API Security Through External Attack Surface Management

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whoami:

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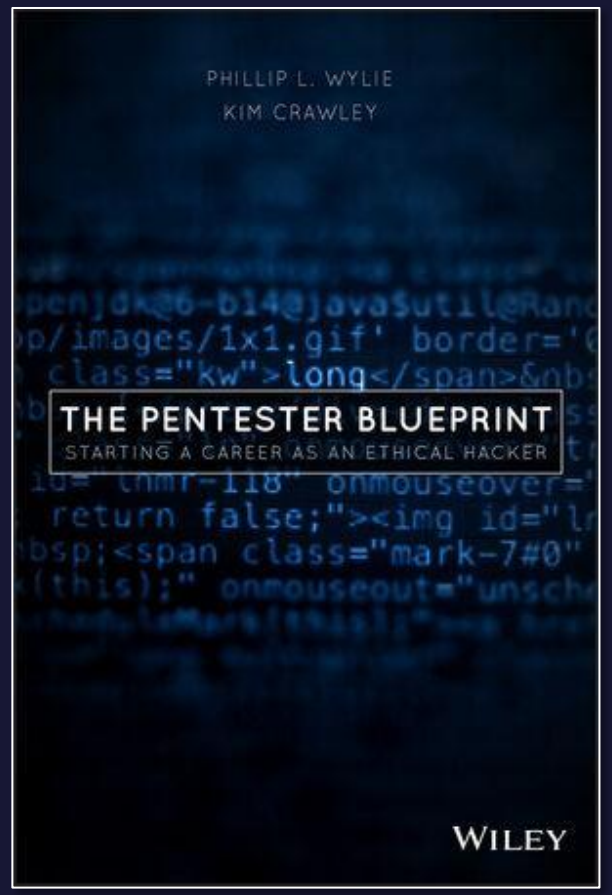


Agenda

- Defining Attack Surface Management (ASM)
- Why Prioritize External Attack Surface Management (EASM)?
- Discovering Attack Surface
- API Pentesting & Tools
- Addressing Gaps EASM
- References & Resources

Attack Surface Management (ASM)

- To understand Attack Surface Management (ASM), we must first define Attack Surface.
- The set of points on the boundary of a system, a system element, or an environment where an attacker can try to enter, cause an effect on, or extract data from, that system, system element, or environment. – NIST
- ASM can be simplified as attack vectors

Why is ASM Important?

- It is hard to assess or secure what you don’t know about
- Penetration testing once or twice a year is not enough
- Reoccurring vulnerability scans are not enough
- 50% of the exploited vulnerabilities are exploited within 48 hours of a Zero-day exploit being released.
- Assess security from a threat actor perspective

Attack Surface Management (ASM)

- Addresses both internal and extremal facing facing systems.
- Both are important, our focus is External Attack Surface Management.

Traditional ASM

- Vulnerability Scanning
- Vulnerability Assessments & Penetration Testing
- Red Teaming aka Adversary Emulation
- Purple Teaming
- Bug Bounties
- Application Security & Testing Integrated in SDLC

Traditional ASM Gaps

- Compliance based penetration testing
- Narrow scopes – miss testing types, systems and whole environments
- Time and resource limitations
- Incomplete and inaccurate asset inventories

Why Prioritize External ASM?

- Internet exposed and highly accessible to threat actors
- Penetration testing once or twice a year is not enough
- Reoccurring vulnerability scans are not enough

Addressing ESAM Gaps

- EASM Discovery
- Reconnaissance Including OSINT (Open-Source Intelligence)

EASM Discovery

- Collect known IP subnets and domain names
- Reconnaissance

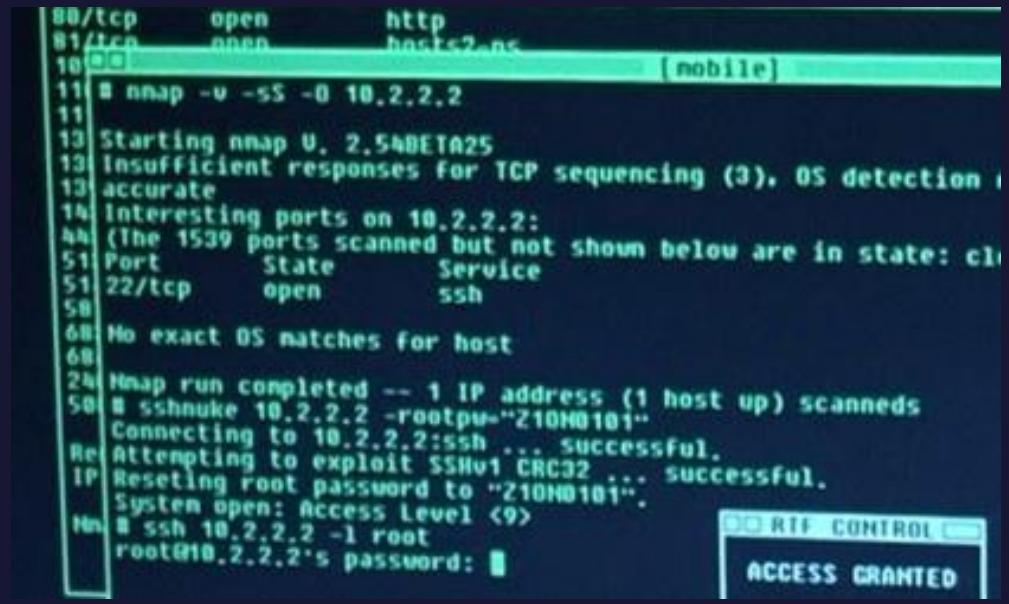
Reconnaissance: Collection

- IP address discovery
  - ASNs (Autonomous System Numbers)
  - ARIN & RIPE regional registrars
- Subdomain enumeration
  - Subfinder
  - AMASS
- Open-Source Intelligence (OSINT)
  - Shodan – locate unknown hosts
  - SpiderFoot
  - Maltego
  - Crunchbase – acquisitions

Reference: Jason Haddix's "The Bug Hunter's Methodology"

Reconnaissance: Scanning

- Scan IP addresses & domains (including subdomains)
  - Nmap scan for live hosts
  - Nmap ports & service scans to identify web resources



API Endpoint Discovery

API Enumeration Tools

- Kiterunner – Restful API discovery
- FUFF – Wordlist based API discovery

Reference:
Katie Paxton-Fear aka InsiderPhD - My API Testing Automated Toolbox
https://www.youtube.com/c/InsiderPhD

API Vulnerability Testing

API Vulnerability Testing Tools

- Autorize – Burp Suite extension for detecting IDOR
- Logger++ - Multithreaded logging extension for Burp Suite
- SQLMap – SQL injection testing tool
- NoSQLMap – NoSQL testing tool
- JWT_Tool – JSON Web Token testing tool
- Burp Suite – Intercepting proxy and vulnerability testing tool

Reference:
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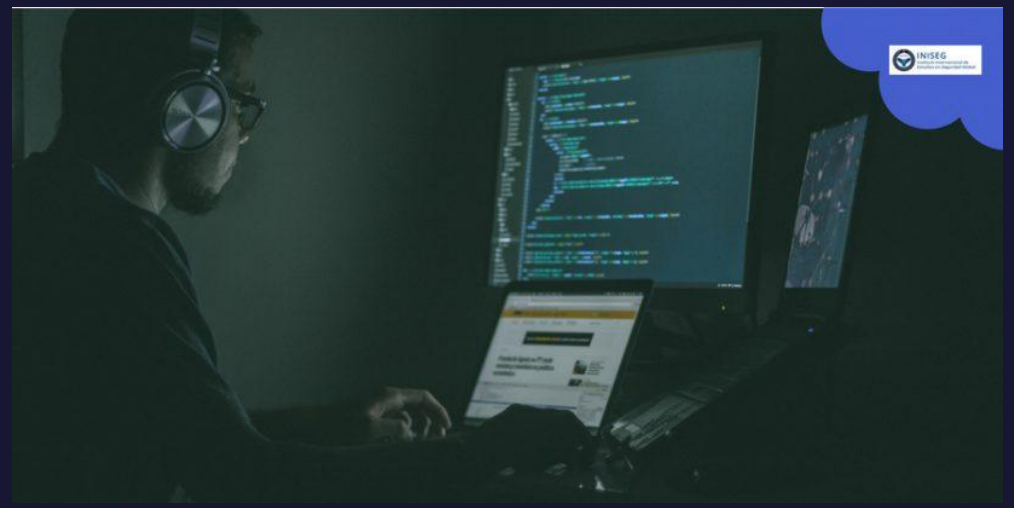


API Vulnerability Testing

API Vulnerability Testing Tools

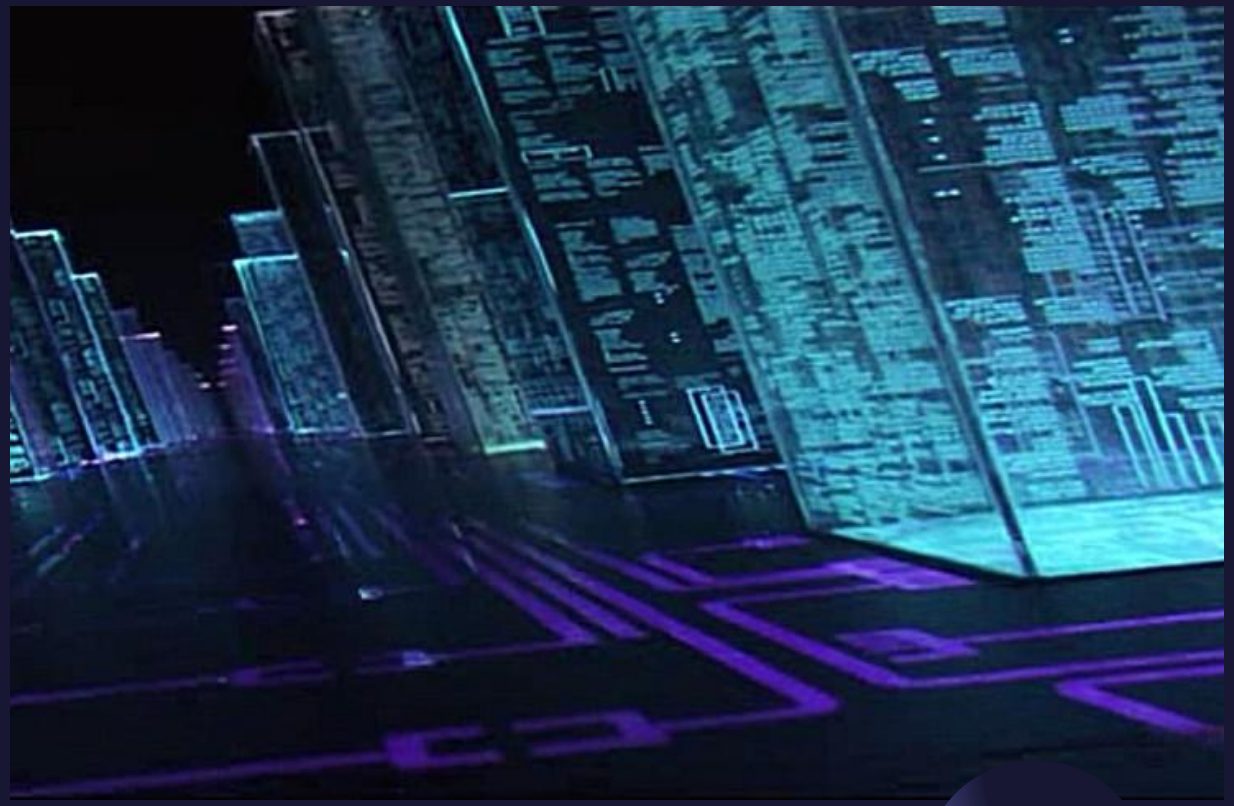
- OWASP ZAP
  - OpenAPI add-on
  - GraphQL add-on
  - SOAP add-on
  - Import files containing URLs add-on

References:
https://www.zaproxy.org/faq/how-can-you-use-zap-to-scan-apis/
https://www.zaproxy.org/blog/2017-06-19-scanning-apis-with-zap/

API Vulnerability Testing

- OWASP API Security Top 10 & API Security Project
  - https://owasp.org/www-project-api-security/

Addressing Gaps with ESAM



- Continuous discovery
  - Achieve and maintain more accurate asset inventory
- Continuous testing
  - Vulnerability scanning
  - Pentesting
  - ESAM platforms
- Automation
  - Improves scalability and resource limitations
  - Improves consistency
- Remediation
  - Timely and complete

References & Resources

- https://www.uscybersecurity.net/csmag/securing-apis-through-external-attack-surface-management-easm/Vulnerability scanning - by Phillip Wylie
- Reconnaissance reference: Jason Haddix's "The Bug Hunter's Methodology." https://www.youtube.com/watch?v=uKWu6yhnhbQ
- API discovery credit: Katie Paxton-Fear aka InsiderPhD – My API Testing Automated Toolbox https://www.youtube.com/c/InsiderPhD
- For further information on API penetration testing, get the new API hacking book by Corey Ball titled "Hacking APIs: Breaking Web Application Programming Interfaces."

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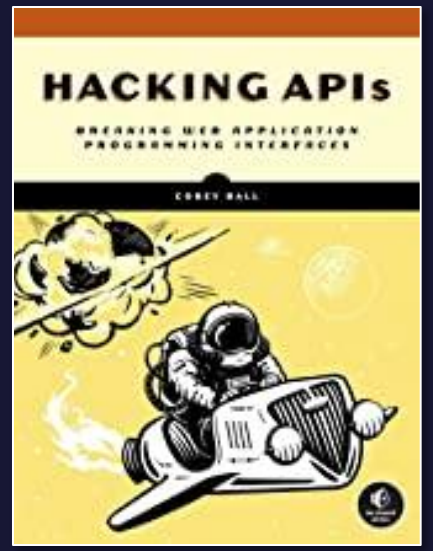

Thank you!

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