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Honeypot Predators: Hunter VS Prey

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Who Am I?

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Introduction

What are honeypots?

Apply What You Learn

Today, we will hopefully complete the equation:

Educate + Learn = Apply

- Did I learn something new?
- Can I implement a honeypot safely in my environment?
- How do I make my organization more secure?

What is a Honeypot?

- System that mimics an organization's production environment
- Designed to attract and lure malicious actors
- Used to monitor cybercriminal behaviors
- Can interrupt the attack cycle, from initial information gathering to the active attack
- Primarily it intercepts cyber attacks in an observable environment
  - Learn cybercriminal tactics, techniques, and methodology

Types of Honeypots

Internal Honeypots

- Locked down systems with no advertisements
  - Access is a result of explicit attempts to find and exploit these systems
- They may provide vulnerable services – system is readily available for exploitation
- They are dangerous – use with caution!
  - Can be used by cybercriminals to perform ”land and expand” attacks
- They are used primarily to detect insider threats

External Honeypots

- Typically they operate outside your network, data centers, or domain
- Have public services
- Very open and available
  - Attract targeted and non-targeted attacks
- Attract sophisticated and simple attackers
- Can be dangerous if compromised unexpectedly

Low Interaction vs. High Interaction Honeypots

Low Interaction

- Passive in nature
- Collects usernames, passwords, login attempts
- Uses logs and packet capture for detailed analysis
- Examples include: SSH, Telnet, VoIP, elastic search, basic Windows services

High Interaction

- Allows attacker interaction with system
- Allows attackers to run commands and interact with systems
- Systems contain what appears to be valuable data (data is not really valuable)
- Records screens, commands, shells
- Almost a game or a challenge. Gives attackers a goal to infiltrate the system, bypass security, and use data exfiltration to transfer critical information from the system.

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Implementation and Deployment

Where and how to run your honeypots

Honeypot Placement Considerations

Internal Honeypots

- On secure, isolated, and segmented network segments
- Not advertised in DNS, ActiveDirectory, or via simple network protocols or services (pings, SNMP scans)

External Honeypots

- Not connected to your network or data centers
- They generate a lot of ‘noise’
- Can be configured for multiple types of services such as WordPress, IoT devices, critical infrastructure, IoT/OT, custom applications

Honeypots – Easiest Implementations

Internal Honeypots

- Isolated network segments

External Honeypots

- Service providers
- Hosting providers
- Virtual Private Server (VPS) or cloud providers
  - CRITICAL - review terms of service with your hosting provider
- Another option - your friend's house (just kidding)
- CRITICAL - review terms of service with your hosting provider

Some Recommended Settings for Honeypots

2 public addresses

- One for management
- One for honeypot services

Do not use Network Address Translation

- Some attacker services are not correctly recorded with NAT

VPS services

- Lots of attacks will cause termination of services

Honeypot cautions and compromises

- Can become a malware host
- Beware of illegal content

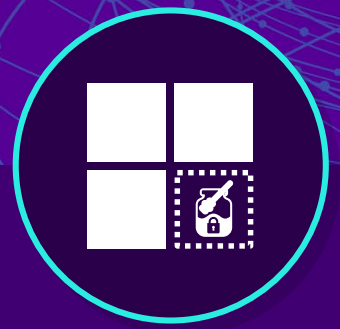
Honeypot Base Configurations

Base

- Ubuntu 14.0.4.1 LTS 64-Bit
- 2 Gb of RAM
- 20 Gb HD

Port 80 honeypots

- conpot
- glastopf
- wordpot
- shockpot



Windows honeypots (445 and 139)

- Amun
- Dionaea

Others with no port conflict

- kippo
- p0f
- elastichoney

Other Honeypot Ideas

- Open ‘listen’ ports for major malware attacks
- Mimic ports on major devices (IoT, OT, etc.)
- Use logs and packets captures (PCAPs)
- Create Windows systems with malware URL feed
  - Run malware sites thru a non-admin account
  - If compromised - you might have found a zero day
- Open FTP server (or one that can be brute forced easily)

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Honeypot Demo

MHN, FTP Honeypot Demo

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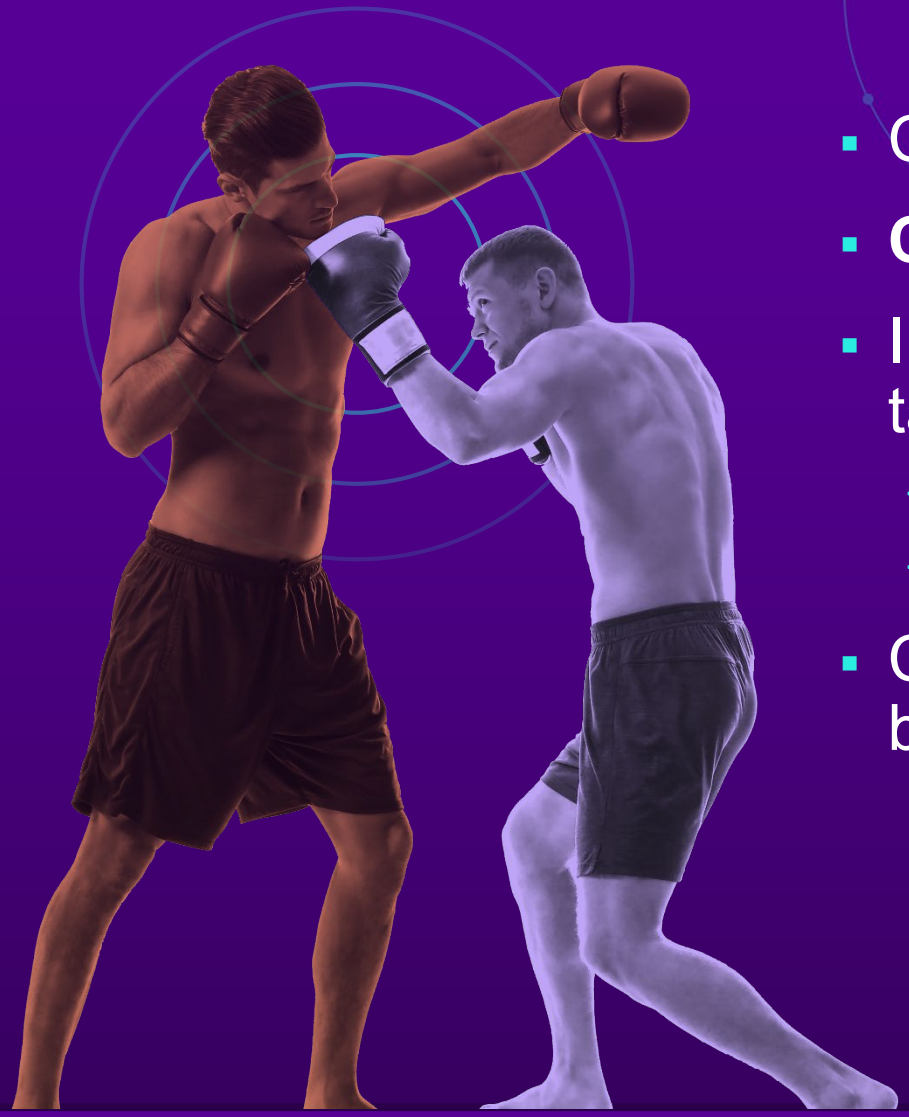
Offensive Security

Hackback and other techniques

What is a Hack Back?



- Counter-attacking those that attack you
- **Caution** – not legal in many countries
- I do not condone what we will be talking about now
  - Everything is hypothetical
  - This has legal implications
- Consider the following occurring in the make believe place of MagicLand

US Hack Back Laws

- Active Cyber Defense Certainty Act (ACDC)
- Computer Fraud and Abuse Act
- Hack back is obviously not a defensive strategy

Phishing to Plant Malware

1

Phisher sends email or contact regarding malware that is seen on your device

2

You are fooled into opening up your system or installing malware to give attacker access to your system

3

Lets pretend it's a fake Microsoft helpdesk claiming our computer is spewing malware. They are a "contractor" of Microsoft when asked.

Counter Phishing Honeypots

1

Setup safe place to interact with phisher — sandbox

2

Act stupid and talk about The Matrix and Blackhat movies. Maybe mention hacking movies and how cool Mr. Robot is.

3

Wrap sharing software with malware

4

Frustrate phisher but offer sharing software to help show why things are not working

Building a Sandbox – Cuckoo as a Honeypot

- The steps to fully install Cuckoo are super complex so read our guide in my book or blog
- Malware looks for Cuckoo
  - Looks for virtualization processes
    - Memory, CPU, Cores, VM Tools, registry entries
    - Looks for specific DLL files such as sbie.dll
    - Real malware analysis means bare metal testing

Dropper, RAT, Empire and Metasploit

Dropper

Beaconing software that doesn't provide a full tunnel and can call back desired data

RAT

Full tunnel to compromised system

Empire

Powershell tool that can communicate using a dropper

Metasploit

Developer meterpreters that can be installed on the victim system

Getting Your RAT

- RATs are detected by AV
  - Counter it by building your own using a PowerShell or Python framework
  - Works on Mac OSX and Windows devices
- EggShell is a good Python based RAT framework that works on MacOS
- ViralmaniaR PowerShell RAT is a another good example
- Infects by connecting back to a public server
  - Send a phishing link
  - Send an uninfected file

Easy Honeypot Projects

- MHN – Modern Honey Net from Threatstream
- HoneyPI
- Fortinet Deceptor
- Thinkst Canary
- TrapX
- Illusive Networks
- Attivo Networks

How We Use Honeypots

Malware Honeypots

- Replication attacks
- Simulate known vulnerable clients, IoT/OT devices, others

Spam Honeypots

- Simulation of open email relays, open Web proxies, open DNS servers
- Allows small number of attacks to occur
- Blocks large attacks (common setup procedure)

Server Honeypots

- Open ports, services, applications (SQL, ElasticSearch), and system emulation

Proxy Honeypot

Top Countries
(from IP Geo Lookup)

- Unlisted Proxy created
- Ports for proxy were 80, 8080, 3128
- SSL Proxy created for HTTPS on port 443 with self-signed certificate
- Top Sites:
  - Google
  - Various adult themed sites

Apply What You Learn

We can complete the equation for this presentation

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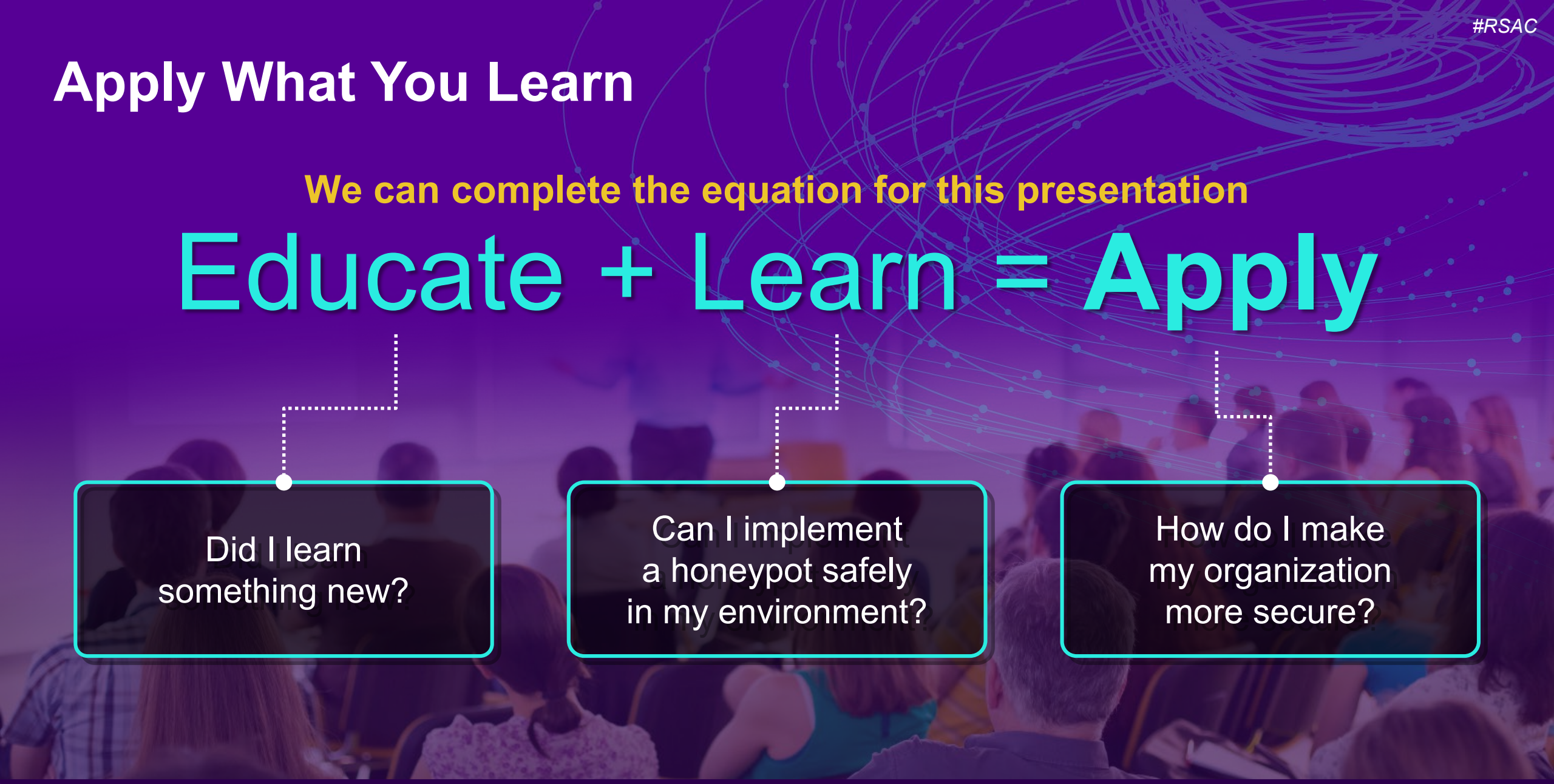

What We Covered

Honeypots

- Deceptive tools designed to learn about the attacker's motivations and techniques
- Can be simple as open ports or simple network services running on a system
- Software such as MHN, Dionaea, HoneyNet provide pre-configured honeypots
- Can be compromised and cause lots of damage

What We Learned

Where to deploy honeypots

- Do you care about insider threats? External threats?

How to automate honeypots

- Use a supported commercial tool
- Use open source tools
- Create your own

What I can do with a honeypot

- Learn who is attacking you
- The techniques they are using
- Automate IOCs into security and logging devices

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Proxy Honeypot Demo

Look what we found

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Thank You!

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