mancalanetworks

making networks manageable

Networkshop 2011

2011-04-12

Introduction

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What we do now

- Why it doesn't work
- It really doesn't work
- Use-cases

What we can do about it

- Integration
- Use all of the information at our disposal
- Enforce network security, don't detect it.

How many systems do we need?

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Networks are complicated

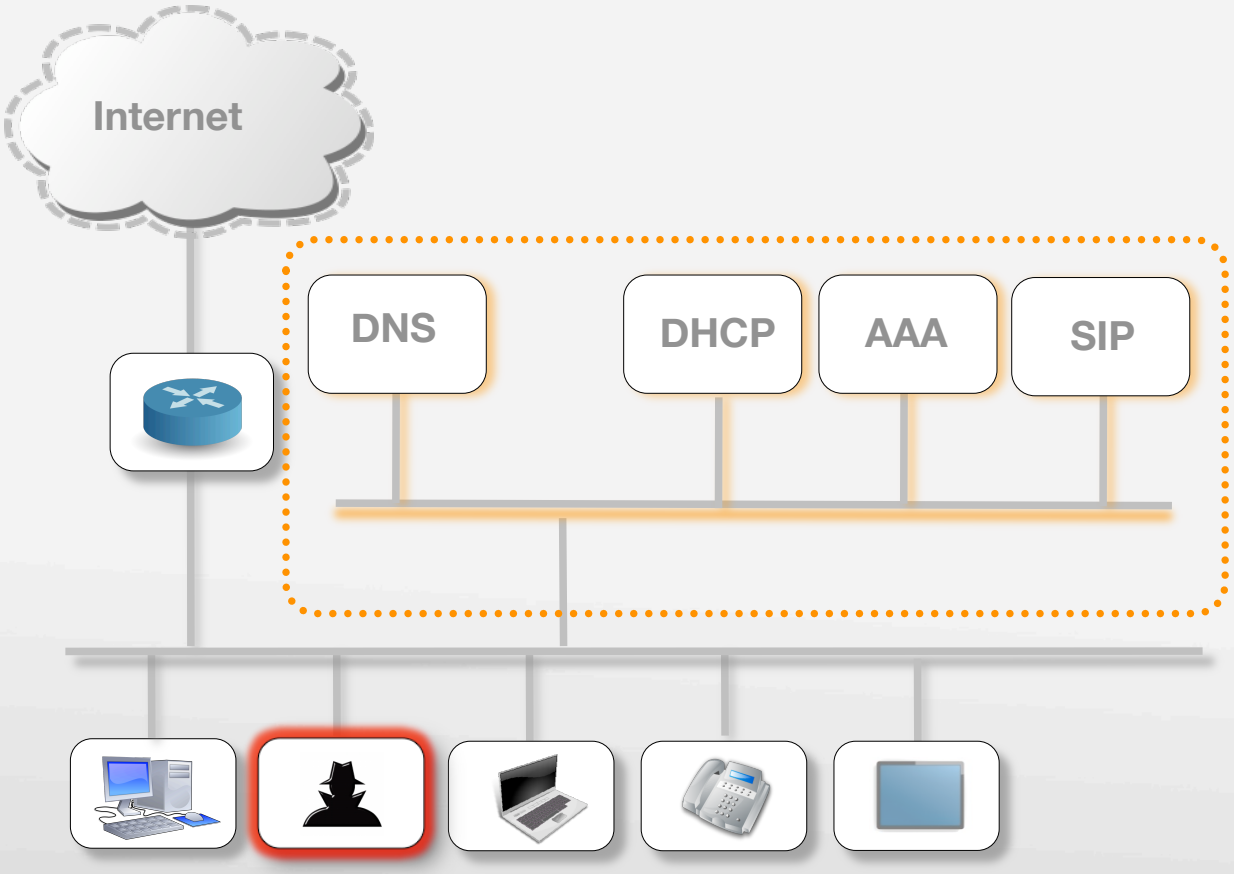
1 RADIUS for authentication

1 DHCP for addresses

1 DNS for name resolution

1 TFTP for VoIP phone booting

1 SIP for voice



They all manage the same users and devices

It gets worse

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Branch offices

Mobile workers

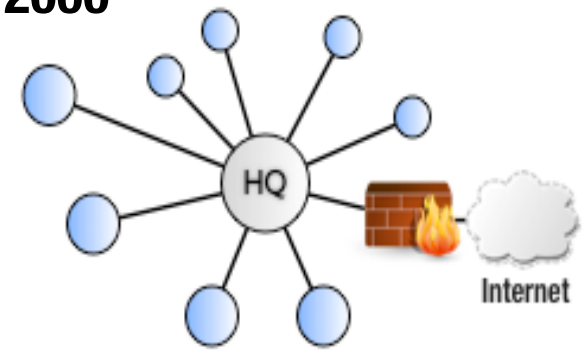
Devices

Threats

Regulation

Networks are more complicated than ever

2000



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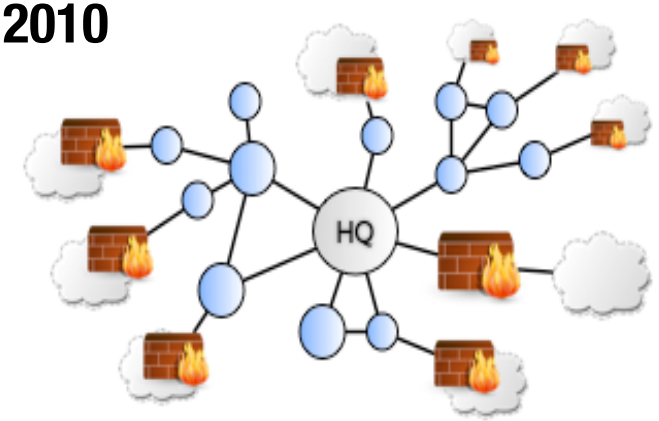

Attacks are more sophisticated

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Branch offices

Mobile workers

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Threats

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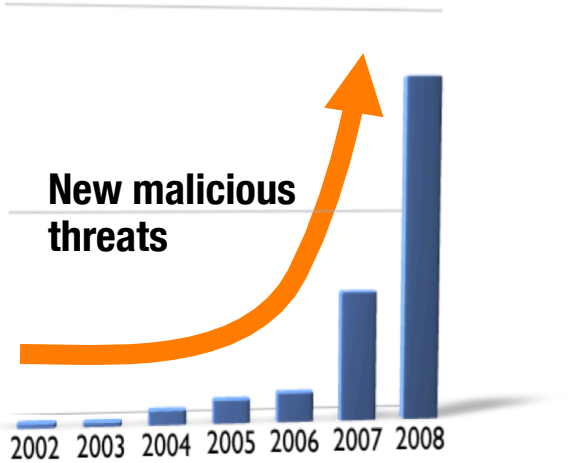
Emerging threats



Number 1 driver for investing in security solutions is
to stop threats from propagating

(Infonetics Research, 2009)

What can we do?

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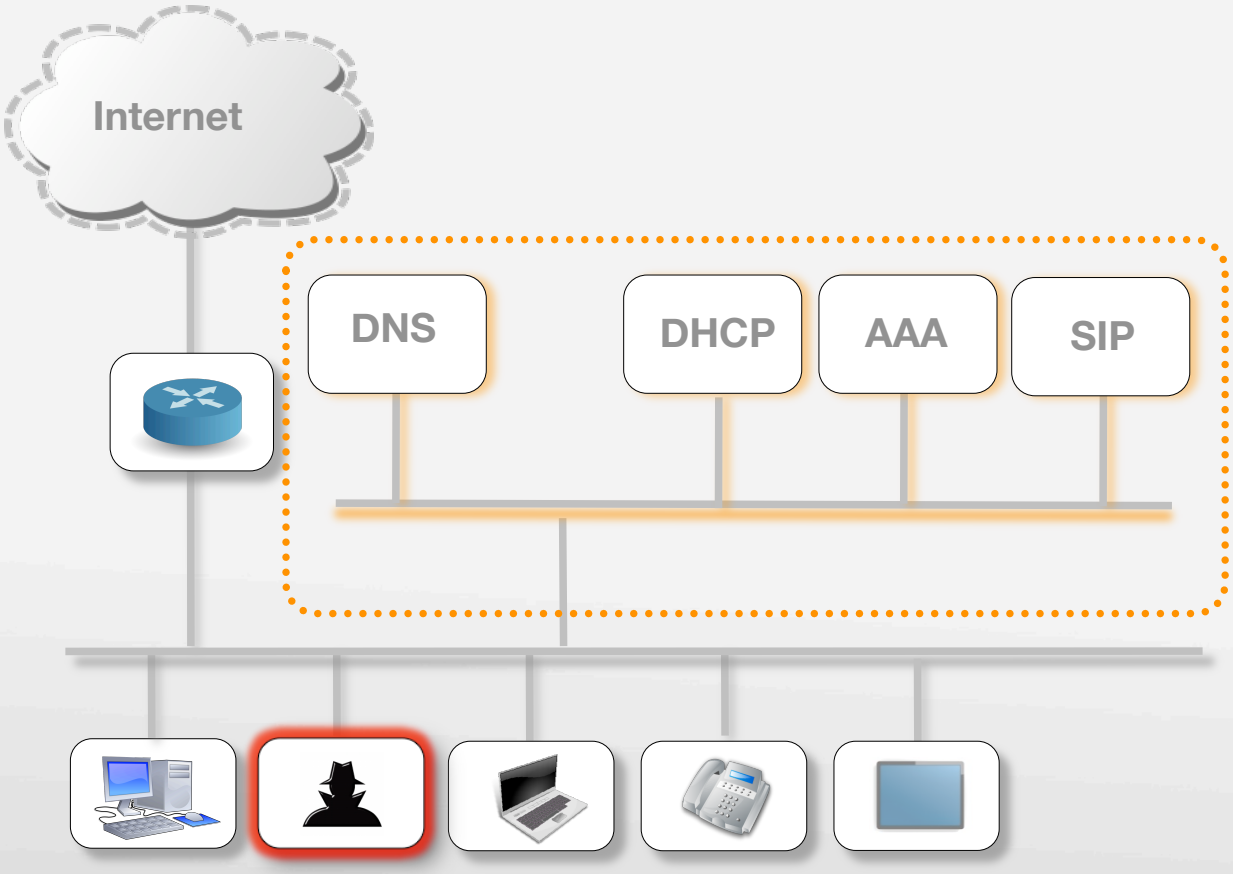
Administration is complicated

1 Different vendors

1 Different protocols

1 Different databases

1 Different administration interfaces



A unified response is a consistent response

Integrated network management

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What we can do

- Extending the security boundary of the LAN to the network edge
- Unifying authentication, location, identity, permissions
- Enabling critical security concepts such as identity, location, and device security posture to be introduced to network management

But…

What about mobile users connecting to authenticated networks?

What about non-authenticating devices like printers, product scanners…?

What about the trend toward the “consumerization” of IT devices?

What if I use PXE Boot or Windows deployment services to provision my devices?

The catch : it all becomes harder to manage and secure

… unless you integrate your systems

Use case: Device Profiling

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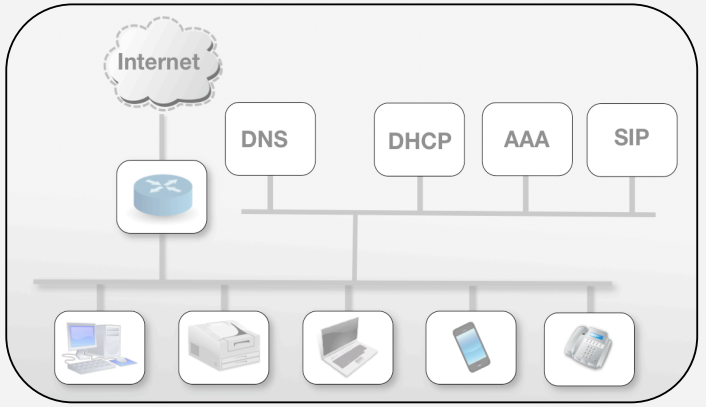
Configured state:

- 802.1X plus MAC auth for 802.1X incapable devices

Observed view:

- Use DHCP + NMAP, etc. to create profile



Enforcement Mode:

- Leverage RADIUS, DHCP, VMPS, etc. for enforcment
- Detect MAC spoofing by comparing current data to historical data

Use Case: Is it a printer?

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How do you know?

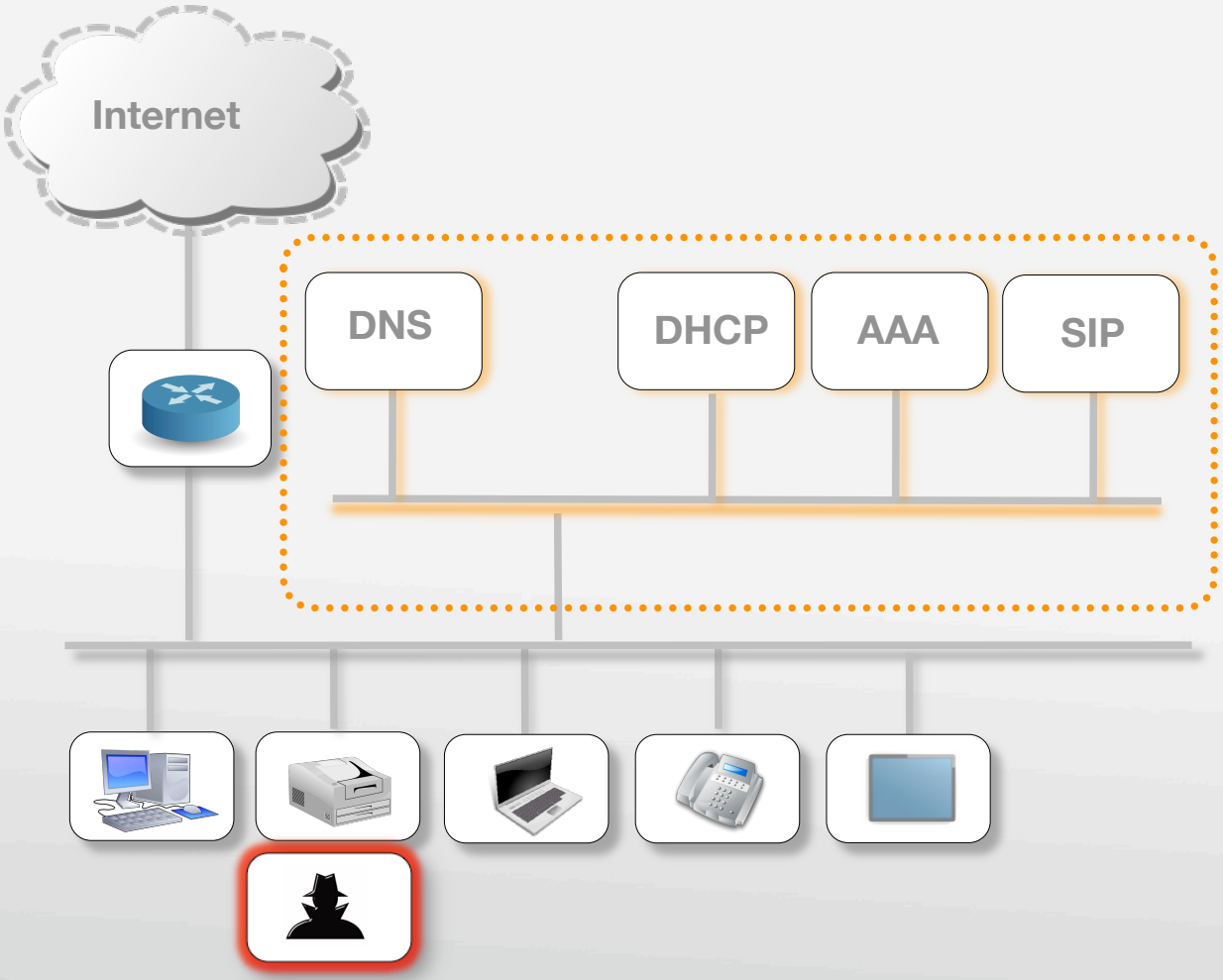
1. It looks like a printer
1. It does printer type things
1. It doesn't do non-printer type things

RADIUS MAC Auth

DHCP fingerprinting

NMAP

Other techniques



A comprehensive device profile fits in a DB

Use Case: VoIP Phones

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Why is the phone outside?

1 Phones have a location

1 Enforce it in RADIUS

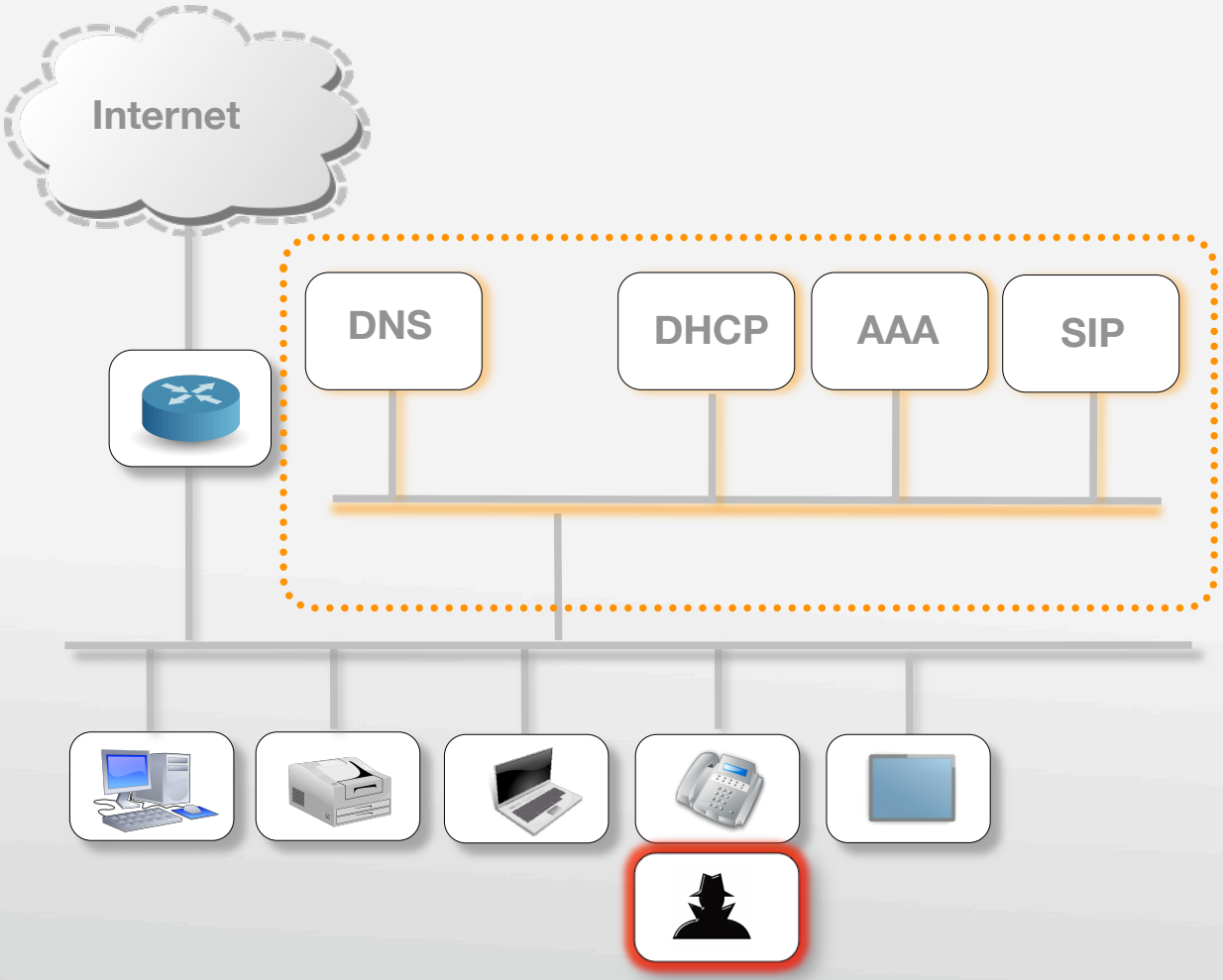
1 SIP Server gains security !

MAC + Switch IP/Port

Device type

User account

All done in RADIUS



A device profile allows enforcement

Similar projects

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Packet Fence

- Already does some DHCP
- Some FreeRADIUS Integration
- Missing VMPS

OSSIM

- Inventory isn't good enough
- Enforcement is required, too

What you need to do

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Integrate everything

- Use a database to store all information about the network
- Look up that information for every networking protocol
- Do cross-correlations
- Look for inconsistencies

If you don't do it, the attackers will

- DNS “private IP attacks”
- Stealing VoIP phones
- Inconsistency means a higher attack profile

What we're doing about it

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Releasing code

- Much better DHCP integration into FreeRADIUS
- Postgresql only for now
- Scripts to convert ISCP DHCP configurations to FreeRADIUS / SQL

Developing new code

- ARP plugins (why not?)
- Starting to work more closely with PacketFence
- More CoA and SNMP work
- “kick user offline” becomes protocol independent

And more

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Doing it all

- TFTP, ARP, SNMP, DHCP, DNS, RADIUS, HTTP(S, VMPS, TACACS+
  - No Diameter!
- Captive portal, VLAN
- Integrated network debugging
- Global policy enforcment
- SQL, LDAP intregration
- Active Directory
- FreeRADIUS + Web UI + SQL integration

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Questions ?