
RED OPS
INFORMATION SECURITY
Cyber Kill Chain
Deep Dive

Whoami

Daniel Feichter Tirol / Thaur

- 12 Jahre Elektronik und Kommunikationstechnik
- Studium Wirtschaftsingenieurswesen
- 5 Jahre in Infosec
- IT-Sec Researcher / **@VirtualAllocEx**
- Gründer RedOps GmbH (vormals Infosec Tirol)
- Mitre Att&ck Contributor (T1562.010, T1562.001)
- Konferenzen: DeepSec, BSides, DEF CON, SANS etc.

Fokus Offensive Security:

- Research: Windows Internals, EDRs, Malware etc.
- Trainings/Workshops, EDR-Evaluation, APT-Simulation etc.
- Red Teaming (SME)

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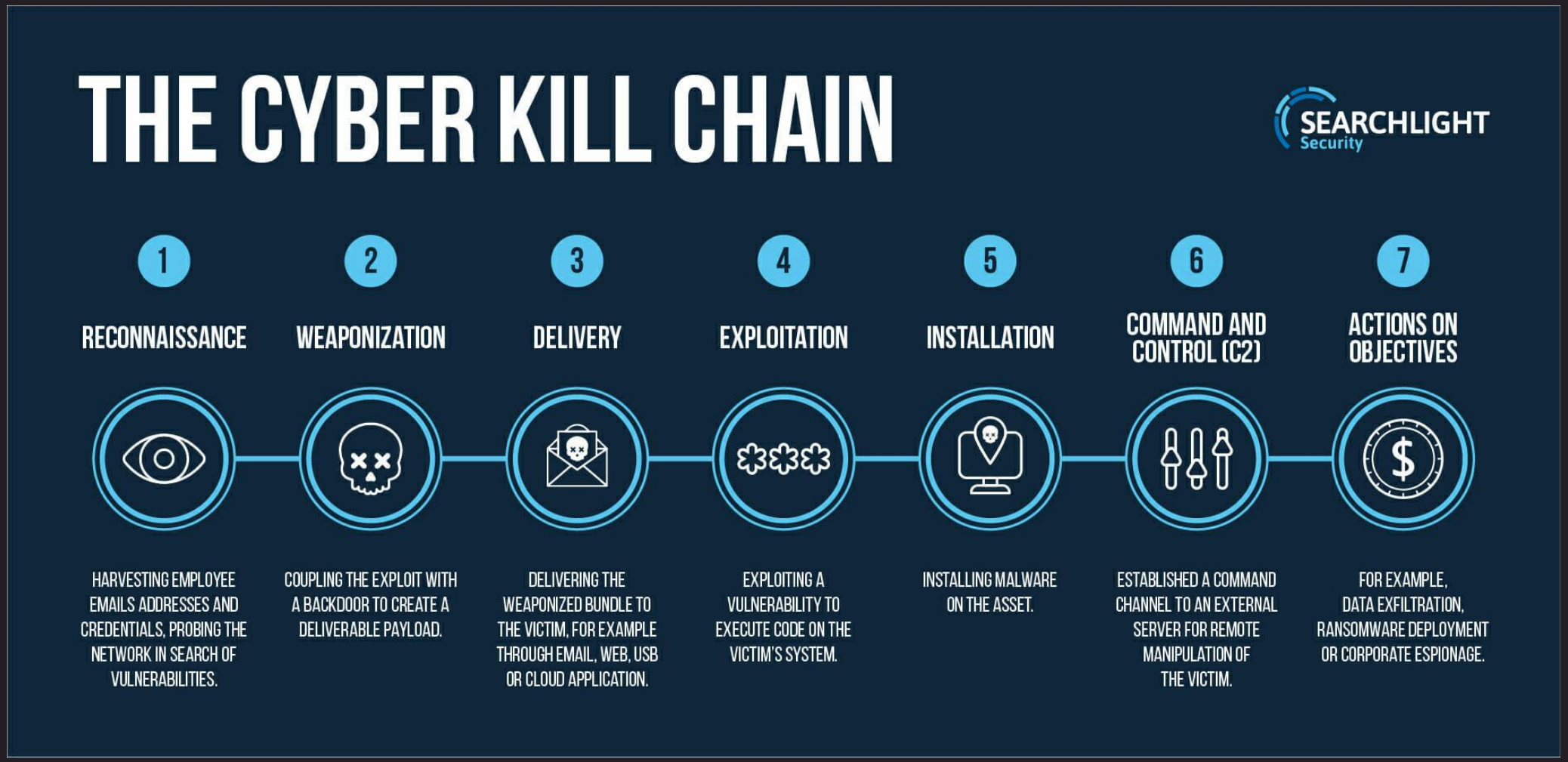
Cyber Kill Chain



Quelle: https://www.slcyber.io/shifting-left-in-the-cyber-kill-chain/

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Agenda

- Deep Dive Cyber Kill Chain
  - Phase 1 bis Phase 7
- (Live) Demo **EDR Evasion** – Kompromittierung via C2
- Limitierungen Cyber Kill Chain

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Blackcat Ransomware

- Praktisches Beispiel -> Blackcat Land Kärnten
- Key Facts Blackcat bzw. ALPHV
  - Ransomware as a Service (Raas)
  - Erstsichtung November 2021
  - Rust
  - Eintrittspunkte:
    - Exchange Server, Kompromittierte Zugangsdaten, Phishing Mail

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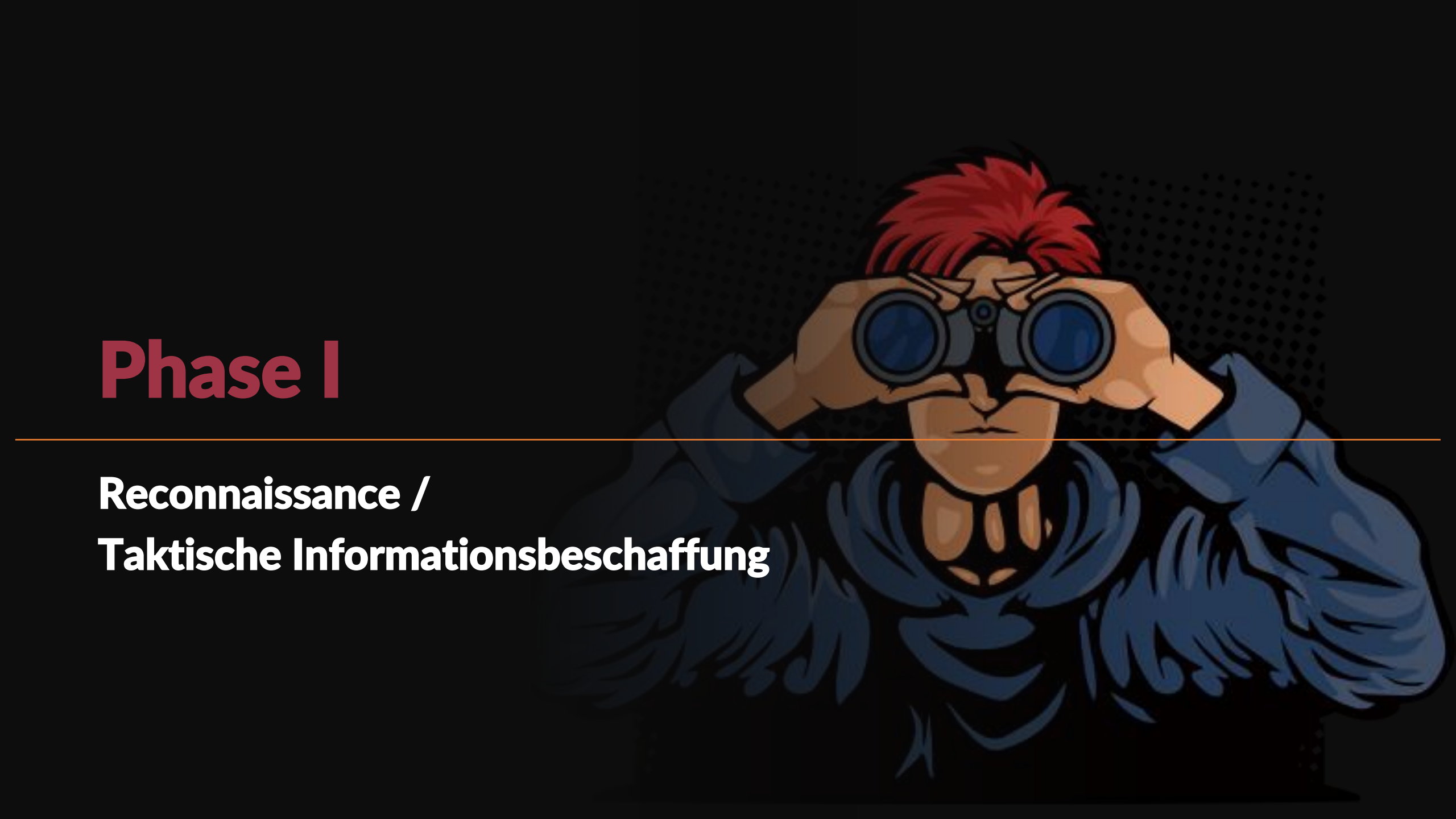
Phase I

Reconnaissance /
Taktische Informationsbeschaffung



Phase I: Reconnaissance

- Red Teaming -> Taktische Informationsbeschaffung

- Möglichst viel relevante Information
- Gute Vorbereitung = Halbe Miete!
- Zeitkontingent Bösartiger Hacker vs. Red Team

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Aktiv vs. Passiv

- **Passiv:** Öffentlich zugängliche Informationen
- Keine direkte Interaktion mit Ziel
- **I hab nur gschaut!** -> gesetzlich konform

- **Aktiv:** Wir testen was geht
- Direkte Interaktion mit Ziel
- Illegal ohne Permission to Attack

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Phase I: Reconnaissance

- Mitarbeiternamen
- E-Mail-Adressen
- Passwörter / Data Breaches
- Software z.B. Betriebssystem, Browser, AV/EPP/EDR etc.
- Sicherheitsprodukte z.B. Firewall, Proxy etc.
- Mögliche Eintrittspunkte

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Phase I: Reconnaissance

- Erreichbare Systeme Internet (Schatten-IT)
  - Weitere Informationsbeschaffung
  - Direkte Kompromittierung via Schwachstellen
  - Login Möglichkeiten (HTTP-Formulare, FTP, SSH etc.)

- Freie Domains -> potentiellen Phishing Angriff

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Phase I: Reconnaissance

- Tochterunternehmen und Beteiligungen
- Technische Dienstleister
  - Hardware, Software und Infrastruktur

- (Unabsichtlich) geleakte Informationen z.B. Source Code
  - Reddit
  - Stackoverflow, GitHub

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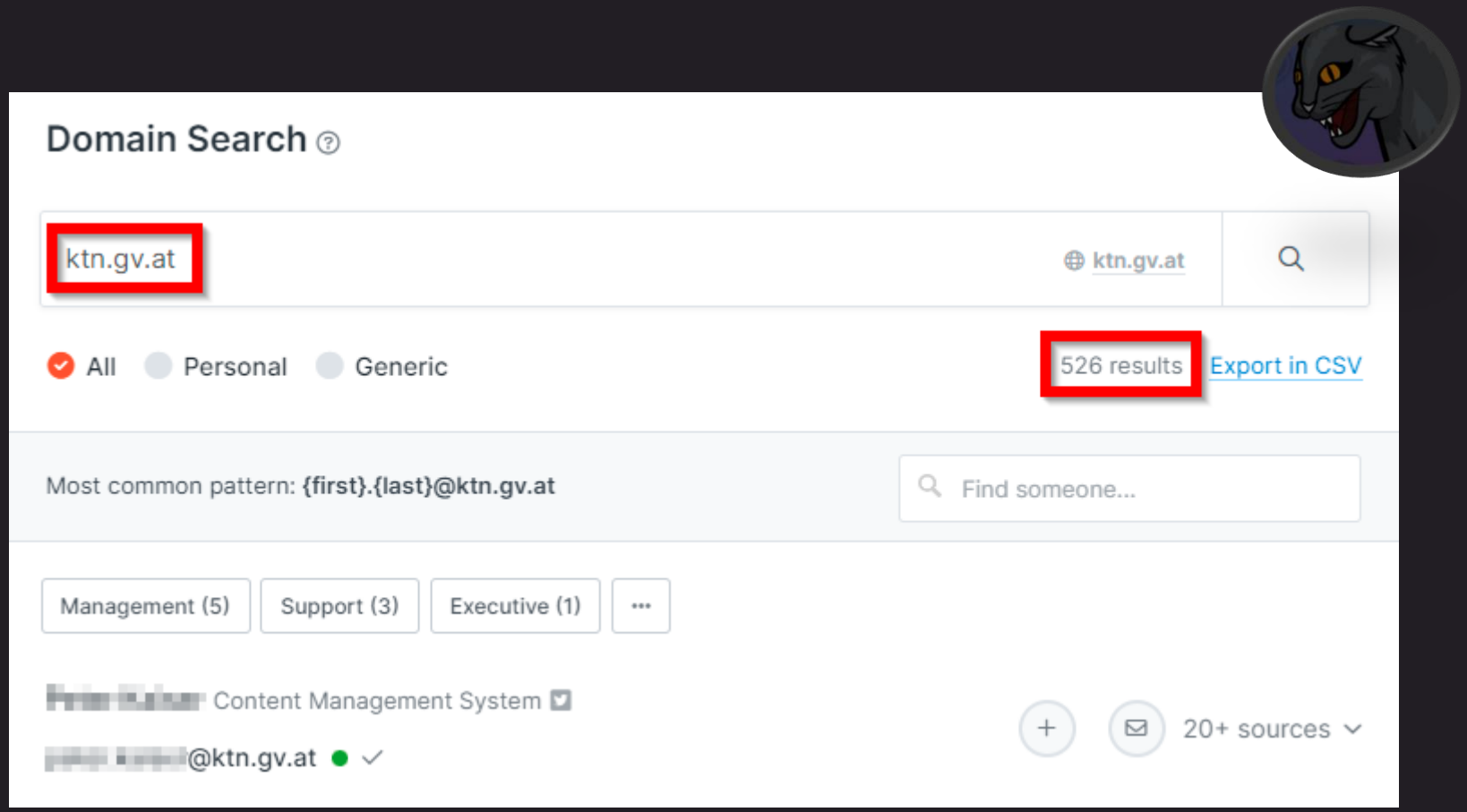
Passiv: E-Mail-Adressen



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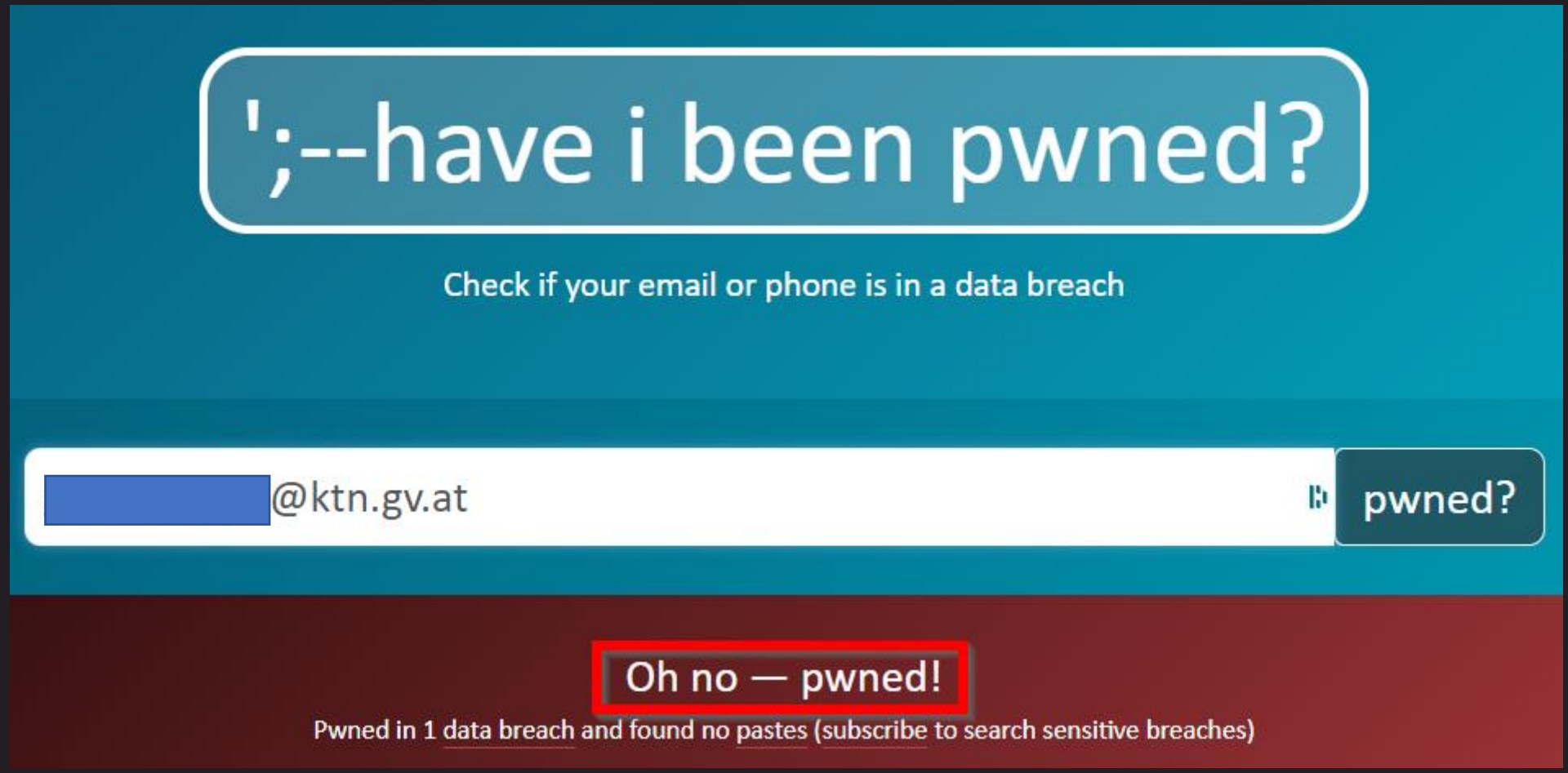
Passiv: Data Breaches



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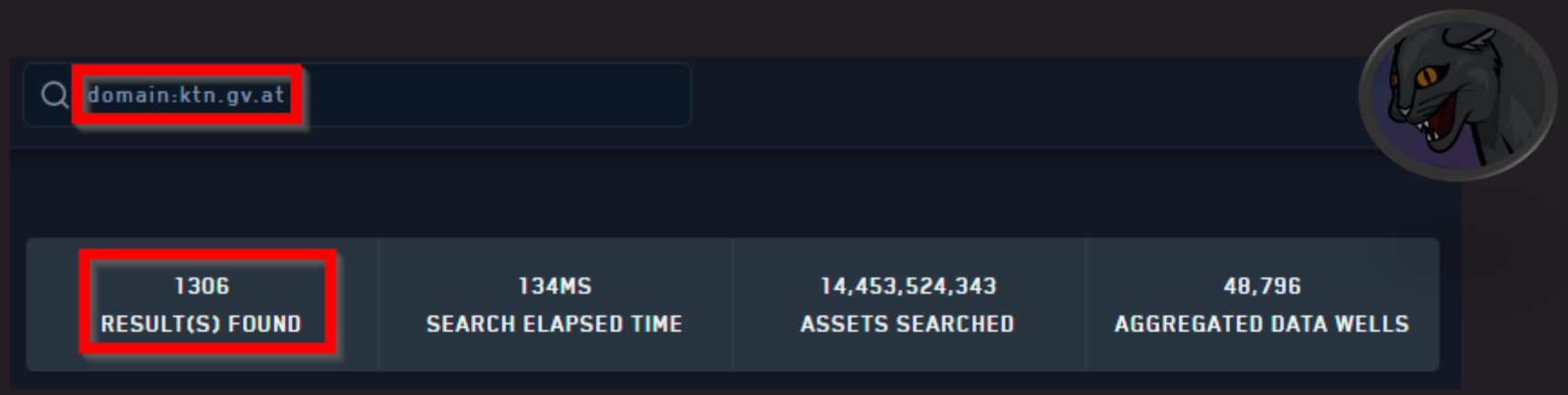
Passiv: Geleakte Passwörter



Result #

Email @ktn.gv.at

Password 4c6

Result #

Email @ktn.gv.at

Password aut

Result #

Email @ktn.gv.at

Password Oks

Result #5804128

Email @ktn.gv.at

Password Mei

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Passiv: Eintrittspunkte

Microsoft 365 supports federated identity. This means that instead of performing the validation of credentials itself, Microsoft 365 refers the connecting user to a federated authentication server that Microsoft 365 trusts. 26.04.2022

```
-# python3 o365chk.py -d ktn.gv.at
This domain is federated
{
    "AuthURL": "https://adfs.ktn.gv.at/adfs/ls/?username=username%40ktn.gv.at
    "CloudInstanceIssuerUri": "urn:federation:MicrosoftOnline",
    "CloudInstanceName": "microsoftonline.com",
    "DomainName": "ktn.gv.at",
    "FederationBrandName": "Amt der K\u00e4rntner Landesregierung",
    "FederationGlobalVersion": -1,
    "Login": "username@ktn.gv.at",
    "NameSpaceType": "Federated",
    "State": 3,
    "UserState": 2
}
```

```
❯ python3 spray365.py -s demo_excpln.json --lockout 10

SPRAY365

By MarkoH17 (https://github.com/MarkoH17)
Version: 0.1.2-beta

[2021-12-06 19:46:39 - INFO]: Processing execution plan 'demo_excpln.json'
[2021-12-06 19:46:39 - INFO]: Identified 56 credentials in the provided execution plan
[2021-12-06 19:46:39 - INFO]: Password spraying will take at least 11466 seconds, and sh
[2021-12-06 19:46:39 - INFO]: Lockout threshold is set to 10 accounts
[2021-12-06 19:46:39 - INFO]: Starting to spray credentials
[2021-12-06 19:46:40 - SPRAY 01/56] (win_ie11_win10->o365spo->msmamservice): gwashington
[2021-12-06 19:46:56 - SPRAY 02/56] (win_edge_win10->intune_mam->office_mgmt): mvanburen
```

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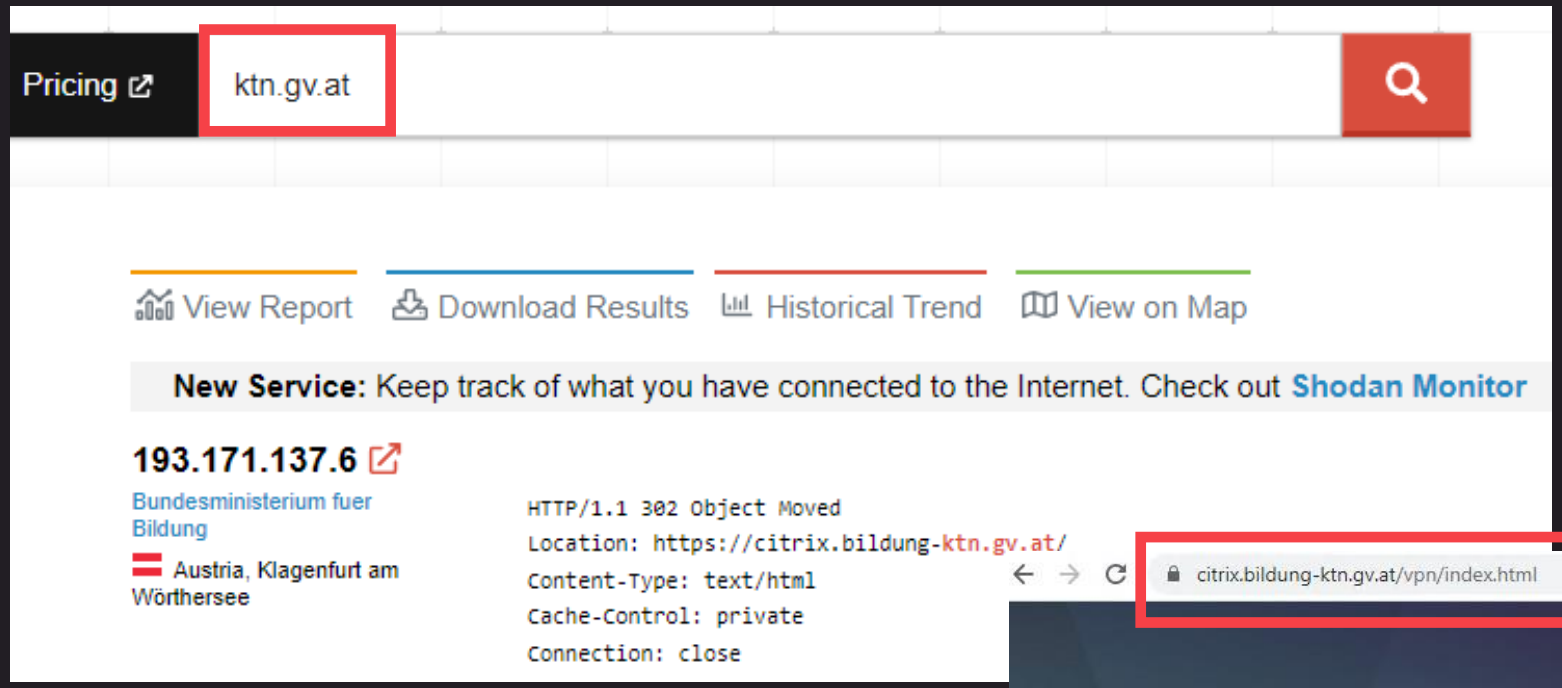
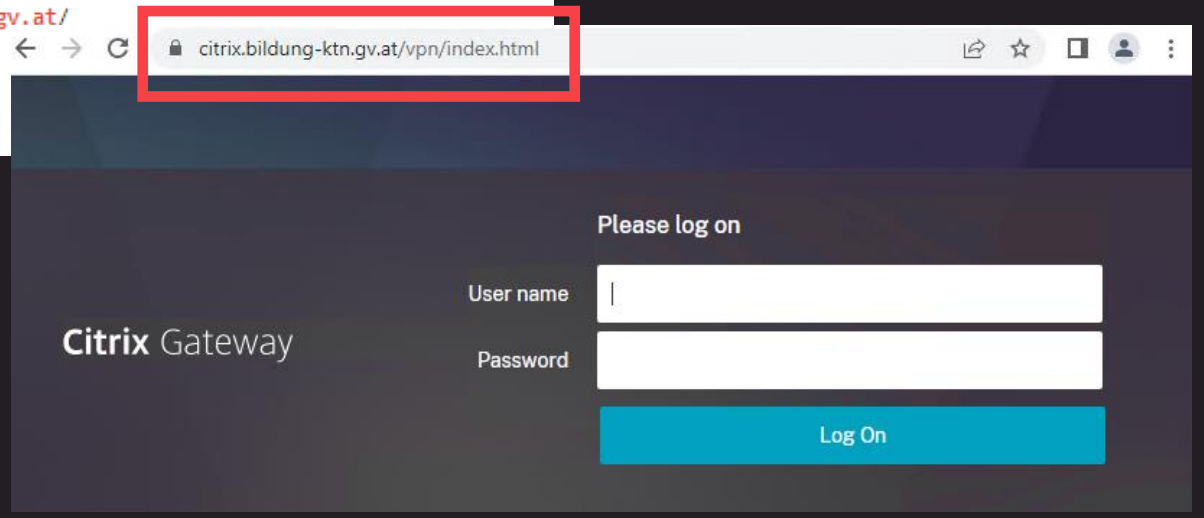
Passiv: Eintrittspunkte





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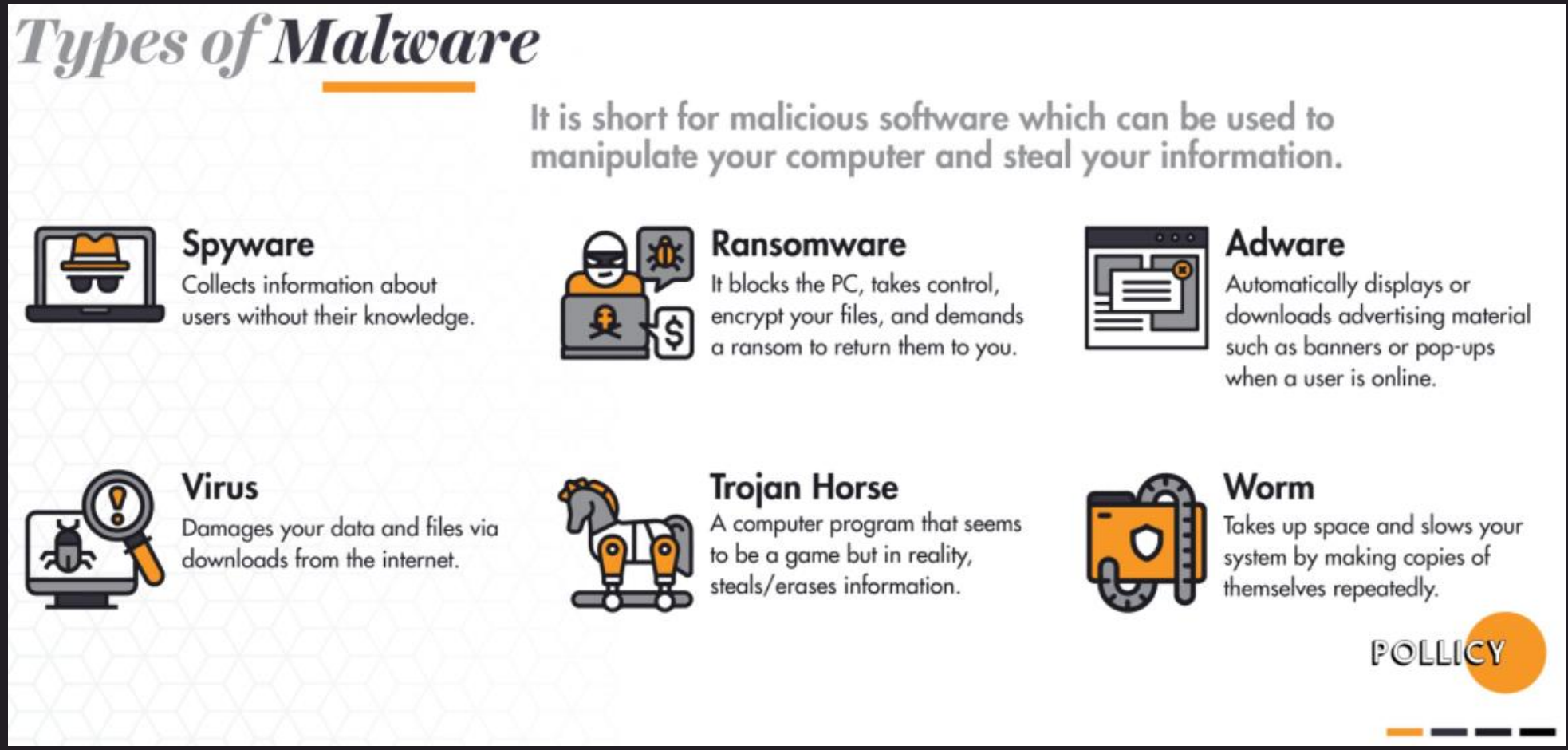
Phase II

Weaponization

Malware: Typen / Familien



Quelle: https://twitter.com/PollicyOrg/status/1260917030393450496

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Malware: Windows File Types

Quelle: https://sensorstechforum.com/de/popular-windows-file-types-used-malware-2018/

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BlackCat: Malicious Macro

Angriff auf Kärnten: Phishing-Mail war Auslöser, Spuren nach Russland

06.06.2022

Patrick Dax

Die Gruppe BlackCat verschaffte sich über ein Phishing-Mail Zugang zu den IT-Systemen des Landes. Ein Datenklau wird weiter nicht bestätigt.

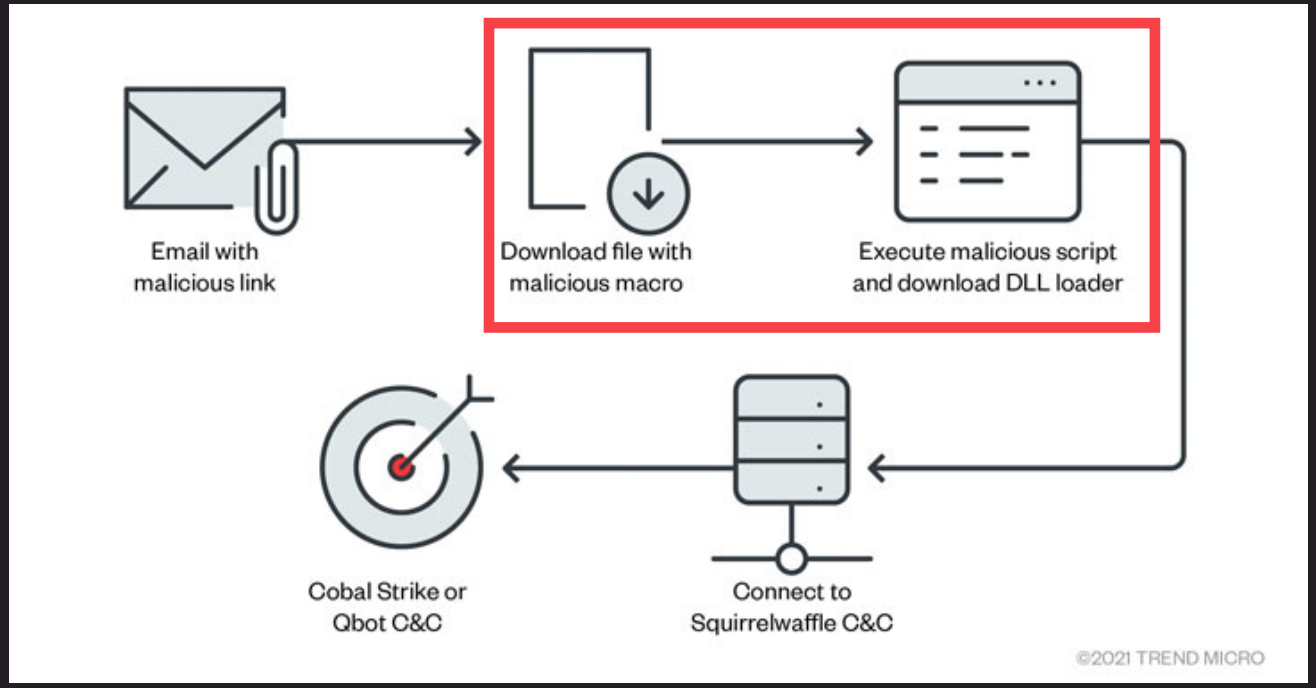
Quelle: https://futurezone.at/digital-life/cyberangriff-auf-kaernten-phishing-mail-datenleck-blackcat-der/402032804

Hackerangriff auf Kärnten: Angreifer nutzten Phishing-Mail

08.07.2022

Der Forensikbericht des Cyberangriffs liegt vor. Daran wird bestätigt, dass dessen Ursprung ein Phishing-Mail von April war.

Quelle: https://futurezone.at/digital-life/hackerangriff-auf-kaernten-cyberattacke-daten-phishing-black-cat/402068170



Quelle: https://thehackernews.com/2021/11/hackers-exploiting-proxylogon-and.html

C2-Malware: Beispiel in C Language

```c
int main() {
    // Insert the Meterpreter shellcode
    unsigned char code[] = "\xfc\x48\x83...";


    // Allocate Virtual Memory with PAGE_EXECUTE_READWRITE permissions to store the shellcode
    void* exec = VirtualAlloc(0, sizeof(code), MEM_COMMIT, PAGE_EXECUTE_READWRITE);

    // Copy the shellcode into the allocated memory region using WriteProcessMemory
    SIZE_T bytesWritten;
    WriteProcessMemory(GetCurrentProcess(), exec, code, sizeof(code), &bytesWritten);

    // Create a new thread to execute the shellcode
    HANDLE hThread = CreateThread(NULL, 0, ExecuteShellcode, exec, 0, NULL);

    // Wait for the shellcode execution thread to finish executing
    WaitForSingleObject(hThread, INFINITE);

    // Return 0 as the main function exit code
    return 0;
}
```

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GitHub Repo: Workshop

- Check out the following GitHub Repository
- Get Hands on! -> Syscall Workshop

  https://github.com/VirtualAllocEx/DEFCON-31-Syscalls-Workshop

All the **theory** and **playbooks for the exercises** can be found in the wiki, which together with the prepared POCs is the heart of this project. The **POCs** for the **exercises** can be found here on the **main page**.

Happy Learning!

Daniel Feichter @VirtualAllocEx, Founder @RedOps Information Security

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Phase III

Delivery

Malware Delivery

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BlackCat: Initial Access via Phising

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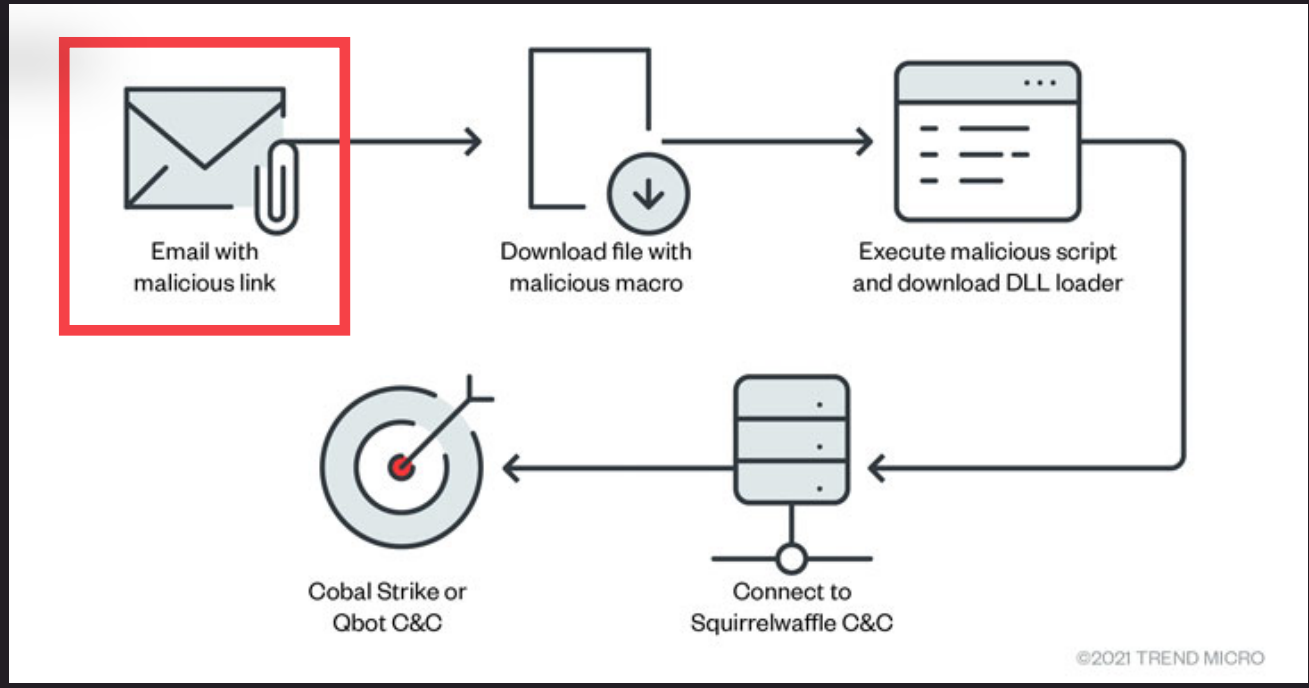

Quelle: https://thehackernews.com/2021/11/hackers-exploiting-proxylogon-and.html

Phase IV

Exploitation

Phase IV: Exploitation

- Schwachstelle = Vulnerability
- Schwachstelle -> ausnutzen via Exploit -> Exploitation
- ProxyShell, PrintNightmare, Folina etc.
- **R**emote **C**ode **E**xecution (RCE)
- Red Teaming optional bzw. gut abwägen/abstimmen
- **Exploit-DB**

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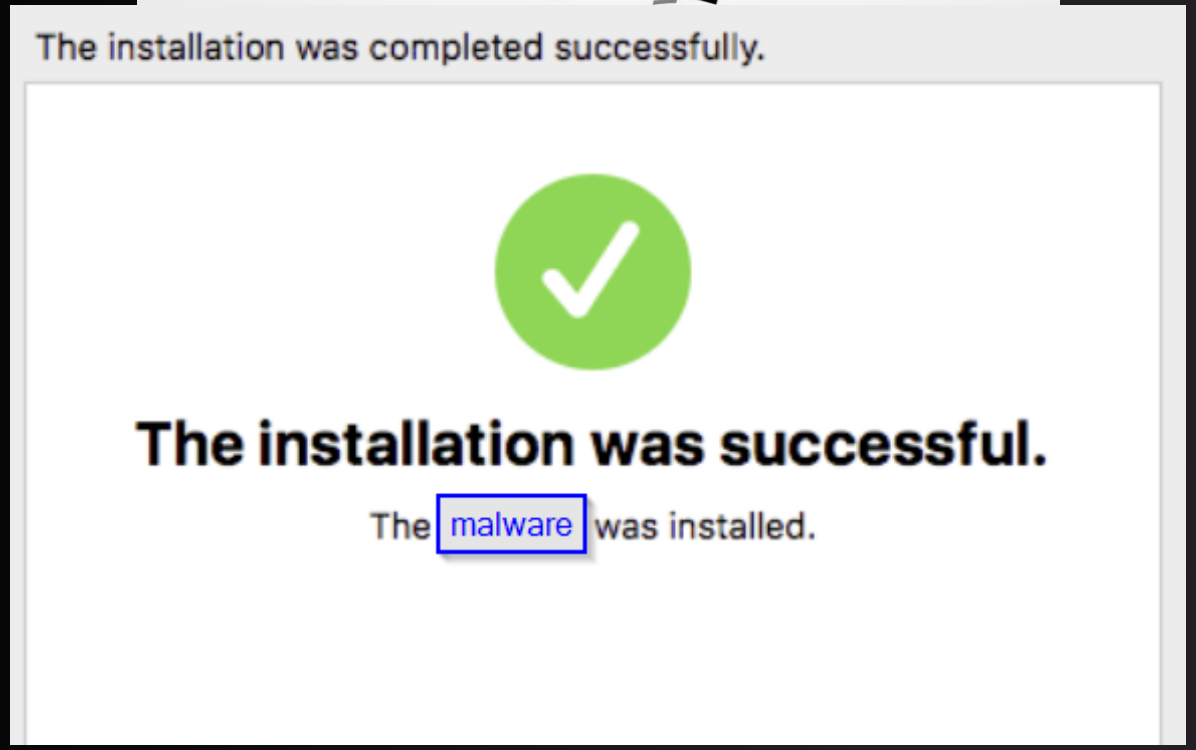
Phase V

Installation



Phase V: Installation

- Rootkit Installation
- Keylogger
- Hidden RDP
- Fallback Channel
- Persistenz: Registry, Scheduled Tasks etc.
- Etc.

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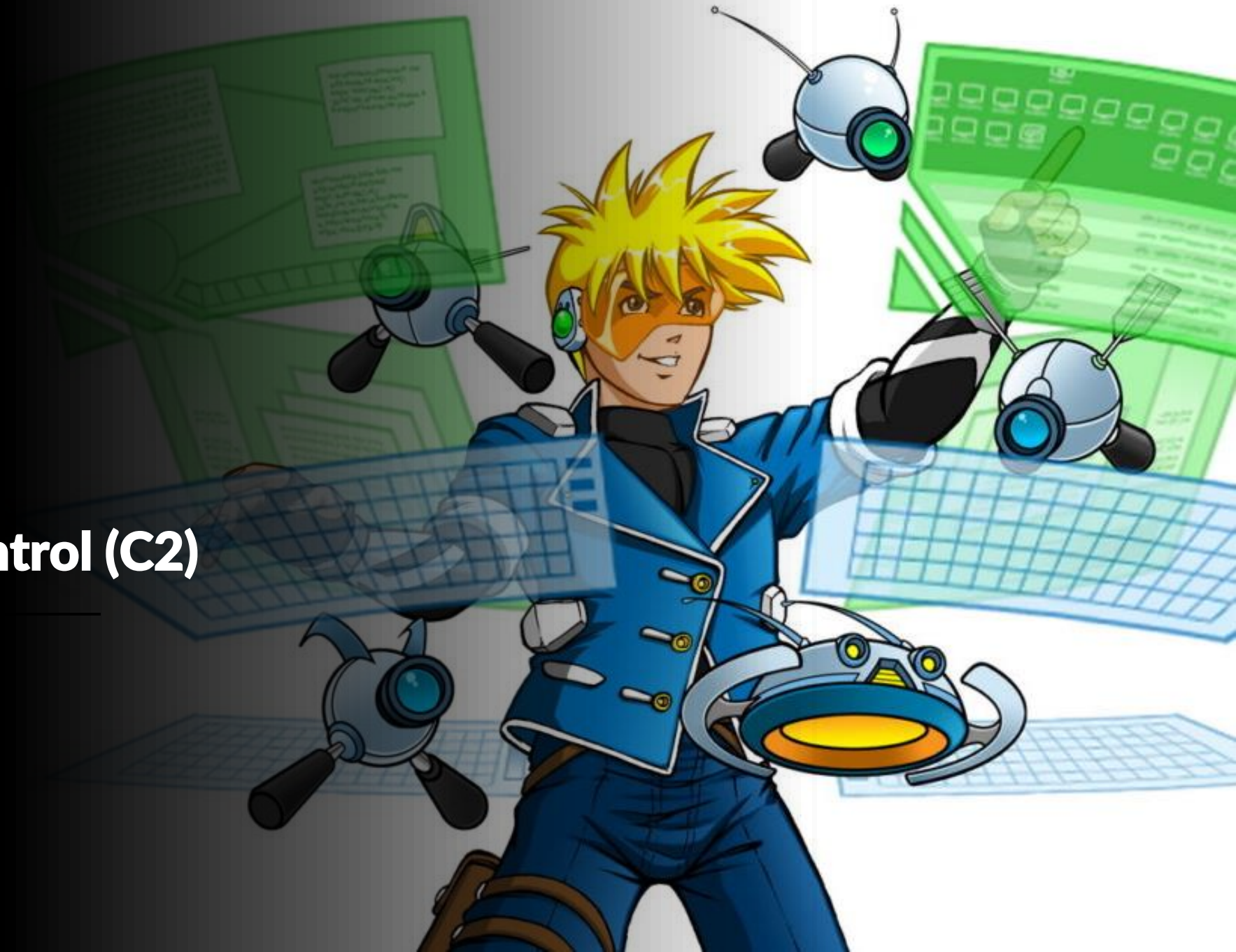
Phase VI

Command and Control (C2)



Phase VI: Command and Control

- Malware -> Aufbau C2
- Malware öffnet Kommunikationskanal -> https, http, tcp, dns etc.
  - Beacon
  - Badger
  - Etc.
- Malware Development -> unentdeckt von AV/EPP/EDR/FW etc.

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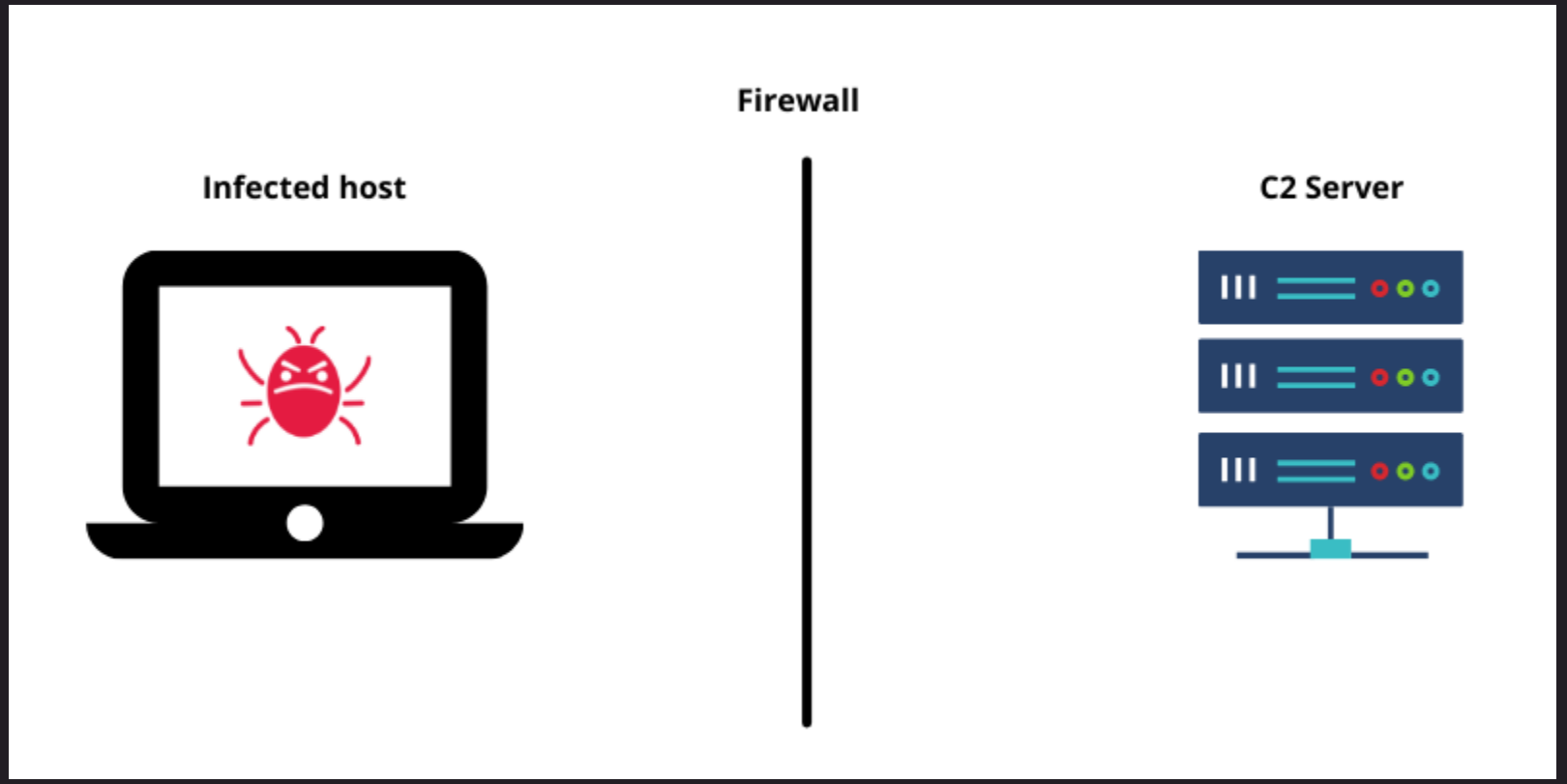
Phase VI: Command and Control



Quelle: https://www.dnsfilter.com/blog/c2-server-command-and-control-attack

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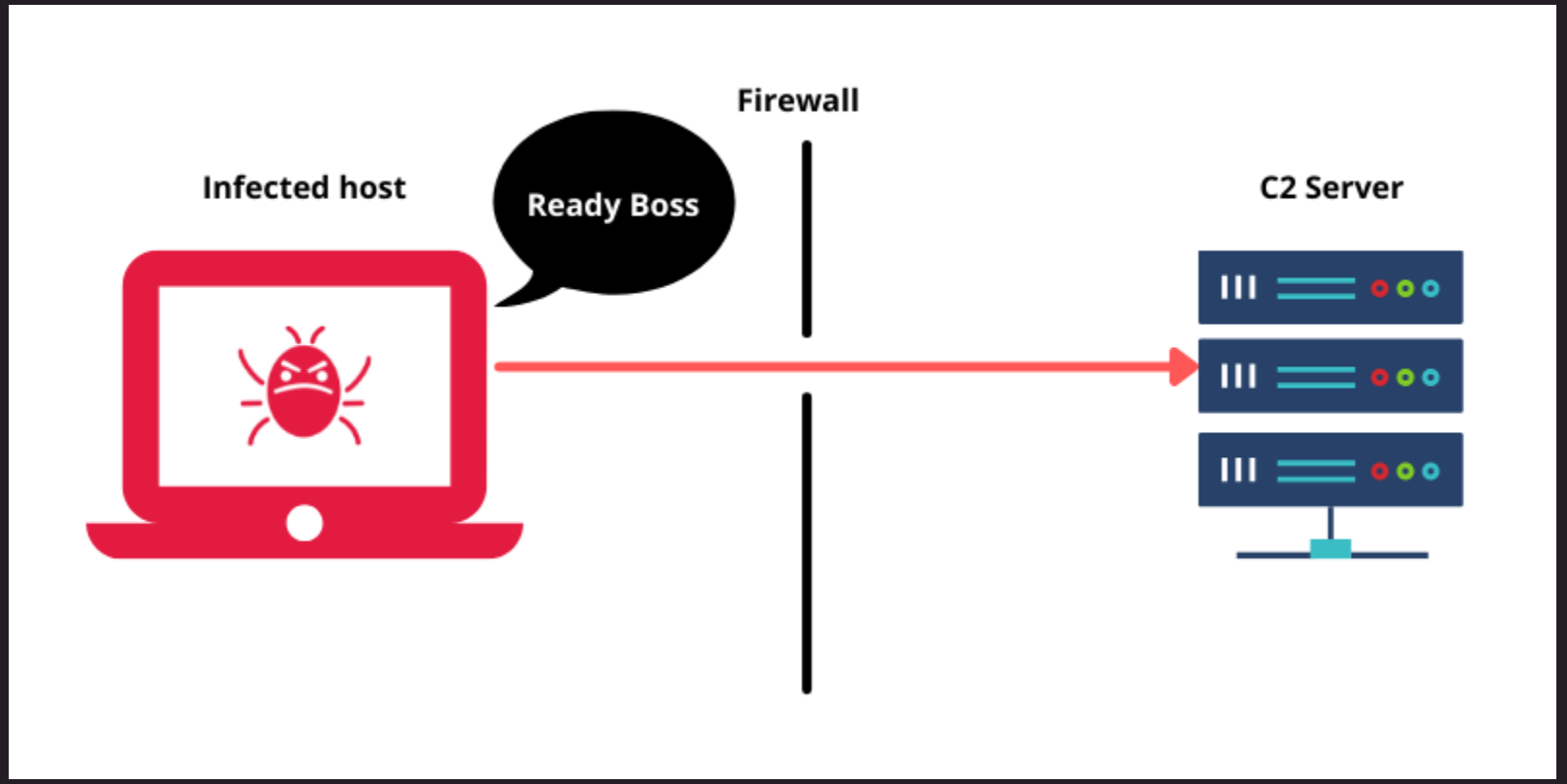
Phase VI: Command and Control



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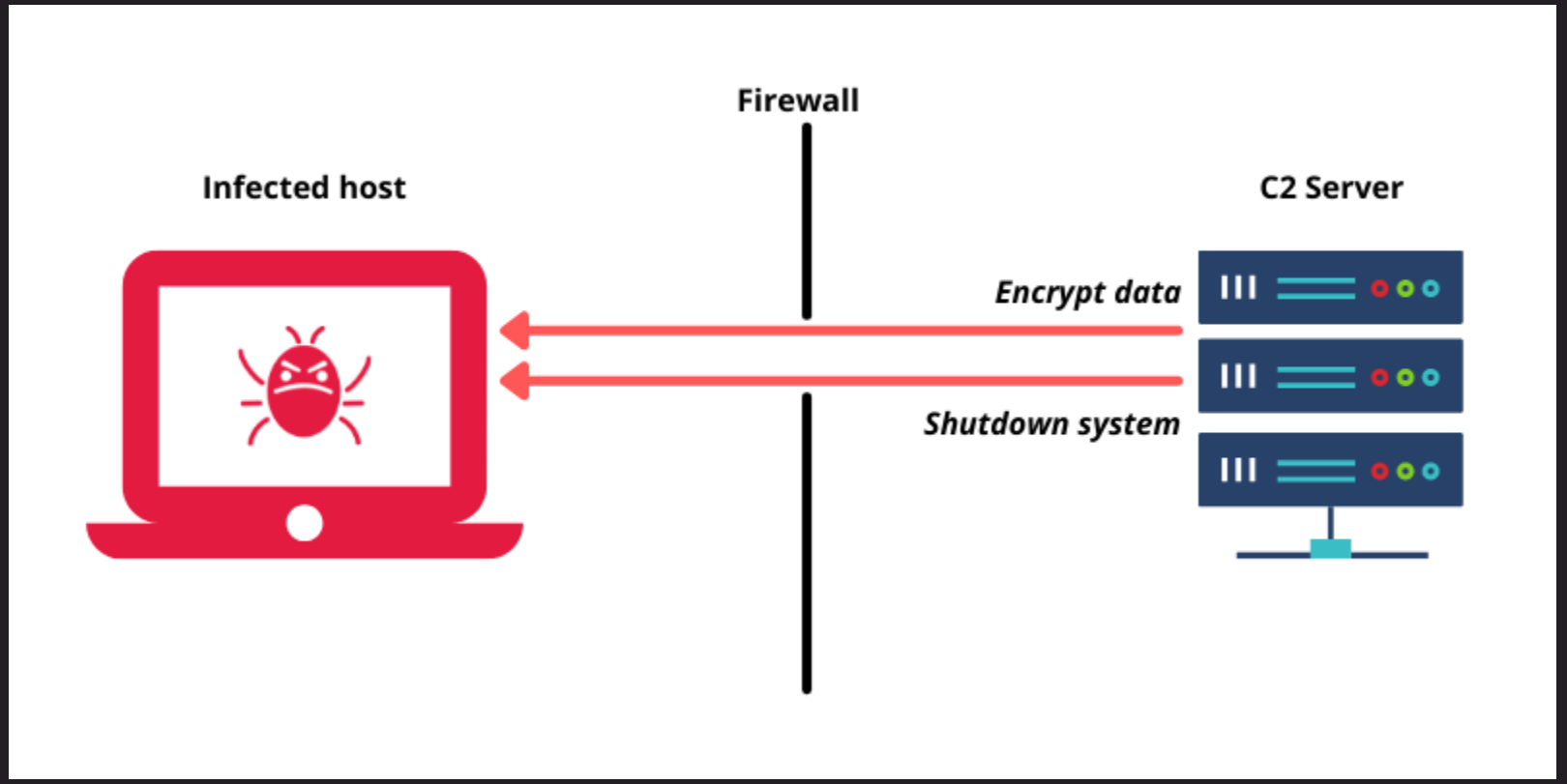
Phase VI: Command and Control



Quelle: https://www.dnsfilter.com/blog/c2-server-command-and-control-attack

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Phase VI: C2 Frameworks

RAPID7 metasploit®

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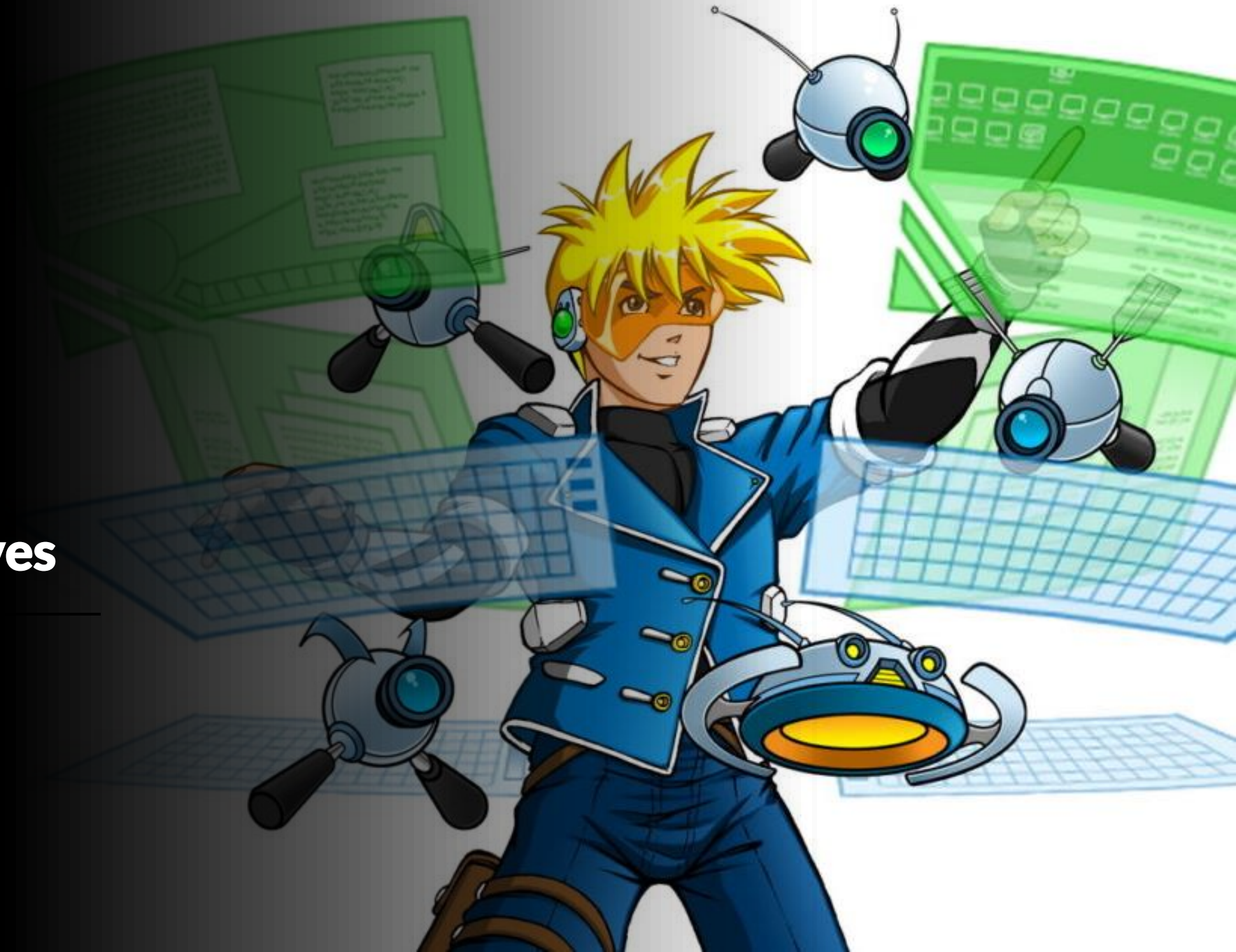
Phase VII

Action on Objectives



Phase VII: Action on Objectives

- Spionage
- Manipulation von Daten / Integrität
- Data Exfiltration
- Ransomware / Verschlüsselung von Daten
- Destruction of data
- Etc.

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Demo: C2-Initial Access

Quelle: https://reciprocity.com/resources/what-are-cybersecurity-threats/

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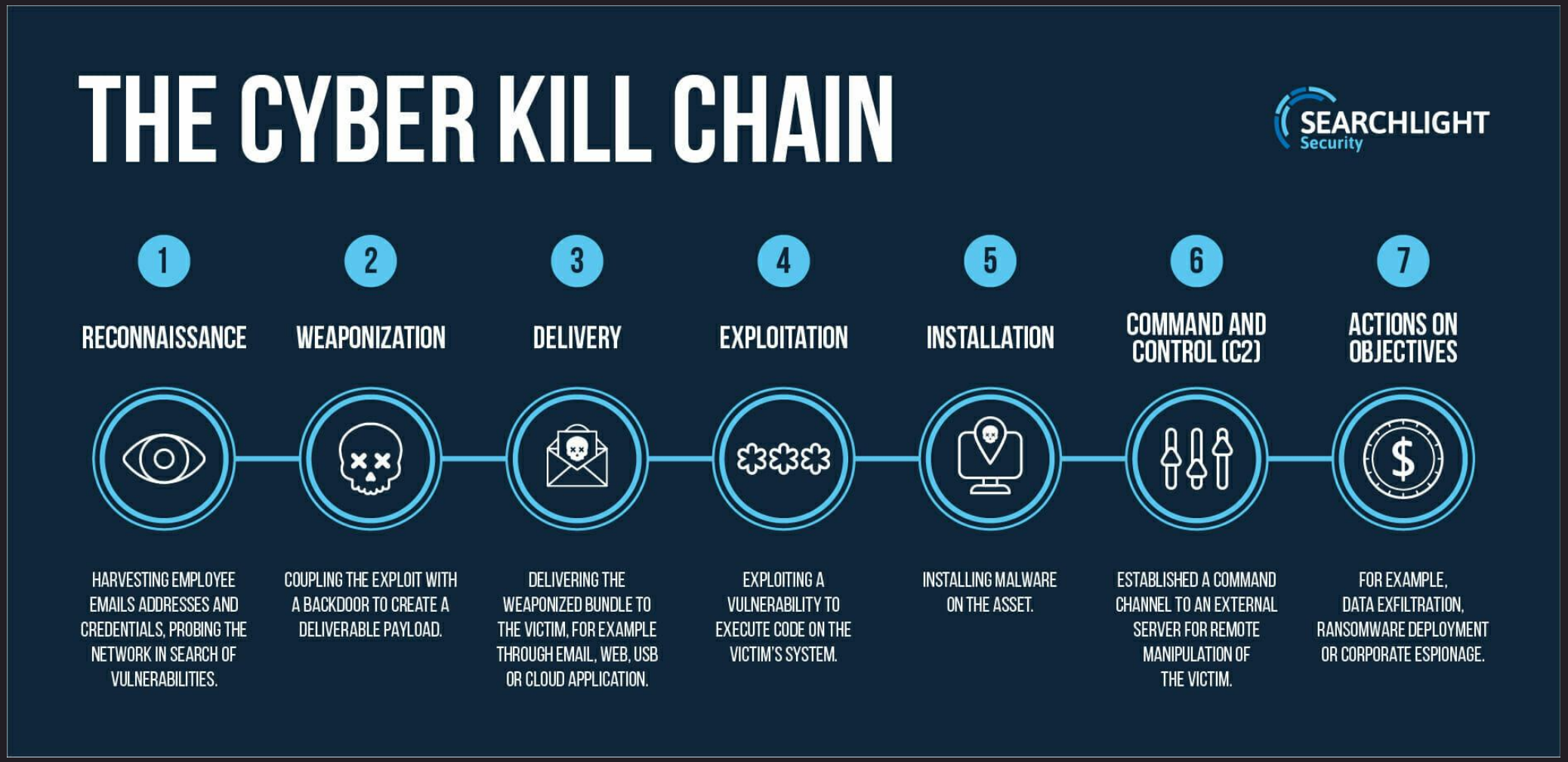
Summary: Cyber Kill Chain



Quelle: https://www.slcyber.io/shifting-left-in-the-cyber-kill-chain/

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Cyber Kill Chain Limitierungen

- **Lineare Struktur** -> Cyberangriffe oft nicht linear, und Angreifer können Phasen überspringen, kombinieren oder wiederholen.

- Unfähigkeit, interne Bedrohungen und webbasierte Angriffe zu erkennen

- Die sich verändernde Landschaft der Cyber-Bedrohungen

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Cyber Kill Chain Limitierungen

- Gute Beschreibung Cyberangriff von Reconnaissance bis Inital Access
- Für spätere Phasen -> Post Exploitation -> **Mitre Att&ck** Framework

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RED OPS
INFORMATION SECURITY

Vielen Dank! Q & A

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- **E-Mail:** office@redops.at
- **Linkedin:** Daniel Feichter
- **Twitter:** @VirtualAllocEx

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Quellen & Referenzen

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