Investigator of Interest –
Our Philosophy of Adaptive Incident Response

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Topic:

- Why Adaptive Incident response
- What is Adaptive Incident Response
- Defining your investigation strategy
- Tips and Tricks

The spying program

They know everything

- Your mail server is being tapped!
- They have access to your chat server!
- They are listening on your system!

Nothing to see here move along

- A lot of communication before the investigation
- Attacker can easily monitor this with an automated system
- He knows the indicators you are looking for and use these as keywords for spying on you

Adaptive Incident Response

Adaptive Incident Response

- Cyber threat landscape
- Incident information
- Attacker profile
- Business impact

Running scared

- Keep the investigation noise down
- The attacker will not run at first sight of an investigation
- Advanced attackers are in your network for the long run
- He has to maintain a lot of systems to.
- The investigator and attacker have a information gap, speculation is needed.

Adaptive IR defining your investigation strategy

Scoping

- Fact finding
  - Investigation motivation
  - Investigation leads

Scoping

- Attacker profiling
  - – Analyze all the facts/ information
  - – Make hypotheses
- Which is the more likely hypothesis
  - – Bored kid or Espionage
  - – Could it be an activist/ hacktivist

Scoping

- Threat landscape
  - Who are your enemies
  - What can they get (Crown-Jewels)
  - External exposure

Investigation questions

- What happened
- Is it targeted
- What has been stolen
- Who did it
- How return to business-as-usual (fast)

Business-as-usual considerations

- Management Doesn’t want to hear anything about BAU not being top priority
- With BAU being highest priority they don’t see the full extend of the breach, what information the attacker has, in what stage the attacker is.
- At the end the business cannot give a complete picture to the stake-holders

Business-as-usual considerations

(Short term) Reasons not going back to BAU:

- (Better) Attacker profiling
- What is the attacker searching for
- What does the attacker know
- In what stage of the attack are they
- Targeted or not

Business-as-usual considerations

(Long term) Reasons not going back to BAU:

- Better remediation
- More lessons learned
- Better defenses for possible upcoming breaches

Determining the strategy

- Combine the gathered information
  - Investigation facts
  - Attacker profile
  - Hypotheses
  - Threat landscape
  - Business impact

Intrusive VS Non-Intrusive investigation

- Intrusive advantages:
  - Faster
  - Smaller group has to know details

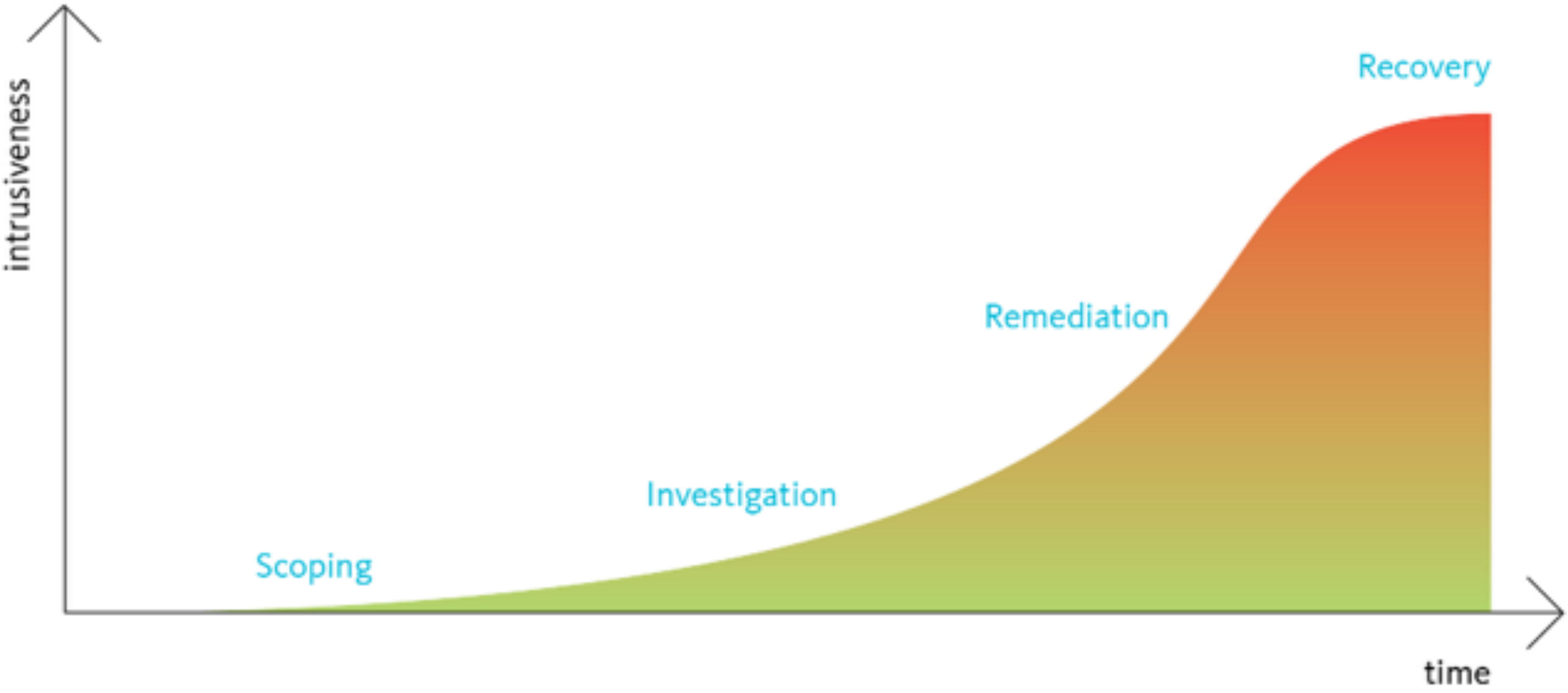
- Intrusive disadvantages:
  - Attacker can easily detect the investigation

Intrusive VS Non-Intrusive investigation

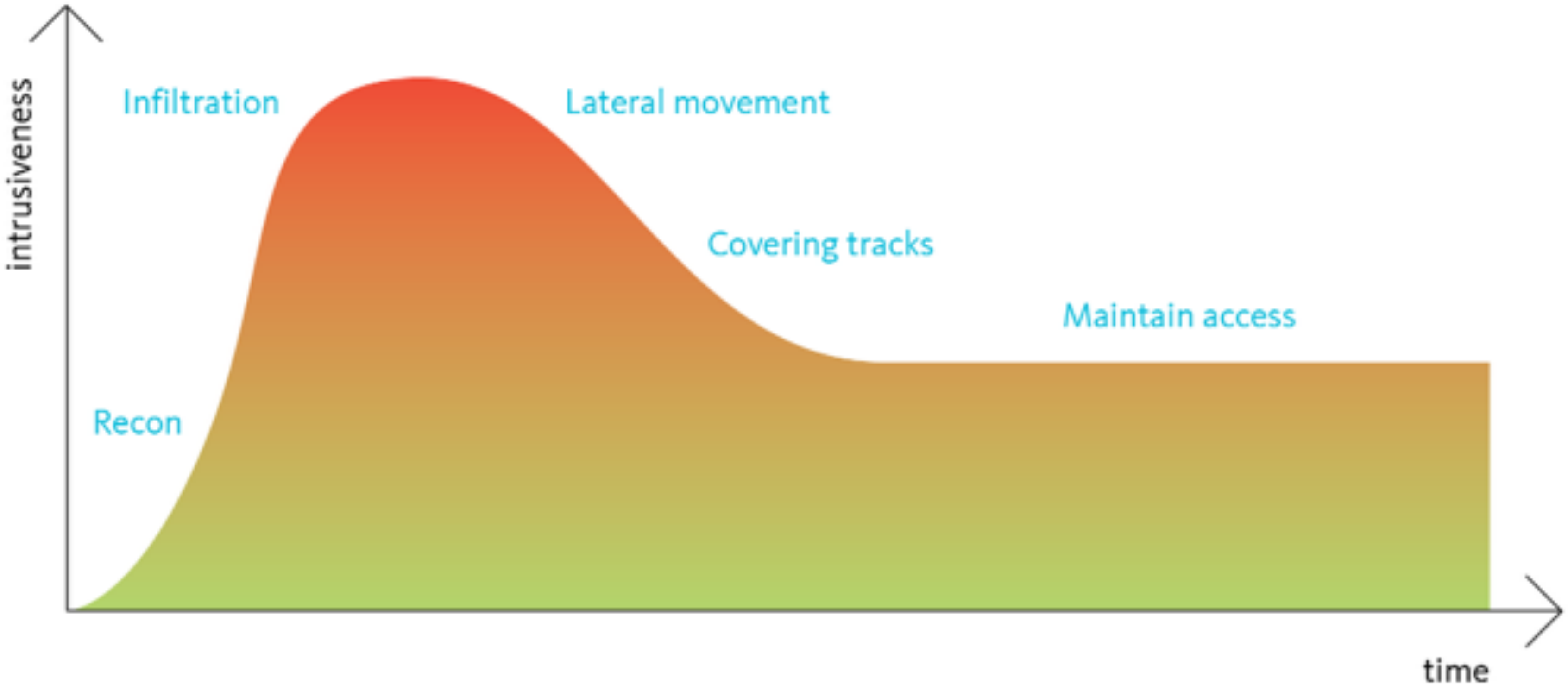
- Non-intrusive advantages:
  - Monitor the attacker
  - Better remediation
  - More lessons learned/ better prepared next time.

- Non-intrusive disadvantages:
  - Slower
  - More employees need to know details

Noise level Non-intrusive investigation



Noise level (typical) breach



Turn the table

Out-Of-Band communication

- Don’t use production communication channels
- Use separate investigation machines
- Use a back-up internet line?
- Use a an out of band document exchange portal

Hide the noise

- The idea is to make as little noise as possible during the investigation, hide in normal day-to-day routines.
  - Use out-of-band sources
  - Use admin tools
  - Use maintenance windows
  - Pull disks (RAID setup?)
  - Use passive network monitoring

Network investigation

High noise

- Software on the host

Medium noise

- TAP/HUB

Low noise

- Switch SPAN

Host acquisition

High noise

- Live acquisition
- Installing agents
- Running scripts

Medium noise

- Offline acquisition
- Using installed agent

Low noise

- Pulling disks (RAID1)
- Make VM snapshots
- Getting information out of backups
- Using maintenance window

Host investigation

High noise

- Live investigation

Medium noise

- Using installed agent
- Retire a system (for live investigation)

Low noise

- Offline investigation

Malware investigation

High noise

- Online research
- Dynamic analysis w. Internet

Low noise

- Static analysis
- Dynamic analysis no internet

Log investigation

High noise

- Live log investigation
- Collect logs through scripting/agents

Low noise

- Pre installed central log collector

Readiness

- Have a data acquisition plan
- Have a central log collector
- Have the backup schema
- Have a SPAN-port available on switches
- Know your Threat landscape
- Talk with the MT about investigation strategies
- Have out-of-band communication channels

If you want to stay off your attackers radar, hide!!

And make the attacker become the defender

Questions?

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