OSY.SSI[2015][7]

Internet, Lab 1

Brace yourselves

You should all have received an e-mail.
If not, please install things as we go on.
If you can't please look on your neighbours.

Programme

- Packet interception, analysis, forge
- TCP scan, SYN/ACK prediction, ARP attacks
- Network mapping and port scanning
- Fingerprinting
- DNS attacks: Amplification and cache snooping
- (Wifi attacks)
- (Tor)
- (Zombie)

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Eavesdropping and packet analysis

We're gonna use something invented by this smiling guy.

Wireshark – Eavesdropping and packet analysis

by Gerald Combs, Riverbed technologies

Task:

- Launch `Wireshark`.
- Open `capture.cap` and analyse it (Demo)
- You can even capture packets if you want.

You can also capture Bluetooth, USB, ...

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Crafting packets

We're gonna use something invented by this Jesus guy (Defcon 10).

Scapy

by Philippe Biondi, EADS

Task: as `root` (why root?)

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```
a=Ether()/IP(dst="www.ecp.fr")/TCP()/"GET /index.html HTTP/1.0 \n\n"
a
hexdump(a)
```

Scapy

Crafting packets

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Scapy

Crafting packets

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Scapy

Crafting packets

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Question:

Scapy

Forging packets

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Question: how do you test that it works?

Scapy

Cartography

Task:

Scapy

Cartography

Task: Traceroute to a certain website:

Scapy

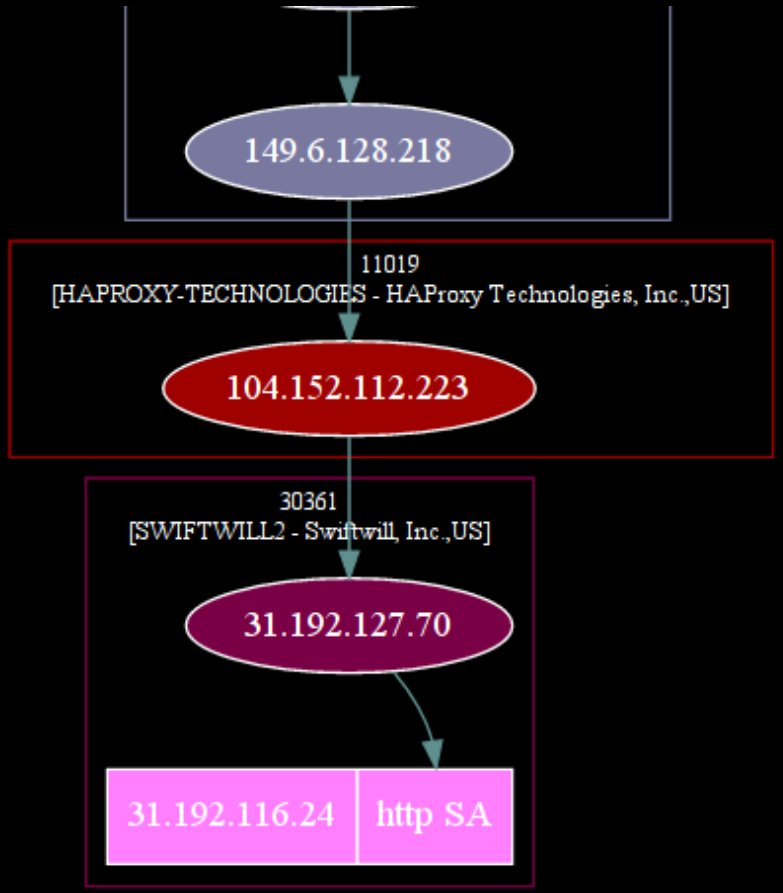
Cartography

Task: Traceroute to a certain website:

```
res, _ = traceroute("www.ecp.xxx",
                    dport=80,
                    maxttl=20,
                    retry=2)
res.graph(target="> graph.svg")
```

Scapy

Cartography



Ad:

Scapy

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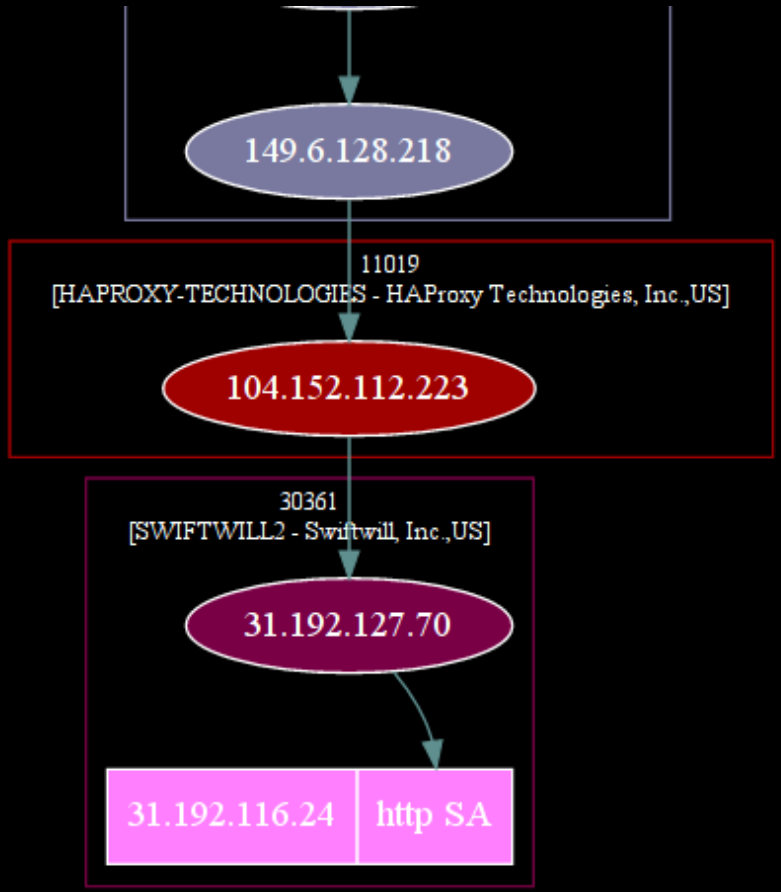

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Scapy

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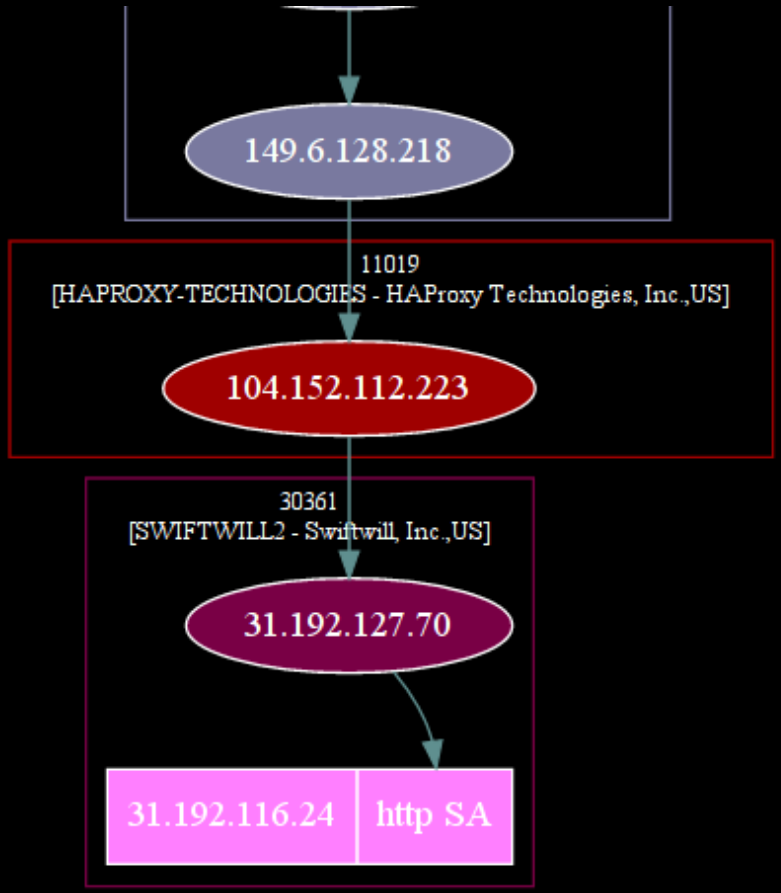


Ad: `scapy` is simple, powerful and extensible. `import scapy`.

Mapping, scanning, fingerprinting

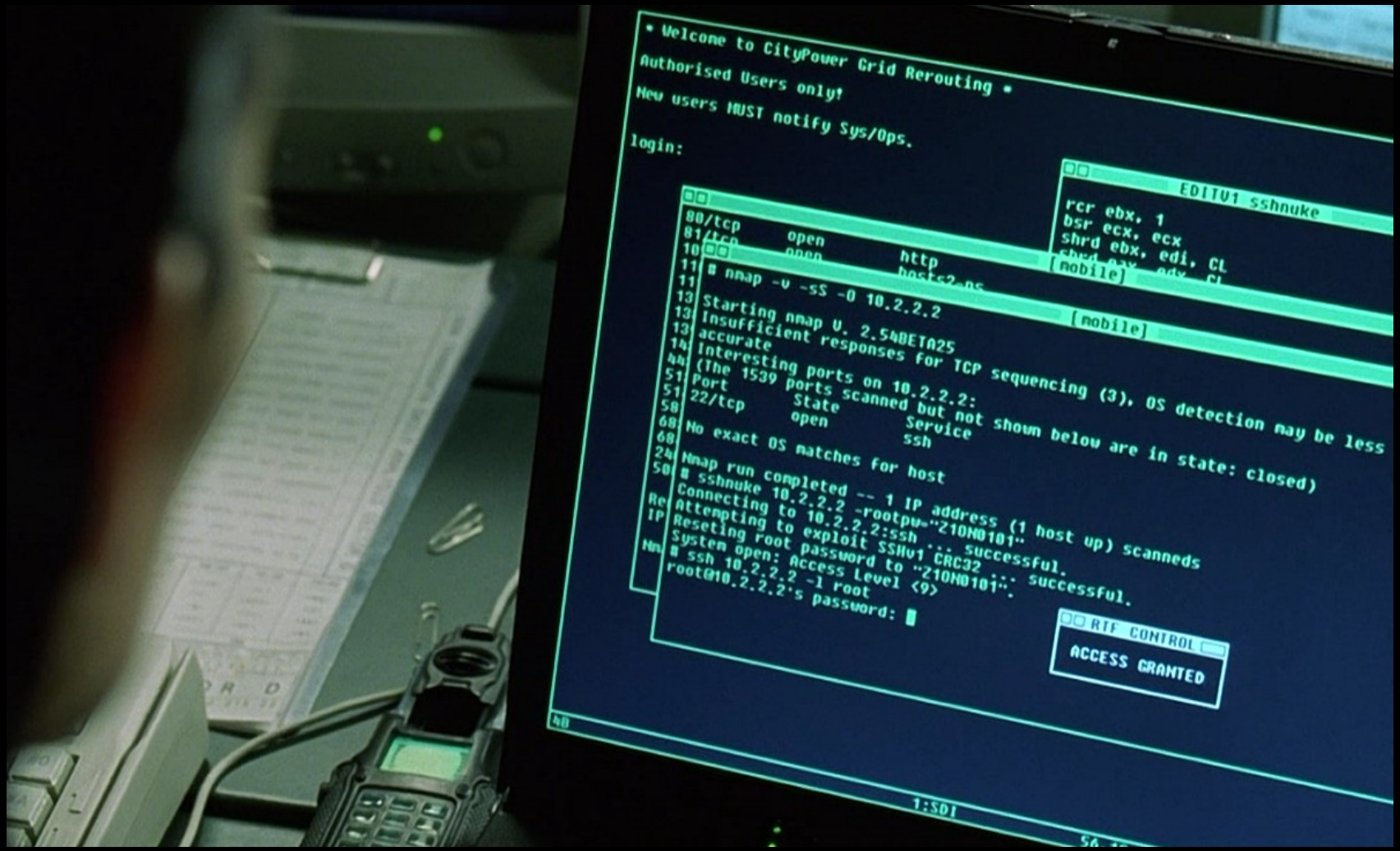
Now we're relying on this classy young lad's toys.

nmap

by Gordon “Fyodor” Lyon, Insecure.com LLC

One of the best tools of the trade, and the most famous.

- Host discovery (ping, `P`)
- Port discovery (scan, `s`)
- Service/OS discovery (fingerprinting)
- Vulnerability discovery (scripts, `v`)


• Welcome to CityPower Grid Rerouting •
Authorised Users only!
New users MUST notify Sys/Ops.
login:
EDITV1 sshnuke
rcr ebx, 1
bsr ecx, ecx
shrd ebx, edi, CL
[mobile]
80/tcp open http
81/tcp open
nmap -v -sS -O 10.2.2.2
Starting nmap V. 2.54BETA25
Insufficient responses for TCP sequencing (3), OS detection may be less accurate
Interesting ports on 10.2.2.2:
(The 1539 ports scanned but not shown below are in state: closed)
Port State Service
22/tcp open ssh
No exact OS matches for host
Nmap run completed -- 1 IP address (1 host up) scanneds
sshnuke 10.2.2.2 -rootpw="Z1ON0101"
Connecting to 10.2.2.2:ssh ... successful.
Attempting to exploit SSHv1 CRC32 ... successful.
Reseting root password to "Z1ON0101".
System open: Access Level <9>
ssh 10.2.2.2 -l root
root@10.2.2.2's password:
RIF CONTROL
ACCESS GRANTED
1:SDI

Mapping, scanning, fingerprinting

Host discovery

- Scan the /24
- Try different ping options PS, PA, PE, PP, PM, PR, PN, sP

Mapping, scanning, fingerprinting

Port and service scanning

- Scan your own ports
- Try different scanning options sA, sW, sF, sX, sM, sU, sY, sZ, sT, sO

Mapping, scanning, fingerprinting

Traceroute and mapping

nmap was originally designed to ease with network mapping.

- You can use `-traceroute`

Mapping, scanning, fingerprinting

Fingerprinting

- `-O -v <IP>`: OS fingerprinting
- `-sV -sCV -v <IP>`: Service fingerprinting

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Amplification attacks

A la mano

Task:

- DNS query `dig ANY isc.org @8.8.8.8`
- Intercept and analyse the packet
- Forge (i.e. with scapy) a DNS query with a fake source IP.
- Test it with one of your friends :)

You can use nmap to find candidate DNS servers, see `https://svn.nmap.org/nmap/scripts/dns-recursion.nse`

Snooping attacks

Using nmap scripts

DNS cache snooping is seomtimes useful, see
`https://svn.nmap.org/nmap/scripts/dns-cache-snoop.nse`