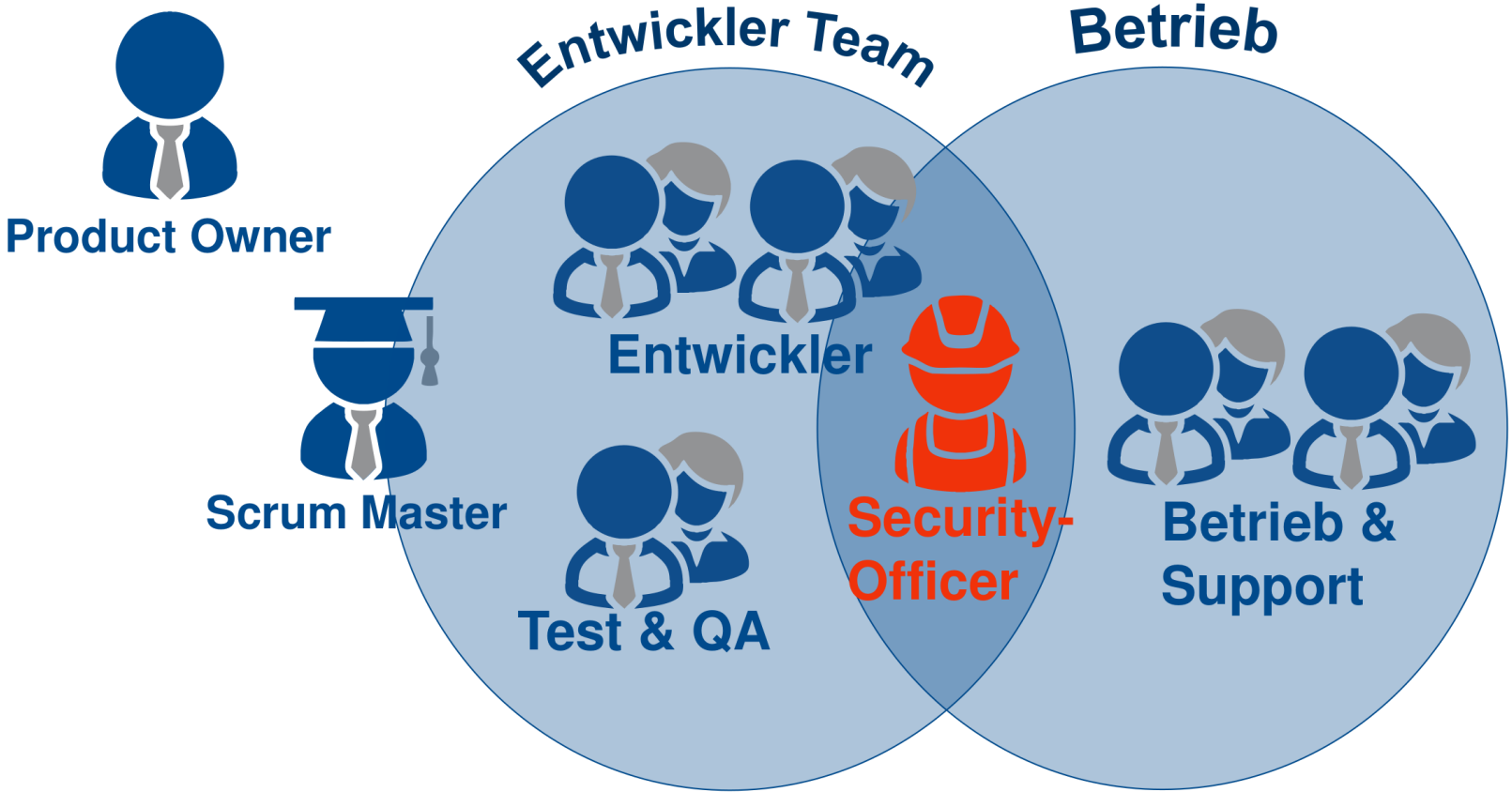
IDEALZUSTAND: SECURITY == AGIL!



SECDEVOPS


Continuous Delivery
Auslieferbares Inkrement
Sprint
Product Backlog
Betrieb / Support
Security
Security

SECURITY OFFICER/CHAMPION IN SECDEVOPS

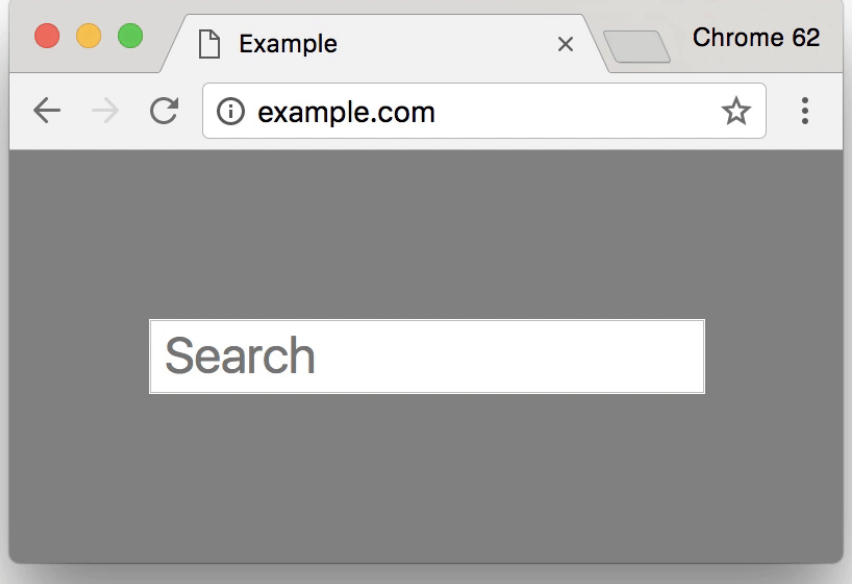


HTTPS IST PFLICHT !!

Let's Encrypt

CloudFlare

HTTP/2



HTTPS-KONFIGURATION ÜBERPRÜFEN

SSL Report: andreas-falk.de (104.28.12.71)

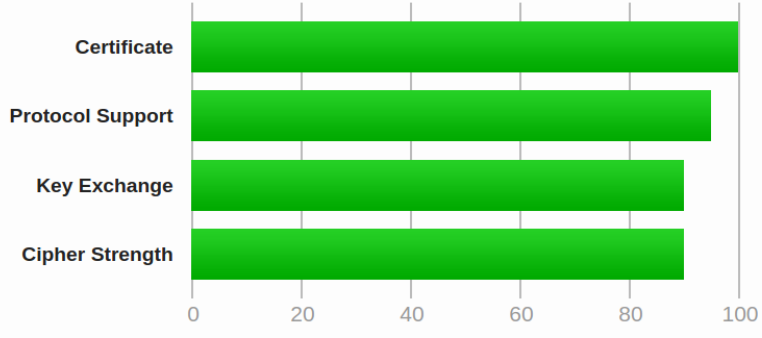
Assessed on: Fri, 23 Feb 2018 12:41:16 UTC | **HIDDEN** | Clear cache

Scan Another »

Summary

Overall Rating

A



Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

This site works only in browsers with SNI support.

www.ssllabs.com/ssltest

SECURITY HEADER ÜBERPRÜFEN

Security Report Summary

B

Site:	https://andreas-falk.de/
IP Address:	2400:cb00:2048:1::681c:c47
Report Time:	23 Feb 2018 12:57:08 UTC
Report Short URL:	Feature disabled.
Headers:	✔ X-Frame-Options ✔ X-XSS-Protection ✔ X-Content-Type-Options ✔ Strict-Transport-Security ✖ Content-Security-Policy ✖ Referrer-Policy

Raw Headers

HTTP/1.1	200 OK
Date	Fri, 23 Feb 2018 12:57:08 GMT
Content-Type	text/html; charset=UTF-8
Transfer-Encoding	chunked
Connection	keep-alive
Set-Cookie	__cfduid=d0e30045de3100883d49939d0349e6bdf1519390626; expires=Sat, 23-Feb-19 12:57:06 GMT; path=/; domain=.andreas-falk.de; HttpOnly; Secure
X-Powered-By	PHP/7.0.20
X-Frame-Options	DENY
X-XSS-Protection	1; mode=block
X-Content-Type-Options	nosniff
Link	<https://andreas-falk.de/wp-json/>; rel="https://api.w.org/", <https://wp.me/P4NtFZ-3X>; rel=shortlink
Set-Cookie	wfvt_1740180939=5a900fa3c1772; expires=Fri, 23-Feb-2018 13:27:07 GMT; Max-Age=1800; path=/; secure; HttpOnly
Strict-Transport-Security	max-age=15552000
Expect-CT	max-age=604800, report-uri="https://report-uri.cloudflare.com/cdn-cgi/beacon/expect-ct"
Server	cloudflare
CF-RAY	3f1a59548d279631-SJC

securityheaders.io


UND IN DER CLOUD?

ALTE BEKANNTE UND MEHR...

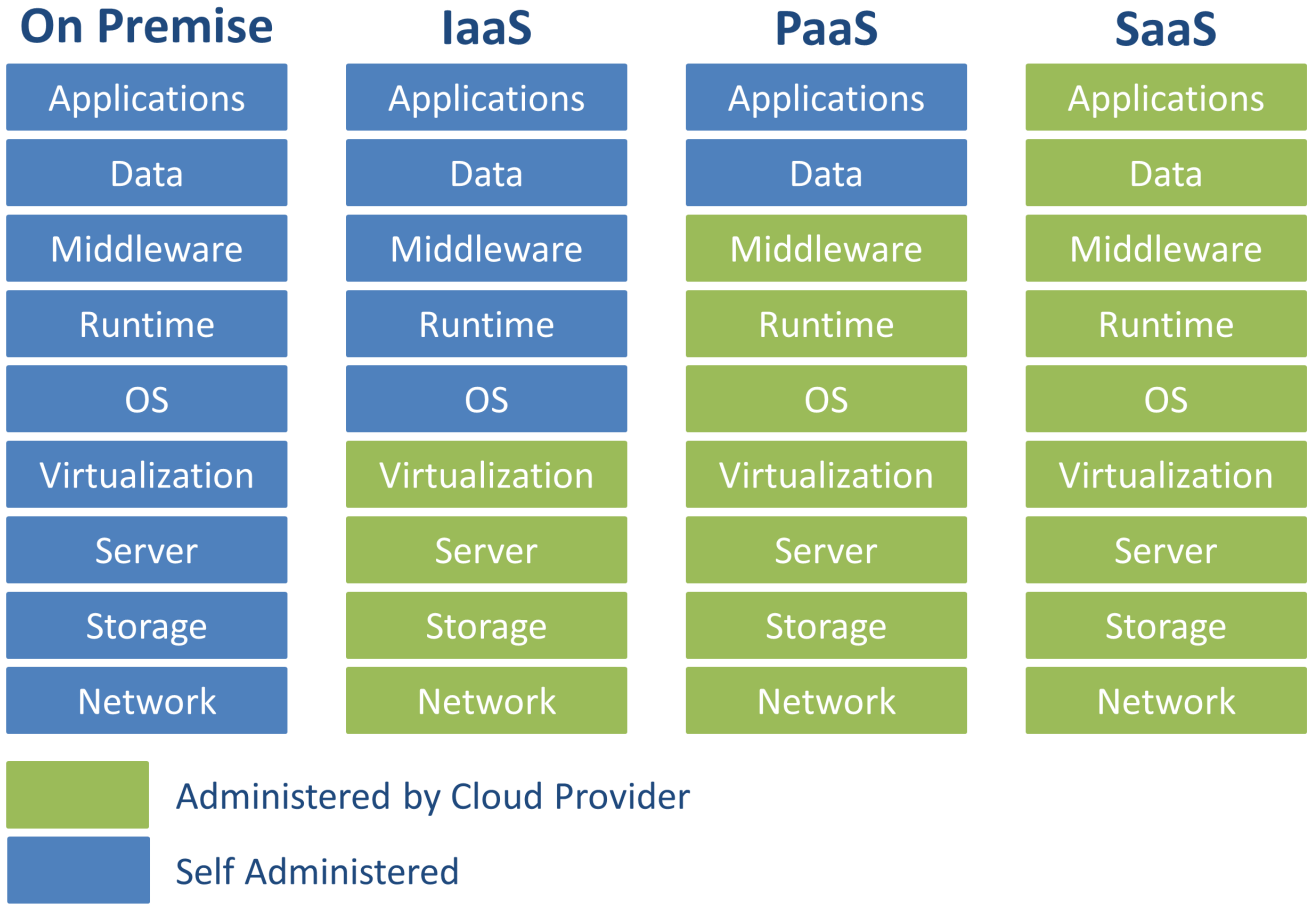
Alle OWASP Top 10 Web Probleme...

Distributed DoS

Economic DoS


UND WAS ÄNDERT SICH DANN
IN DER CLOUD?

Cloud Service Models



ROTATE, REPAIR, REPAVE

“What if every server inside my data center had a maximum lifetime of two hours? This approach would frustrate malware writers...”

Justin Smith (Chief Security Officer at Pivotal)

https://thenewstack.io/cloud-foundrys-approach-security-rotate-repair-repave

DAMIT DAS NICHT PASSIERT !!

Quelle: youtube.com

REFERENCES

- Have I been pwned?
- Shodan.io
- Deutschland sicher im Netz (DsiN): Sicherheitsindex 2017
- OWASP Top 10 2017 (https://github.com/OWASP/Top10)
- Application Security Verification Standard (https://github.com/OWASP/ASVS)
- Pro Active Controls (https://www.owasp.org/index.php/OWASP_Proactive_Controls)
- https://docs.microsoft.com/de-de/azure/security/azure-security-threat-modeling-tool
- https://github.com/mike-goodwin/owasp-threat-dragon
- https://github.com/bkimminich/juice-shop
- Rotate, Repair, Repave (https://thenewstack.io/cloud-foundrys-approach-security-rotate-repair-repave)

https://www.novatec-gmbh.de
https://blog.novatec-gmbh.de

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