

**Raspberry Pi**  
**malware honeypot**

# AGENDA

- \* **honeypot**, what is it? what is it's purpose?
- \* **Dionaea honeypot**, hardware, software and network setup
- \* **MHN server**, how to manage sensors effectively?
- \* **system security**, quick demo, todo and links

# TL;DR

- \* Raspberry PI runs **Dionaea honeypot** for 2 months
- \* it is connected to our **guest WiFi network**
- \* and it **caught nothing** ;-]



# HONEYPOT

# WHAT IS HONEYPOT?

- \* honeypot is a **decoy infrastructure** that is **deployed to be attacked**
- \* since it has no other purpose, **every attempt to interact is suspicious**



# WHAT IS IT'S PURPOSE?

- \* it can **discover malicious activity**, especially when deployed **behind firewall**
- \* it can **slow down and mislead the attacker** by providing slow responses or incorrect information
- \* it can **collect the logs, tools and other stuff** left by attacker to aid forensics

# MY GOALS

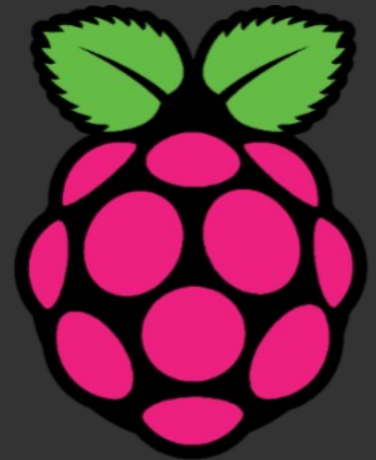
- \* **excuse to purchase** Raspberry PI ;-]
- \* **monitor malware activity** in our network, as 1/2 of the office runs on Windows
- \* **detect network scans**, as our guest WiFi isn't separated

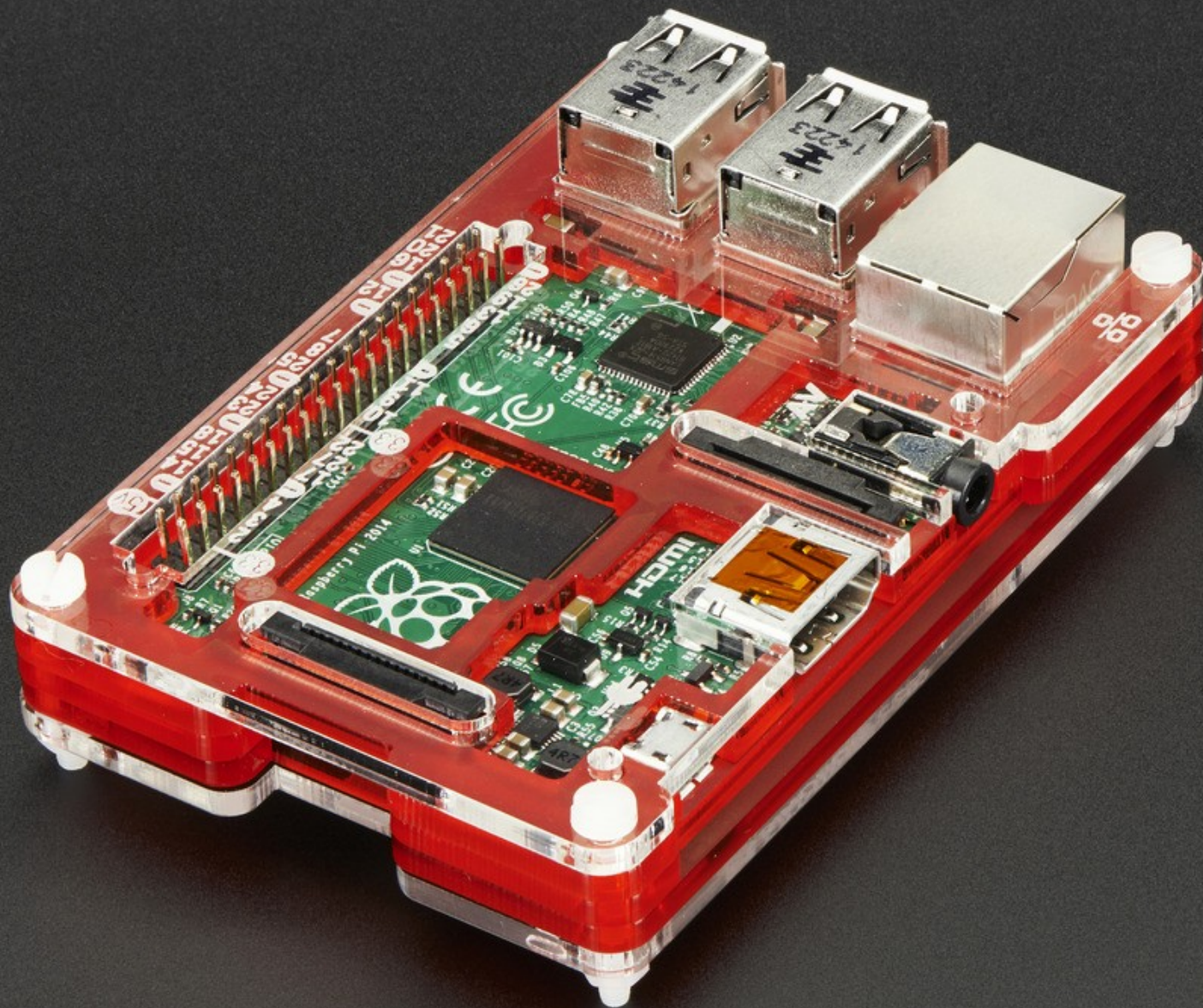
**DIONAEA HONEYPOT**



# HARDWARE

- \* cheap, affordable, yet fashionable Raspberry PI 2
  - \* 900MHz quad-core ARM Cortex-A7 CPU
  - \* 1GB RAM
  - \* 8GB SD card
  - \* WiFi dongle
- \* costs around €65 (inc. Sue's fee;)





# SOFTWARE

- \* **Raspbian**, optimized Debian for the Raspberry Pi
- \* **Dionaea**, low interaction, **malware detection** and **network reconnaissance** honeypot



# HOW DIONAEA WORKS?

- \* it listens on few ports and reports connections
- \* it waits for malware and pretends to be exploitable
- \* it will capture and store payload

# NETWORK SETUP

- \* wlan0, auto DHCP, connects on boot to Guest WiFi
- \* headless setup, plug in 5V and SSH into it 30s later
- \* current IP and MAC address are [REDACTED ;-]



# MORE DETAILS

\* **opened ports:** 21 (FTP), 22 (SSH), 42 (WINS), 69 (TFTP), 135 (RPC), 445 (SMB), 1433 (MSSQL), 3306 (MYSQL), 5060/5061 (SIP/VOIP)

\* **hostname:** **accounting-dev**

\* **detectability:** **spoof MAC address** to imitate DELL, **move SSH** to non-standard port, **attempt would trigger alert** anyway

**MANAGEMENT SERVER**

# MHN (Modern Honey Network)

- \* so if honeypots are so cool **why we don't use them?**
- \* they are **difficult to deploy and maintain**
- \* also often **log to files**



# MHN (Modern Honey Network)

- \* guys from **ThreatStream** developed **MHN**, open-source honeypot management server
- \* **automates deployment** process
- \* sets up **data flows** with hpfeeds
- \* **collects data** and correlates it with GeolP
- \* does **real time visualization** with honeymap

# SYSTEM SECURITY

- \* MHN is running on **t2.micro EC2 instance**
- \* **access to server is restricted** to office and home IPs
- \* **no extra services**, only necessary ports are opened
- \* **SSH keys everywhere**, self-signed SSL cert ;-]
- \* regular **updates are necessary**

**DEMO**

TODO

# TODO

- \* **migrate MHN** to proper server
- \* **integrate with Slack** or centralized logging
- \* persuade CTO to **buy 3 boards** ;-]

# TODO continued

- \* use OpenVPN for consistent IPs
- \* deploy more sensors, ex. Kippo, high interaction SSH honeypot
- \* script updates, (MHN rules, Diaonea package)

**GITHUB**

# GITHUB

\* [github.com/rep/dionaea](https://github.com/rep/dionaea)

\* [github.com/desaster/kippo](https://github.com/desaster/kippo)

\* [github.com/threatstream/mhn](https://github.com/threatstream/mhn)



**THE END**