Presenting P@cketR@quet:

An Auditory IDS/Network Auralizer

Introduction

- Killian Ditch – killianditch@gmail.com
  - @killianditch / github.com/KillianDitch
- Penetration Tester for Coalfire Systems, Inc.
- Toiled through 8 years of IT and software support: helpdesk, sysadmin, developer, fix-it-now-or-get-blamed, etc.
- Moved to an offensive security consulting role relatively recently.

Agenda

- ~~Introduction~~
- Briefing – What & Why?
- Current Solutions
- PR Introduction
- Code Overview?
- Q&A

What?

- Tool Debut
  - First shared tool/code
- Only a basic level of networking knowledge assumed
  - Create foundations via demonstrations
- Slides + Hands-on

Why?

Why?

- Cool idea

Why? (The Formal Version)

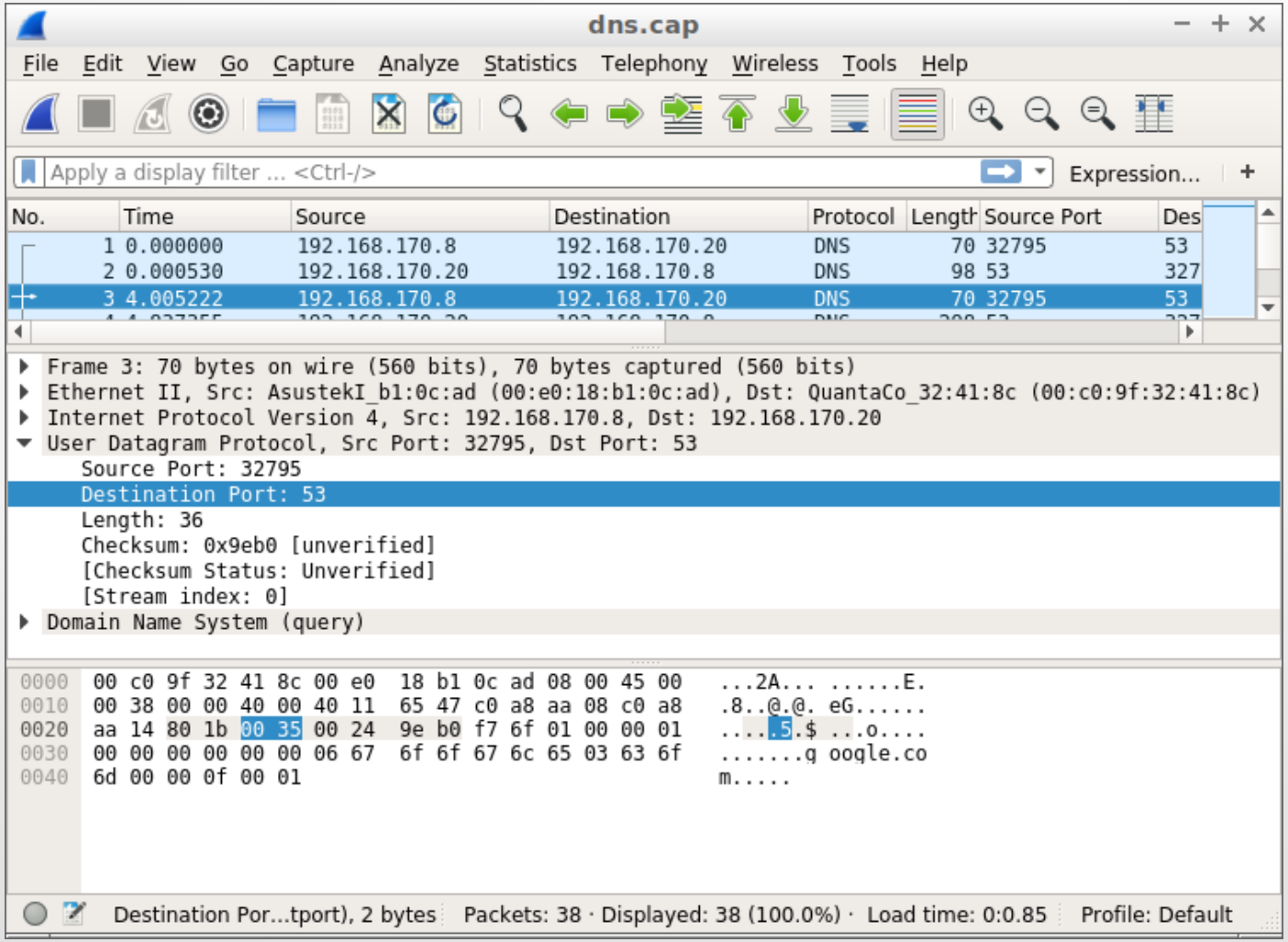
- Alternative means of network analysis
  - Wireshark & tcpdump
- Experience network traffic in a new way – via sound
- Expanded appeal?
- Accessibility

Standard Solutions – tcpdump

```
root@lUbuntu1:/home/kditch/pcaps# tcpdump -r dns.cap

reading from file dns.cap, link-type EN10MB (Ethernet)
02:47:46.496046 IP 192.168.170.8.32795 > 192.168.170.20.domain: 4146+ TXT? google.com. (28)
02:47:46.496576 IP 192.168.170.20.domain > 192.168.170.8.32795: 4146 1/0/0 TXT "v=spf1 ptr ?all" (56)
02:47:50.501268 IP 192.168.170.8.32795 > 192.168.170.20.domain: 63343+ MX? google.com. (28)
02:47:51.333401 IP 192.168.170.20.domain > 192.168.170.8.32795: 63343 6/0/6 MX smtp4.google.com. 40, MX smtp5.google.c
om. 10, MX smtp6.google.com. 10, MX smtp1.google.com. 10, MX smtp2.google.com. 10, MX smtp3.google.com. 40 (256)
02:47:59.313231 IP 192.168.170.8.32795 > 192.168.170.20.domain: 18849+ LOC? google.com. (28)
02:47:59.452255 IP 192.168.170.20.domain > 192.168.170.8.32795: 18849 0/0/0 (28)
02:48:07.320873 IP 192.168.170.8.32795 > 192.168.170.20.domain: 39867+ PTR? 104.9.192.66.in-addr.arpa. (43)
02:48:07.321379 IP 192.168.170.20.domain > 192.168.170.8.32795: 39867 1/0/0 PTR 66-192-9-104.gen.twtelecom.net. (87)
02:49:18.685951 IP 192.168.170.8.32795 > 192.168.170.20.domain: 30144+ A? www.netbsd.org. (32)
02:49:18.734862 IP 192.168.170.20.domain > 192.168.170.8.32795: 30144 1/0/0 A 204.152.190.12 (48)
02:49:35.461181 IP 192.168.170.8.32795 > 192.168.170.20.domain: 61652+ AAAA? www.netbsd.org. (32)
02:49:35.698849 IP 192.168.170.20.domain > 192.168.170.8.32795: 61652 1/0/0 AAAA 2001:4f8:4:7:2e0:81ff:fe52:9a6b (60)
02:50:35.523440 IP 192.168.170.8.32795 > 192.168.170.20.domain: 32569+ AAAA? www.netbsd.org. (32)
02:50:35.523827 IP 192.168.170.20.domain > 192.168.170.8.32795: 32569 1/0/0 AAAA 2001:4f8:4:7:2e0:81ff:fe52:9a6b (60)
02:50:44.735890 IP 192.168.170.8.32795 > 192.168.170.20.domain: 36275+ AAAA? www.google.com. (32)
02:50:44.752428 IP 192.168.170.20.domain > 192.168.170.8.32795: 36275 1/0/0 CNAME www.l.google.com. (52)
02:50:54.349862 IP 192.168.170.8.32795 > 192.168.170.20.domain: 56482+ AAAA? www.l.google.com. (34)
02:50:54.366527 IP 192.168.170.20.domain > 192.168.170.8.32795: 56482 0/0/0 (34)
02:51:35.204348 IP 192.168.170.8.32795 > 192.168.170.20.domain: 48159+ AAAA? www.example.com. (33)
02:51:35.437491 IP 192.168.170.20.domain > 192.168.170.8.32795: 48159 0/0/0 (33)
```

Standard Solutions – Wireshark



P@cketR@quet

- TLDR: Nifty Python tool to play music corresponding to network traffic that contains the potential for an accessibility function for the visually-impaired.
- Name: the tool redirects packets from their digital form to audio; a tennis racket for packets.

Theory

- Provide insight into normal and aberrant traffic patterns by creating a sound-based representation of network traffic.
- Establish a baseline sound profile for normal traffic, thereby causing oddities such as ICMP, ARP, or UDP/TCP port scans to stand out.

Purpose

- Anyone interested in keeping track of the network, whether an analyst or tester, can listen to the sounds of the packets instead of scrolling through Wireshark or tcpdump output.
- Monitor service responses.
- Aberrant floods.

Accessibility

- Visually-impaired individuals could be trained in the notes and corresponding packets and then be empowered to conduct hitherto inaccessible network analysis.

Example

- If a port scan was observed by the monitoring interface, those packets would correspond to different sounds, thereby yielding an aural experience matching that traffic pattern.

Prove It!

- basic_r@quet.py
  - Basic, all-in-one script with standard dependencies only
    - Currently missing pcap reading feature
- p@cketr@quet.py
  - Scapy!
  - Sound options

Known Issues/Future Plans

- Rewrite in Python3
- Implement pcap functionality in basic_r@quet
- Expand protocol coverage
- Tune catalog

Known Issues/Future Plans

- Attacking/Defending flag
- Performance/Scaling

Recap

- P@quetR@quet will not do away with Wireshark and tcpdump or their like.
- It may serve as a companion tool.
- Most importantly, it’s fun.

Questions/Comments/Discussion?