RSAConference2020
Asia Pacific & Japan

A Virtual Learning Experience | 15–17 July

HUMAN ELEMENT

SESSION ID: **Sao-W03V**

You See Honey, I See Beehive
- Developing Honey Networks -

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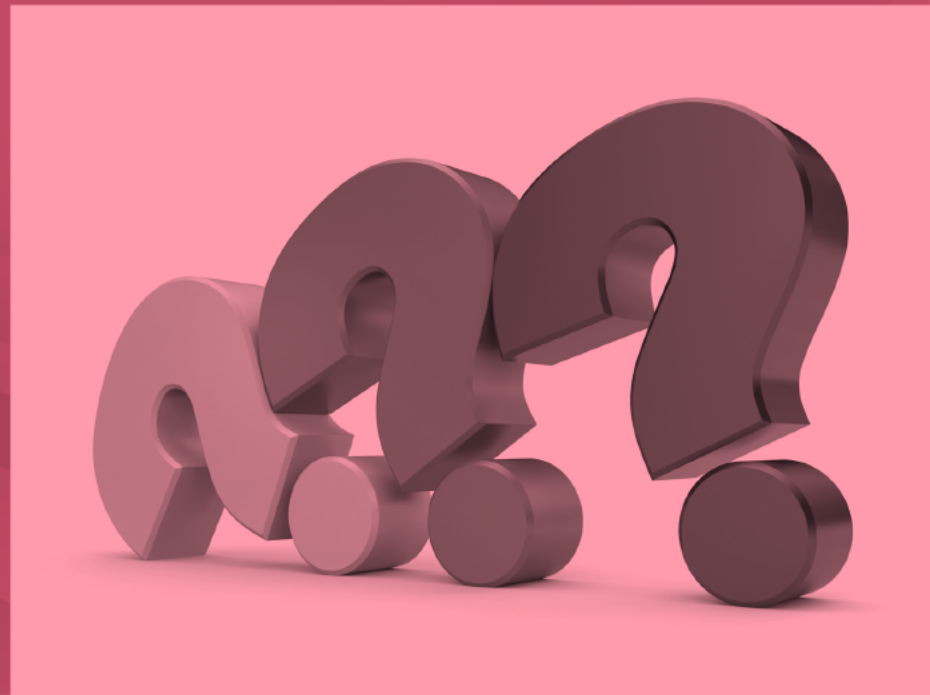
Why Care About This?



Cat And Mouse Game

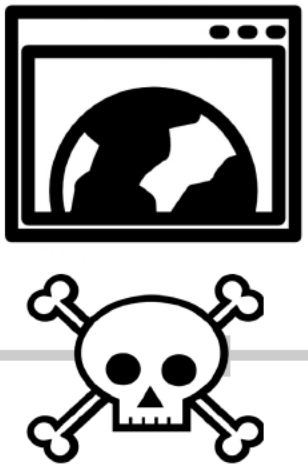
Computer OS

Internet Browser

Browser Plugins

Powershell
IoT
Phishing
Etc.

Cat And Mouse Game



Time

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Cat And Mouse Game

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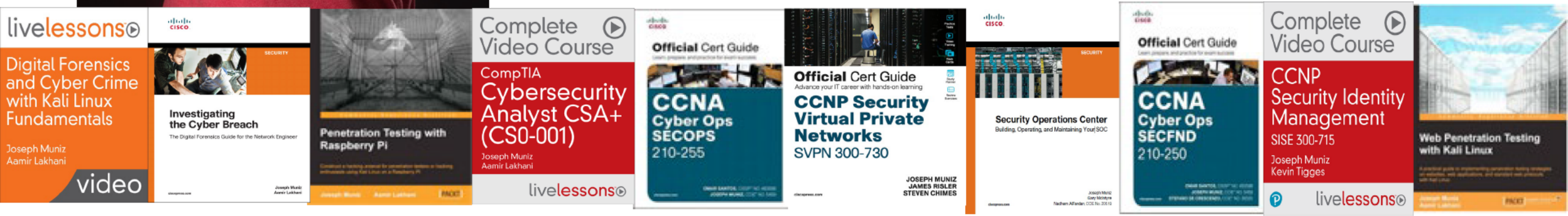

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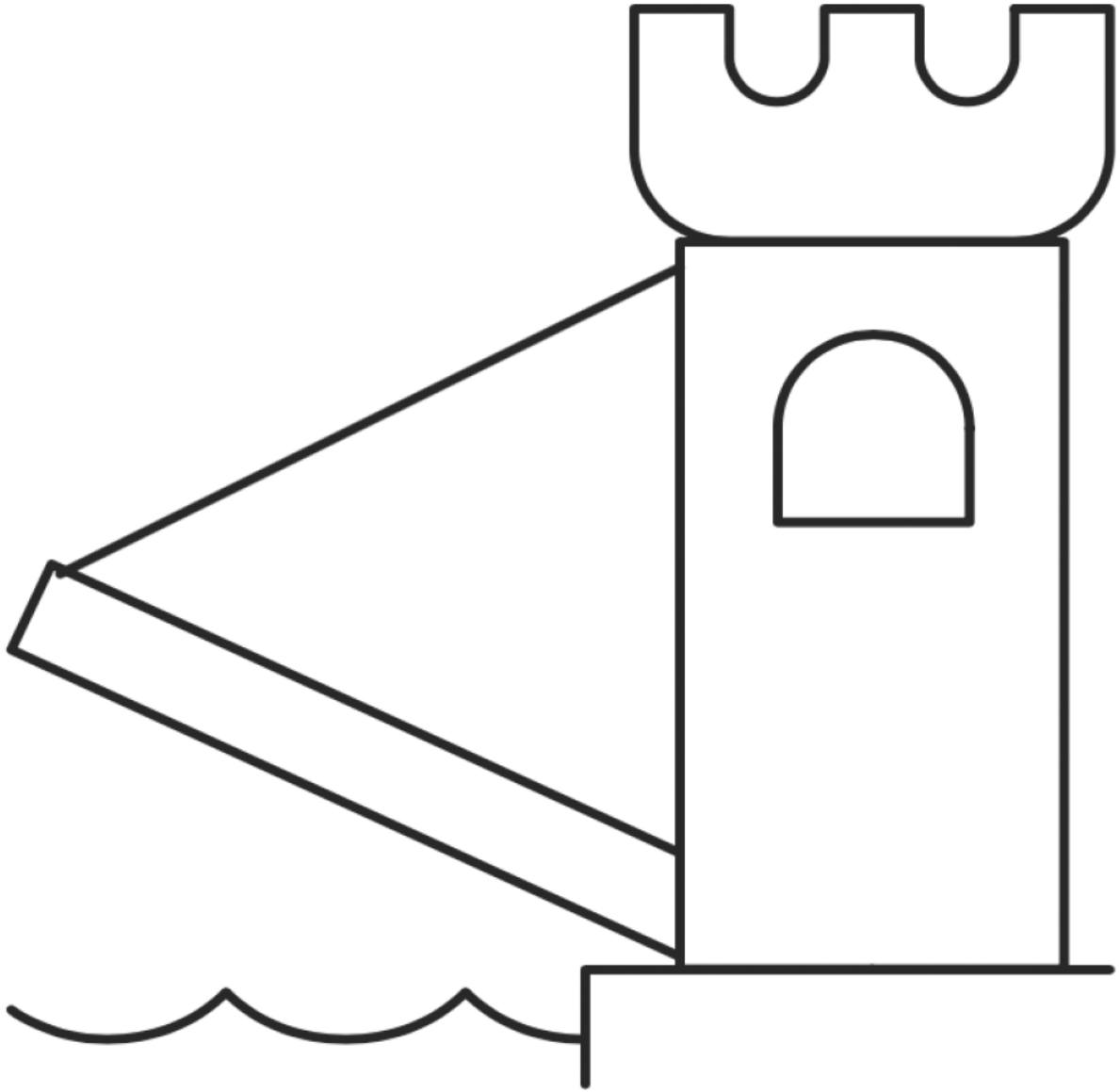
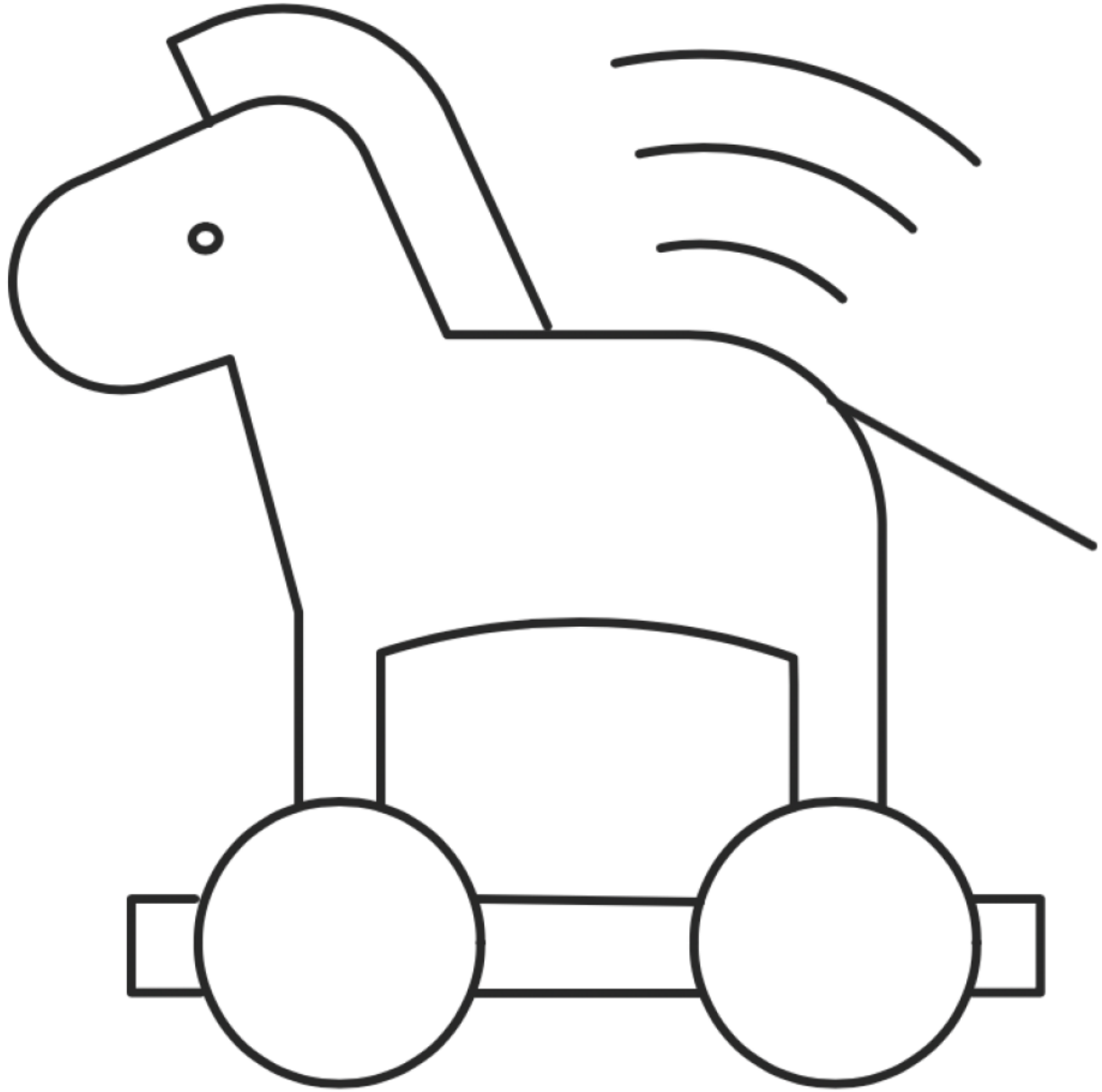
Breach Detection

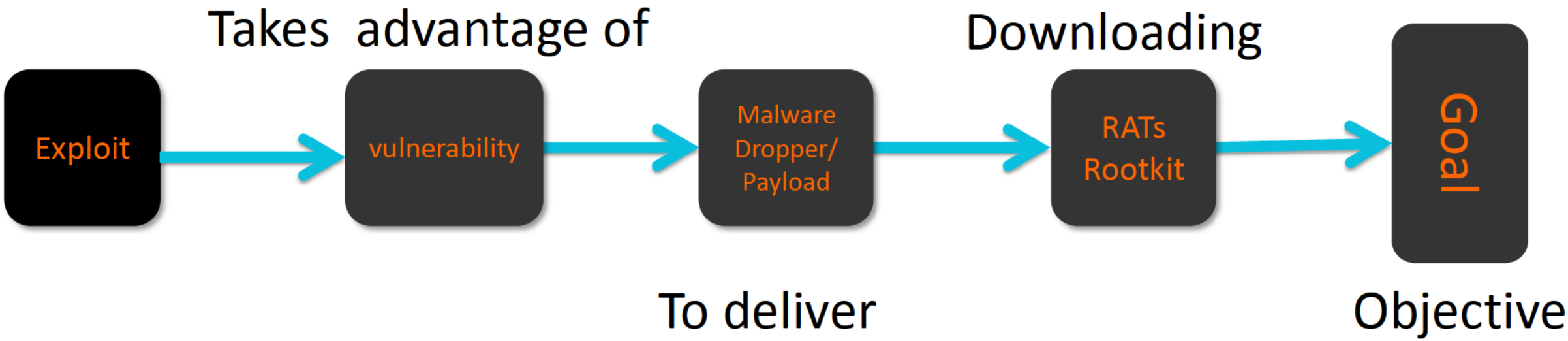


Perimeter-based defense



Change tactics, breach from inside

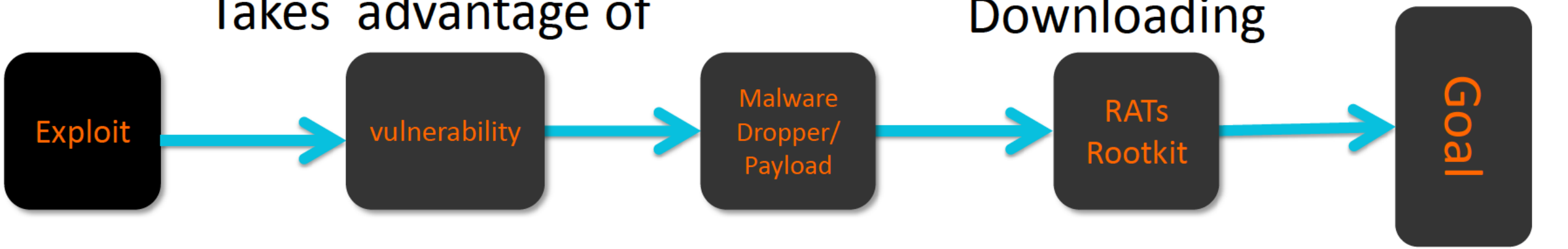
Basic Attack Conept



ttack Conept

Takes advantage of

Downloading



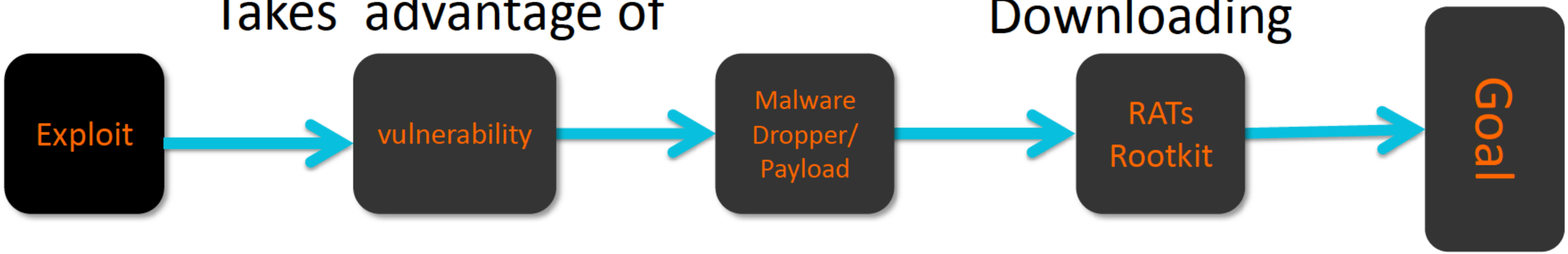
To deliver

Objective

ttack

Takes advantage of

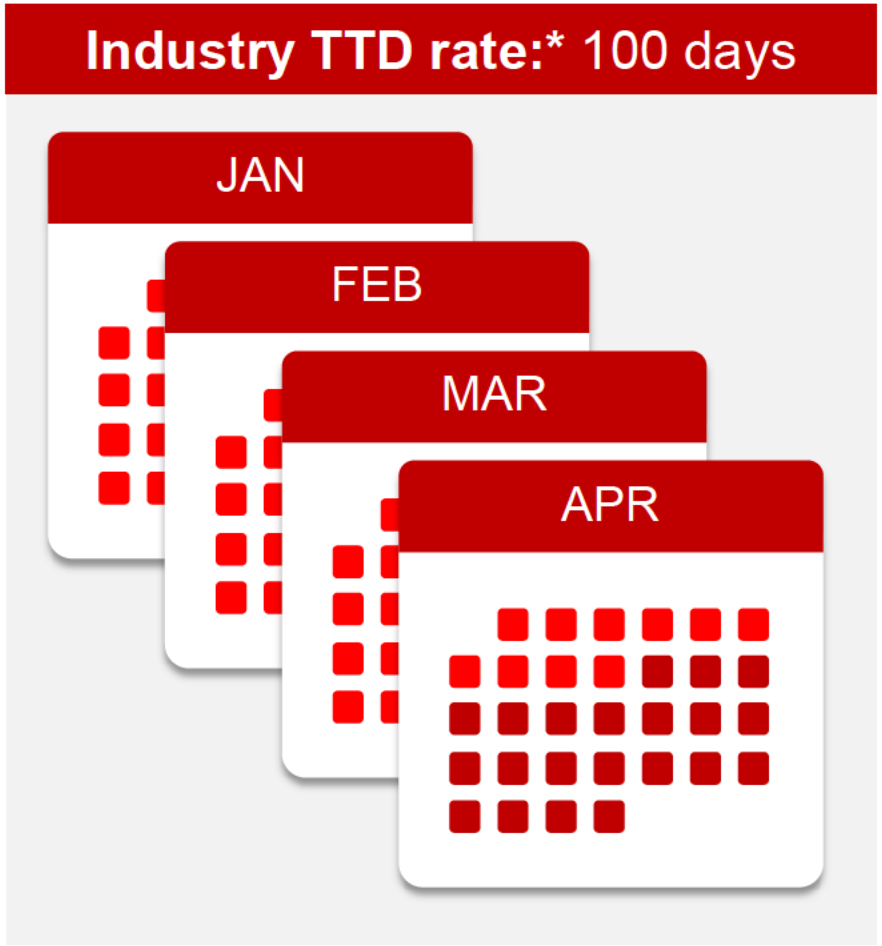
Downloading



To deliver

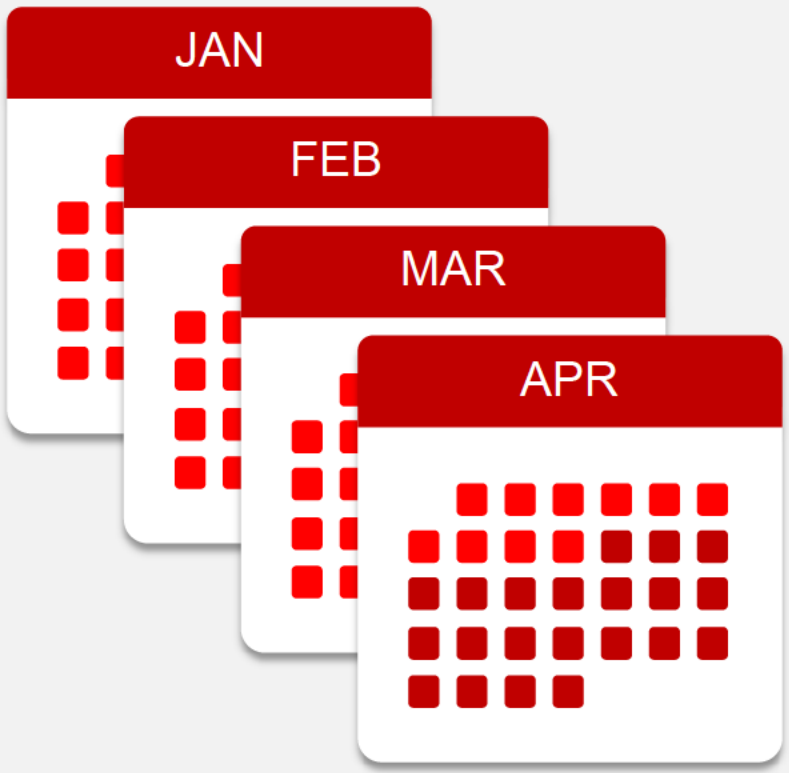
Objective

BD Goal = Detect Infections Earlier and Act Faster



BD Goal = Detect Infections Earlier and Act Faster

Industry TTD rate:* 100 days



Goal: hours


Recon

Breach Detection Options (NIST / ISO)

Honey Pots
Sandbox
NetFlow
IDS/IPS
Packet Capturing
Antimalware
Continuous Monitoring
Reputation Security

Network
Routers
Endpoints
Datacenter
Cloud
IoT

Endpoint and Branch Network

Honeypot

Employee

ENDPOINT

Anti-Virus | Anti-Malware | Data Loss Agent | Reputation Security | Personal Firewall | Disk Encryption | Vulnerability Management | VPN Concentrator | Policy/ Configuration

Access Control

Access Control | Identity | Posture Assessment

Security Operations

SOAR | SIEM | Monitoring | Threat Intelligence | Posture Assessment | Data Orchestration

CISCO

Web Security

Breach Defense

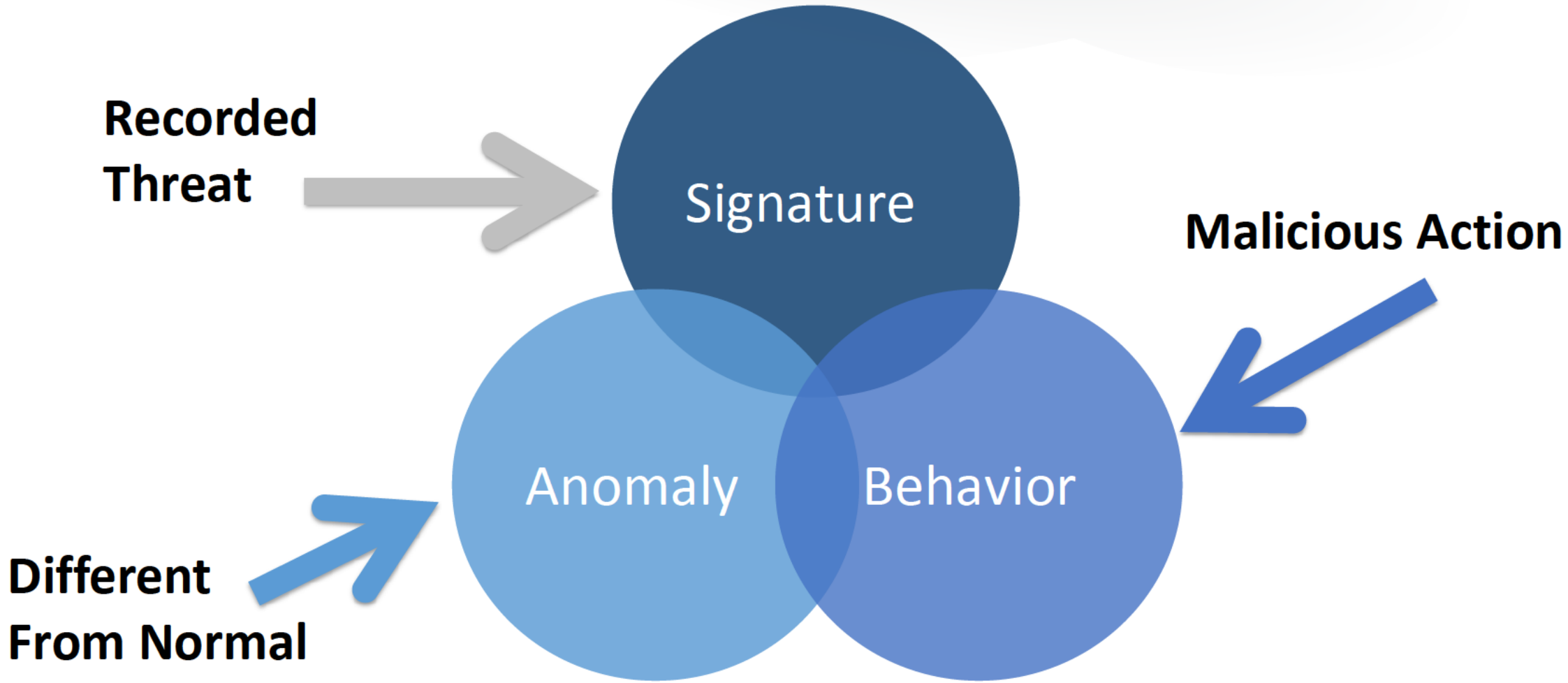
Sandbox / Honeypot | Flow Analytics | Network Anti-Malware | Anomaly Detection | Intrusion Detection East / West

Phantom Networks

Gateway Defense

Anomaly Detection | Intrusion Detection | Application Visibility Control (AVC) | SSL Decryption | Firewall | Geo Filtering | DNS Security | Website

Security Capabilities



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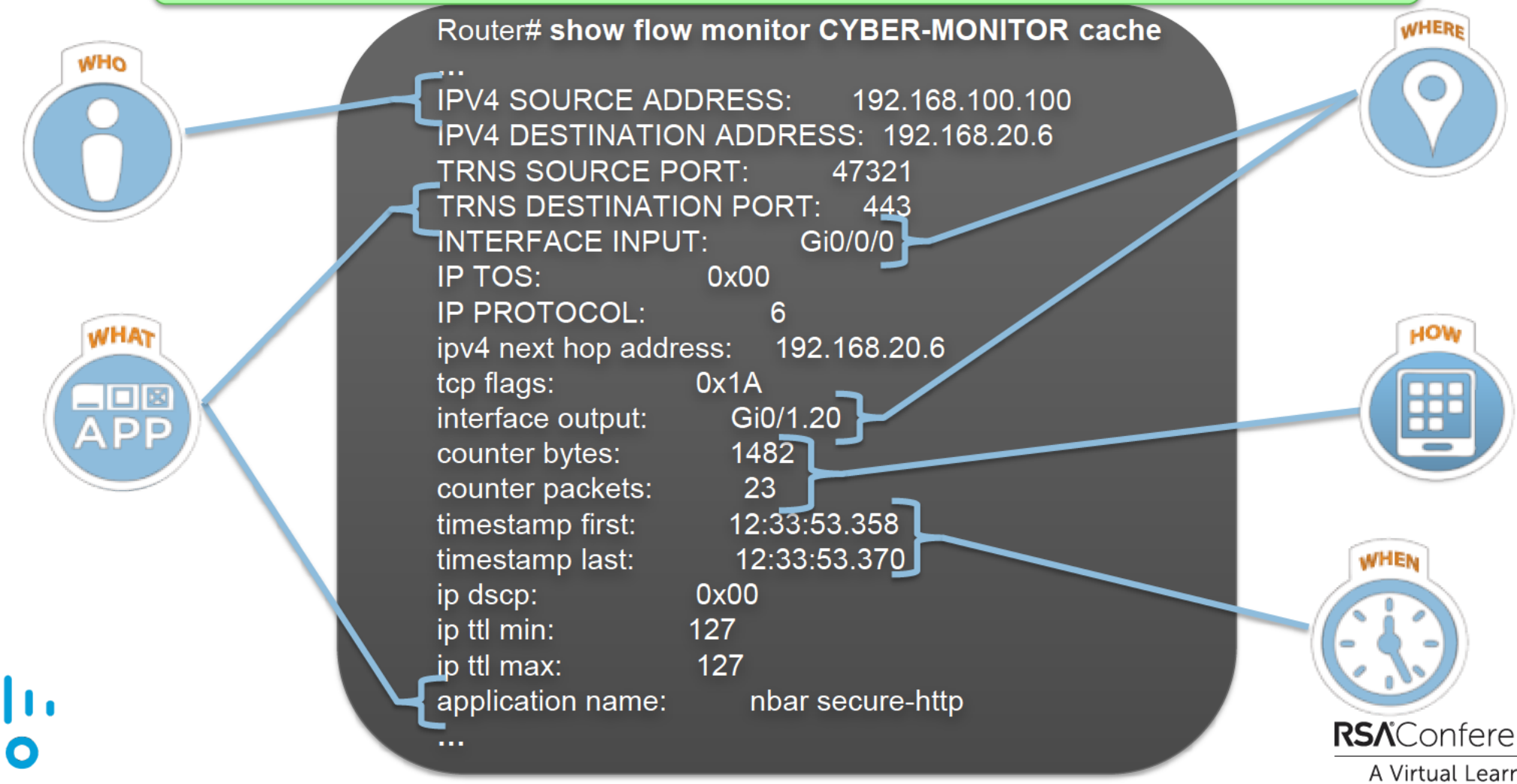
Phantom Networks

NetFlow = Visibility

A single NetFlow Record provides a wealth of information



Why Unsampled NetFlow?

Sampled NetFlow

- Subset of traffic, usually less than 5%,
- Gives a snapshot view into network activity
- Similar to reading every 20th word of a book
- Suitable for detecting large scale DDoS attacks, but not extended, slow attacks

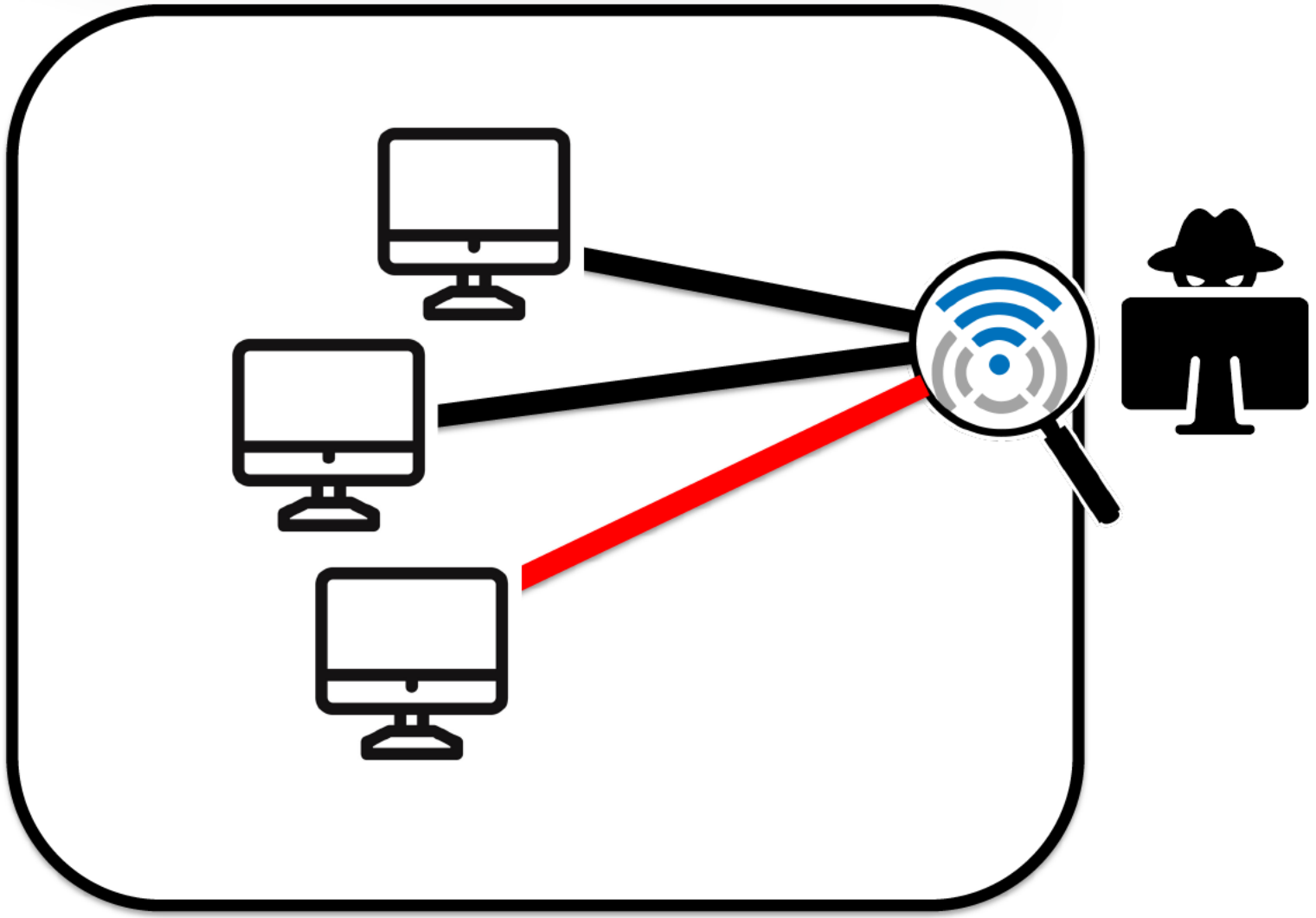
Full NetFlow

- All traffic is collected
- Provides complete view of all network activity
- Similar to reading every word, page of a book
- Suitable for detecting large scale as well as extended, slow attacks

Phantom Network Zones Concept

Malware, Attackers or other Internal Threats must perform **RECON** to identify other targets and networks.

A phantom network is a tripwire



Phantom Network Alarm Examples

Investigation revealed x-ray machine scanning Class B range on DISA owned Internet

Host	CI	CI%	Security Events
10.146.30.23	497,325,158	68,996%	Exploitation, High Concern Index, High SMB Peers, Max Flows Initiated, New Flows Initiated
[redacted] (10.34.100.42)	205,529,732	263%	

Splunk scanning example which led to breach discovery

Subnets Designed for "Threat Detection"

- **Monitor for connections** – NetFlow Triggers / Crossing network Zones
- **Configure packet capture triggers –** Linked to SIEM or NetFlow tool
- **Integration with NAC**
  - **Context** = Who and What
  - **Auto quarantine devices** = Many options for "quarantine"

Concerns

- False Positives – Whitelist vulnerability scanners, etc.
- Management of alarms

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Honey Pots

Honeypots

- Decoy system to lure cyberattacks, and detect, deflect or study
- Learn attacker techniques and test new attacks in the wild

- ***2 Public Addresses*** *- 1 for management and 1 for honeypot services*
- ***No NAT*** *- Some attacker services not correctly recorded with NAT*
- ***VPS services*** *- Lots of attacks will cause termination of services*
- ***Honeypot compromises*** *- Used to host malware and illegal content*

Honeypot Personas

- **Low** – Emulate UDP / TCP listening ports to detect scanning
- **Medium** – Allows login attempts and contain basic file structures
- **High** – Complete emulation of a system

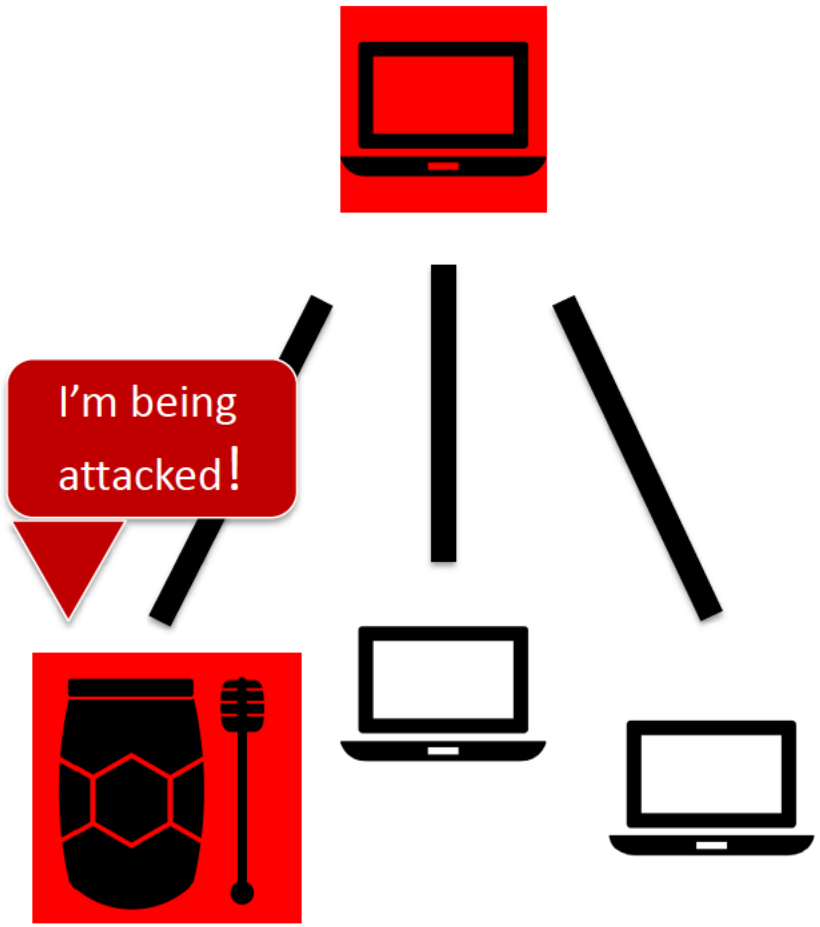
FTP Server | IoT Device | Laptop | WordPress | HTTP | Router


YouTube
Warning!

Honeypot Usage

- High interactive honeypots are also Sandboxes
  - Requires a lot more time to analyze data
- Opensource tends to be harder to setup but more flexible
  - EX) Honeyd can emulate over 100 operating systems down to windows Xp S1 vs S2
- Must have ownership for maintenance or it will be forgotten.
  - Use script to copy data to the honeypot

Internal Honeypots

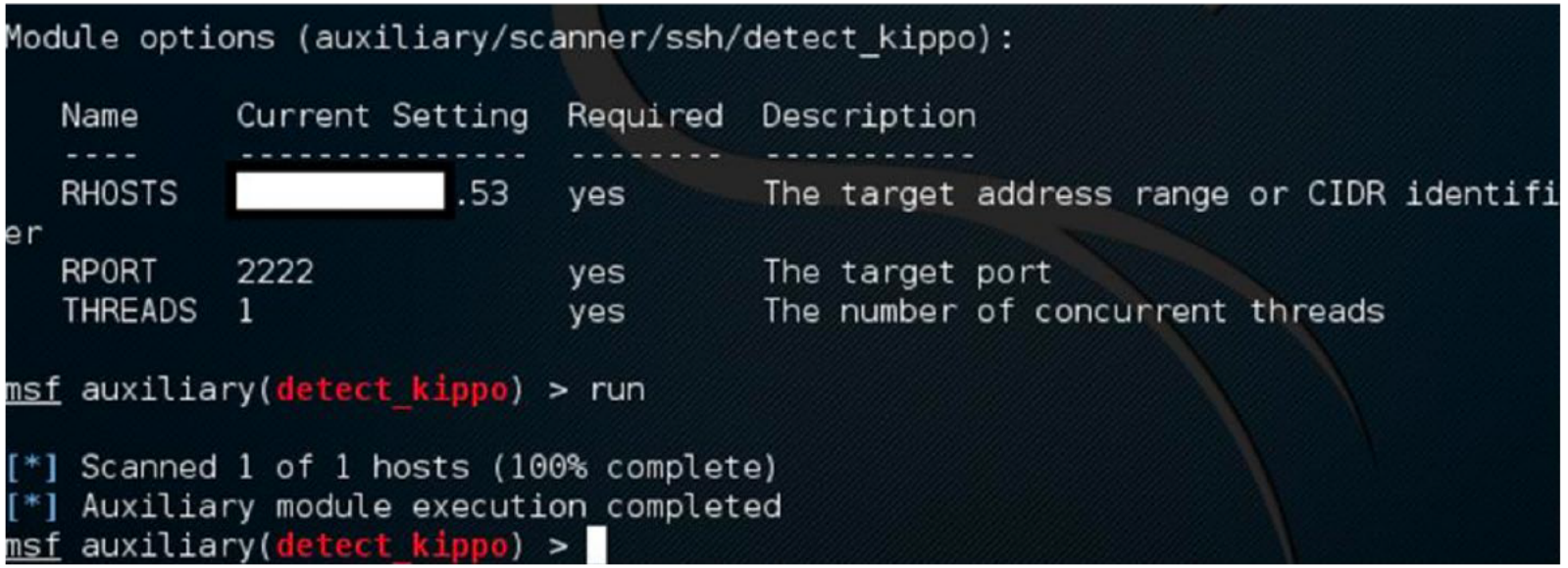


Internal Honeypot = Detect Threats That Breached Perimeter

- Configure vulnerable to lure attacker
- Hide within network (place near similar assets)
- Alert when contacted
- Possibly monitor like sandbox to learn attack behavior

Beware - Honeypot Recon

- Attacker pings from honeypot = Set results to unknown host
- Attacker pings a website from honeypot will not match = Simulate something
- Try Metasploit testing such as kippo even if you are using a different but similar honeypot



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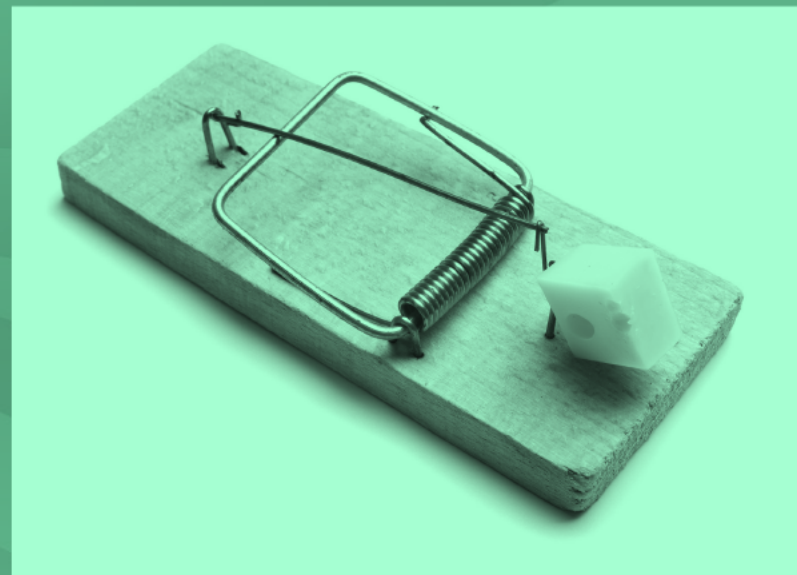
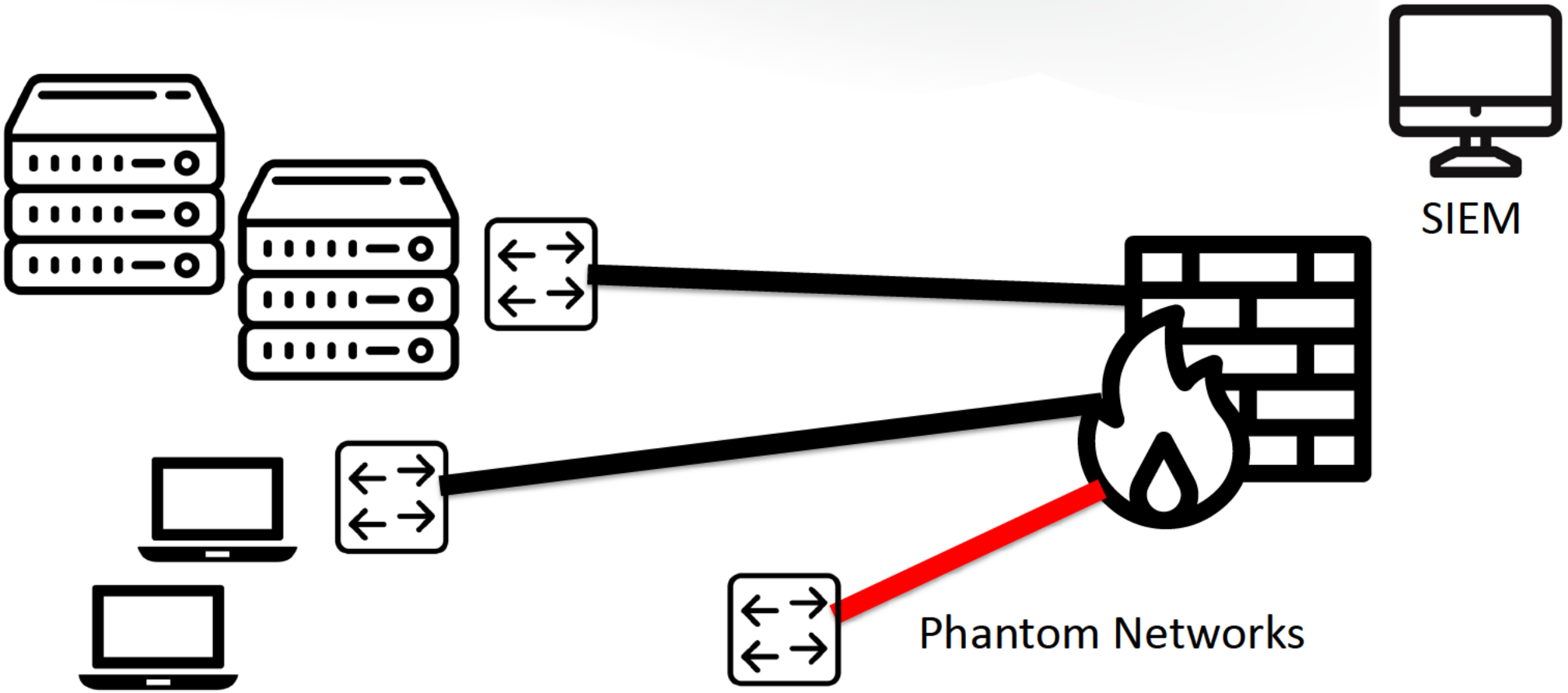
Honey Networks – Total Deception



Combine Phantom Networks, Honeypots + Others



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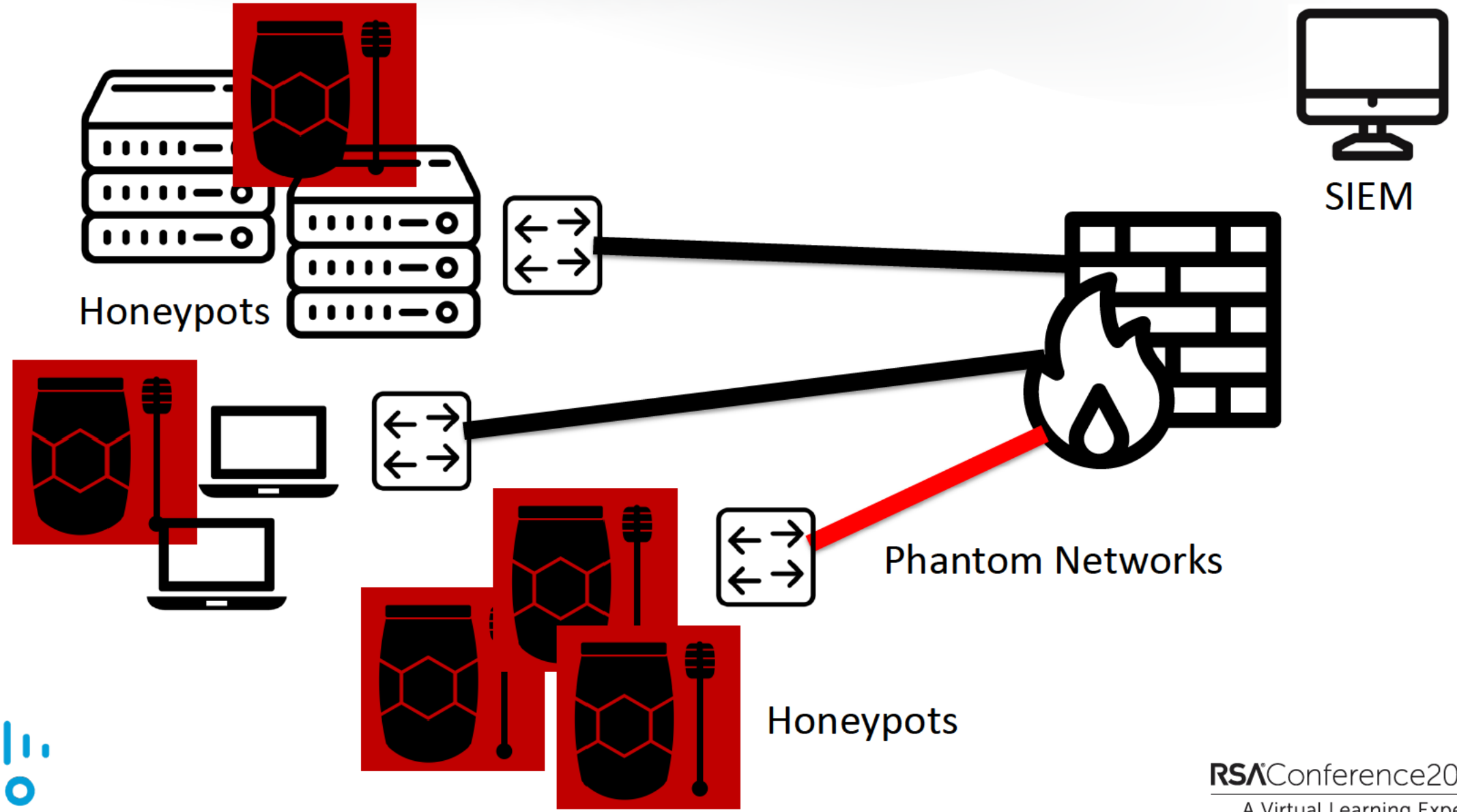

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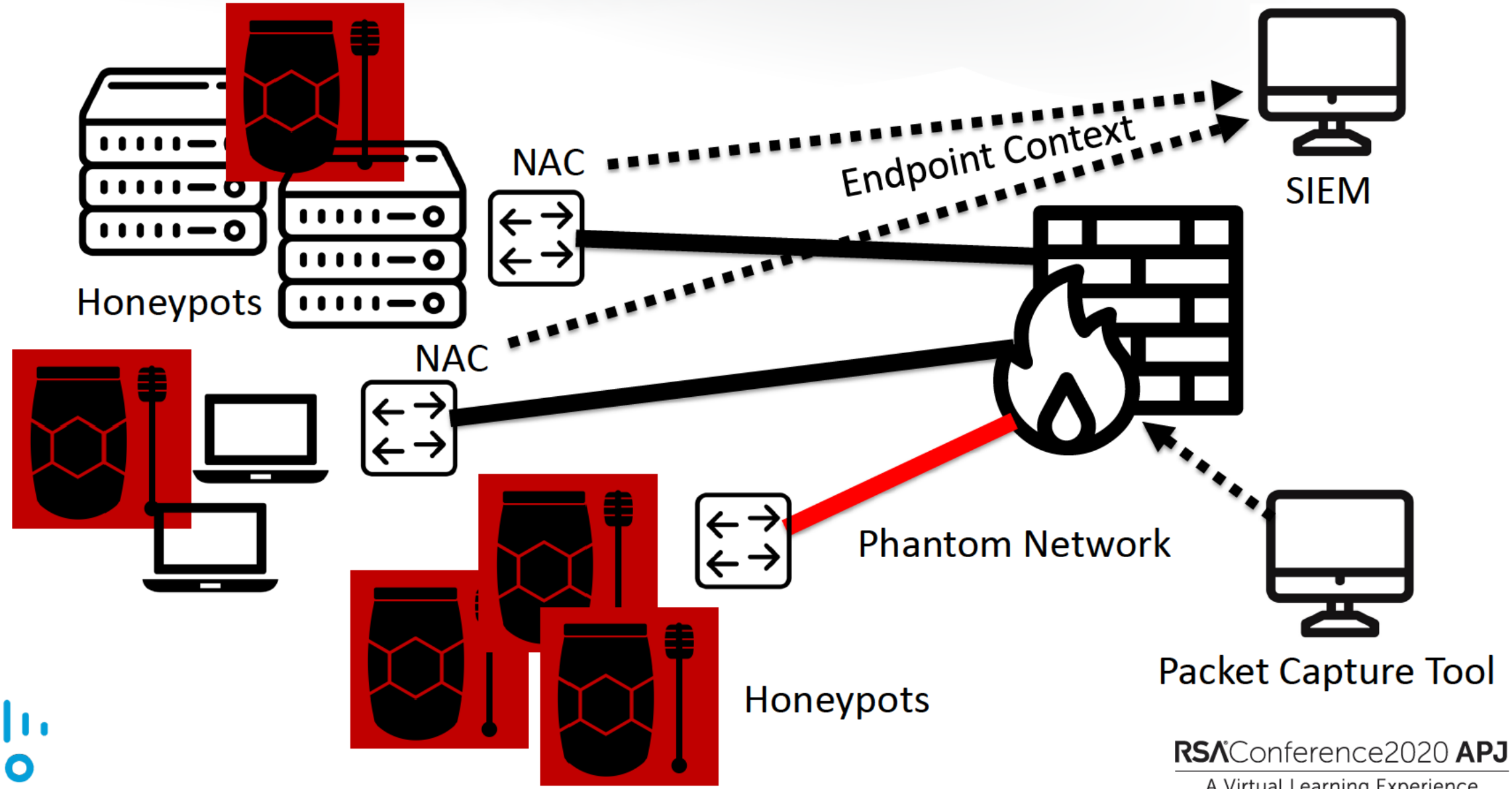


Technology Today

- **NetFlow** – Cisco Stealthwatch, Plixer
- **Honeypots** – Trapx, Attivo Networks, HoneyThing (IoT), ElasticHoney (Database), Thug (Client), Honeydrive, KFSensor,
- **SIEM** – Splunk, Qradar, Logrhythm, OSSIM, OSSEC
- **Packet Capture** – Wirehshark, LiveAction Omnipeek, tcpdump
- **NAC** – Cisco ISE, FortiNAC, ForeScout CounterACT

Tuning Your SIEM

Need Exporter on Honeypot

- Example for Splunk Apps (Splunk Stream, Splunk Universal Forwarder, etc.)

Alert on all inbound activity

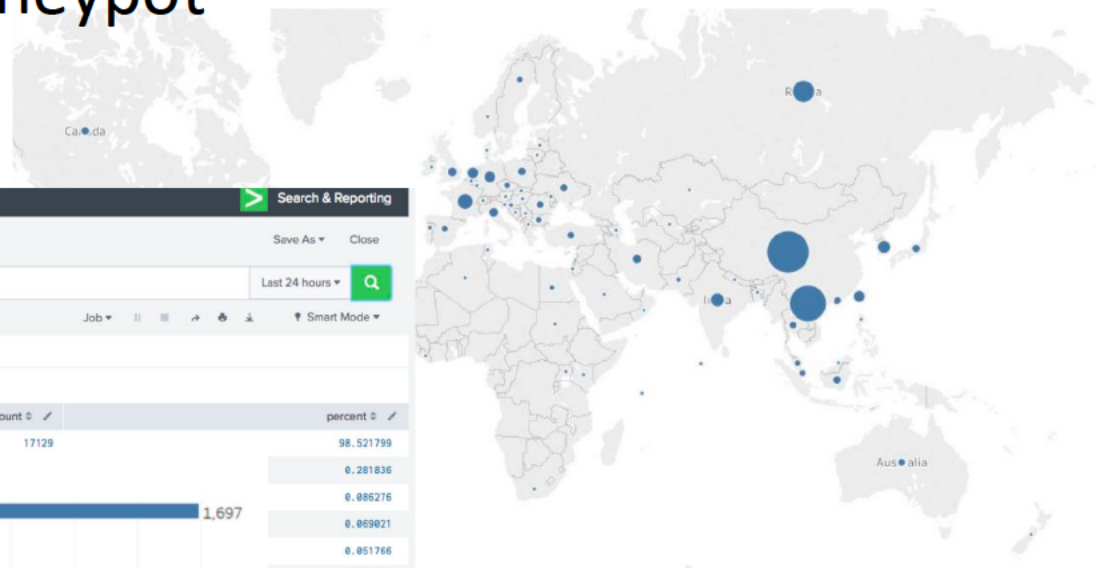
- Honeypot serves no purpose so inbound and pings received are of interest

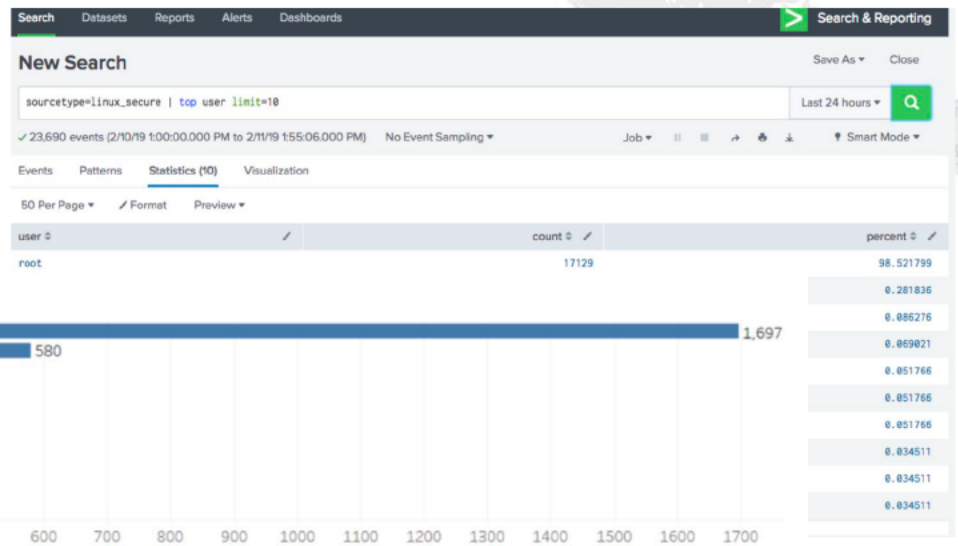
Configure Triggers

- File modification
- Unset command (used to hide history)
- System recon commands (free –m to see memory or id to see group)
- Wget command to download stuff
- IP addresses from other countries – convert into widget
- Login and password attempts – convert into widget

Widgets and Dashboards

- Countries associated with triggering phantom networks
- Login attempt credentials
- Recorded IP addresses
- NetFlow Concern Widgets – Focus on Recon
- Alerts Combining NetFlow tool and Honeypot





Keep it Simple

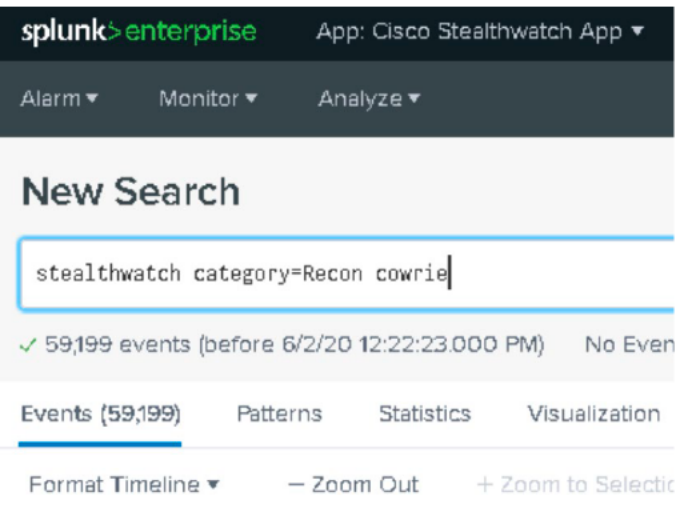
Phantom Networks = recon and IP address identifier.

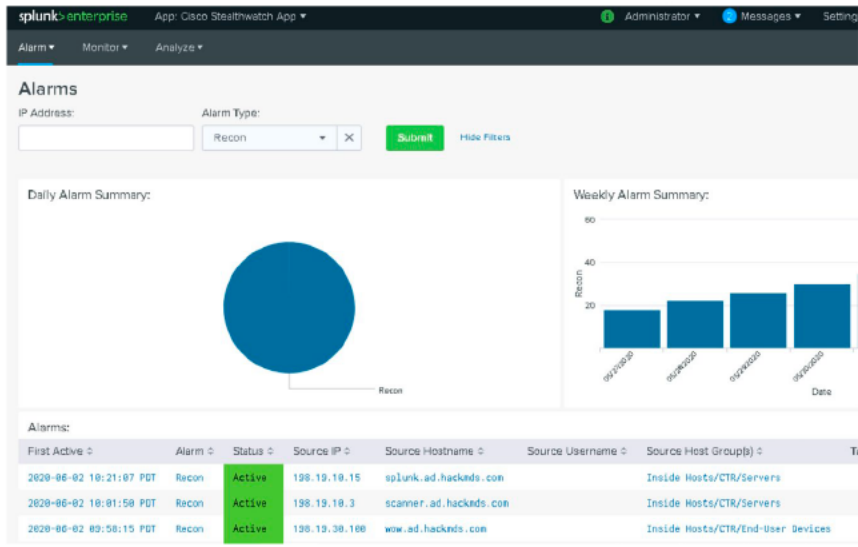
- Ex: Search Splunk: NetFlow or Vendor + recon or + IP

Honeypots = Login and action triggers

- Ex: Search Splunk: honeypot IP + event

Correlate alarms from honeypot and NetFlow tool





Next Steps – Try It Out

- Develop a phantom network (choose technology and triggers)
- Install a honeypot (recommended low interaction at first)
- Test port scanning (AngryIP/Zenmap/Etc.).
- Tune events within SIEM or other event tool
- Assignment management of system
- Add integration (NAC / Packet Capture) and more networks /honeypots

Security is a **Journey** … not a **Destination**!