Armitage + Metasploit for Penetration Testing: from Information Collecting to Post Exploitation

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Disclaimer

Most contents are from the Internet!

Outline

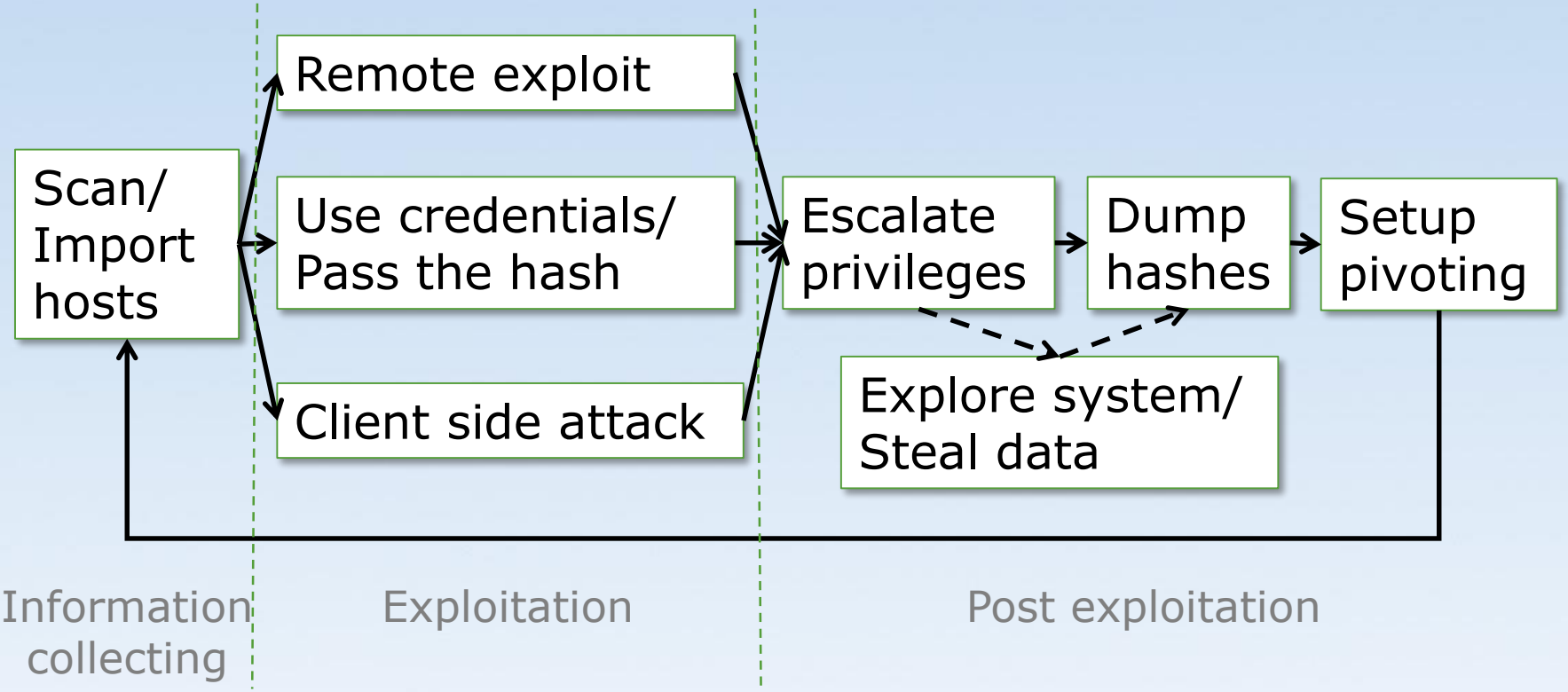
- Introduction to cyber attack cycle
- Introduction to Metasploit and Armitage
- Demos

Cyberattacks

- Fighting cybercrimes is among FBI's top three priorities
- We shall think like an adversary and understand cyberattacks for the sake of defense
- Penetration testing requires cyberattack knowledge too

Cyberattack Cycle

- Penetration testing follows a similar cycle



https://onehack.us/t/armitage-fast-easy-hacking/162550

Cyberattack Cycle (Cont'd)

1. Launches scans and imports data from other scanners
2. Choose exploits and optionally check which exploits work
3. Perform post-exploitation
   - Escalate your privileges
   - Log keystrokes
   - Dump password hashes
   - Screen capture
   - Camera streaming
   - Browse the file system
   - Use command shells
   - Setup and use pivots: use compromised hosts as stepping stones to attack target network from inside

Remote Exploit

- The target is on the Internet or in a network
- The attacker is not on the target computer
- The attacker attacks the target remotely
  - from its own/local (maybe compromised) computer against a target

Use credentials/Pass the hash

- Use potential credentials to try to log into the target
- Sometimes, the target accepts the credential hash
  - *Pass the hash* to login

Client Side Attack

- The user is tricked to run the malicious payload/malware
  - click a link,
  - open a document, or
  - somehow get to the malicious website
- The malware runs on the target computer, not deployed from a remote computer

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Metasploit

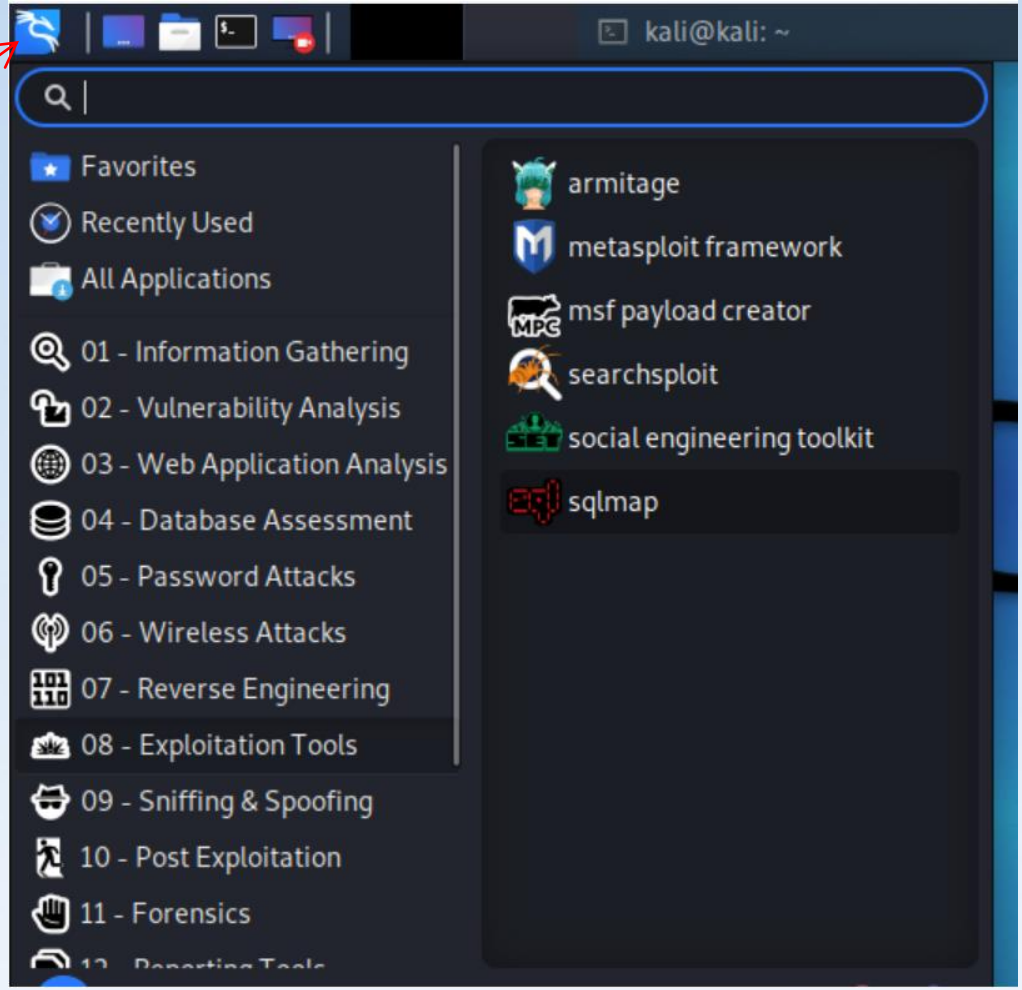
- Used for penetration testing to find security vulnerabilities
- Available within Kali Linux
- Can be used through command prompt or Web UI or other GUI interfaces

Armitage

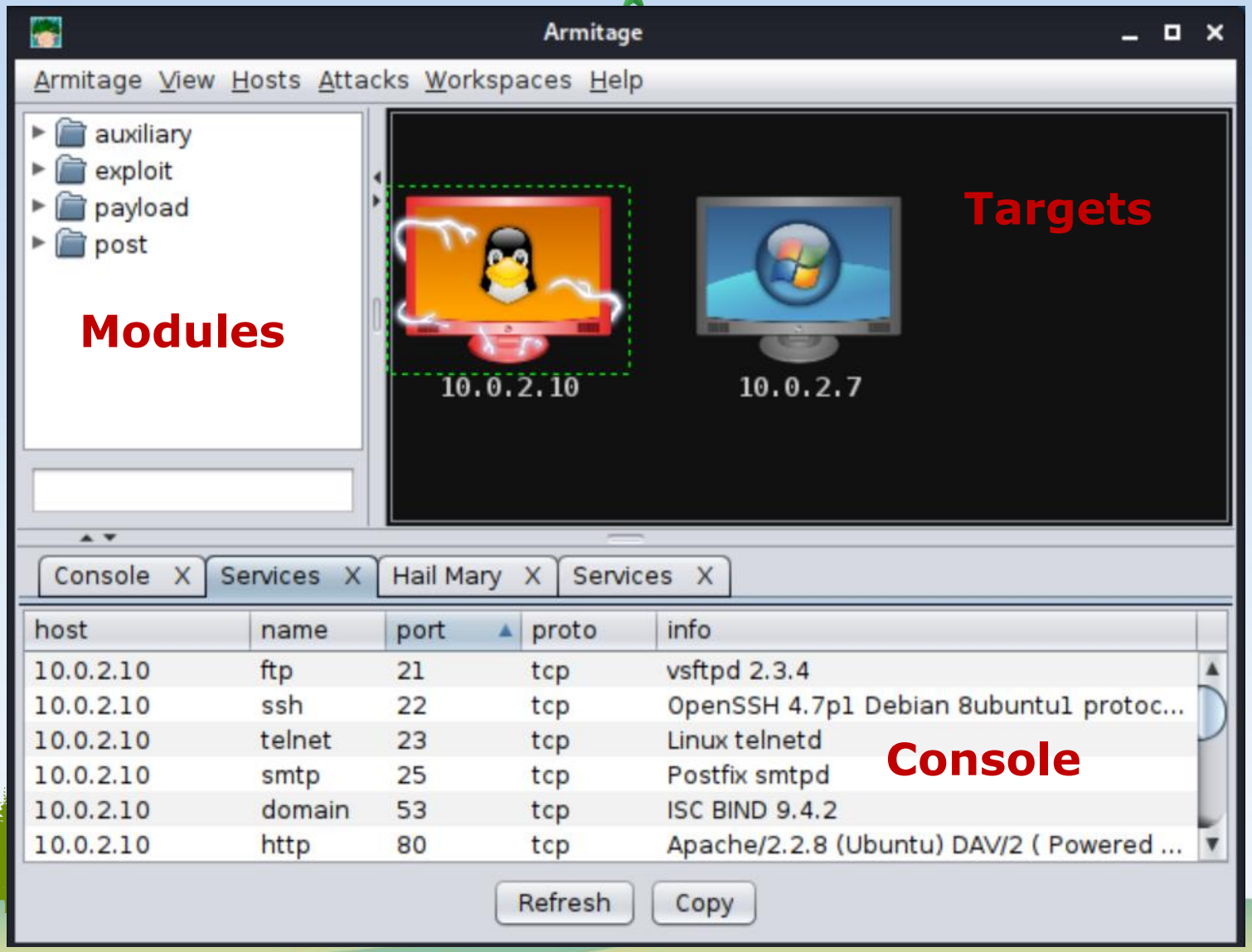
- GUI front-end for the Metasploit framework
  - What you do in Armitage will be translated into Metasploit commands
  - What you can do in Armitage can also be done with Metasploit commands

Start Metasploit/Armitage in Kali

- Better work as root
- Metasploit
  - *Applications*
    - → *Exploitation Tools*
    - → *Metasploit framework*
- Armitage
  - *Applications*
    - → *Exploitation Tools*
    - → *Armitage*

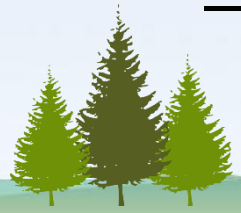


Armitage Interface



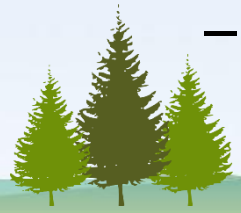
Notes of Starting Armitage

- Better work as root to use all functionalities and avoid confusion
  - E.g., start Armitage with *sudo* in a *terminal*: *sudo armitage&*
- If Armitage cannot start, start Metasploit first, close it and then start Armitage
- After Armitage is started, configure to try all exploits
  - *Armitage → Set Exploit Rank →* ***Poor***



Terms

- Nmap Scans
  - Armitage can launch nmap scans and import results into Metasploit
- MSF Scans
  - Armitage combines several Metasploit scans into a feature called MSF Scans
- Payload
  - Scripts/code adversary utilizes to compromise target system and interact with compromised system
- Exploit rank
  - How reliable the exploit is and impacts the target



Armitage for Demonstrating Cyberattack Cycle

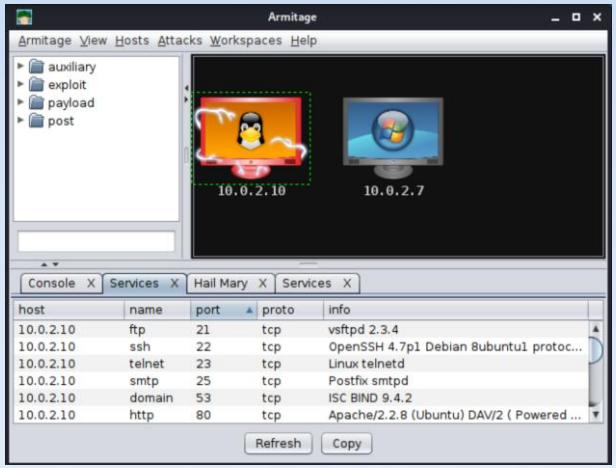
1. Scanning
2. Exploitation
3. Post exploitation

Example Target: Metasploitable

- Vulnerable computers on the Internet
  - Do not try!
  - Presenter takes no responsibility
- Metasploitable 2 virtual machine
  - A lot of vulnerabilities for exercise
  - Default username: msfadmin
    Default password: msfadmin

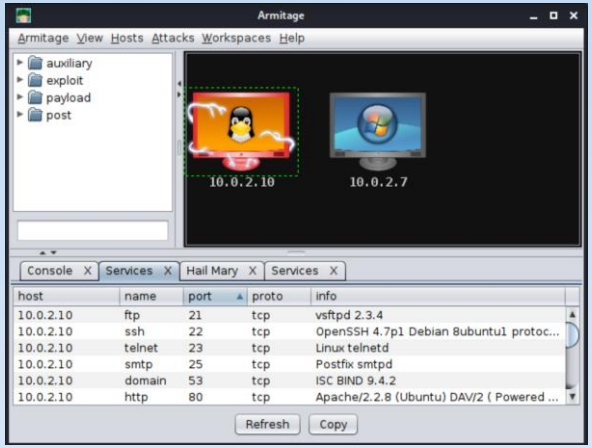
1. Armitage Scanning

- Hosts → MSF Scans
  - Enter a single IP: 10.0.2.16
  - Or enter scan range: or 10.0.2.0/25 or 10.0.2.1-254
- Hosts → Nmap Scan → Intense Scan
- Found IPs are listed as computer icons



2. Armitage Exploitation

- Select the IPs/hosts
- Deploy attack
  - Find the exploit in the tree
  - Or *Attacks* → *Find Attacks*



- Learning *which exploits to use* and *when* needs experience
- (Double) click on it to bring up the configuration
- Launch

Example Exploitation: Brute-Force Attacks

- The attacker enumerates possible passwords automatically to guess the password and gain access over a host or a service
  - Time consuming
  - Dictionary attack will help
- Potential services for brute-force attacks
  - FTP, SSH, mysql, http,Telnet, etc

Social Engineering

- Social engineering is a process of extracting sensitive information (e.g., usernames and passwords) by tricks
  - E.g. fake websites and phishing attacks
- Metasploit can perform *Phishing Campaign*

3. Armitage Post Exploitation

- Select the post exploitation module
- (Double) click on it
- Click on ‘Launch’

Example Post Exploitation: Collect Credentials

- Once into a computer, collect sensitive information for the purpose of auditing (in penetration testing)
  - E.g., usernames and passwords
- ***Meterpreter*** is a Metasploit attack payload
  - provides an interactive shell to the attacker exploring the target machine and execute code
- For example, within meterpreter, *hashdump* can list all the usernames and the passwords
  - Then use John the ripper to crack password hashes

Example Post Exploitation: Maintaining Access

- If we don't maintain access, we will have to exploit it from the beginning in case the hacked system is closed or patched
  - The best way is to install a *backdoor*.
- Metasploit can plant persistent backdoors so that even if the system restarts, we can still get in

Meterpreter commands!!!

- help
- getuid
- getsystem
- webcam_list
  - Enable webcam within VM (Devices -> Webcams -> Click the camera name)
- webcam_snap
- webcam_stream
- screenshot
- record_mic
- keyscan_start
- keyscan_dump
- keyscan_stop
- shell
- Installing service *Persistence* and opening a persistent backdoor

Screen Capture!!!

1. ps
2. migrate PID # e.g. explorer.exe
3. use espia # loading extension espia
4. screengrab

Reports

- Metasploit has in-built options that you can use to generate reports to summarize all your activities and findings

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Demo Setup

- Kali VM and Metasploitable 2 VM on VirtualBox
  - Networking: the two VMs shall be able to ping each other
  - E.g. Nat Network

Attacker

Kali

Target

Metasploitable 2 VM

Video Demo

With explanation: https://youtu.be/PfeKkinOBcU

Steps

1. Start armitage: *sudo armitage&*
   - *If "could not connect to database",* start Metasploit, exit it and start Artimtage again
2. Set to use what exploits: *Armitage → Set Exploit Rank →* ***Poor***
3. Post scanning: *Hosts → MSF Scans*
4. Select a found IP and detect the OS running on that IP
   - *Hosts → Nmap Scan → Quick Scan (OS Detect)*
5. Select a found IP and find attacks
   - *Attacks → Find Attacks*
6. Select a found IP, choose an attack and deploy it
   - *Attack → IRC → unreal_ircd_3281_backdoor*
   - Check "*Use a reverse connection*"
   - *Shell 1 → Interact*
7. Post exploitation
   - Search *hashdump* within modules and choose *post -> Linux -> gather -> hashdump*
   - Copy and paste the displayed hashes into a file, e.g. hash-dump (remove "[+] ")
   - John the ripper to crack the hashes: *john hash-dump*

unreal_ircd_3281_backdoor

UnrealIRCD 3.2.8.1 Backdoor Command Execution

Disclosed	Created
06/12/2010	05/30/2018

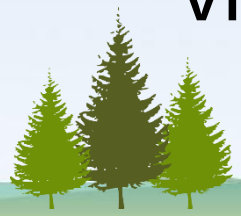
Description

This module exploits a malicious backdoor that was added to the Unreal IRCD 3.2.8.1 download archive. This backdoor was present in the Unreal3.2.8.1.tar.gz archive between November 2009 and June 12th 2010.

https://www.rapid7.com/db/modules/exploit/unix/irc/unreal_ircd_3281_backdoor/

Summary

- Armitage + Metasploit for intuitive live demos to explain cyberattacks and penetration testing
- A few clicks and commands needed to perform information collecting, exploitation and post exploitation
- Armitage and Metasploit on a Kali Linux virtual machine.



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[5] OTW, Metasploit Basics, Part 15: Post- Exploitation Fun (Web Cam, Microphone, Passwords and more), Oct 16, 2018

THANK YOU!

Q&A