UNIVERSITY of WASHINGTON

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Hacking 310

Lesson 01: Pentesting Process

Course Overview

Hacking 310 is the first of three courses for the Ethical Hacking certificate.

Objectives for Hacking 310:

- Describe the various types of penetration tests and ethical hacking;
- Recognize the limitations of penetration testing and ethical hacking;
- Identify several free testing methodologies;
- Demonstrate the overall process and rules of engagement of a penetration test;
- Demonstrate reconnaissance by using Nmap, DNS lookups, Maltego, search engine vulnerability (finding tools);
- Demonstrate network-based exploitation using tools such as Metasploit to compromise vulnerable systems, basics of pivoting, and pilfering;
- Describe the common web vulnerabilities; and
- Exploit common application vulnerabilities and flaws.

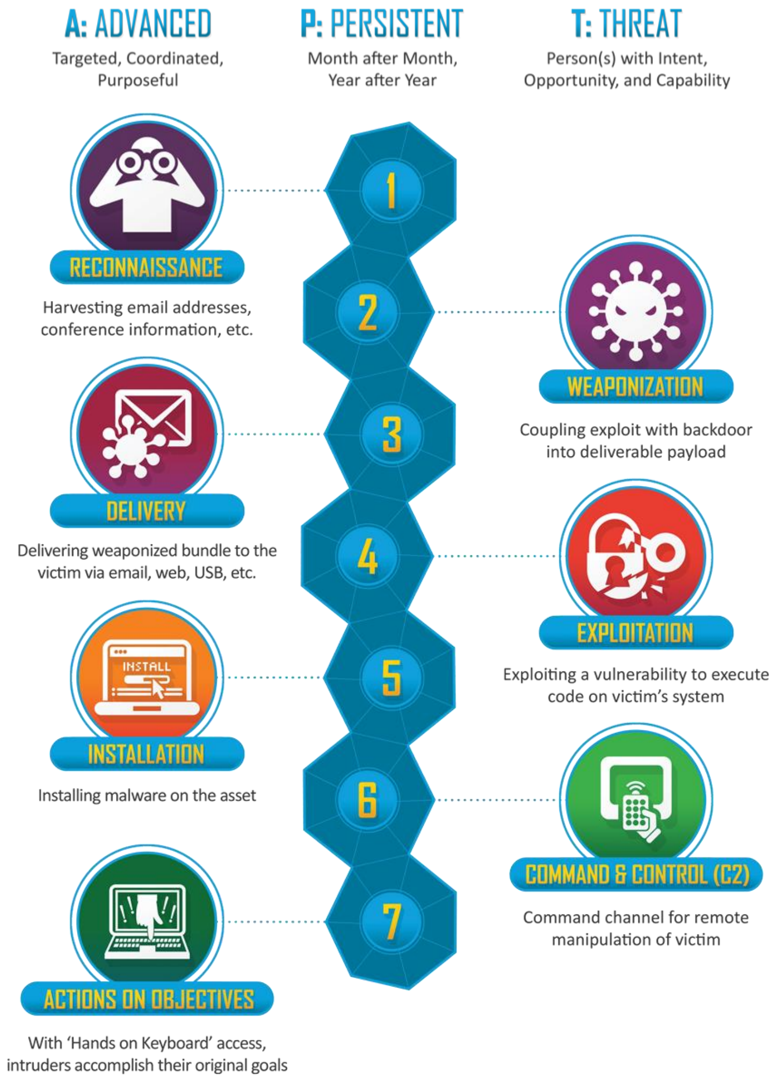
Introduction

- Who am I?
  - James Walker
- Ways to contact me?
  - Preferred - Canvas Online Learning System Messaging
  - UW Email: jaywalk@uw.edu
  - SMS/Phone: 801-419-6359
- Class Format
  - Weekly Lectures: Monday 6PM – 9PM PST
  - Grades
    - Weekly Homework – Canvas Online Learning System
    - Weekly Participation – Don’t miss more than 4 lecture sessions
  - **If you have an extenuating circumstance, please let me know in advance; exceptions will be approved on a case-by-case basis**

Learning Objectives

- What is Penetration Testing?
- What is Ethical Hacking?
- Types of Penetration Tests
- Red/Blue Teams
- Phases of a Penetration Test
- Setting up a Penetration Testing environment

Lockheed Martin Corp: Cyber Kill Chain



A: ADVANCED
Targeted, Coordinated, Purposeful

P: PERSISTENT
Month after Month, Year after Year

T: THREAT
Person(s) with Intent, Opportunity, and Capability

1. **RECONNAISSANCE**
Harvesting email addresses, conference information, etc.

2. **WEAPONIZATION**
Coupling exploit with backdoor into deliverable payload

3. **DELIVERY**
Delivering weaponized bundle to the victim via email, web, USB, etc.

4. **EXPLOITATION**
Exploiting a vulnerability to execute code on victim's system

5. **INSTALLATION**
Installing malware on the asset

6. **COMMAND & CONTROL (C2)**
Command channel for remote manipulation of victim

7. **ACTIONS ON OBJECTIVES**
With 'Hands on Keyboard' access, intruders accomplish their original goals

Figure © Lockheed Martin Corporation:

https://www.lockheedmartin.com/us/what-we-do/aerospace-defense/cyber/cyber-kill-chain.html

Penetration Testing

- What is pentesting?
    - Security assessment
    - Black/White/Gray box testing
- What is ethical hacking?
    - Hacking is about learning how things work
    - Hollywood & misconceptions
    - Informal security assessments and responsible disclosure
    - Bug bounty
    - Red/Blue/Purple team

Phases of a Penetration Test

- Intelligence Gathering
- Threat Modeling
- Vulnerability Analysis
- Exploitation
- Post Exploitation
- Reporting

Intelligence Gathering

- What is it?
- Target selection
- OSINT
- Covert gathering
- Foot printing
- Identifying Protection Mechanisms

Threat Modeling

- What is it?
- Business asset analysis
- Business process analysis
- Threat agents / threat communities analysis
- Threat capability analysis
- Comparable targets

Vulnerability Analysis

- What is it?
- Testing
- Active
- Passive
- Validation
- Research

Exploitation

- What is it?
- Countermeasures
- Evasion
- Precision Strike
- Customized Exploitation
- Pivoting
- Escalation
- Objectives

Post Exploitation

- We have success, what now?
- Rules of Engagement
- Persistence
- Infrastructure Analysis
- Pillaging
- Exfiltration
- Cleanup

Reporting

- Last but not least, arguably the most important step, the deliverable the client is paying for
- Notes, notes, more notes, also did I mention take notes
- Screenshots are great proof too

Preparing Your Pentesting Platform

- Home lab & setup, if you want
- Student lab environment
  - Windows VM
  - Kali Linux VM
- Tools used in this course:
  - Kali Linux
    - Nmap
    - Wireshark
    - Maltego
    - Ettercap
    - OWASP ZAP
    - Standard Unix/Linux utils:
      - Nslookup
      - Whois
      - Netstat
      - Bash Primer: http://linuxcommand.org/lc3_learning_the_shell.php
  - VMWare vSphere via Web Browser