Cyber Scotland Week

Reconmap

Generating pentest reports with Reconmap

CyberScotland Week

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Before the talk

- Time for Q&A
- Slides
- Survey

Agenda

1. Basic pentesting concepts
2. Reconmap

About the presenter

- Software engineer and entrepreneur
- Based in Scotland
- Security advocate
- Reconmap's founder

Imposter syndrome

Figure: https://flic.kr/p/dQC9kt

Section outline

Vulnerability assessment

- Assess security of network or apps
- Identifies vulnerabilities
- Involves scanning tools
- Produces a report

Vulnerability assessment

- Assess security of network or apps
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False positives

Findings are not exploited, some of them could just be false positives.

Pentest definition

- Assess security of network or apps
- Identifies vulnerabilities
- Use scanning tools
- **Vulnerabilities are carefully exploited**
- Produces a report

Pentest definition (continued)

- Systematic process
- Defined scope
- Legal
- Authorised

Types of pentesting

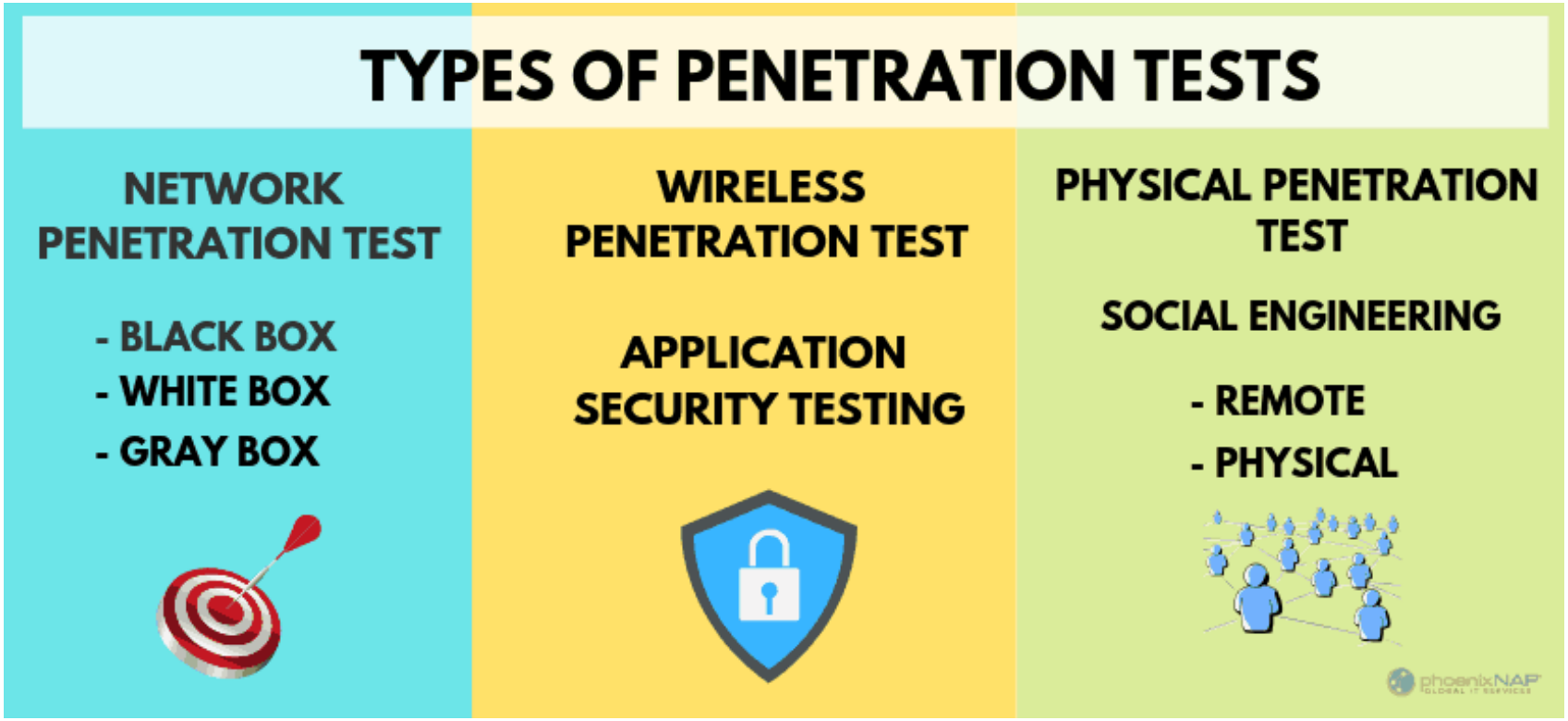

Figure: Source phoenixnap.com

Pentesting objectives

- Depict the current security level
- Identify gaps
- Quantify potential damage
- Validate/Invalidate security controls
- Decreases the possibility of real attacks

Business benefits

- Helps with compliance
  - ISO27001
  - PCI DSS
  - HIPPA
  - GLBA
  - FISMA/NIST
- Protects staff, customers and business partners
- Preserves company reputation
- Helps sustain business continuity

Cost of a pentest

Test size	Guide price[1]
Small	£1000-£3000
Medium	£3000-£5000
Large	£5000-£20000

[1] Source `bulletproof.co.uk`

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Cost

Data breaches costed £2.9M to orgs in 2020

[1] Source `bulletproof.co.uk`

Engagement length

- Typical engagements are 1 to 3 weeks*

[1] https://www.itgovernance.co.uk/blog/the-cost-of-a-data-breach-in-2020

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Recovery time

Orgs take 280 days on average to detect and respond to an incident.[1]

[1] https://www.itgovernance.co.uk/blog/the-cost-of-a-data-breach-in-2020

When to perform a pentest

Reactively

- Prior to contracting a data breach insurance
- Before and after corporate milestones
- After noticing viruses, malware, spyware on the system
- After noticing unusual system patterns, traffic
- After system change & new system deployments
- After new system integrations
- After the release of new products/features

When to perform a pentest

Proactively

- Regularly as a preventive measure
- At least once a year

Penetration testing standards

- OSSTMM
- OWASP
- NIST
- PTES
- ISSAF

Pentesting workflow

- Pre-engagement, analysis and plan
- Information gathering and reconnaissance
- Discovering vulnerabilities
- Exploitation
  - Gaining access
  - Privilege escalation
  - Maintaining access
  - Covering tracks
- Analysis and reporting
- Re-test (aka post-fix verification)

Pre-engagement

- Paperwork
  - Rules of engagement
  - Contract
  - NDA
- Documentation sharing
- Setup
  - Sharing credentials
  - Lifting restrictions
  - ...

Determine scope

- Targets
  - Web app
  - Mobile apps
  - Database
  - Network
  - Wireless
- End user and social engineering attacks
- DDos and performance tests
- Internal/External
- Physical/Remote

Determine scope (continued)

- Testing hours/days (eg workdays vs weekends)
- Locations
- Network range
- Teams

Analysis and reporting

Typical report

- Summary
- Findings
- Recommendations
- Methodology

Communication

- Executive summary delivered to leadership
- Project closure meeting organised to discuss

Analysis and reporting (examples)

Pentest report examples → `https://pentestreports.com`

- Over 150 example reports
- Stored on Github
- Source of learning and inspiration

Re-test

- The company is expected to close the gaps
- After the gap-closure, a time frame is determined by both parties for verification tests
- Findings in the report are reevaluated in the verification tests

Pentester

- Plans and designs penetration tests
- Carry out tests and other simulations
- Creates reports and offer recommendations
- Advises management on security improvements
- Work with other employees to improve organizational cybersecurity

Pentester tools

- From notebooks and post its to text files and wikis
- (Power)Shell scripts
- Security tools (Zap, Burp, nmap, ...)
- Jira/Trello/Gitlab, ...
- Word/Libreoffice
- Email/Chat

Becoming a pentester

- Courses
- University degress
  - Computer science
  - Ethical hacking/Cybersecurity
    - Abertay University
- Practice, practice practice

Becoming a pentester (continued)

- Capture the flag/Interactive
  - Hackthebox.eu
  - PentesterLab.com
  - VirtualHackingLabs.com
- Cybrary
- PentesterAcademy

Bug bounty programs

To receive recognition and compensation for reporting bugs, especially those pertaining to security exploits and vulnerabilities.

Becoming a pentester (continued)

Certifications

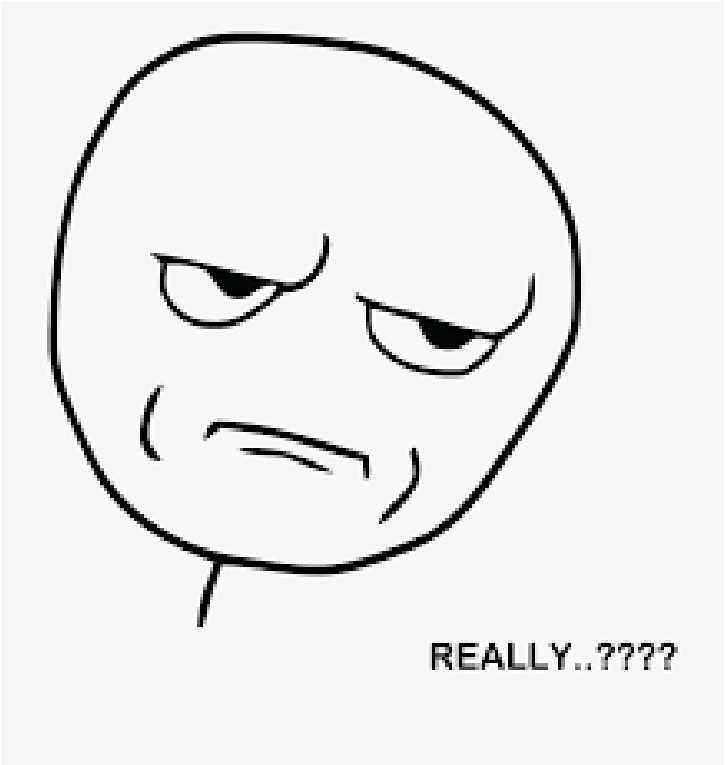
- EC-Council CEH and LPT
- IACRB CPT and CEPT
- OSCP, OSCE
- CREST Practitioner, Registered, Certified Tester
- CompTIA PenTest+

Section outline

Reconmap mission

Reconmap is making of every software engineer a penetration tester

Reconmap mission



Reconmap mission (continued)

- Make security testing more accessible
- Help (infosec)engineers collaborate better
- Accelerate project delivery
- Maximise returns

What is Reconmap?

- Collaboration platform for InfoSec projects
- Automation and reporting tool for pentesters
- Also...
  - Early-stage project
  - Open-source and SaaS
  - Developed in Dundee[1]

[1] with contributions from Argentina and the world

Who is it for?

- InfoSec pros and teams looking to become more efficient
- Other technical minded people[1] wanting to
  - Learn about security
  - Perform basic security on their projects

[1] devs, devops, it admins, sys admins, qa, etc...

Reconmap's functionality

- Project/Methodology templating
- Task management
- Shared space for
  - Files (docs, results, screenshots, etc)
  - Notes
- Automation tool

Features

- Database
  - Commands
  - Vulnerabilities
  - Notes
- Command automation
- Report generator

Commands

Custom commands

- Any arbitrary command
- Exec and dependencies installed by the user
- No upload integration

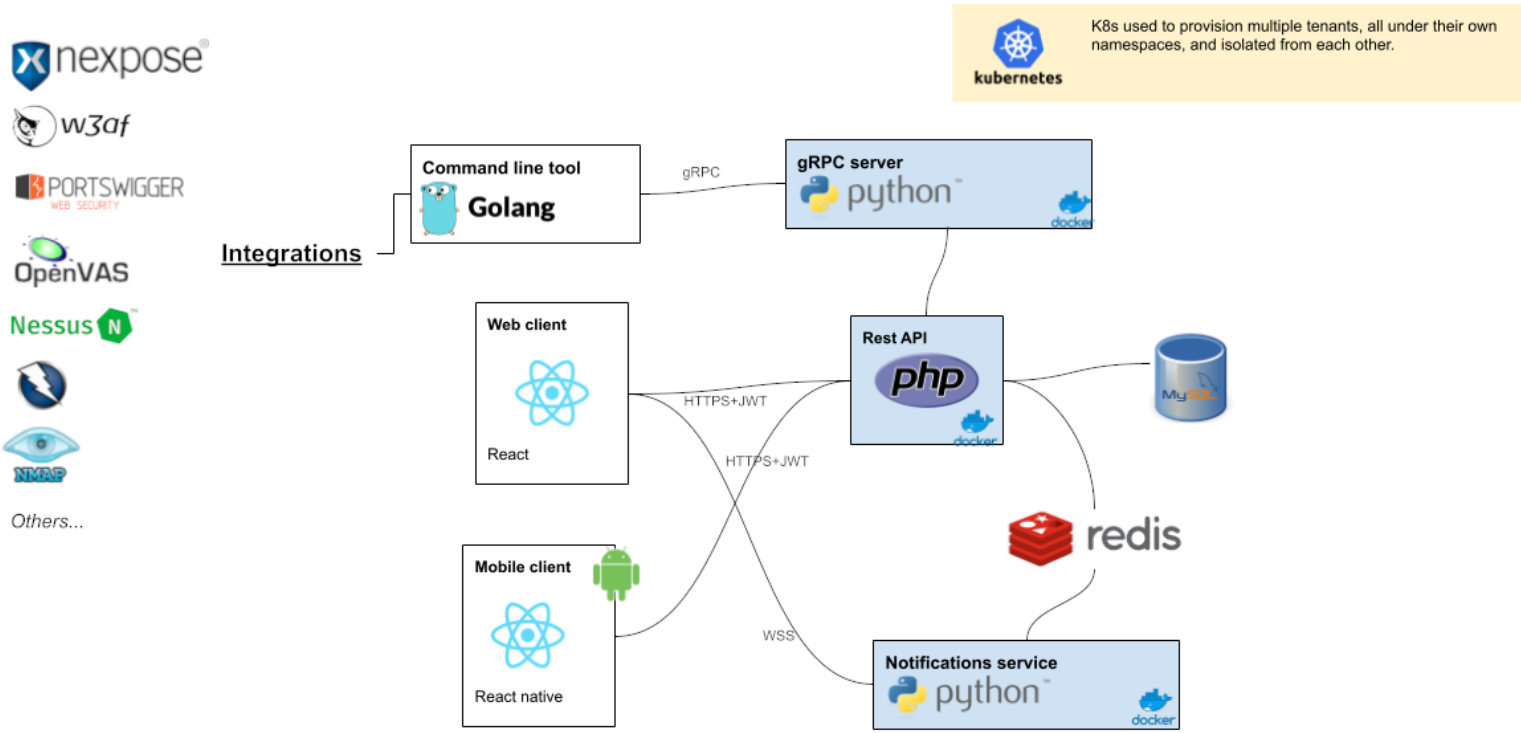
Rmap commands

- Container based
- Dependencies included
- Portable to Windows/Macos/Linux
- Tighter integration with dashboard

Reconmap's code

- Open-source
- On Github → `https://github.com/reconmap`
- Easy to setup local environments
- Open for contributors

Reconmap's architecture



API

- RESTful API
- OpenAPI specs
- Fully featured
- Used by CLI, Web and mobile clients
- `https://api.reconmap.org/docs/`

Typical workflow

1. Create client
2. Create project from template
3. Complete tasks
4. Some tasks require running commands
5. Reconmap (*rmap*) runs the command, upload results, and analyses them
6. User annotates and triage vulnerabilities
7. Generate and share the report

Reconmap's demonstration

- General tour
- Pentest generation walk-through

Reconmap's present

- Young project ($\sim$ 7 months, part-time)
- Usable, but not complete
- Evolving fast (releases every 2 weeks)

Reconmap's future

- Immediate term
  - Polish up
  - Expand docs
  - Expand test coverage
- Short term
  - Add more integrations
  - 2FA
  - Item triage
  - Better analytics

Reconmap's future

Medium term

- Machine learning for classification
- Non-interactive agents
- Many other things!

Recap

1. Basic pentesting concepts
2. Reconmap

More information

Documentation

`https://reconmap.org`

SaaS

`https://reconmap.com`

Code

`https://github.com/reconmap`

Twitter

`https://twitter.com/reconmap`

Questions?