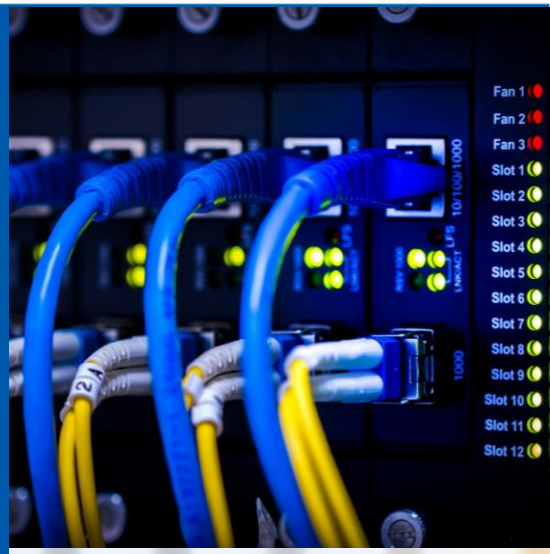
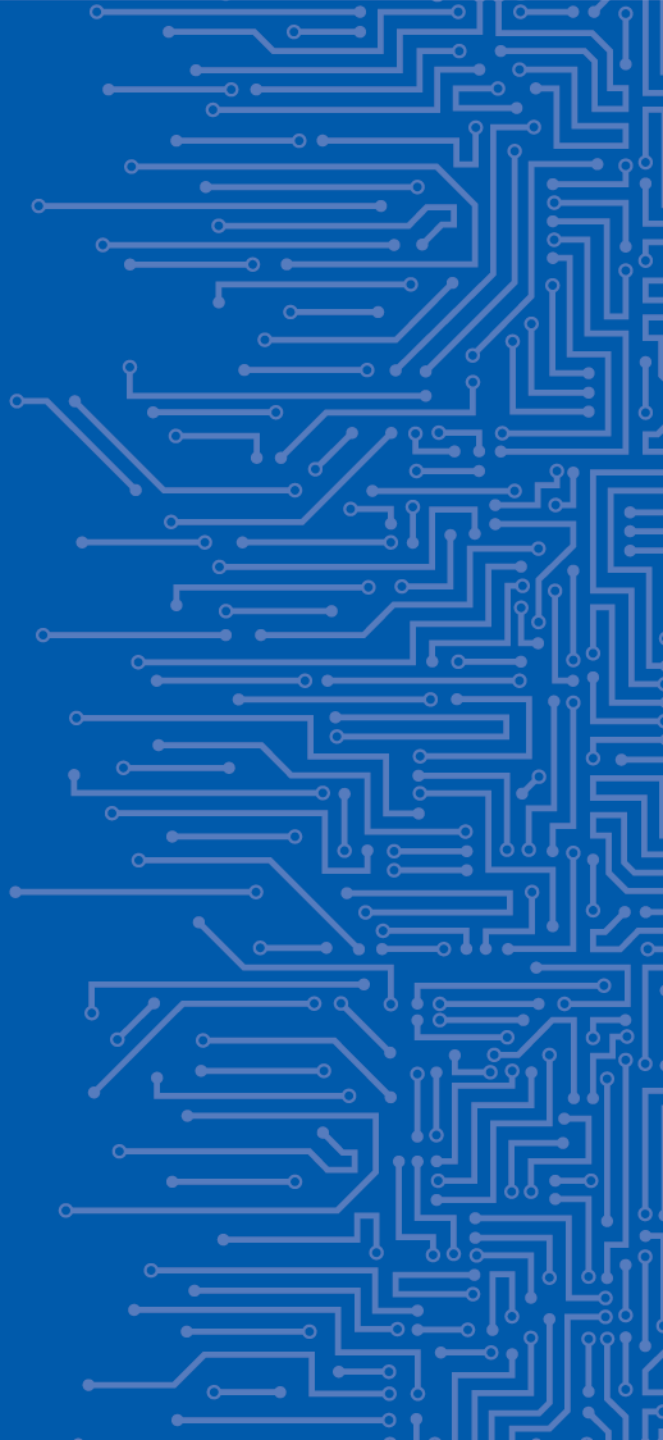
EUROPEAN UNION AGENCY
FOR CYBERSECURITY

CYBER EXERCISE (ANALYSING AN ATTACK RELATED TO A SPECIFIC THREAT)



09 | 10 | 2024

INTRODUCTION TO INCIDENT HANDLING



INCIDENT HANDLING DEFINITIONS

A security **incident** encompasses a range of **events** that may indicate a threat to an organization's security.
A security **alert** is derived from security events that are logged by the systems in an organization.

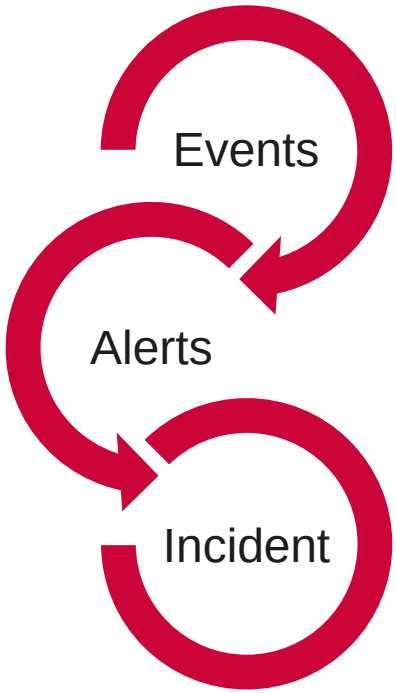
Security Event: Any log message related to security, such as authentication logs, firewall logs, etc.
Security Alert: One or more events flagged by the SIEM solution as possibly suspicious. These can be either true positives or false positives.
Security Incident: A security alert that has been validated as a genuine **threat**.

It's important to differentiate between a security incident and a **security breach**.
A **security breach** is a type of security incident that specifically involves verified unauthorized access or exploitation, impacting the confidentiality, integrity, or availability of systems, services, networks, or data. While breaches often involve data compromise, they can also encompass other forms of security compromise, such as the unauthorized usage of systems, the installation of malware, or the disruption of operational services.

INCIDENT HANDLING

Events. Alerts. Incidents. Precursors. Indicators.

- An **event** is any observable happening
  - Each log entry is an event
- **Alerts** are events which match a specific condition
- **Incidents** are violations or an imminent threat of violation of security policies



- **Indicators**
  - An incident may have occurred or is occurring.
- **Precursor**
  - An incident may occur in the future, for example a vulnerability disclosure

MANAGING INCIDENT RESPONSE

MANAGING INCIDENT RESPONSE

Planning and Preparation	Detection and Reporting	Assessment and Decision	Responses	Lessons Learned
Development and documentation of strategic IR policies	Monitor	When did the event happen?	Containment	Create an Incident Report
Establish communication guidelines	Detect	How was it discovered?	Eradication	Post-Incident monitoring
Incorporate threat intelligence feeds	Alert	Have any other areas been impacted?	Recovery	Identify preventative measures
Perform threat hunting exercises	Report	What is the scope of the compromise?		
Backups		Has the point of entry been discovered?		

DETECTING AN INCIDENT

Security Alerts

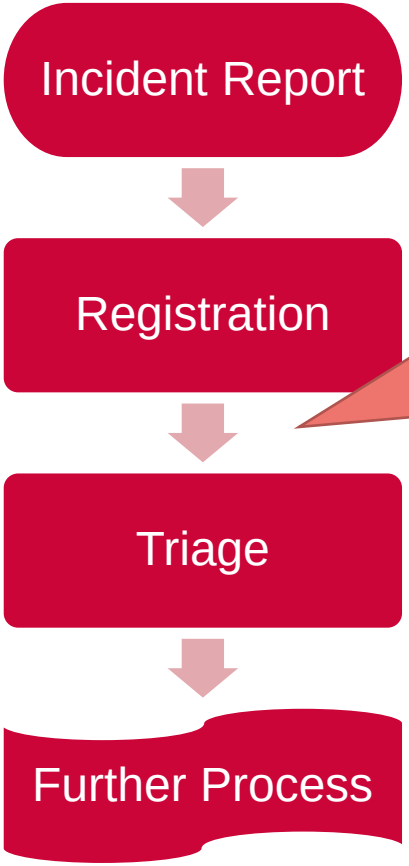
- Security **tools**
  - IDS, AV, Firewall
  - Sigma rules
  - Threat intelligence
- **Human** report
  - Helpdesk
  - System administrator
- Other **teams**
  - CSIRT
  - LEA
  - Regulatory bodies

Threat Hunting

- Sophisticated attacks have different steps
- Attackers blend in
  - Living of the Land
  - Signature bypass
  - Unknown techniques
- **Anomaly** detection
- **Correlation**
  - Human factor
  - Know your assets
  - Connecting the dots

INCIDENT REGISTRATION

Ensure completeness of the report



- **When** did it start?
- **What** triggered the incident report or how was an incident detected?
- Is it a **reliable** source? Quality of the source?
- **Where** was it detected?
- **What** is the severity and impact?
- Impact on availability, integrity or confidentiality?
- PII. Safety? Criminal act?

TRIAGE (1)

Validating an Incident Before Triage

1. Is this a genuine threat or attack?
2. Was the attack successful?
3. What was the outcome of the attack on the affected system?
4. How severe is this threat?
5. Does this threat grant the attacker network access?
6. Are other systems at risk as well?

TRIAGE (2)

Not First Come First Served

- Is it really a **security incident**?
- **Relevant** for your team?
  - In your constituency?
- **Previously** reported to your team?

- What is the **impact** and **severity** of the incident?
  - Escalation, notification or legal requirements?

- **Categorize** the incident
  - After the registration, categorize the incident so you can use a correct incident response plan or playbook

VICTIM INFORMATION

Sector	• OES?
Region	• Offices • Central or main branch
Legislation	• Other CSIRT?
Contact	• Role • Mandate, authority • Responsibility
Threat Actors	• MITRE • CSIRT Network
Changes in legislation	• Affecting the victim
Public Reports	• Press
Incidents	• Victim • Sector

Compile knowledge

PRESERVE EVIDENCE

Inform the victim first

- No reboot. Do not run security software
- Do not start or stop services or applications
- Do not change user configuration
- Do not tip off the attacker
- Assume communication is breached

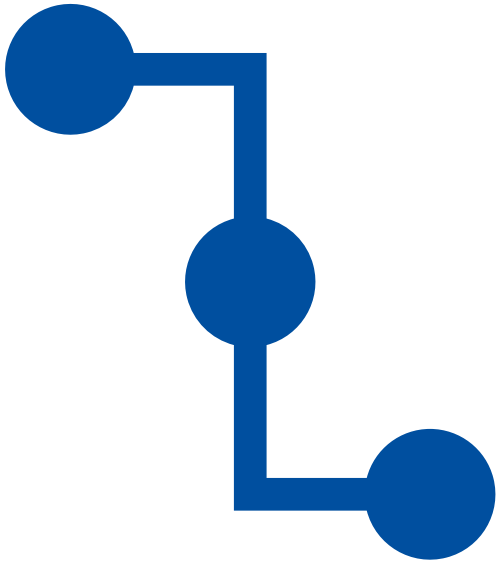
Collection

- Outweigh balance between evidence collection and risk of tampering material
- Have a standard method for collecting evidence

EVIDENCE: CHAIN OF CUSTODY

Audit trail

- Validating collection, storage, movement and protection of evidence.
- Was everything handled correctly?
- Is the source **known**?
- Ensure **no modifications** can take place.



Label everything

- Case and item identification. Location. Date. Tools.

Document everything

- Timestamps. Conditions. Expected outcome and actual outcome.

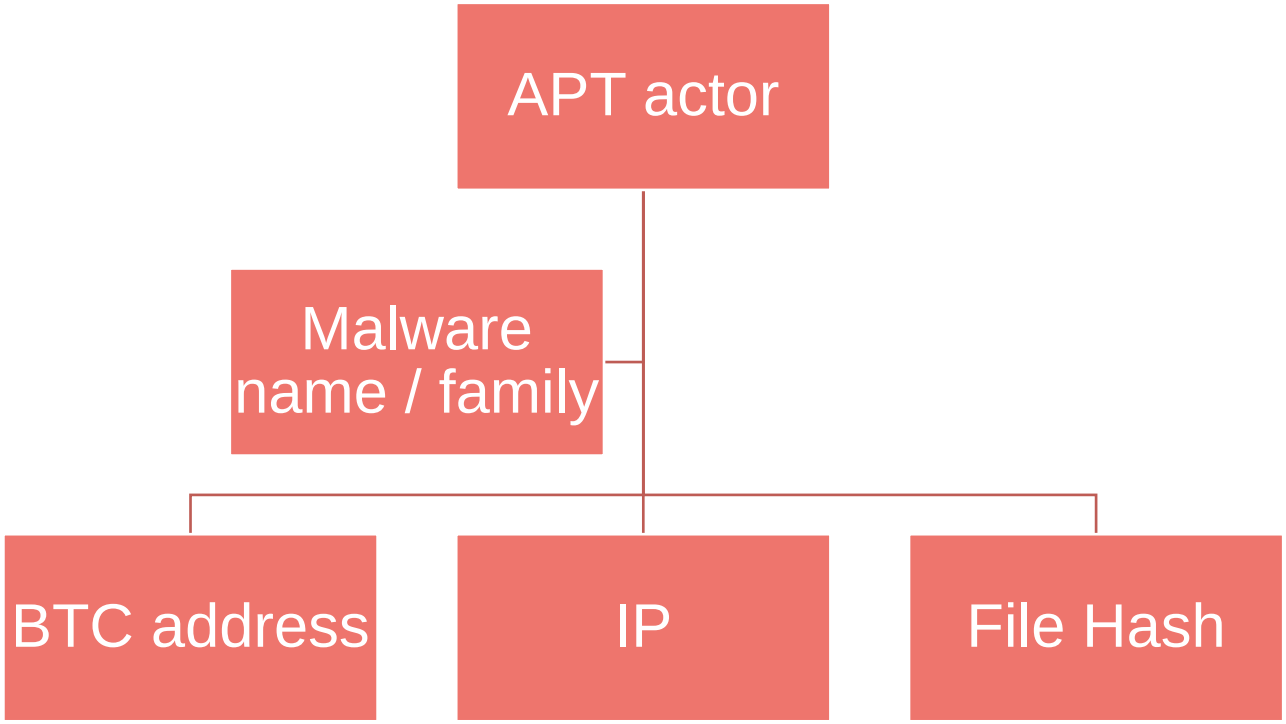
EVIDENCE: CHAIN OF CUSTODY

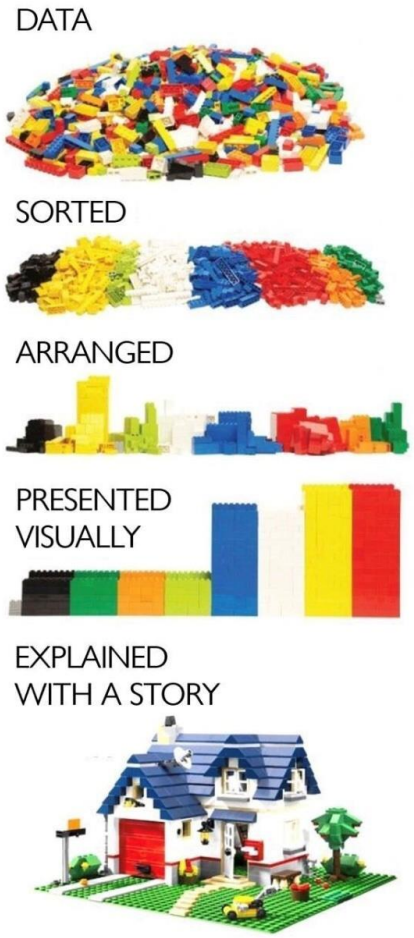
The O.J. Simpsons case: June 12, 1994

1. Sloppy forensic evidence collection
2. Cross – contaminated evidences
3. “Missing blood”
4. Holding evidence in unsecured environment
5. Fingerprint not collected

CTI AND IRANIAN THREAT ACTOR

THREAT INTELLIGENCE





TTPS

Tactics

- Tactics are defined as what the attacker does.

Techniques

- Techniques best describe what the attacker uses to accomplish their goal.

Procedures

- Procedures are the manner, or order, in which an attack is carried out.

ABOUT CTI

Sources:

1. Open Source (Shodan, Virus Total, Google, Malpedia)
2. Free Subscriptions
3. Paid subscriptions
4. Own data collection
5. Collaborations, memberships

Types of CTI:

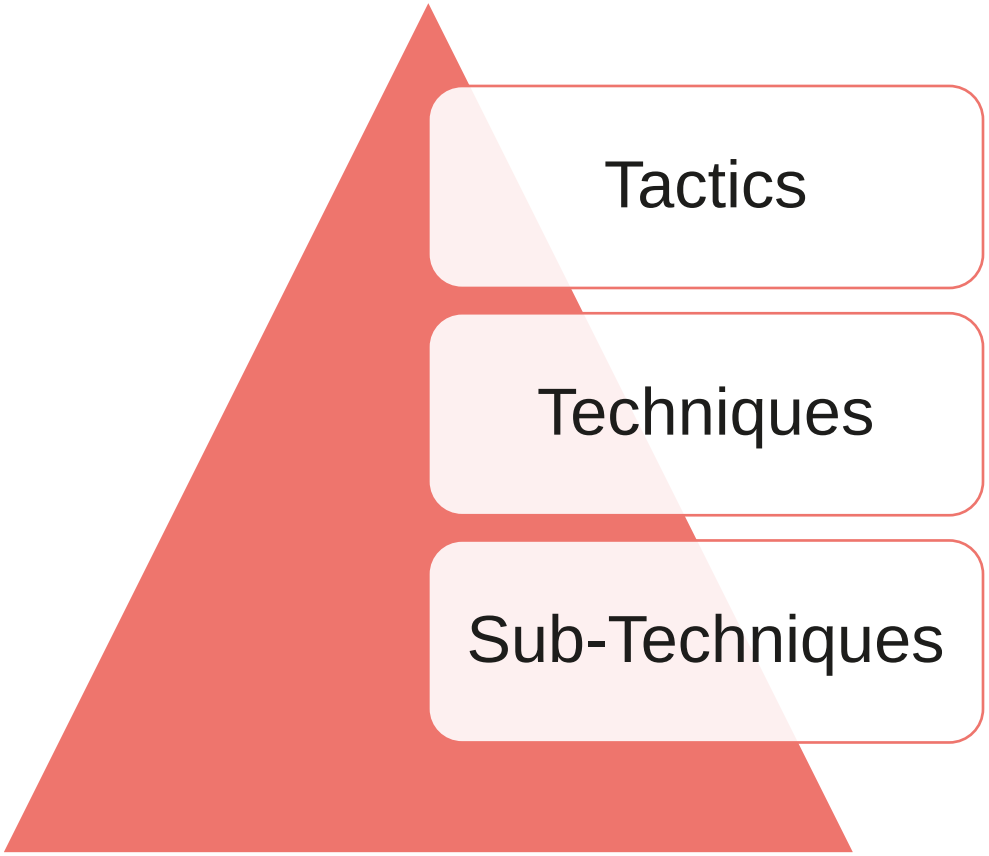
1. Strategic CTI
2. Tactical CTI
3. Technical CTI
4. Operational CTI

CTI is NOT a brainless collection of all data available!

The use of a TIP (Threat Intelligence Platform) can either help you or drive you away from your goal. Be wise.

MITRE ATT&CK OVERVIEW

The MITRE ATT&CK framework is a standardized knowledge base of Adversary Techniques, Tactics & Common Knowledge.



Techniques are categorized into 14 different tactics, which progress from pre-attack to impact and data exfiltration.

Techniques describe the actual activities an attacker might perform in order to reach their goals.

Many techniques in the MITRE ATT&CK framework consist of multiple sub-techniques that describe different ways to carry out each technique.

MITRE ATT&CK OVERVIEW

OILRIG, APT34, TWISTED KITTEN, CRAMBUS, HELIX KITTEN, CRIMSON

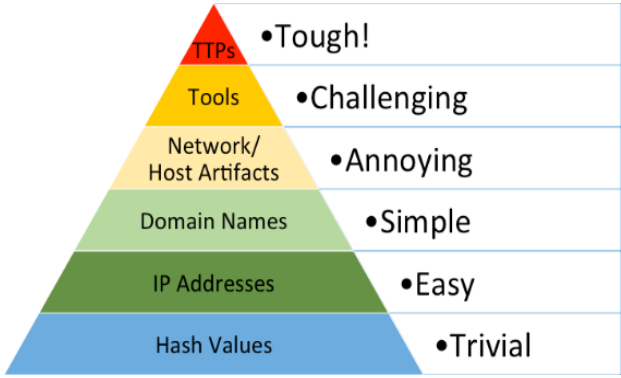
Motivation: state sponsored
Goals: espionage
Target: mainly Middle-East, but in addition: Turkey, Albania
First sight: 2014
Target sectors: Academic/Research Institutes, Commercial Aviation, Energy, utilities & mining, Financial services, Government & public services, Healthcare, Industrial manufacturing, Insurance, Transportation & logistics

APT34 has conducted reconnaissance aligned with the strategic interests of Iran

SCENARIO

Advanced adversary

- How an adversary operates
  - TTPs: **Tools**, **Techniques**, **Procedures**
  - Not as concrete as indicators of compromise (IoCs)



- Understand current **exposure**
- Assess **detection** capabilities

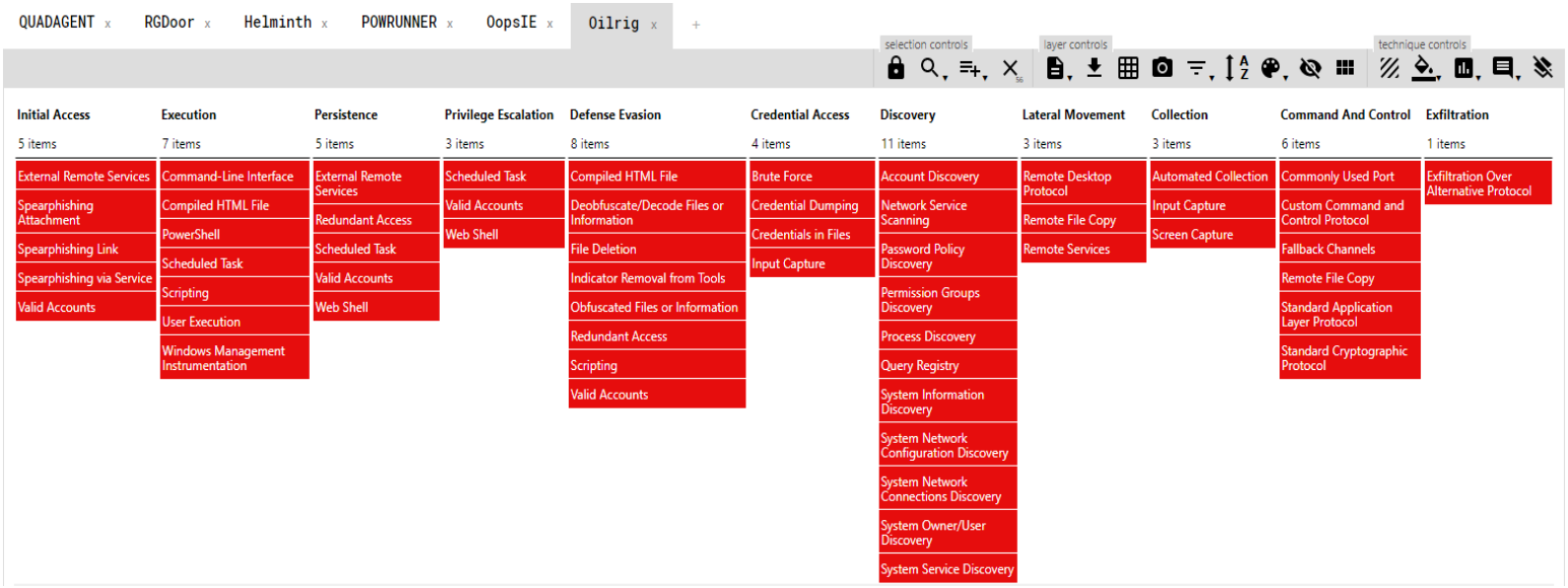
MITRE ATT&CK™

- Tactics: **Why**
- Techniques: **How**

ADVERSARY

Adversary

- OilRig



OILRIG

Software

ID	Name
S0360	BONDUPDATER
S0160	certutil
S0095	ftp
S0170	Helminth

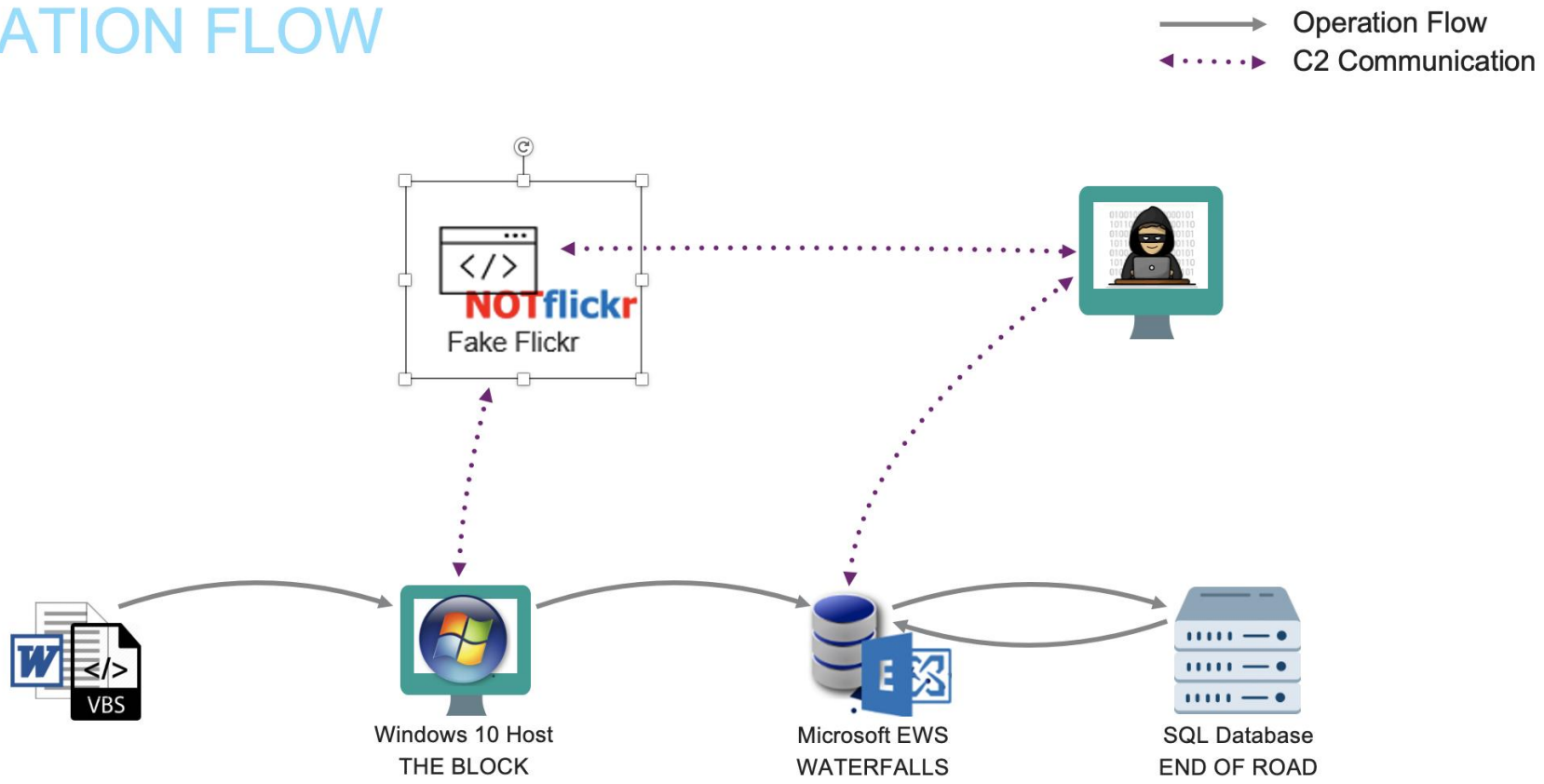
Associated Group Descriptions

Name	Description
COBALT GYPSY	[8]
IRN2	[9]
APT34	This group was previously tracked under two distinct grou of the activity.[7][6][10]
Helix Kitten	[7][9]
Evasive Serpens	[5]

Multiple threat intelligence organisations following this group and therefore multiple names.

OPERATION FLOW

OPERATION FLOW



TOOLS NEEDED FOR TODAY

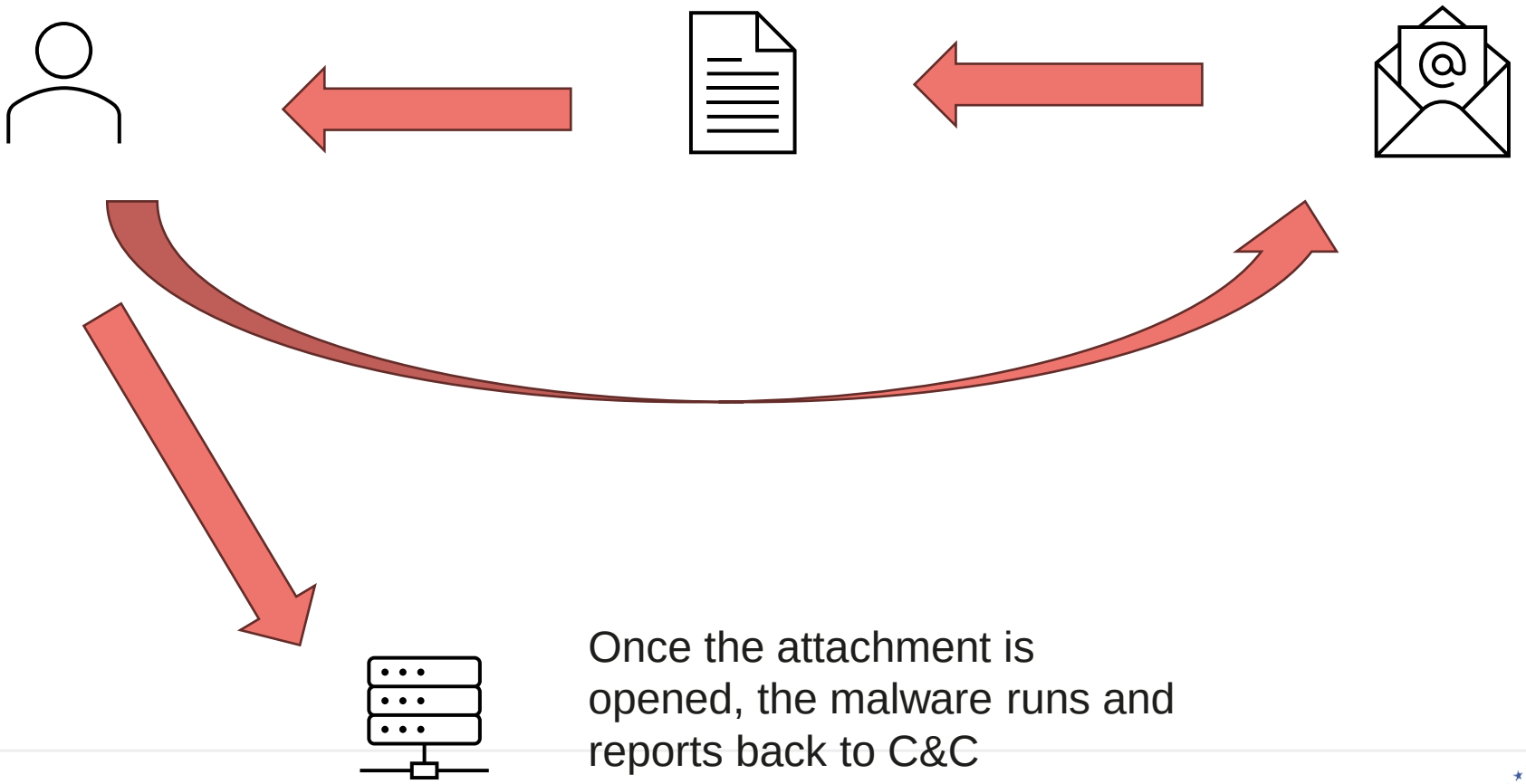
TOOLS

https://github.com/Lensver65/ESDC-BP

THE STORY

STEP 1

User receives a SpearPhising email with a malicious attachment…



Once the attachment is opened, the malware runs and reports back to C&C

STEP 1

- Base64 encoded text → SideTwist Malware
- VBS in doc creates scheduled task, writes the base64 text to file in the localappdata\SystemFailureReporter\ directory as b.doc (file actually is executable)
- Has basic Sandbox evasion technique
- b.doc is renamed as „SystemFailureReporter.exe" and is scheduled to run every 5 minutes
- Executable connects to **X.X.X.X**

TASK 1:

Use the LINK of „GGMS Overview.doc" (from GitHub) and have it analysed with VirusTotal and HA. Do the same with the „SideTwist.exe" file

Q:

What is the verdict?

DEMO

See the macro

Domo the weaponisation

I’m only a script kiddie’

Start VMs

Start control server

Execute SideTwist malware

Binaries are available on the server: http://192.168.0.5/marketing_materials.zip

Q: TASK 1

What are the hashes of the „b.exe” file?

- MD5: a59b8539af98a6a6df7af4a771d05ea5
- SHA-1: 0188756ec0173ba6af6c51551521997a316e588b
- SHA-256: 9a080bb47fab612597fcb8d31b85f95fc080ed23ca86f75422a73b3f632a1e06

What is the comment „jinfantes” made on VT about the file „update.xml”?

„Iran’s APT34 Returns”

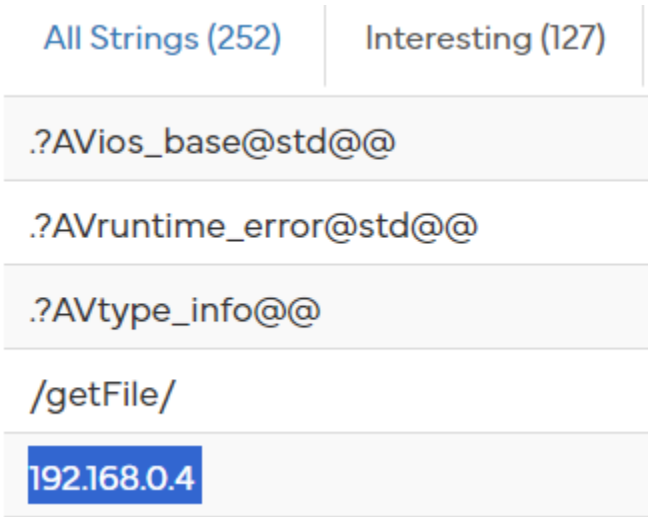
Q: TASK 1

What APIs are called by SideTwist?

- GetUserNameW
- GetComputerNameW
- TerminateProcess
- OutputDebugStringW
- UnhandledExceptionFilter
- IsDebuggerPresent
- GetComputerNameExW
- GetModuleHandleW

What is the IP of the C&C server?

192.168.0.4



STEP 2

Enumeration of the current user, accounts, groups, system information, network connections, processes, services, and if remote desktop is enabled.

Low privilege credential dumping

SystemFailureReporter.exe to download VALUEVAULT (the executable for which is b.exe) which is then leveraged to perform a low privilege credential dumping. SystemFailureReporter.exe then uploads the VALUEVAULT dump (named ***.dat**) back to C2 via HTTP POST request.

STEP 2

TASK 1:

Use the LINK of „b.exe” (from GitHub) and have it analysed with VirusTotal and HA

Q:

What is the verdict?

Q: TASK 2

What is the name of the file created?

%APPDATA%\fsociety.dat

b.exe

PID: 7176, Report UID: 00000000-00007176
MD5: a59b8539af98a6a6df7af4a771d05ea5
SHA256: 9a080bb47fab612597fcb8d31b85f95fc080ed23ca86f75422a73b3f632a1e06

nts | Handles | Modules | Files

	m32\netutils.dll
OPEN	%WINDIR%\System32\samlib.dll
OPEN	%WINDIR%\System32\samlib.dll
OPEN	%APPDATA%\FSOCIETY.DAT
OPEN	%APPDATA%\FSOCIETY.DAT
OPEN	%APPDATA%\FSOCIETY.DAT
CREATE	%APPDATA%\fsociety.dat

What is the name of the xml file embeded in b.exe?

Hash:
a73f26a8d504043f785d7360e8febf2eeb8522ec873a0d4dd5d1d4bfd1e67d3d
Name: 1.xml (among others)

STEP 3

Lateral movement

It has been discovered from the credentials dumped in Step2 that the user logged in the Victim has admin privileges on the EWS server

Installing webshell to remote server

Downloading the TWOFACE webshell (named contact.aspx) via SystemFailureReporter.exe; TWOFACE is then copied from the victim to SERVER and hidden with attrib + h.

STEP 3

TASK 1:

Use the LINK of „contact.aspx” (from GitHub) and have it analysed with VirusTotal

Q:

What is the verdict?

FINAL CHALLENGE

Create a threat report about this threat actor!
Include:

- Executive summary
- Description
- IOCs
- TTPs
- Mitre ATT&CK Framework references
- Recommendations

Target Audience:

Your SOC ppl

REFERENCES

This scenario is based on the Adversary Emulation Library created by Center for Threat-Informed Defense for education purposes.
https://github.com/center-for-threat-informed-defense/adversary_emulation_library/

Full attack scenario is available: https://github.com/center-for-threat-informed-defense/adversary_emulation_library/blob/master/oilrig/Emulation_Plan/README.md

THANK YOU FOR YOUR ATTENTION

European Union Agency for Cybersecurity
Vasilissis Sofias Str 1, Maroussi 151 24
Attiki, Greece

+30 28 14 40 9711

info@enisa.europa.eu

www.enisa.europa.eu