DFIR -

Digital Forensics & Incident Response

TEMS SECURITY SERVICES

Work smarter
Not harder

whoami

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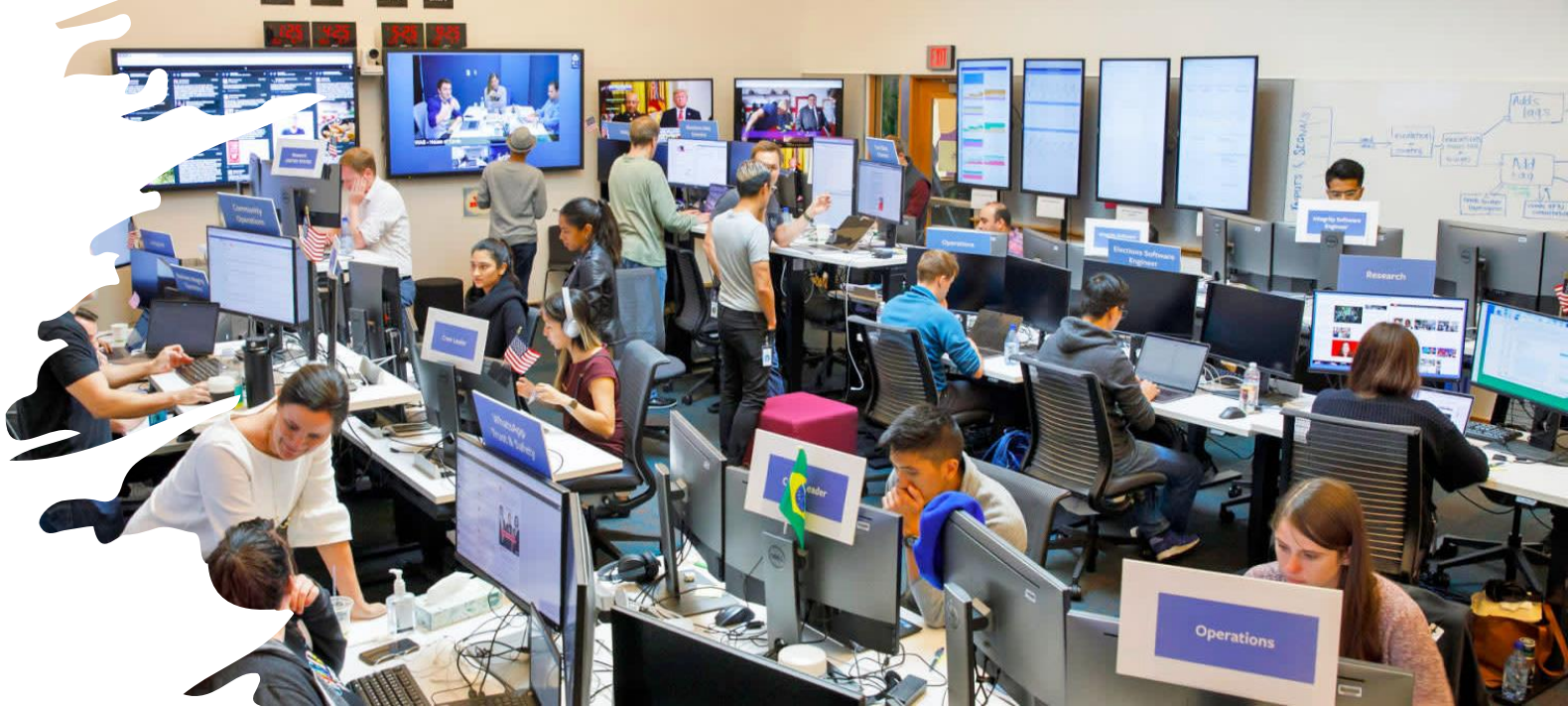
My comparison in Incident Response



Before and during IR

- **Before:**
  - Documentation (network, segments, server list, software list).
  - SIEM (would be helpful)
- **During IR:**
  - Keep calm
  - Get an overview
  - Disconnect Internet
  - Isolate IT Systems as best as possible
  - AD Check (Do I still have access?)
  - Storage check (Do I still have access and am I missing disks?)
  - Virtualization (Do I still have access and am I missing servers?)

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Standards for IR

NIST Incident Response Steps

Step #1: Preparation

Step #2: Detection and Analysis

Step #3: Containment, Eradication and Recovery

Step #4: Post-Incident Activity

SANS Incident Response Steps

Step #1: Preparation

Step #2: Identification

Step #3: Containment

Step #4: Eradication

Step #5: Recovery

Step #6: Lessons Learned

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From the field

- **Stay calm and professional**
  (Job is done in case of IR by the Hacker Team. Mostly the Hacker is already disconnected)
- **Designated document writer**
  - Collect and record all events, track activities
- **Define communication channel to the IR Team**
  (phone, messages, documents)
- **Define IR Leader**
  - Shutdown Remote Access
  - Check Backup System Status
  - Check File Server Status
  - Check ERP System Status
  - Check AV-Server Status
  - Export AD with last password changes
- **At least two IR-Teams**
  - Team 1: Check if the hacker is still in the network and collect IOC`s, preserve evidence, find the initial vector
  - Team 2: Check and document damage, check running systems, check backup
- **Big questions to discuss with IT-Team and IR-Team:**
  - Should AD be reinstalled from scratch?
  - How long was the hacker in the system/network?
  - What was the initial vector?
  - Communication with the MGMT

IOC *= indicator of compromise ,* ***ERP*** *= Enterprise resource planning,* ***AD*** *= Active Directory,* ***AV*** *= Anti Virus*

From the field

- **Everyone from the IR should have reading access to at least the following IOC at any time and (IR - Message of the Day):**
    - Affected systems *(confirmed)*
    - Files of Interest *(confirmed)*
    - Accessed and taken data *(confirmed)*
    - Significant attacker activities *(confirmed)*
    - Verified and proven IOC *(confirmed)*
    - Compromised accounts *(confirmed)*
    - *Lateral movement map (confirmed)*

From the field

- **Use interrogative words as inspiration:**

  - **When?**: first compromise, first data loss, access to x data, access to y system, *etc.*
  - **What?**: impact, vector, root cause, motivation, tools/exploits used, accounts/systems compromised, data targeted/lost, infrastructure, IOCs, *etc.*
  - **Where?**: attacker location, affected business units, infrastructure, *etc.*
  - **How?**: compromise (exploit), persistence, access, exfiltration, lateral movement, *etc.*
  - **Why?**: targeted, timing, access x data, access y system, *etc.*
  - **Who?**: attacker, affected users, affected customers, *etc.*

From the field

Useful artifacts

Running Processes	Running Services	Executable Hashes	Installed Applications	Local and Domain Users	Listening Ports and Associated Services
Domain Name System (DNS) Resolution Settings and Static Routes	Established and Recent Network Connections	Run Key and other AutoRun Persistence	Scheduled tasks and cron jobs	Artifacts of past execution (e.g., Prefetch and Shimcache)	Event logs
Group policy and WMI artifacts	Anti-Virus detections	Binaries in temporary storage locations	Remote access credentials	Network connection telemetry (e.g., netflow, firewall permits)	DNS traffic and activity
Remote access activity including Remote Desktop Protocol (RDP, SSH)	virtual private network (VPN)	virtual network computing (VNC) and other remote access tools	Uniform Resource Identifier (URI) strings, and proxy enforcement actions	Web Traffic (HTTP/HTTPS)	User agent strings

Set of Tools for IR

https://Any.run

https://Virustotal.com

Memory Dump

X-Ways

https://hybrid-analysis.com

CYLR

EvtxECmd.exe

Security Onion

Cuckoo

Notepad++

dtSerach

Excel

https://otx.alienvault.com

Wireshark

WinWord

NetFlow

volatility

https://gchq.github.io/CyberChef/

Elastic Stack

NUIX

EnCase

p0f

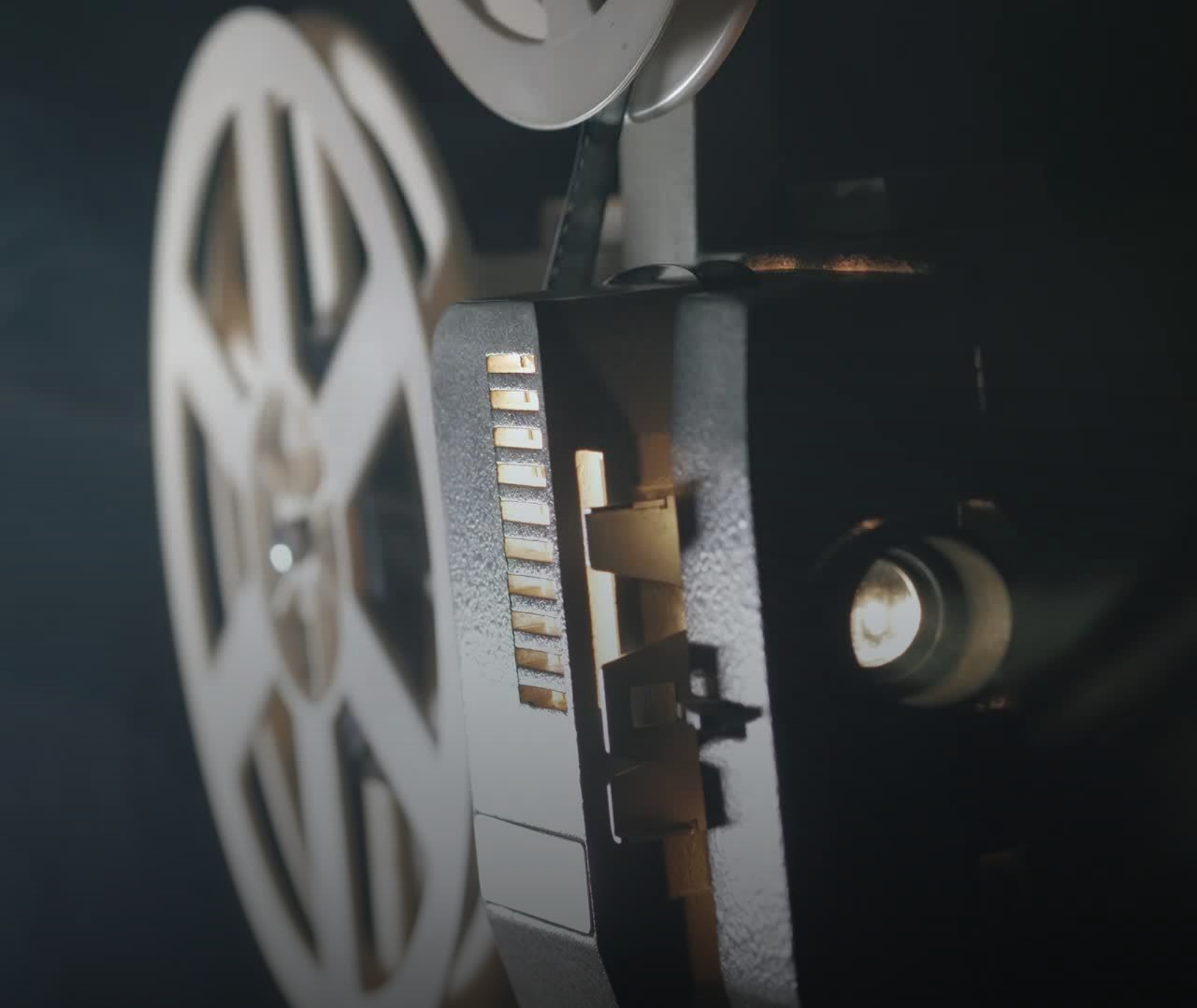
Axiom (IEF)

Regripper

Internet resource

HINT: Keep it simple and use only tools which you have known before

Commercial Software



From an investigation in Summer 2022 I found on a victim´s machine the following script

Hacker-Script.txt

How to make it harder for the attacker

State of the art administration

Protect Backup Solution

Proper Client Patch Management

Recurring change of service accoun password

Past Incidents

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Cases

- Big Austrian Company > 5000 Employees — **7 out of 12**
- Big Austrian Company > 1000 Employees — **5 out of 12**
- Small Company 50 – 100 Employees — **4 out of 12**
- Small Company < 20 Employees — **4 out of 12**

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Rules of the game

- The hacker needs **only one vulnerability or misconfiguration** and the hacker has access to a company network.
- A company can catch the hacker **only through command or lateral movement** within the network, and we are able to detect the hacker.

Training and knowledge are the key factor for success

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Know your limit

Work smarter
Not harder

Source: Internet

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