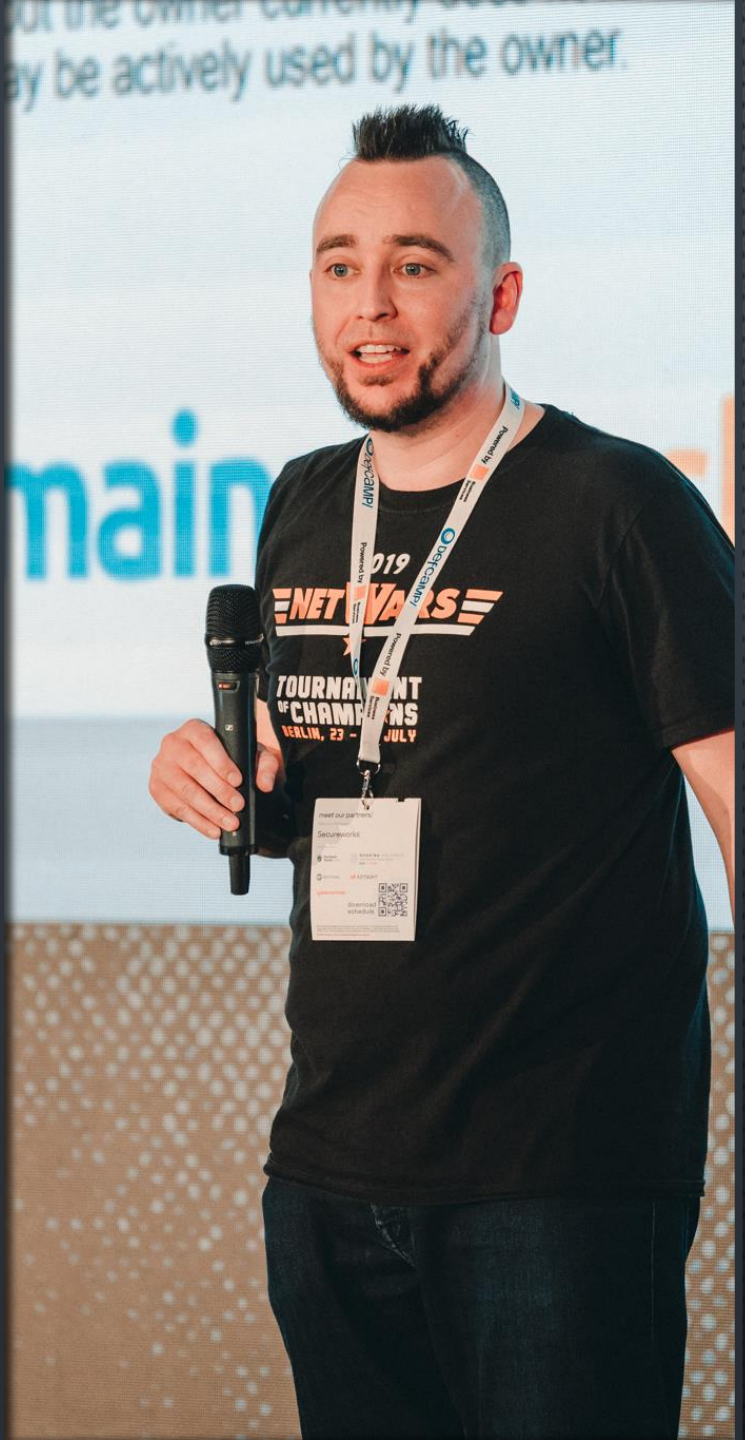

Pentest
Methodology
A reform is needed



CHRIS DALE

- CHO at River Security
- Principal Instructor at SANS
- EX CISO

Short WHOAMI:

I show how criminals break-in,
and I help throw them back out…

CERTS

GCIH	GIAC Certified Incident Handler
GPEN	GIAC Certified Penetration Tester
GSLC	GIAC Security Leadership
GIAC	GIAC Mobile Device Security Analyst
GDAT	GIAC Defending Advanced Adversaries
GCTI	GIAC Cyber Threat Intelligence
GCFA	GIAC Certified Forensic Analyst
GXIH	GIAC Experienced Incident Handler
GXPT	GIAC Experience Penetration Tester
GSP	GIAC Security Professional

Provider in the Offensive Security Space

- And a touch of Incident Response

- 20 employees
- Boot strapped
- 4 years in business
- 41+ public customer testimonials
- 8+ customer cases

Provider in the Offensive Security Space

- And a touch of Incident Response

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- 41+ public customer testimonials
- 8+ customer cases

Team River Security @ Hacker Space 2024

50+ Companies in Norway providing pentesting

Ahmad A. • 1st
Fagansvarlig Offensive Security - Author - Speaker - Content Creator - Nerd
2w • Edited •

50+ selskaper som tilbyr sikkerhetstesting (pentest) i Norge

1. Experis AS
2. River Security AS
3. Netsecurity AS
4. Kovert
5. Binary Security AS
6. Watchcom (nå Telenor Cyberdefence)
7. EVRY AS
8. Semaphore
9. Atea AS
10. Aztek AS (nå Accelerate at Iver)
11. Promon AS
12. Mnemonic AS
13. Fencenordic
14. Secure-NOK AS
15. Itera Consulting Norway AS
16. NorSIS
17. Horangi Cyber Security
18. PwC Norge
19. Capgemini Norge AS
20. Accenture AS
21. Motit AS
22. Visma Consulting AS (nå Twoday)
23. KPMG Norge
24. Defendable AS
25. Teknograd AS
26. Secure Practice AS
27. Greenberg Traurig Norway AS
28. DataGardens AS
29. Nixu / DNV
30. Sopra Steria AS
31. Encripto AS
32. EY Norge
33. Banshie
34. BDO AS
35. Orange Cyberdefense
36. Agenda Risk AS
37. Knowit Secure AS
38. CyberIntelsys
39. CGI Norge
40. Mily
41. ShieldTech AS
42. NetNordic Norway
43. NORMA Cyber
44. Konfitech AS
45. Capra Consulting AS

Let us take
a look at

Pentest
Methodologies

Google penetration test methodology

All Images Videos Short videos Forums News Web More Tools Saved

Vulnerability assessment | Osstmm | External | Standard | Nist | Mobile application security testing | Security flaws | Ec council | Web application penetration | Software testing

Imperva
hat is Penetration Testing | Step-By ...

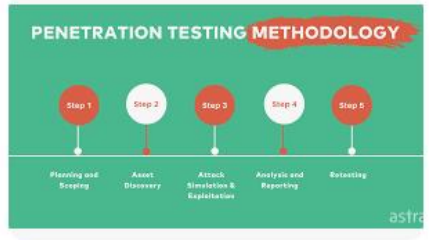
Astra Security
Top 5 Penetration Testing Methodology ...

Sprinto
Top 5 Penetration Testing Methodology ...

| Cobalt
eb Application Penetration Testing ...

StationX
Penetration Testing Step...

TechTarget
Pen testing guide: Types,...

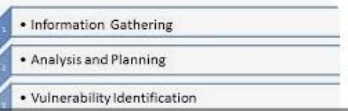


Astra Security
NIST Penetration Testing: A ...

Aress Software
p 5 Penetration Testing Methodology ...

eLuminous Technologies
Web Application Penetration Testing ...

GeeksforGeeks
Penetration Testing - Software ...



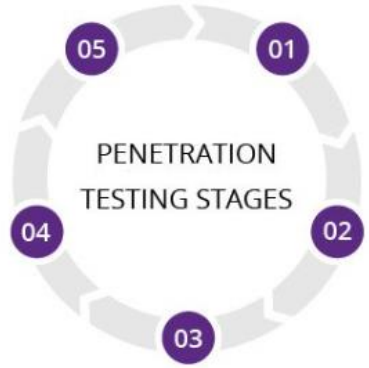
Imperva

Analysis and WAF configuration
Results are used to configure WAF settings before testing is run again.

Planning and reconnaissance
Test goals are defined and intelligence is gathered.

Maintaining access
APTs are imitated to see if a vulnerability can be used to maintain access.

Scanning
Scanning tools are used to understand how a target responds to intrusions.



Gaining access
Web application attacks are staged to uncover a target's vulnerabilities.

What is Penetration Testing | Step-By-Step Process & Methods | Imperva

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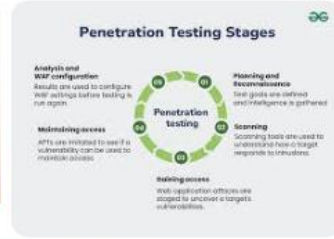
Sprinto
Top 5 Penetration Testing Methodo...



GeeksforGeeks
Penetration Testing - Software Eng...

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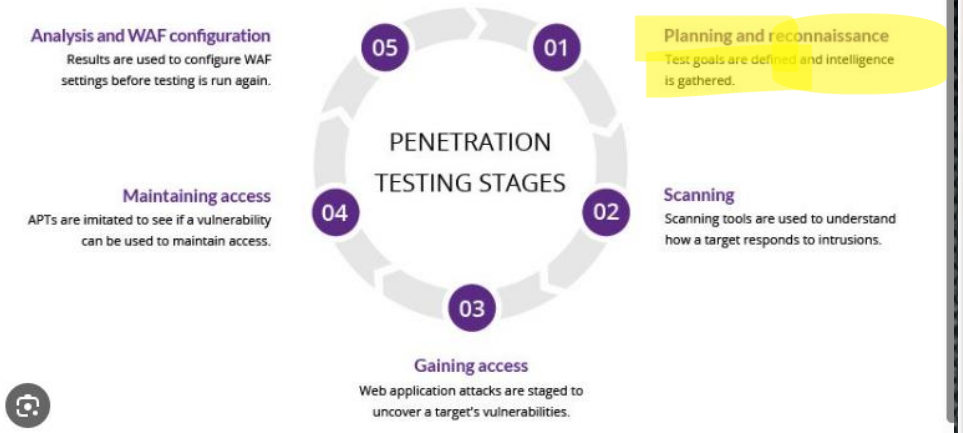

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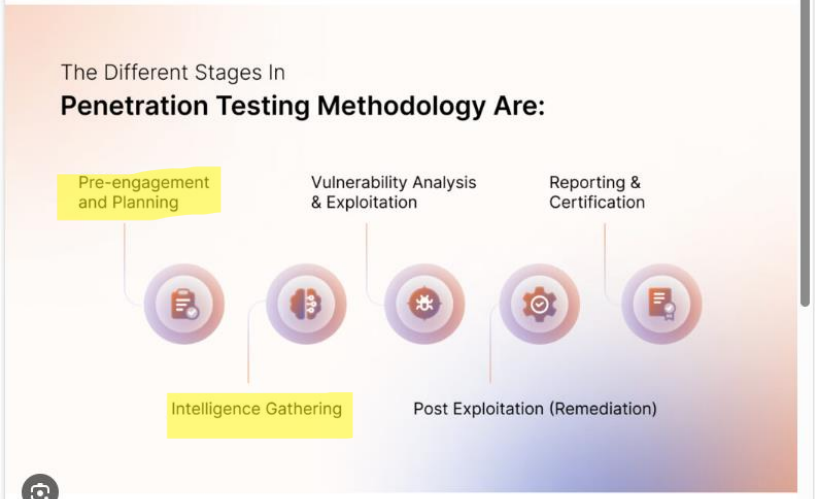

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Top 5 Penetration Testing Methodology to Follow in 2025

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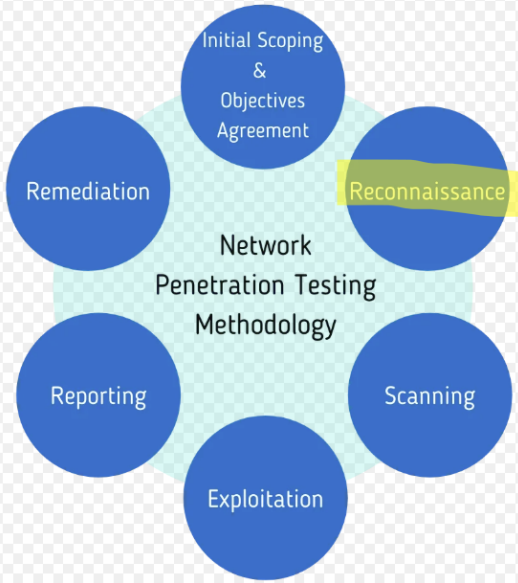
IGspectrum



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Security Metrics

6 Steps to a Penetration Test

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can you list out the phases of a pentest?

Certainly — here's a solid breakdown of the classic pentest phases, which you can adjust depending on your engagement style (goal-based, red teaming, assumed breach, etc.):

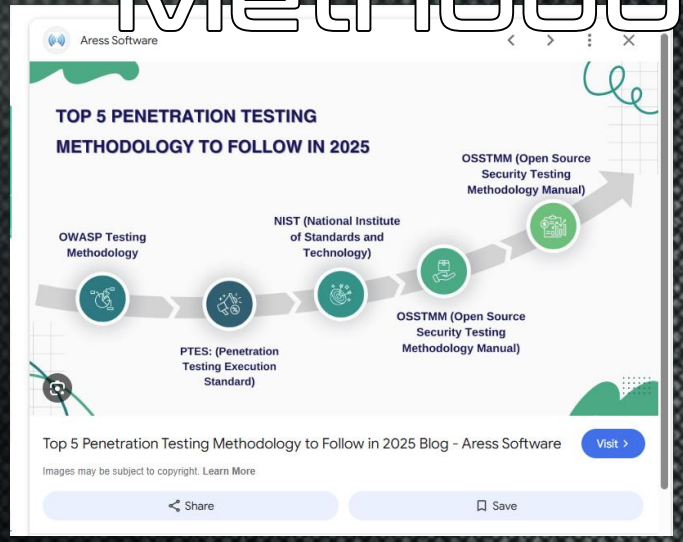
1. Reconnaissance (Passive & Active)

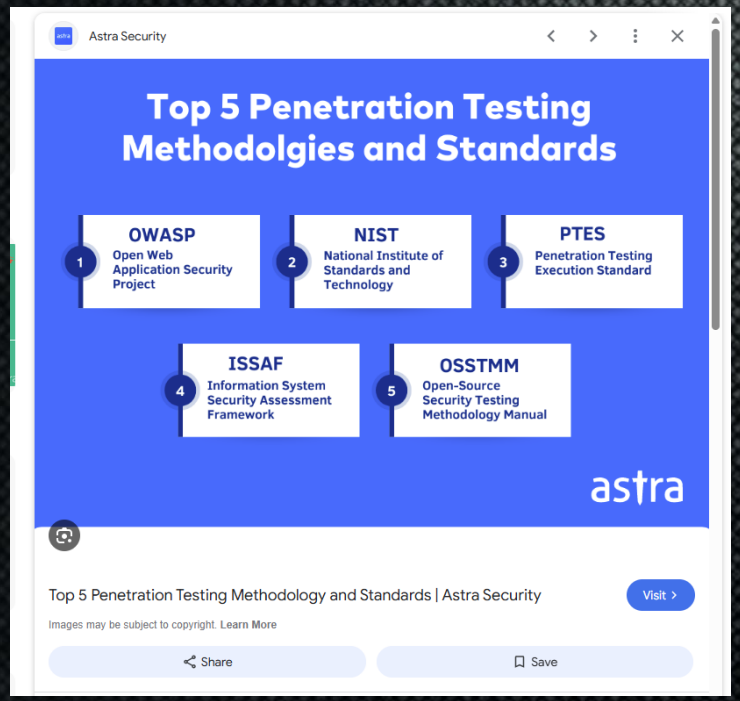
- **Passive Recon:** Harvesting intel without direct interaction (e.g., WHOIS, social media, DNS records, breach data).
- **Active Recon:** Touching the target (e.g., port scanning, banner grabbing, service enumeration).

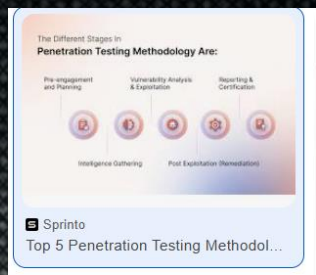
Do we do reconnaissance in a modern pentesting?

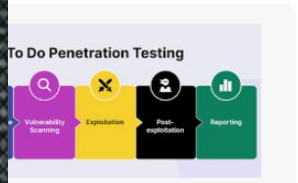
Or do we just tell what ever the customer asks us to?

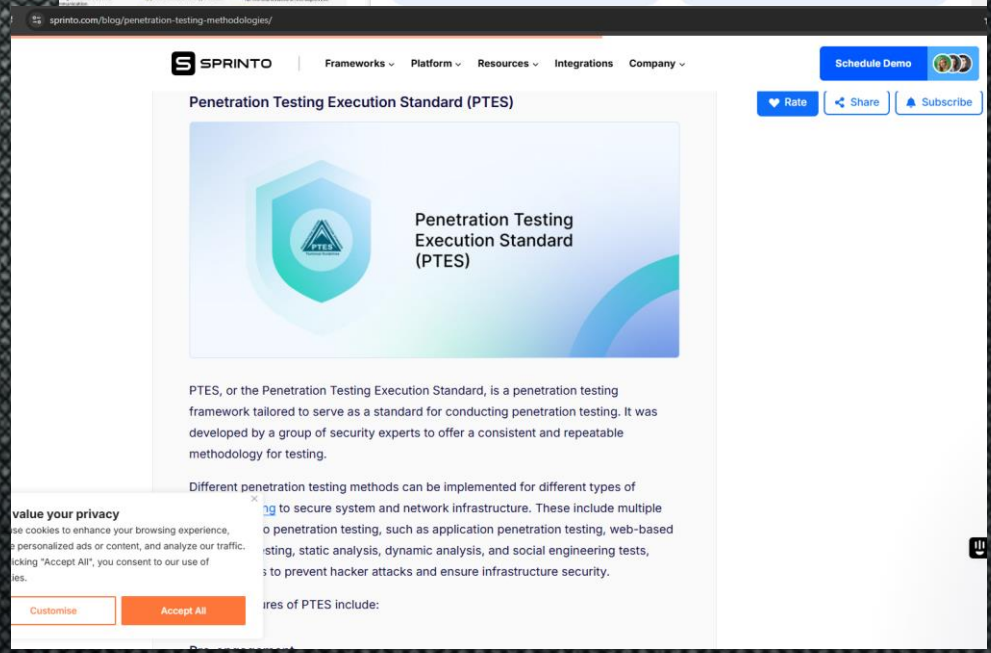
The Latest and Greatest Methodologies!

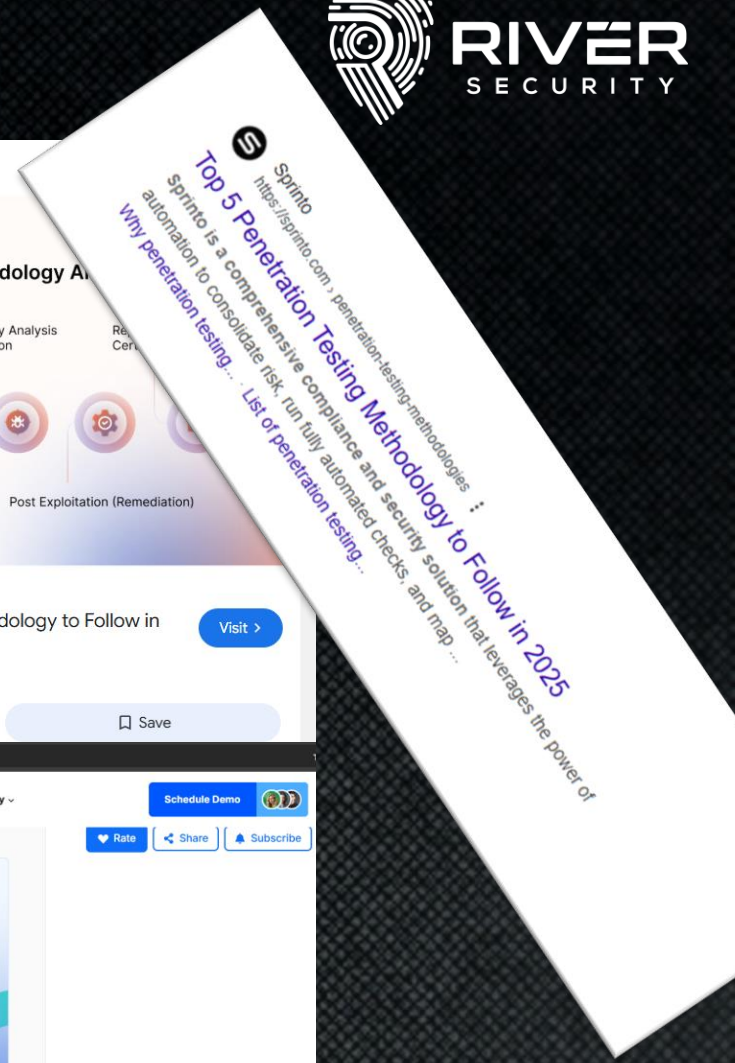












ose Your Security Testing Provider

< Forrige Neste >

ose Your Security Testing Provider

If you want to simulate a cyber attack and understand the consequences of vulnerabilities being exploited, you should perform a **penetration test**. Such a test will tell you whether it is possible to break into the company's network and achieve specific goals.

Make sure to check out the following list on how to choose the right provider and maximize project value:

t You Are Buying

provider, what you get when buying a penetration test can vary greatly. There is no unanimous standard for nd how it is supposed to be conducted. It is therefore important for you to ask the provider about what andard they are following. If the answer is "my own", there is reason to worry.

maximize value of the test, the provider should follow one of the international standards for pentesting, such **Testing Execution Standard (PTES)** or **OWASP** for application testing. First of all this will ensure you a process. Second, you will have an idea of what you are buying.

t Button" Test

t is expanding, and so is the number of pentest providers. There are two types of providers, the ones that are what they do, and the ones that are in it for the money.

probably offer you what is called "big fat button" test. This test consists of a security consultant directing an inst a network or application, and thereafter letting the tool do all the work. Unfortunately a tool can only and find obvious vulnerabilities. This approach will provide little value to organizations that have a security.

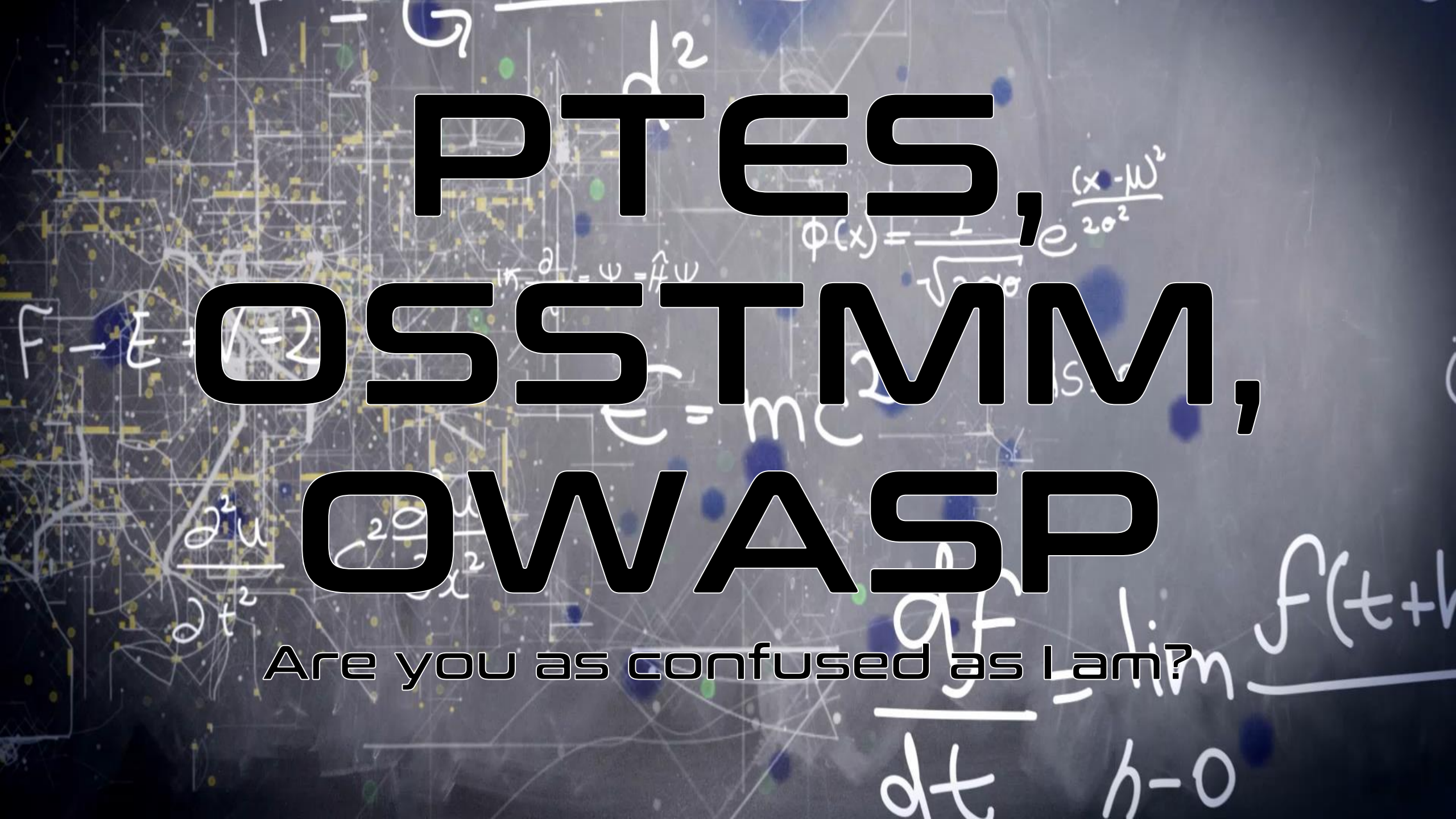
service

We set up a plan for continuous pentesting throughout the year together with you. You get:

- Thorough practical examination
- Tailored to the actual risks of your business and industry
- The penetration testing is using frameworks like the *Penetration Testing Execution Standard (PTES)*
- Full report including recommendations and solutions to improve your cyber security
- Work together to remedy the important findings and retest to verify them

Book a pentest meeting

All pentests in Norway performed by [redacted] follow the Penetration Testing Execution Standard (PTES) framework:


PTES,
OSSTMM,
OWASP
Are you as confused as I am?

Main page
PTES Technical Guideline
In the Media
FAQ

Tools
What links here
Related changes
Special pages
Printable version
Permanent link
Page information

Main Page

High Level Organization of the Standard

The penetration testing execution standard consists of seven (7) main sections. These cover everything related to a penetration test - from the initial communication and reasoning behind a pentest, through the intelligence gathering and threat modeling phases where testers are working behind the scenes in order to get a better understanding of the tested organization, through vulnerability research, exploitation and post exploitation, where the technical security expertise of the testers come to play and combine with the business understanding of the engagement, and finally to the reporting, which captures the entire process, in a manner that makes sense to the customer and provides the most value to it.

This version can be considered a v1.0 as the core elements of the standard are solidified, and have been "road tested" for over a year through the industry. A v2.0 is in the works soon, and will provide more granular work in terms of "levels" - as in intensity levels at which each of the elements of a penetration test can be performed at. As no pentest is like another, and testing will range from the more mundane web application or network test, to a full-on red team engagement, said levels will enable an organization to define how much sophistication they expect their adversary to exhibit, and enable the tester to step up the intensity on those areas where the organization needs them the most. Some of the initial work on "levels" can be seen in the intelligence gathering section.

Following are the main sections defined by the standard as the basis for penetration testing execution:

- Pre-engagement Interactions
- Intelligence Gathering
- Threat Modeling
- Vulnerability Analysis
- Exploitation
- Post Exploitation
- Reporting

As the standard does not provide any technical guidelines as far as how to execute an actual pentest, we have also created a technical guide to accompany the standard itself. The technical gude can be reached via the link below:

- Technical Guidelines

For more information on what this standard is, please visit:

- The Penetration Testing Execution Standard: FAQ

RIVER SECURITY

XSS

<Contribution Needed>

CSRF

<Contribution Needed>

Ad-Hoc Networks

<Contribution Needed>

- Information Leakage

Detection bypass

<Contribution Needed>

- FW/WAF/IDS/IPS Evasion
- Human Evasion
- DLP Evasion

Resistance of Controls to attacks

<Contribution Needed>

Type of Attack

<Contribution Needed>

- Client Side
- Phishing (w/pretext)
- Service Side
- Out of band
- Post-Exploitation
- Infrastructure analysis

The Social-Engineer Toolkit

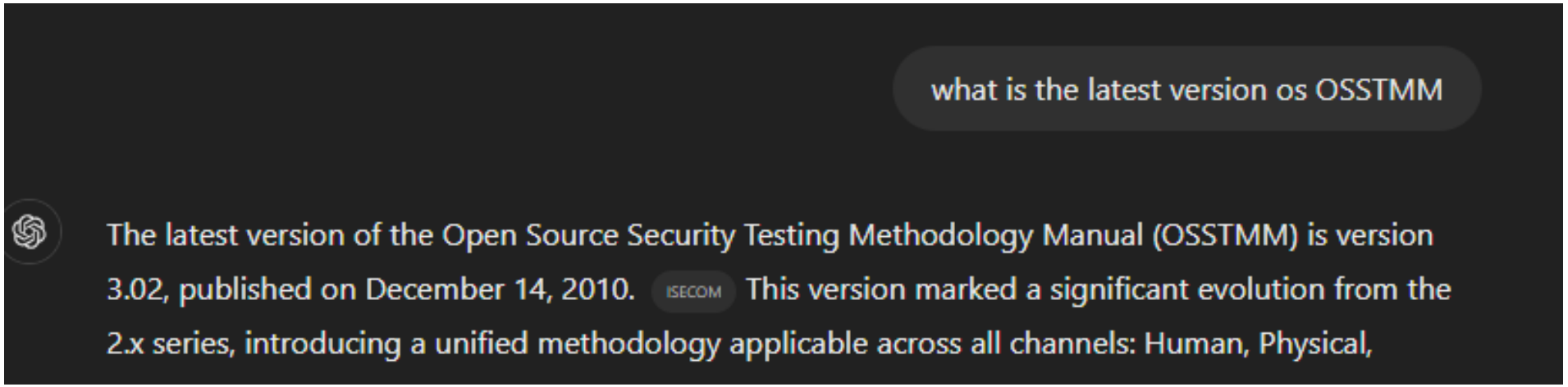
The Social-Engineering Toolkit (SET) is a python-driven suite of custom tools which solely focuses on attacking the hu
attacks and allow the tester to effectively test how a targeted attack may succeed. Currently SET has two main metho
malicious website (which you can clone whatever one you want) that ultimately delivers your payload. The second me
open-mail relay, a customized sendmail open-relay, or Gmail integration to deliver your payloads through e-mail. The
You can see detailed tutorials here or by downloading the user manual here.

OSSTMM 3 – The Open Source Security Testing Methodology Manual

Version Information

The current version of the Open Source Security Testing Methodology Manual (OSSTMM) is 3.02. This version of the OSSTMM ends the 2.x series. All OSSTMM versions prior to 3.0 including 3.0 release candidates (RC versions) are now obsolete.

The original version was published on Monday, December 18, 2000. This current version is published on Tuesday, December 14, 2010.



what is OWASP WSTG?

OWASP WSTG (Web Security Testing Guide) is a comprehensive manual for testing the security of web applications. It's maintained by the OWASP Foundation and is widely used by penetration testers, developers, and security professionals.

WSTG - v4.2

Table of Contents

The OWASP® Foundation works to improve the security of software through its community-led open source software projects, hundreds of chapters worldwide, tens of thousands of members, and by hosting local and global conferences.

WSTG Contents (v4.2)

0. Foreword by Eoin Keary
1. Frontispiece
2. Introduction
2.1 The OWASP Testing Project
2.2 Principles of Testing
2.3 Testing Techniques Explained
2.4 Manual Inspections and Reviews
2.5 Threat Modeling
2.6 Source Code Review
2.7 Penetration Testing
2.8 The Need for a Balanced Approach
2.9 Deriving Security Test Requirements

WSTG Contents (v4.2)

PortSwigger Top 10 Attacks

- 1 - Account hijacking using dirty dancing in sign-in OAuth-flows
- 2 - Browser-Powered Desync Attacks: A New Frontier in HTTP Request Smuggling
- 3 - Zimbra Email - Stealing Clear-Text Credentials via Memcache injection
- 4 - Hacking the Cloud with SAML
- 5 - Bypassing .NET Serialization Binders
- 6 - Making HTTP header injection critical via response queue poisoning
- 7 - Worldwide Server-side Cache Poisoning on All Akamai Edge Nodes
- 8 - Psychic Signatures in Java
- 9 - Practical client-side path-traversal attacks
- 10 - Exploiting Web3's Hidden Attack Surface: Universal XSS on Netlify's Next.js Library

https://portswigger.net/research/top-10-web-hacking-techniques-of-2022
renewed 2023, 2024

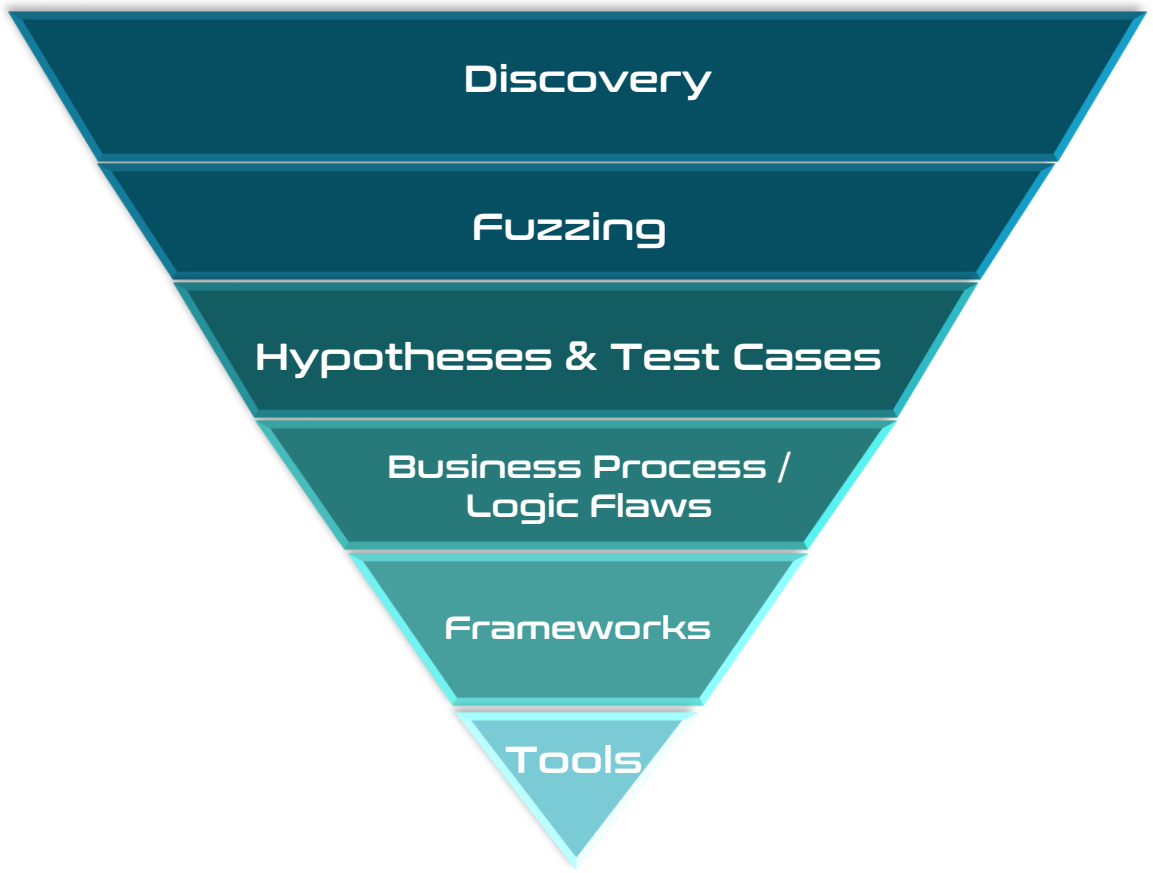
RIVER SECURITY

Most Valuable Pentesting

Timeless Methodology for Pentesting Tradecraft

Most Valuable Pentesting (MVP) Methodology

Be Honest, Find Vulnerabilities, Improve Gradually



Producing High Value Penetration Tests

Reliable and consistent testing is important, and not relying on a single individual's skills and efforts to complete a penetration test helps ensure the highest levels of standards.

Team Based Effort

Penetration Testing is a team effort, not an individual effort. Utilize a team to maximize the penetration test efforts.

Thoroughly Map Attack Surface

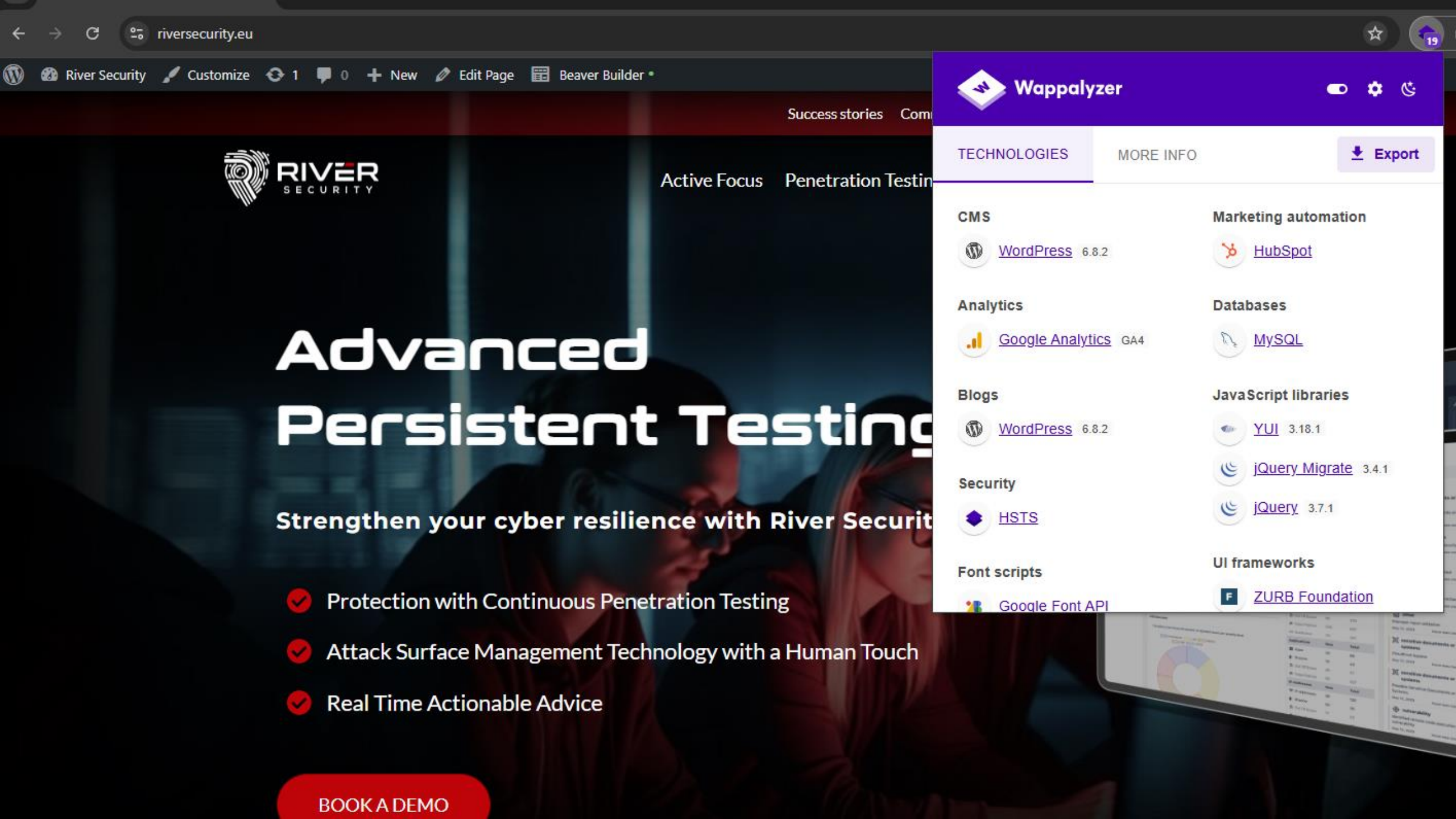
Leave no stone unturned. Many vulnerabilities are found in the "paths least travelled". Fully explore!

Reporting

Document findings, process, discrepancies and hypothesis. It will be useful now and later.

Hypothesis and Knowledge Sharing

A team is stronger. Produce hypothesis to uncover potential attacks across all layers. Strengthen the team knowledge by working as one.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River Security
Customize
1
0
New
Edit Page
Beaver Builder
Success stories
RIVER SECURITY
Active Focus
Penetration Testin
Advanced
Persistent Testing
Strengthen your cyber resilience with River Securit
Protection with Continuous Penetration Testing
Attack Surface Management Technology with a Human Touch
Real Time Actionable Advice
BOOK A DEMO
Wappalyzer
TECHNOLOGIES
MORE INFO
Export
CMS
WordPress 6.8.2
Marketing automation
HubSpot
Analytics
Google Analytics GA4
Databases
MySQL
Blogs
WordPress 6.8.2
JavaScript libraries
YUI 3.18.1
jQuery Migrate 3.4.1
jQuery 3.7.1
Security
HSTS
Font scripts
Google Font API
UI frameworks
ZURB Foundation

WordPress Enumeration

```
#USERS
Chris Dale,chris
Karina Aarland,karina
Krister Kvaavik,krister
Magnus Holst,magnus
silje,silje
#POSTS
```

```
https://riversecurity.eu/wordpress/wp-content/uploads/2021/08/20210729_175011.jpg
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https://riversecurity.eu/wordpress/wp-content/uploads/2021/06/image.png
https://riversecurity.eu/wordpress/wp-content/uploads/2021/06/New-Project.png
https://riversecurity.eu/wordpress/wp-content/uploads/2021/05/River-security-01.jpg
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https://riversecurity.eu/wordpress/wp-content/uploads/2021/05/eye-black-red_in_middle.png
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https://riversecurity.eu/wordpress/wp-content/uploads/2021/03/tv2-exchange-2.png
https://riversecurity.eu/wordpress/wp-content/uploads/2021/03/tv2-exchange.png
```
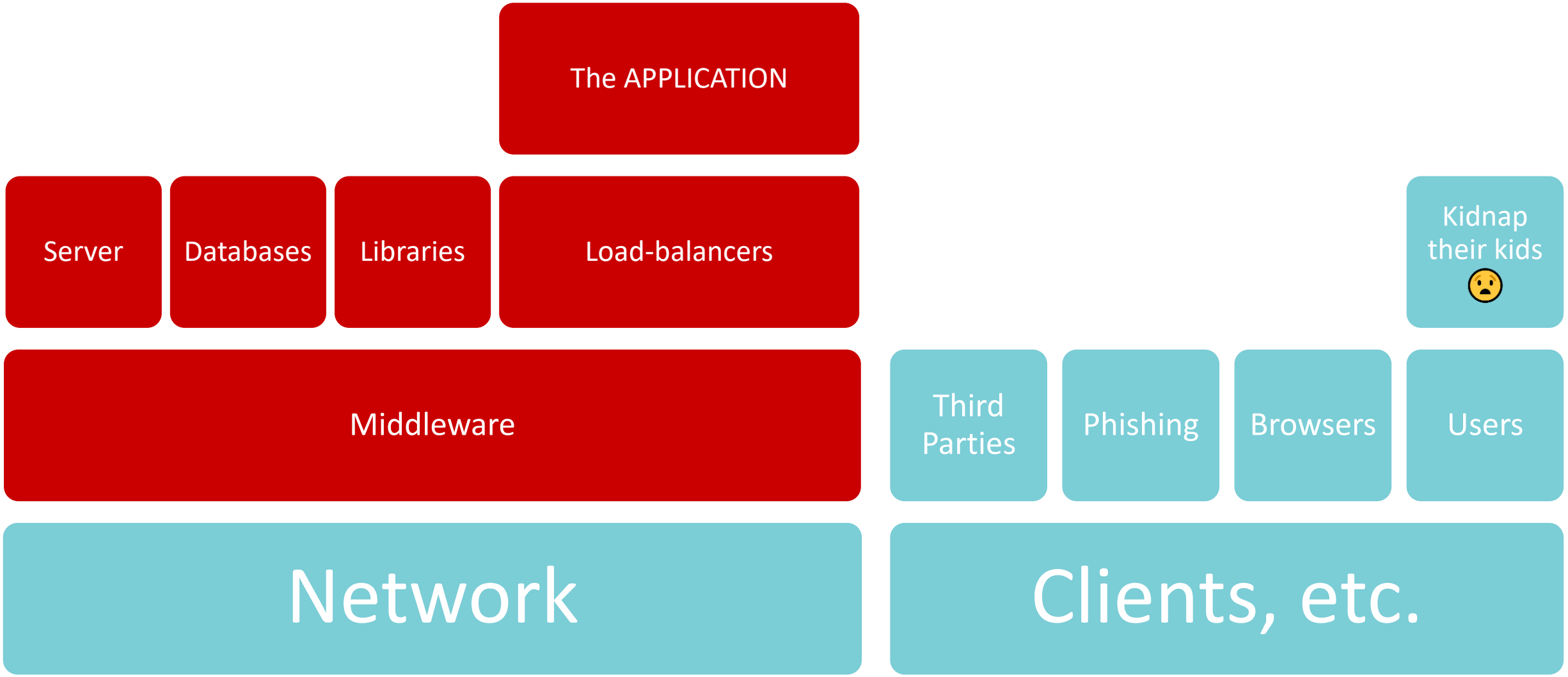


WAR IS PEACE
BIG BROTHER
I will not be owned
RIVER SECURITY
Offensive SOC
Continuous Attack Surface Management
Always-On Penetration Testing
By your SANS instructor
Chris Dale
SANS
Empower Your Defenses
Proactive & Continuous Penetration Testing
Seize Control, Gain Visibility, Become Compliant
I hacked the Dutch government
and all I got was this lousy t-shirt
HACK NAKED
FIGHT DYSTOPIA

Discovery

What to attack in the pentest?



WordPress (MVP)

Page Discussion

Contents hide

Discovery edit edit source

- Run wordpress-rest-enum to look for inappropriate content, sensitive file and other interesting the API might expose
- Use wpscan to help identify themes and plugns, this is where you might strike gold.
  - Themes and plugins can be vulnerable, should be worked on individually. At the very list, do your best to identify all themes, plugins, customization and other entrypoints.
- Unless looking for a zero-day, the core engine of wordpress is likely to be quite hardened on its own. Look for known CVE's for the engine.
- Use Wordpress dictionary files and check all files and folders for access control issues

Fuzzing edit edit source

- The plugins might be open-source. Check them out, find all entrypoints/endpoints and look for vulnerabilities

Category:MVP Type

Help

Category Discussion

Edit Edit source History

A MVP can be for different things, for example:

- A framework, e.g. Django (MVP), PHP (MVP), Angular (MVP), React (MVP), etc.
- A middleware, e.g. IIS (MVP), Apache (MVP), Nginx (MVP), CosmosDB (MVP)
- A specific type of application, e.g. WordPress (MVP), Salesforce (MVP)
- A feature or functionality, for example File Upload (MVP), Login (MVP), MFA (MVP), Payment (MVP)
- A general type of testing type, e.g. Commercial of the Shelf (MVP), Mobile Testing (MVP), Hardware Testing (MVP)

Subcategories

This category has the following 9 subcategories, out of 9 total.

A

- Application-MVP (45 P)

F

- Feature-MVP (12 P)
- Framework-MVP (16 P)

G

- General-MVP (17 P)

M

- Middleware-MVP (9 P)
- MVP Type (9 C)

N

- Notype-MVP (1 P)

P

- Protocol-MVP (5 P)
- Provider-MVP (10 P)

IIS Short Name Scanning

```
PS C:\tmp\repos\IIS_shortname_Scanner> C:\Python27\python.exe .\iis_shortname_Scan.py https://                /metadatacard/
Server is vulnerable, please wait, scanning...
[+] /metadatacard/m~1.* [scan in progress]
[+] /metadatacard/me~1.*        [scan in progress]
[+] /metadatacard/met~1.*       [scan in progress]
[+] /metadatacard/meta~1.*      [scan in progress]
[+] /metadatacard/metad~1.*     [scan in progress]
[+] /metadatacard/metada~1.*    [scan in progress]
[+] /metadatacard/metada~1.z*   [scan in progress]
[+] /metadatacard/metada~1.zi*  [scan in progress]
[+] /metadatacard/metada~1.zip* [scan in progress]
[+] File /metadatacard/metada~1.zip*    [Done]
---------------------------------------------------------------
File: /metadatacard/metada~1.zip*
---------------------------------------------------------------
0 Directories, 1 Files found in total
```

- Angular (MVP)
- AngularJS (MVP)
- Apache (MVP)
- API (MVP)
- ArcGis (MVP)
- Argo CD (MVP)
- Auth0 (MVP)
- Authentication (MVP)
- Azure API Management (MVP)
- Azure Function (MVP)

B

- Backstage (MVP)
- Bankid (MVP)
- Blazor (MVP)
- Bookstack (MVP)
- Bynder (MVP)

C

- Citrix Gateway (MVP)
- Cloudflare (MVP)
- Cognito (MVP)
- Commercial of the Shelf (MVP)
- Content Management System (MVP)
- CorePublish (MVP)
- CosmosDB (MVP)
- CPanel (MVP)

- Hybridauth (MVP)

I

- IIS (MVP)
- Ivanti (MVP)

J

- Javascript frameworks (MVP)
- Jira (MVP)
- JSON-RPC (MVP)

L

- Lambda (MVP)
- Local Privilege Escalation (Windows) (MVP)
- Login (MVP)

M

- Machform (MVP)
- Magento (MVP)
- Mediawiki (MVP)
- Mega Upload (MVP)
- Methodology (Hardware)
- Methodology (WIFI)
- MFA (MVP)

S

- S3.amazonaws.com (MVP)
- Salesforce (MVP)
- Salesforce Marketing Cloud (MVP)
- Salto (MVP)
- Sanity (MVP)
- SAP CX Backoffice (MVP)
- SAP NetWeaver (MVP)
- Search (MVP)
- ServiceStack (MVP)
- Sharepoint (Authenticated) (MVP)
- Sharepoint (MVP)
- Sharepoint Foundation (MVP)
- Signicat (MVP)
- Sinatra (MVP)
- SIP (MVP)
- SparQL (MVP)
- SQL Injection (MVP)
- SSH (External) (MVP)
- SSRF (MVP)
- Subdomain Takeover (MVP)
- Sysero (MVP)

T

- Third Party Application (MVP)

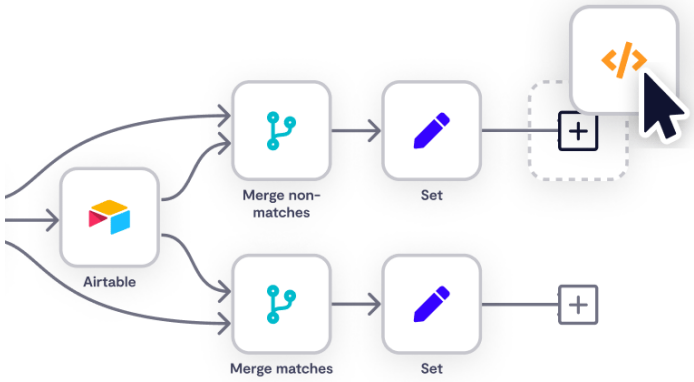
- [ ] Test for Reflected Cross Site Scripting
- [ ] Test for Stored Cross Site Scripting
- [ ] Test for DOM based Cross Site Scripting
- [ ] Test for Cross Site Flashing
- [ ] Test for HTML Injection
- [ ] Test for SQL Injection
- [ ] Test for SOQL Injection
- [ ] Test for LDAP Injection
- [ ] Test for ORM Injection
- [ ] Test for XML Injection
- [ ] Test for XXE Injection
- [ ] Test for SSI Injection
- [ ] Test for XPath Injection
- [ ] Test for XQuery Injection
- [ ] Test for IMAP/SMTP Injection
- [ ] Test for Code Injection
- [ ] Test for Expression Language Injection
- [ ] Test for Command Injection
- [ ] Test for Overflow (Stack, Heap and Integer)
- [ ] Test for Format String
- [ ] Test for incubated vulnerabilities
- [ ] Test for HTTP Splitting/Smuggling
- [ ] Test for HTTP Verb Tampering
- [ ] Test for Open Redirection
- [ ] Test for Local File Inclusion

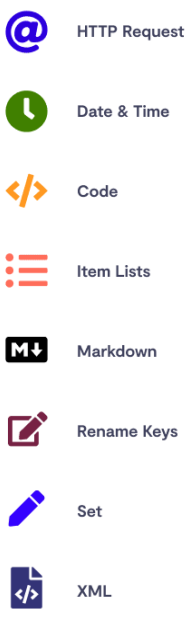
RIVER SECURITY

WEB APPLICATION PENETRATION TESTING

IT'S NOT JUST CHECKLISTS

AI as a Pentester Companion





Caption: Illustrative image of agentic workflows from n8n.io

- AI has knowledge of the entity you are testing
  - What features
  - What technology (tech stack, libraries, plugins, you name it)
  - This is based on automated collected results
    - Think scanners, collectors / sensors, ASM data
- When pentester "arrives" to the asset, they can be presented with DYNAMIC checklists
- AI companion can also make sure documentation of work is done according to attack surface

When You Don't Have MVP

- Create one
  - Set up the **minimum** of what you know
  - A starting point is better than nothing
  - Get the ball rolling with your team
- Dedicate days before the engagement to:
  - Build
  - Set-up
  - Configure
  - Break & Hack
  - Create CTF challenges ;)
- Create foundations for future hypothesis

Incomplete MVP's

DocuWiki (MVP)

Page Discussion

- Relevant: Mediawiki (MVP)

Contents hide

1 Discovery
2 Fuzzing
3 Test Cases & Hypotheses
4 Business Process and Logic Flaws
5 Framework
6 Tools

Discovery edit edit source

Get Version: Version `http://<domain>/VERSION`

- Interesting urls:
  - Login: doku.php?do=login
  - Register: doku.php?do=register
  - Recent changes: doku.php?do=recent&show_changes=pages
  - Media Files doku.php?id=mfiles:mfiles&do=media&ns=mfiles
- TODO: Generate Plugin fuzzing list, multiple plugins are bundled.
  - Located http://<domain>/lib/plugins/

Fuzzing edit edit source

- Check read permission on /conf/ directory, fuzz for known backup extension for. Use a good wordlist for backup extensions
  - /conf/local.php
  - /conf/users.auth.php
  - /conf/acl.auth.php

Test Cases & Hypotheses edit edit source

Can this MVP section be expanded? The reason given is: *What are good test cases to aim for? Any hypothesis to test?*

Business Process and Logic Flaws edit edit source

Can this MVP section be expanded? The reason given is: *Any business process or logic flaws to consider?*

Framework edit edit source

Can this MVP section be expanded? The reason given is: *Any good frameworks or external resources to help test for this?*

Tools edit edit source

Can this MVP section be expanded? The reason given is: *What tools exist to aid testing? Any wordlists?*

PayloadAllTheThing
Hacktricks
Exploit-DB

Notice: Feel free to add important steps to complete during testing.

Keep in mind, this is not a page to learn about this technology, only steps to hack it. It should not contain how-to guides, but instead precise bullet points about what to achieve. See How to write MVP. Use/Create DocuWiki for other documentation, e.g. tutorials, best practices, and other valuable information pertaining this Technology.

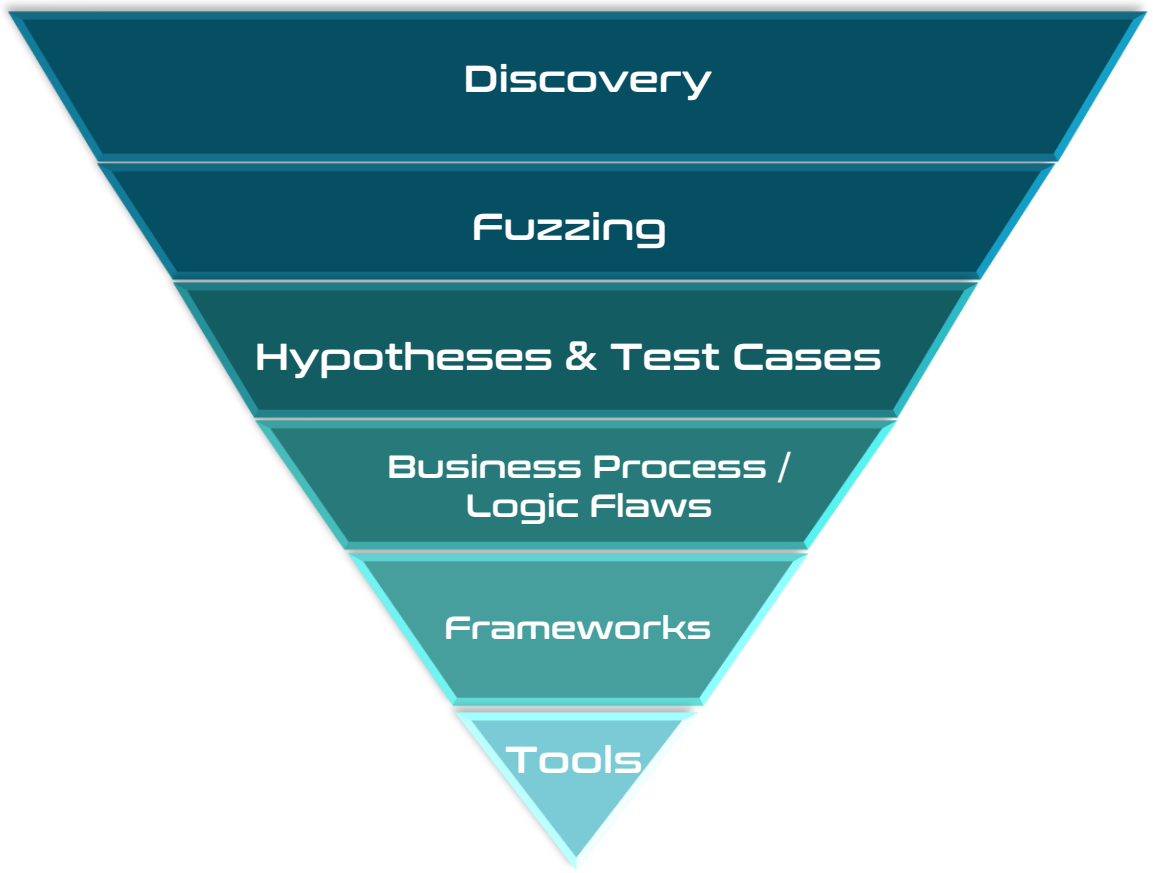
Have you experience testing on this MVP? Add yourself to the list of users, so other pentesters can reach out to you for collaboration 💪.

MVP
Application
Pages to be

```
docker run -d --name dokuwiki \
  -p 8080:8080 -p 8443:8443 \
  -e DOKUWIKI_USERNAME=admin \
  -e DOKUWIKI_PASSWORD=supersecurepassword \
  -e DOKUWIKI_FULL_NAME="Admin User" \
  -e DOKUWIKI_EMAIL=admin@example.com \
  -v dokuwiki_data:/bitnami/dokuwiki \
  bitnami/dokuwiki:latest
```

Most Valuable Pentesting (MVP) Methodology

Be Honest, Find Vulnerabilities, Improve Gradually



Producing High Value Penetration Tests

Reliable and consistent testing is important, and not relying on a single individual's skills and efforts to complete a penetration test helps ensure the highest levels of standards.

Team Based Effort

Penetration Testing is a team effort, not an individual effort. Utilize a team to maximize the penetration test efforts.

Thoroughly Map Attack Surface

Leave no stone unturned. Many vulnerabilities are found in the "paths least travelled". Fully explore!

Reporting

Document findings, process, discrepancies and hypothesis. It will be useful now and later.

Hypothesis and Knowledge Sharing

A team is stronger. Produce hypothesis to uncover potential attacks across all layers. Strengthen the team knowledge by working as one.

Discovery

- What are you going to attack?
- What are you NOT going to attack?
  - Keep documenting what you are NOT attacking
- What can you source to your co-workers?
  - What skills do they have, what are they good at?
- Can you find every script, every piece of content and function?
  - Content enumeration is key. What if there is a gaping vulnerability in a script you didn't find?

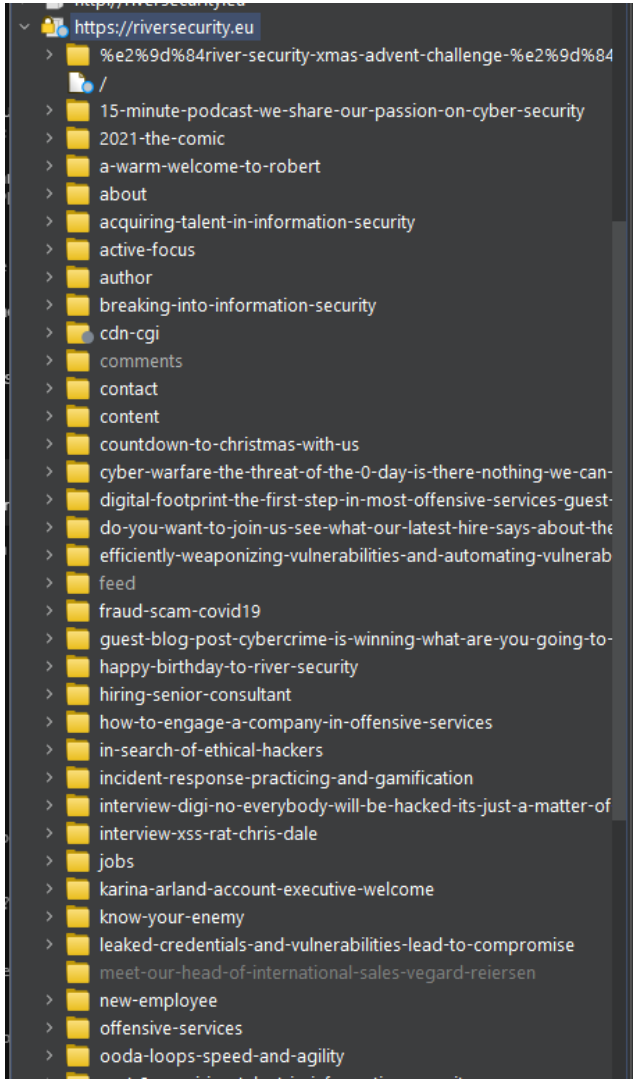
Goal: Find Everything

i. Map Browsable Attack Surface
ii. Find Unlinked Content & Params
iii. Repeat for each `Platform Distinctions` of the application

Leave no stone unturned. Many vulnerabilities are found in the "paths least travelled". Fully explore!

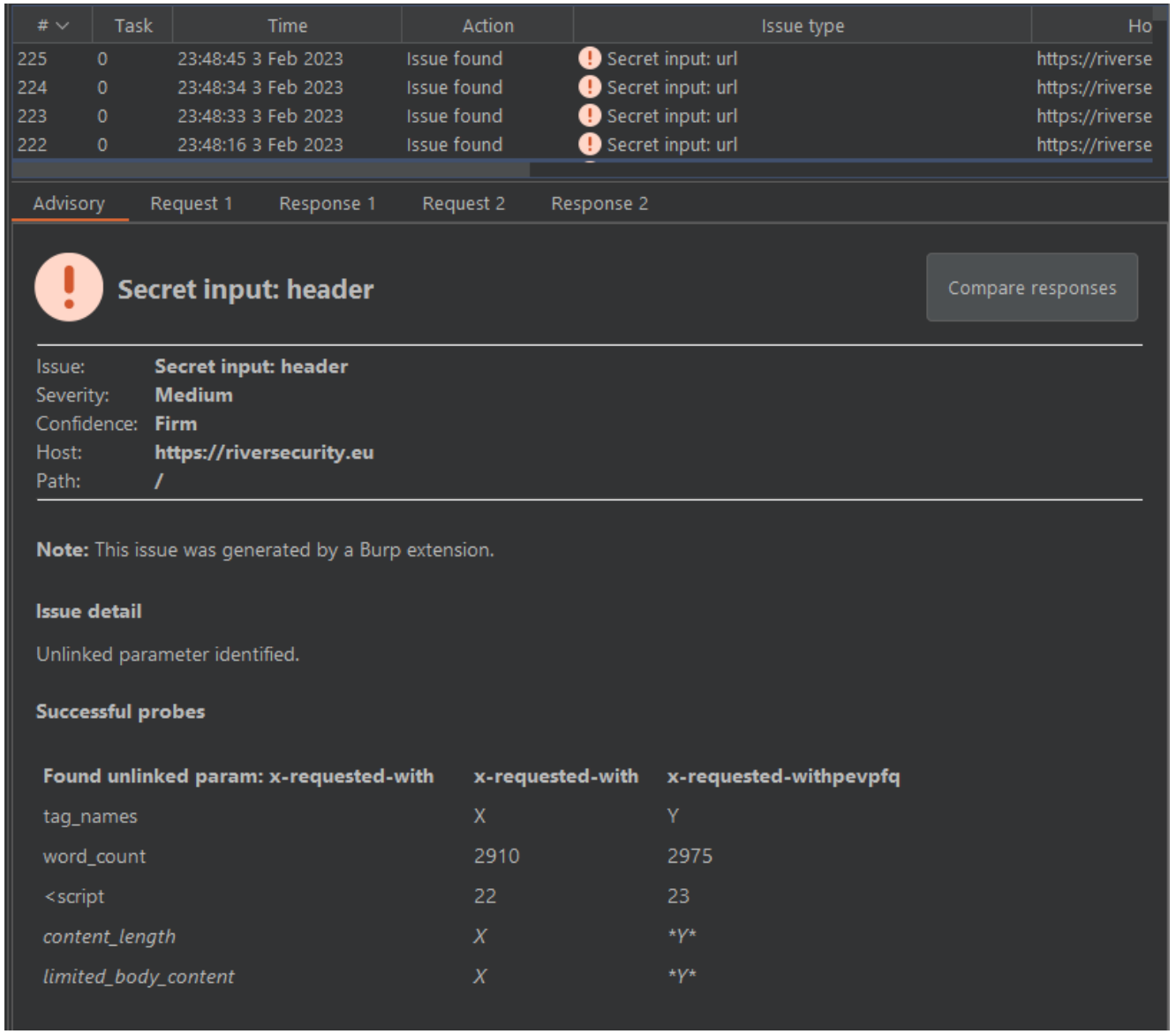
Map Browsable Attack Surface

- Browse the entire application, discover all browsable content
  - Click
  - Use
  - Learn
- Use the Burp Suite Crawl feature on the top level of the application.
  - Has decent support for SPA as of Burp Suite v. >2
  - Helps build a complete sitemap
  - Use most complete configuration, which is the slowest
- For JavaScript, extract file paths and references.
  - CyberChef extract file paths module
  - GAP Burp Plugin
  - JSParser



Unlinked Parameters

- Discover if there are any unlinked parameters
  - Particularly important on all Platform Distinctions
  - Any change based on a new parameter is interesting
  - GET, POST, Cookies, Headers
- Headers might bypass authentication
- Might find attack surface
- **Param miner extension!**



#	Task	Time	Action	Issue type	Ho
225	0	23:48:45 3 Feb 2023	Issue found	Secret input: url	https://riverse
224	0	23:48:34 3 Feb 2023	Issue found	Secret input: url	https://riverse
223	0	23:48:33 3 Feb 2023	Issue found	Secret input: url	https://riverse
222	0	23:48:16 3 Feb 2023	Issue found	Secret input: url	https://riverse

Advisory | Request 1 | Response 1 | Request 2 | Response 2

Secret input: header

Compare responses

Issue: **Secret input: header**
Severity: **Medium**
Confidence: **Firm**
Host: **https://riversecurity.eu**
Path: **/**

Note: This issue was generated by a Burp extension.

Issue detail

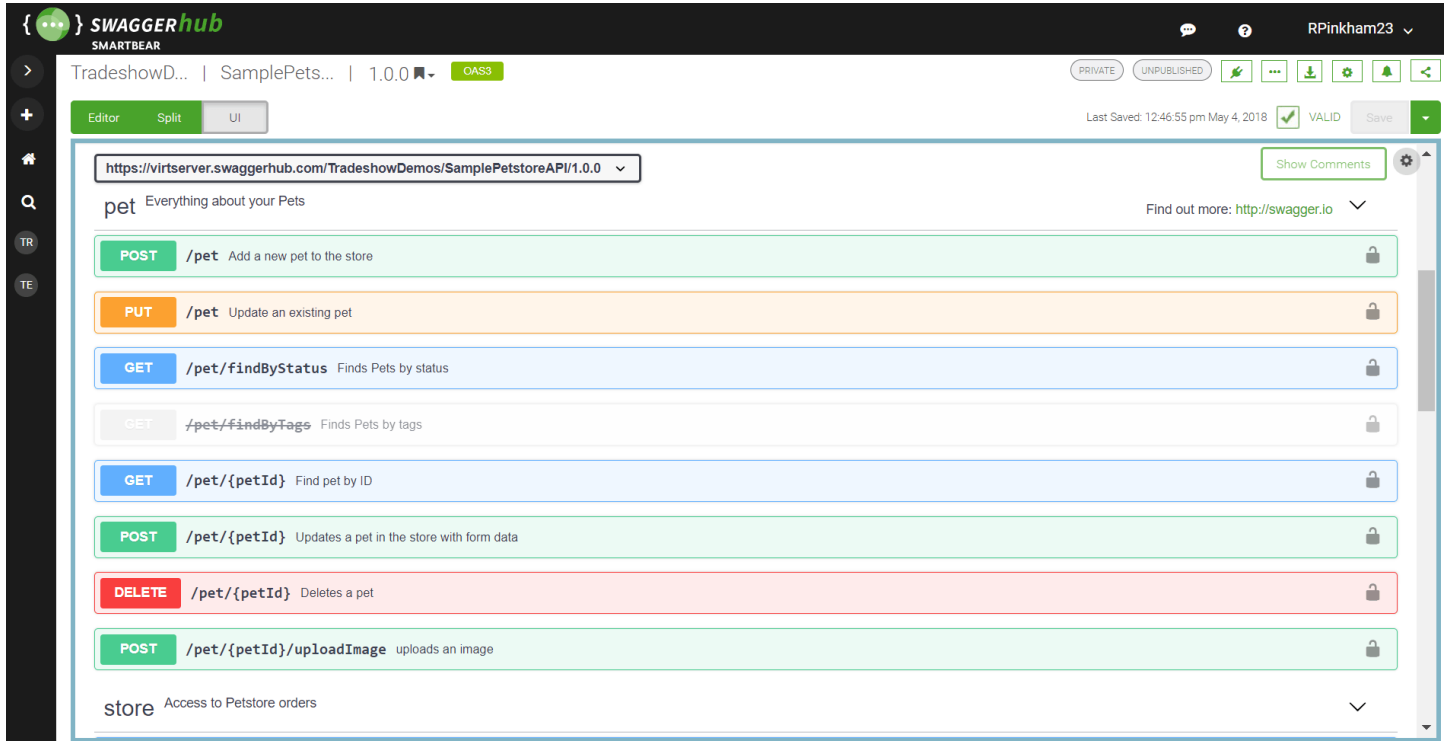
Unlinked parameter identified.

Successful probes

Found unlinked param: x-requested-with	x-requested-with	x-requested-withpevpfq
tag_names	X	Y
word_count	2910	2975
<script	22	23
content_length	*X*	**Y**
limited_body_content	*X*	**Y**

OpenAPI / Swagger Specs

- If we can cheat, we should!
- Paints a picture of what the developers **intended** to include
- Still requires us to do content discovery



Archive.org

- WaybackRobots.py
- WaybackURLs.py

SANS Institute online
A Cooperative Education & Research Organization

- About the SANS Institute
- Contact SANS
- Search SANS
- SANS Key : Local copy
- Security News of the Week
- Northcutt Interview Whether Certification Matters
- SANS Forum
- ALERT: BIND DNS Buffer Overflow (1/29/01)

Events

Major Conferences

SANS 2001 Baltimore, MD
May 13 - 20, 2001
SANS Parliament Sq. London, England
June 20 - 23, 2001
SANSFIRE Washington DC
July 30 - August 3, 2001
Call for Papers
SANS Parliament Hill Ottawa, Canada
August 8 - 17, 2001
Info. available soon
SANS Network Security 2001
San Diego, CA October, 2001
Brochure available online July 2001

Regional Conferences

SANS Darling Harbour Sydney, Australia
February 12 - 15, 2001
SANS Aloha II Honolulu, Hawaii

online_head.gif (1214 bytes)

Security KickStart
SANS Security Essentials
Windows NT 4.0 Security Step-by-Step
NEW! Advanced Incident Handling & Hacker Exploits

news_head.GIF (1280 bytes)

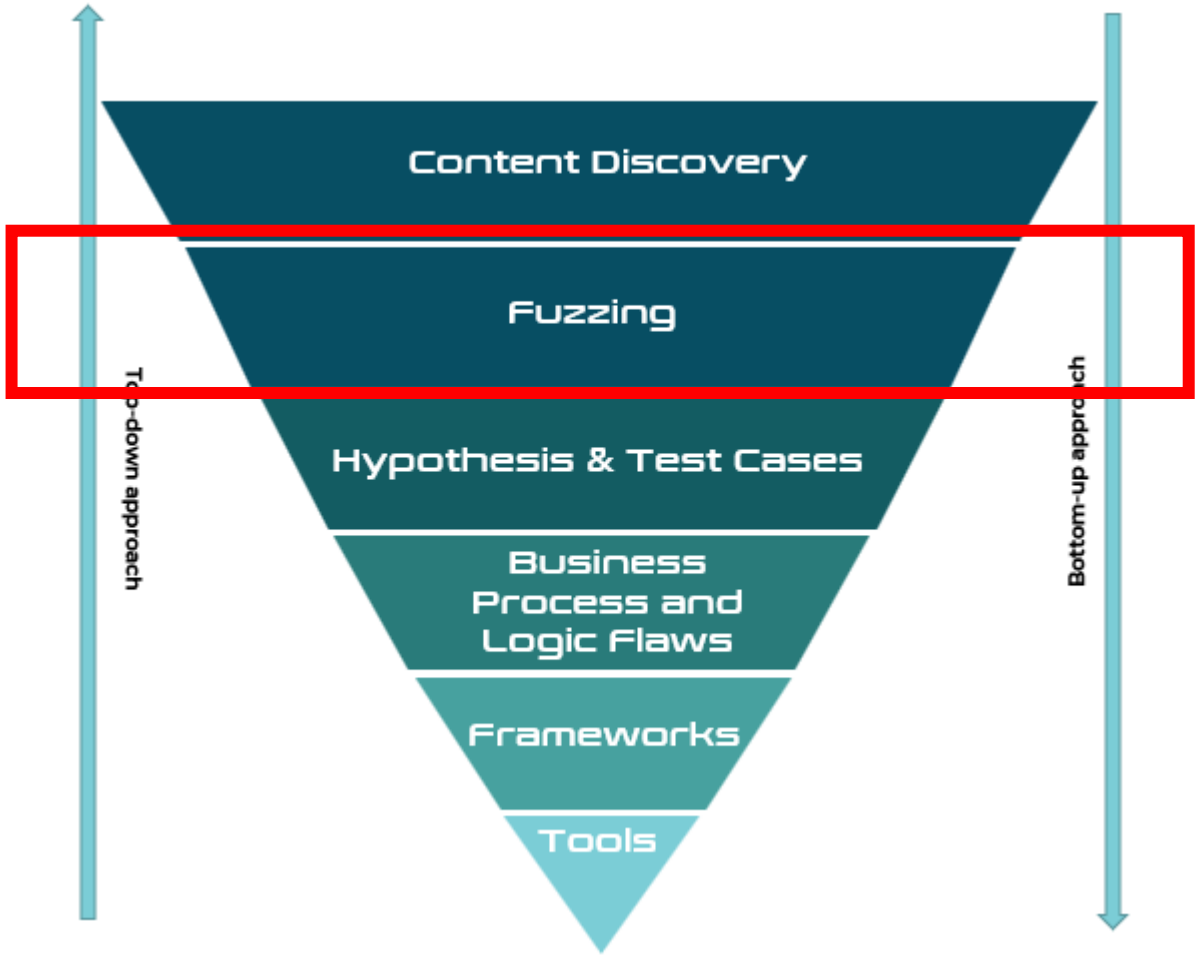
Today's GIAC Detects
Global Incident Analysis Center
SANS GIAC Security Skills Certification Program
Information Security Reading Room
Intrusion Detection FAQ

Resources

NEW! Late Arriving SANS @ Night Presentation from SANS Security 2001 (Programming Perl on NT by Harlan Carvey)

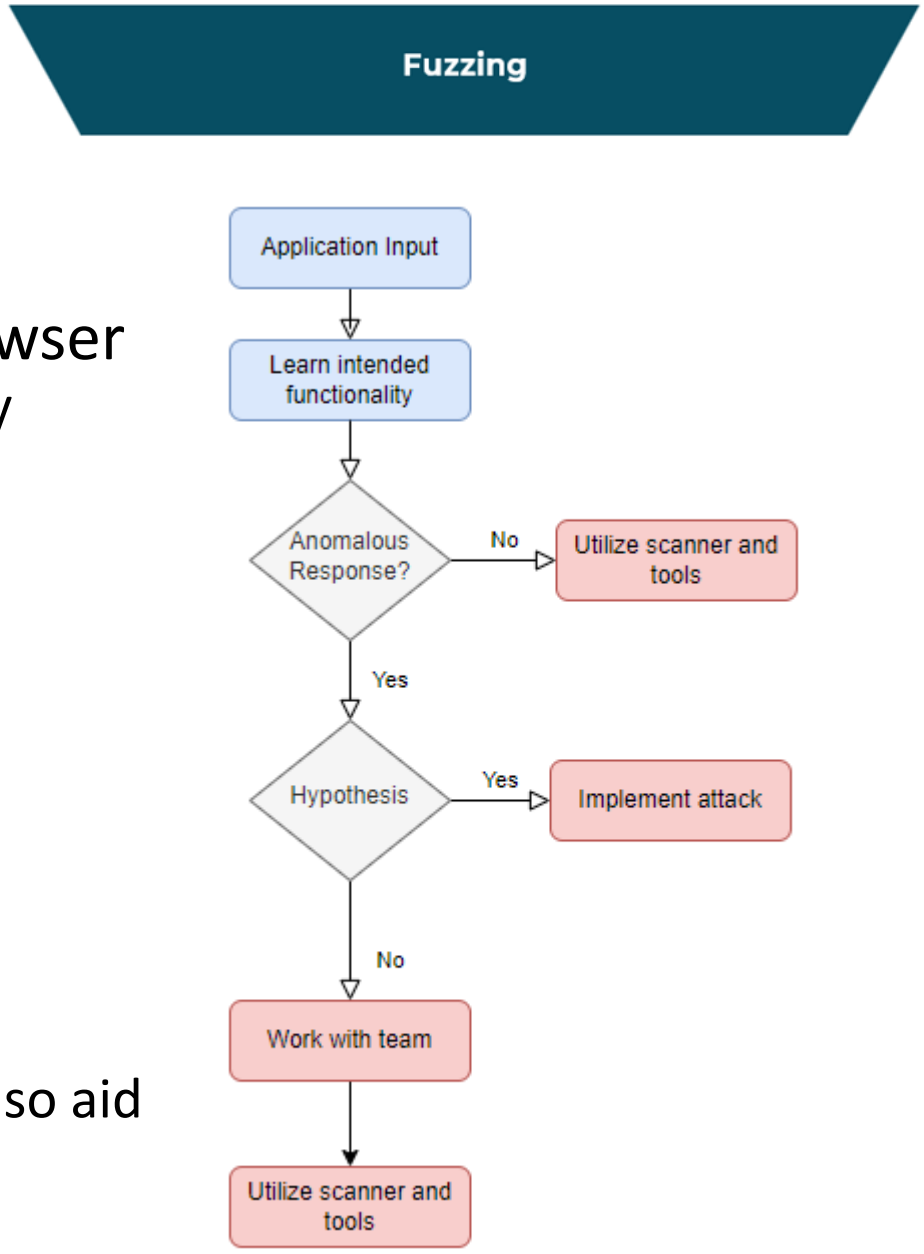
Fuzzing

Find bytes and input producing different/unexpected results

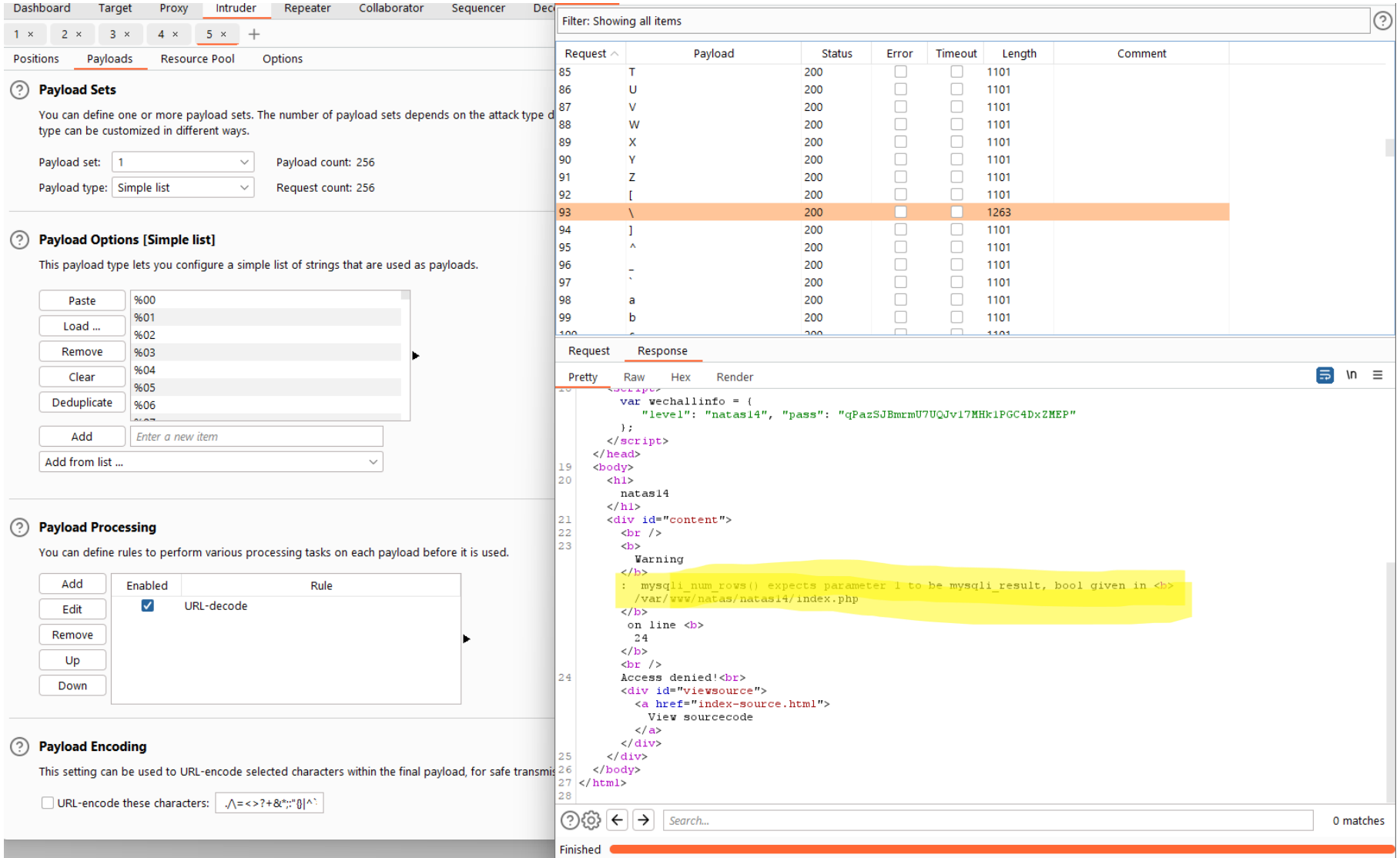


Fuzzing Bytes 101

1. For-each script and input
2. Send their script to repeater / play with it in browser
   - Determine properly how the functionality works and try related attack
3. Send to intruder and fuzz
   - %00 to %FF
     - URL Decode targets Middleware
     - URL Encode targets App
   - Anomalies, discrepancies, interesting results?
     - Create Hypothesis
     - Work with team if you cannot produce hypothesis
   - Use wordlists
4. Utilize vulnerability scanner
   - Backslash Powered Scanner and other extensions will also aid here.
5. Scanner results? Update methodology



Second example: A Single Character



Fuzzing

Attack Save Columns

Results Positions Payloads Resource Pool Options

Filter: Hiding 4xx responses

Request	Payload	Status	Error	Timeout	Length
38	%25	500			2179
39	%26	500			2179
43	%2A	500			2179
49	%3A	500			2179
51	%3C	500			2179
53	%3E	500			2179
54	%3F	500			2179
0		500			2325
33	%20	500			2325
34	%21	500			2325
35	%22	500			2325
36	%23	500			2325
37	%24	500			2325
40	%27	500			2325
41	%28	500			2325
42	%29	500			2325
45	%2C	500			2325
46	%2D	500			2325
47	%2E	500			2325
50	%3B	500			2325
52	%3D	500			2325
55	%40	500			2325
56	%5B	500			2325
58	%5D	500			2325

Request Response

Pretty Raw Hex Render

```
1 HTTP/2 500 Internal Server Error
2 Cache-Control: private
3 Content-Type: text/html; charset=utf-8
4 Server: Microsoft-IIS/10.0
5 X-Content-Type-Options: nosniff
6 X-Powered-By: ASP.NET
7 Strict-Transport-Security: max-age=63072000; includeSubDomains; preload
8 Content-Security-Policy: default-src 'unsafe-eval' 'unsafe-inline' 'self' htt
9 Content-Security-Policy-Report-Only: default-src 'unsafe-eval' 'unsafe-inline
                https://www.google.com                https://maps.googleap
  https://maps.gstatic.com;              frame-ancestors 'self'; form-action
10 Date: Fri, 03 Feb 2023 14:13:31 GMT
11
12
13
14 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3
15
16 <html xmlns="http://www.w3.org/1999/xhtml">
17   <head>
       <title>
18
19     </title>
       <link href="css/default.css" rel="stylesheet" type="text/css" />
```

Search...

	A	B	C	D	E
1	HTTP Status Code	Byte	URL decoded	Reasoning	Comment
2	500	%25	%	URL	
3	500	%26	&	URL	
4	500	%2A	*	FILE	Wilcard
5	500	%3A	:	FILE	ADS
6	500	%3E	>	FILE	Redirect
7	500	%3F	?	URL	
8	500	%3C	<	FILE	Redirect
9	404	%2B	+	URL	

Using Wordlists

With our fuzzing efforts, wordlists can help produce valuable results, e.g., anomalies in cases of:

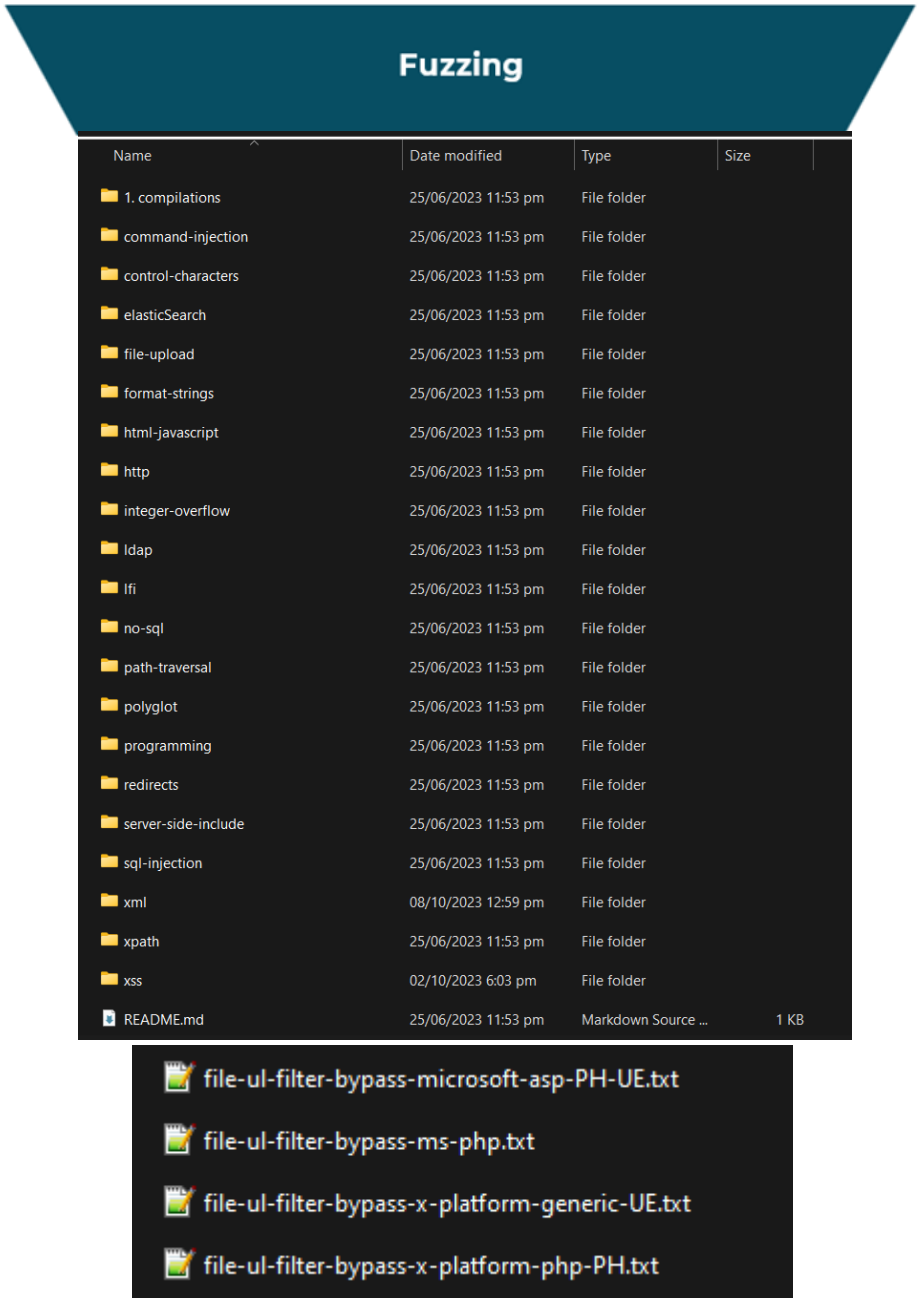
- Different results
- Timing impacted
- External server interaction

Use wordlists that help you target technology and hypothesis.

Great starting points:

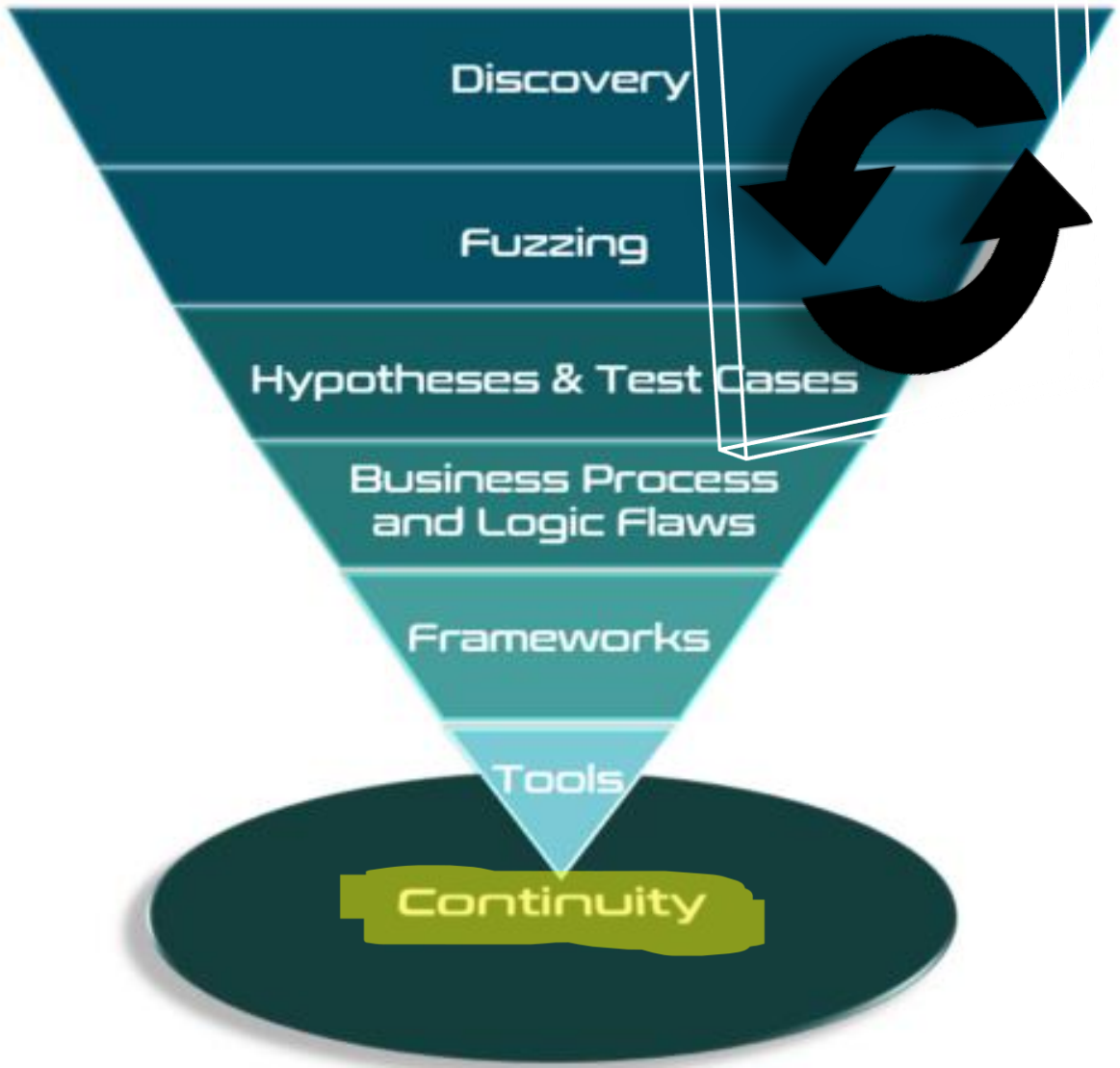
- SecLists: https://github.com/danielmiessler/SecLists
- AssetNote: https://wordlists.assetnote.io/

Take time to learn what these wordlists contain; it will help you learn when to apply them



Finding Vulnerabilities Process Pyramid

Fully test the scope, every script and input



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Here Be Dragons
Europe

RED VERSUS BLUE

IT IS TIME WE "STOP FIGHTING" AND FORM PURPLE TEAM

RIVER SECURITY

Connect with me – https://into.bio/chrisdale

LinkedIn – https://www.linkedin.com/in/chrisad/

Fighting Cyber Crime – https://riversecurity.eu