The Summary: Malicious PowerShell Execution and Credential Dumping

Crowdstike Incident (or detection) Link:

VMI1146645 at 2023-09-12T07:27:42Z

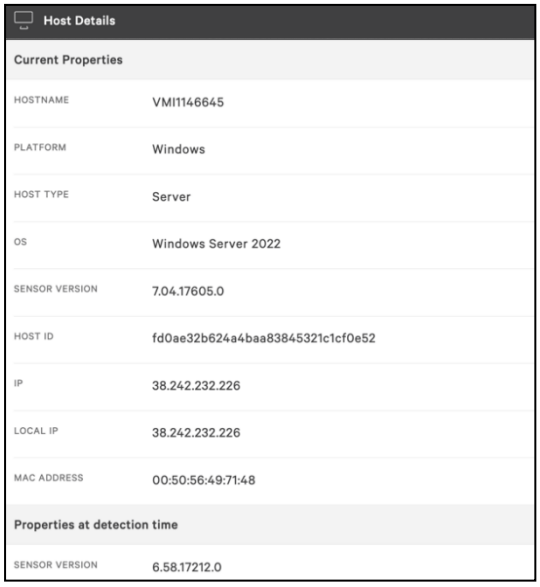
https://falcon.us-2.crowdstrike.com/crowdscore/incidents/details/inc:fd0ae32b624a4baa83845321c1cf0e52:b4c93bd1a35a40e5af84da75cb9cfe8a

Process Tree:

https://falcon.us-2.crowdstrike.com/activity/detections/detail/fd0ae32b624a4baa83845321c1cf0e52/85905108560?pid=275170693264&processView=tree

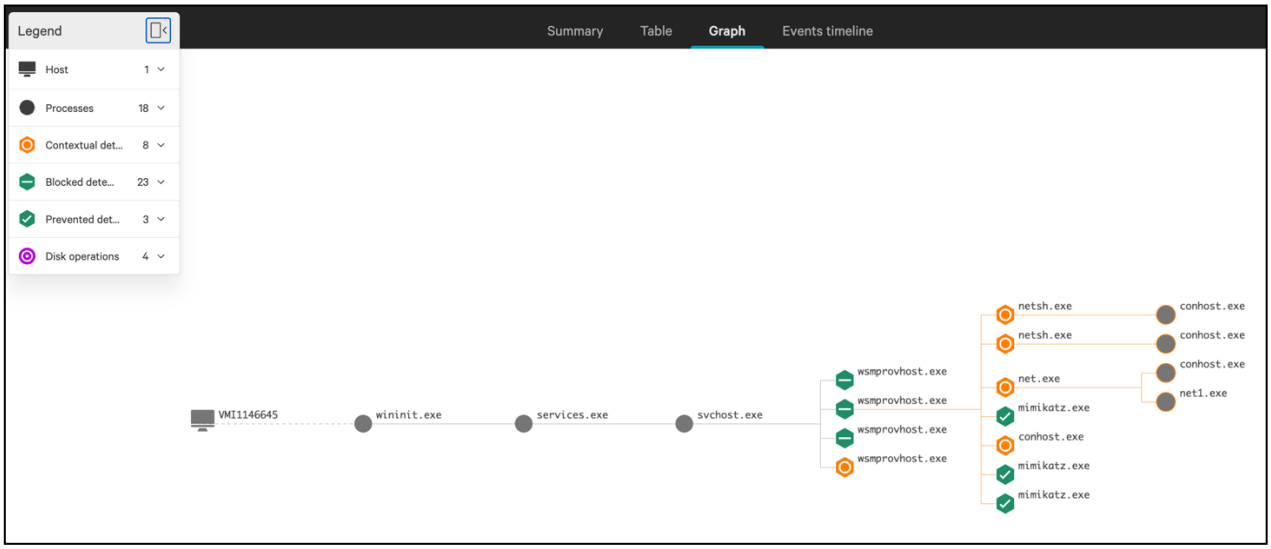
Description

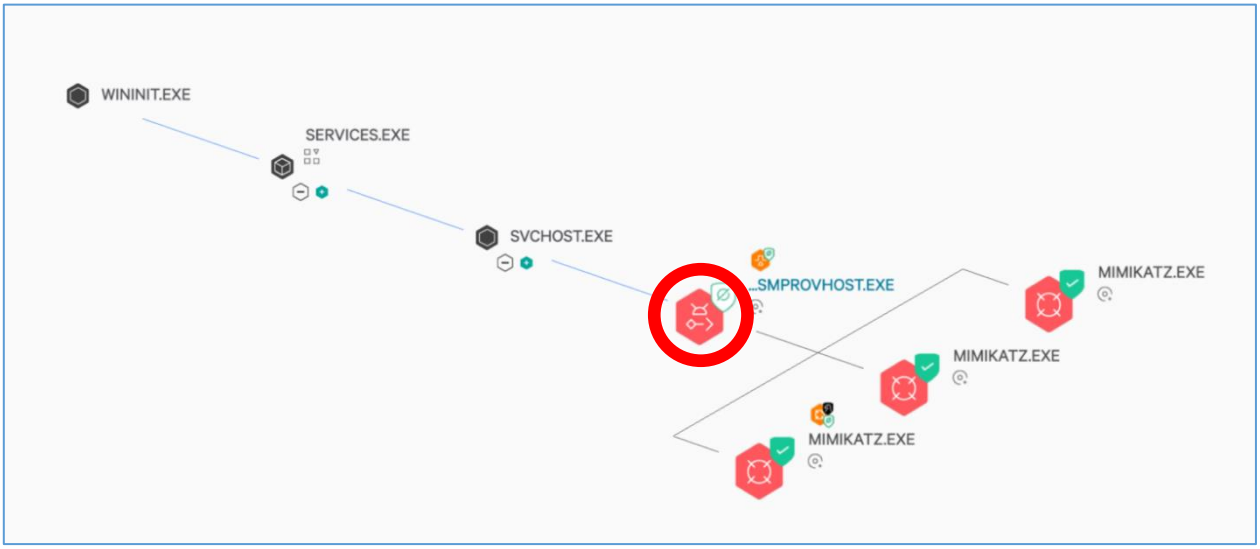
- **Incident name:** VMI1146645 at 2023-09-12T07:27:42Z
- **Victim IP:** 38.242.232.226 (VMI1146645 / OS Windows Server 2022)
- **Objectives in this incident:** Explore, Follow Through, Gain Access, Keep Access, Falcon Detection Method.
- **Techniques:** Windows Remote Management, Command and Scripting Interpreter, PowerShell, OS Credential Dumping, Masquerading, Sensor-based ML.
- **Involved hosts and end users:** VMI1146645, Administrator.



Host Details	
Current Properties	
HOSTNAME	VMI1146645
PLATFORM	Windows
HOST TYPE	Server
OS	Windows Server 2022
SENSOR VERSION	7.04.17605.0
HOST ID	fd0ae32b624a4baa83845321c1cf0e52
IP	38.242.232.226
LOCAL IP	38.242.232.226
MAC ADDRESS	00:50:56:49:71:48
Properties at detection time	
SENSOR VERSION	6.58.17212.0

Investigation Findings:



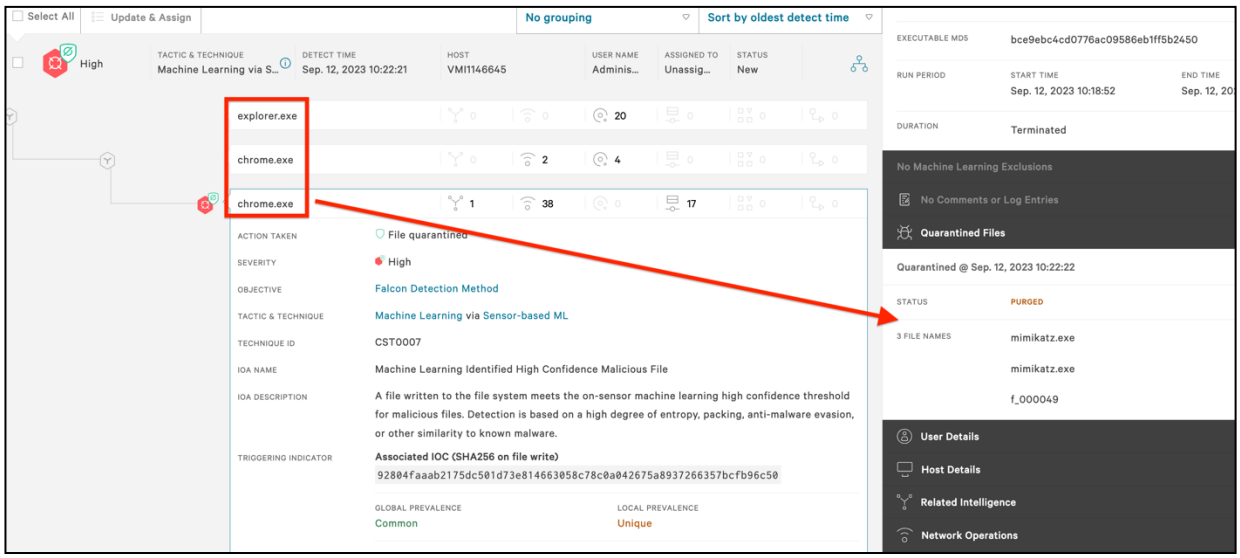


Analysis: The command "C:\Windows\system32\wsmprovhost.exe -Embedding" which starts execution of the malicious "\??\C:\Users\Administrator\Desktop\winPEAS.ps1" and then execution of "\Device\HarddiskVolume2\Users\Administrator\Desktop\mimikatz.exe" by the user **Administrator** indicates a highly suspicious action. The script, known as Invoke-Mimikatz, is commonly used for credential dumping, which poses a significant security risk.

https://falcon.us-2.crowdstrike.com/activity/detections/detail/fd0ae32b624a4baa83845321c1cf0e52/85905108560?pid=275170693264&processView=tree

https://falcon.us-2.crowdstrike.com/activity/quarantined-files?filter=sha256%3A%20%2792804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50%27%2Bhostname.raw%3A%27VMI1146645%27%2Busername%3A%27Administrator%27

.Observed Files:



First Event (Sep. 12, 2023 10:22:21): A cache was created under \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Google\Chrome\User Data\Default\Cache\Cache_Data\f_000049 just after ***mimikatz.exe*** was downloaded using chrome browser.

Filename (Executable): ***mimikatz.exe***

Hash - SHA-256:
92804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50

FILE PATHS

- \Device\HarddiskVolume2\Users\Administrator**Desktop**\mimikatz.exe,
- \Device\HarddiskVolume2\Users\Administrator**Documents**\mimikatz.exe,

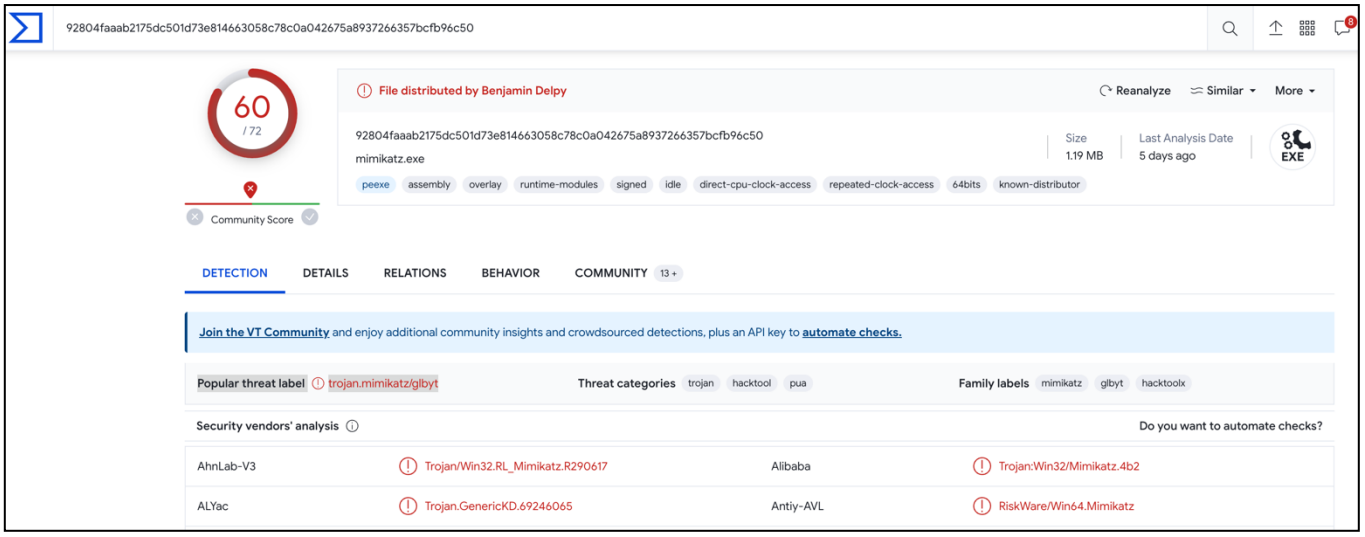
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Google\Chrome\User Data\Default\Cache\Cache_Data\f_000049

Virus Total Result:
https://www.virustotal.com/gui/file/92804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50

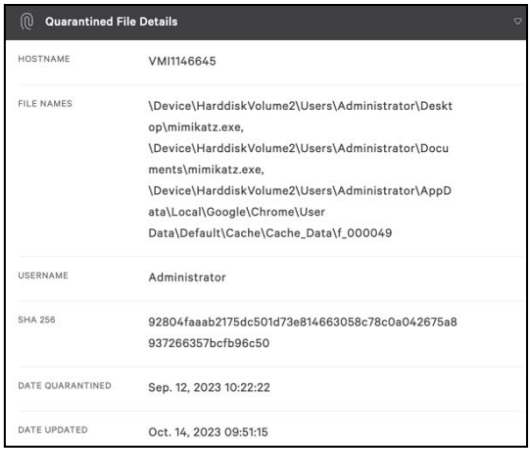
Brief Community Comments: -
Security Vendors' Analysis from Virus Total: **File distributed by Benjamin Delpy**

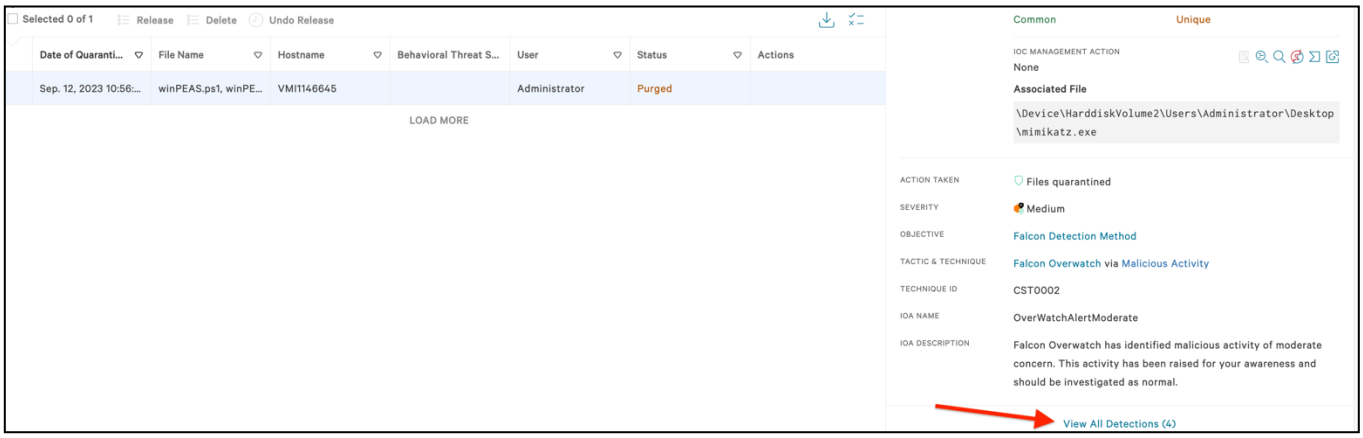
Multiple vendors labeled it as malware.
Popular threat label: trojan.mimikatz/glbyt

Other reports:
https://analyze.intezer.com/files/92804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50?vt



ACTIONS TAKEN: All files were quarantined and purged.





Go to this link to view all detections related to the mimikatz.exe and cache: https://falcon.us-2.crowdstrike.com/activity/detections/?filter=quarantined_file_hash%3A%2792804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50%27&groupBy=none

COMMAND LINE for downloading mimikatz.exe:

- "C:\Program Files\Google\Chrome\Application\chrome.exe" --type=utility --utility-sub-type=network.mojom.NetworkService --lang=de --service-sandbox-type=none --mojo-platform-channel-handle=2084 --field-trial-handle=1920,i,9084043800257210304,2273113495787540303,262144 /prefetch:8

Disk Operations:

explorer.exe:

\Device\HarddiskVolume2\Users\Administrator\AppData\Roaming\Microsoft\Windows\Recent\de10ae21bb262728c616a707f90aa05088c9d8f2b810fc0f2fb1bddcf9aba938.zip.lnk

\Device\HarddiskVolume2\Users\Administrator\AppData\Roaming\Microsoft\Windows\Recent\cffa16329e13d62acf61bc633131673dd876a04ed8dd76d178fa98a87e2ee2bb.zip.lnk

\Device\HarddiskVolume2\Users\Administrator\AppData\Roaming\Microsoft\Windows\Recent\Downloads.lnk

\Device\HarddiskVolume2\Users\Administrator\AppData\Roaming\Microsoft\Windows\Recent\88b7aa1440c142faa404021ffe25eb4cf1bf7d4b2b7979c7ffdc98014961aadf.xlsx.lnk

chrome.exe:

\Device\HarddiskVolume2\Windows\SystemTemp\chrome_PuffinComponentUnpacker_BeginUnzipping9504_557610398\page_embed_script.js

\Device\HarddiskVolume2\Windows\SystemTemp\chrome_PuffinComponentUnpacker_BeginUnzipping9504_1612496392\Google.Widevine.CDM.dll

\Device\HarddiskVolume2\Windows\SystemTemp\chrome_PuffinComponentUnpacker_BeginUnzipping9504_1612496392\Google.Widevine.CDM.dll

.Observed Network connections and IP Analysis (for downloading mimikatz.exe)

https://falcon.us-2.crowdstrike.com/activity/detections/?filter=quarantined_file_hash%3A%2792804faaab2175dc501d73e814663058c78c0a042675a8937266357bcfb96c50%27&groupBy=none

Chrome connection with the IP: 239.255.255.250 (Phishing Attachment IOC). This IP address might be related with downloading mimikatz.exe to the server. Should be blocked immediately.

IP: 239.255.255.250 (Phishing Attachment IOC - Multicast)
User Agent: -
Browser Name: -
Browser Version: -
OS: -

Analyst Investigation Results:
Virus Total Result: [here|https://www.virustotal.com/gui/ip-address/239.255.255.250]

Brief Community Comments: "ET MALWARE Possible Downadup/Conficker-C P2P encrypted traffic UDP Ping Packet (bit value 1)"
"I added the IP 239.255.255.250 to the user defined IOCs and got a couple thousand alerts from the workstations. Apparently it is a UPnP multicast address"

Security Vendors' Analysis from Virus Total: 3 security vendors flagged this IP address as
malicious

Talos Intelligence:
REPUTATION DETAILS:
IP Reputation: **Neutral**
Web Reputation: **Unknown**
BLOCK LISTS:
BL.SPAMCOP.NET: **-**
CBL.ABUSEAT.ORG: **-**
PBL.SPAMHAUS.ORG: **-**
SBL.SPAMHAUS.ORG: **-**

Shodan Result: [here|https://www.shodan.io/search?query=239.255.255.250]
Open Ports: 1900, 1723, 520, 20087, 3001

Other reports:

https://blogs.vmware.com/security/2023/11/jupyter-rising-an-update-on-jupyter-infostealer.html#:~:text=netconn_ipv4%3A146.70.101.83%20OR-,239.255.255.250,-OR%20224.0.0.251%20OR

https://blogs.vmware.com/security/2023/11/jupyter-rising-an-update-on-jupyter-infostealer.html

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Second Event (Sep. 12, 2023 10:53:42): wsmprovhost.exe was executed.

File Name: wsmprovhost.exe

Hash - SHA-256:
36f5a0512ff6a9717720fd11b160c88e43cd7a58370a75599a2f9b209ce542d0

Command Line: C:\Windows\system32\wsmprovhost.exe -Embedding

File Path: \Device\HarddiskVolume2\Windows\System32\wsmprovhost.exe

- **wsmprovhost.exe** is likely legitimate and related to Windows Management Instrumentation (WMI) providers. However, it was exploited to run **winPEAS.ps1** script to initiate **mimikatz** attack in the incident.
- The wsmprovhost.exe process is critical and linked to remote sessions in Windows (Remote Desktop Connection).

- The *wsmprovhost.exe* process indicates that a **Windows Remote PowerShell** session is active and generally appears when entering a remote session. The process is created on the server, and more such are added when you run other processes in the remote session.
    - https://windowsreport.com/wsmprovhost-exe/
    - https://windowsreport.com/remote-desktop-connection-windows-10/
    - Possible Misuse: https://strontic.github.io/xcyclopedia/library/wsmprovhost.exe-7FF8C32DD798BAB05FA7B271C09153CA.html
- -*Embedding* switch is often used with COM (Component Object Model) objects to indicate that the program should be run in a mode where it can be controlled by another program.

Objective: Gain Access

Possible Misuse: https://strontic.github.io/xcyclopedia/library/wsmprovhost.exe-7FF8C32DD798BAB05FA7B271C09153CA.html#possible-misuse:~:text=All%20rights%20reserved.-,Possible%20Misuse,-Permalink

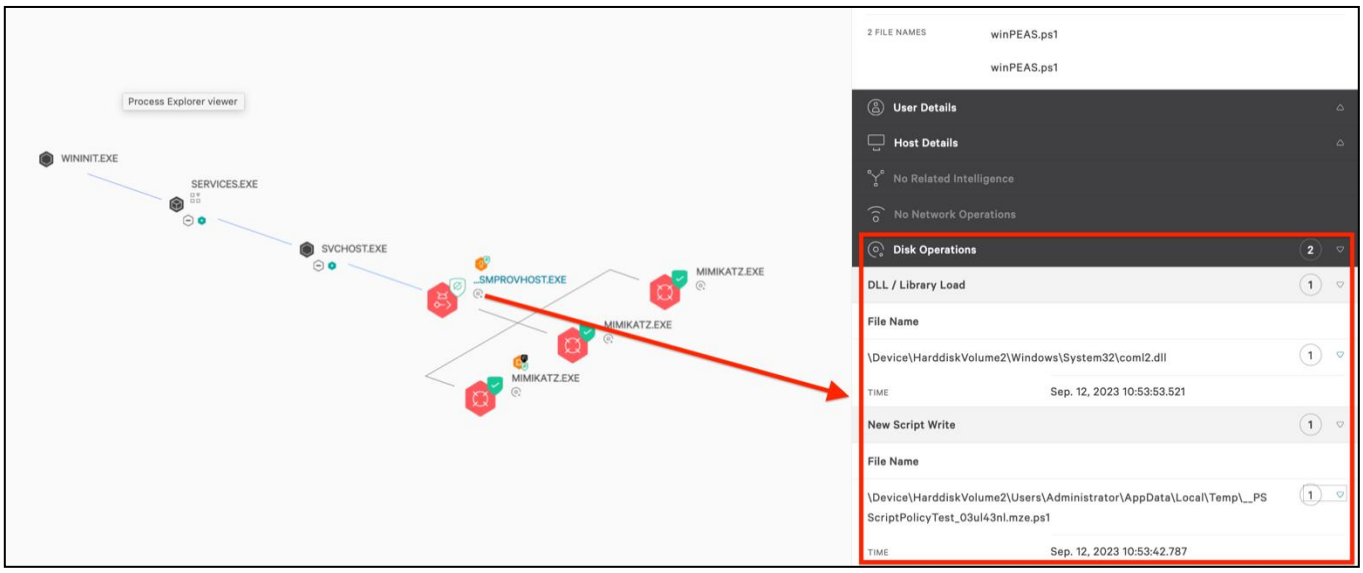
Virus Total Result:
https://www.virustotal.com/gui/file/36f5a0512ff6a9717720fd11b160c88e43cd7a58370a75599a2f9b209ce542d0/detection

Brief Community Comments: -
Security Vendors' Analysis from Virus Total: **File distributed by Microsoft**

Popular threat label: -

ACTIONS TAKEN: Operation blocked, Files quarantined

Disk Operations:



- \Device\HarddiskVolume2\Users\Administrator\Desktop\mimikatz.exe
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Temp__PSScri ptPolicyTest_4rs0xa4d.j4j.ps1
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Temp__PSScri ptPolicyTest_03ul43nl.mze.ps1
- \Device\HarddiskVolume2\Windows\System32\coml2.dll
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Temp__PSScri ptPolicyTest_pu5yy4b0.u0g.ps1
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Temp__PSScri ptPolicyTest_03ul43nl.mze.ps1
- \Device\HarddiskVolume2\Users\Administrator\AppData\Local\Temp__PSScri ptPolicyTest_su1gf442.2md.ps1

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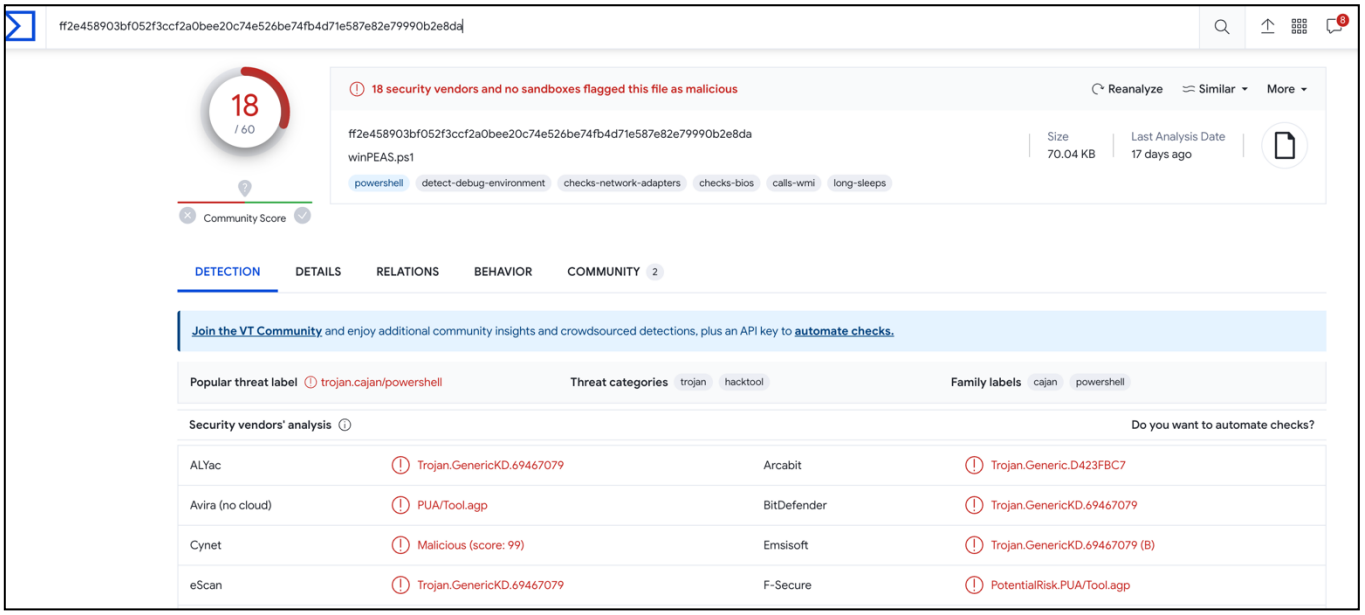
Third Event (Sep. 12, 2023 10:53:53):
\??\C:\Users\Administrator**Desktop****winPEAS.ps1** and \??\C:\Users\Administrator**Documents****winPEAS.ps1** were executed just after the attacker connected to server VMI1146645 via RDP with **wsmprovhost.exe**.

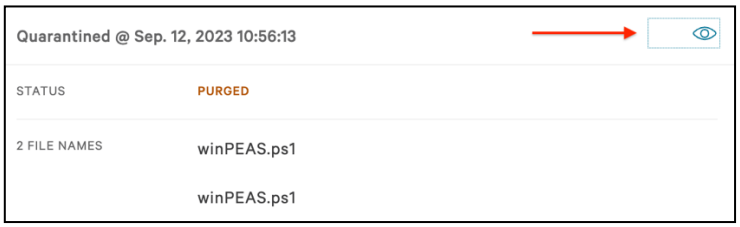
Filename: winPEAS.ps1
Hash - SHA-256:
ff2e458903bf052f3ccf2a0bee20c74e526be74fb4d71e587e82e79990b2e8da

Virus Total Result:
https://www.virustotal.com/gui/file/ff2e458903bf052f3ccf2a0bee20c74e526be74fb4d71e587e82e79990b2e8da
Brief Community Comments: -
Security Vendors' Analysis from Virus Total: 18 security vendors and no sandboxes flagged this file as malicious

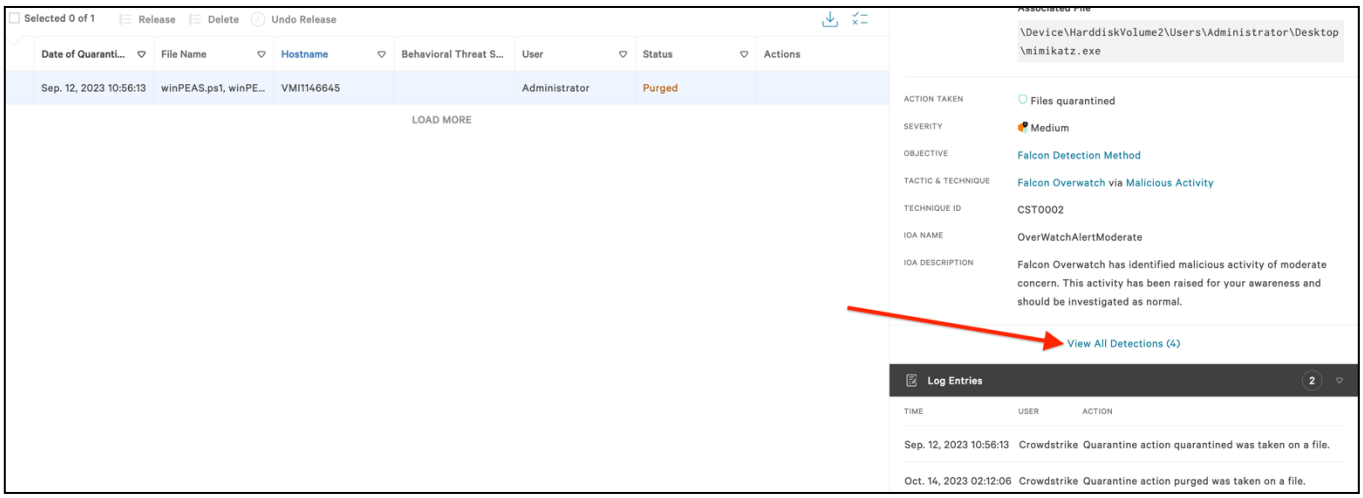
Popular threat label: trojan.cajan/powershell



⇒ From the Crowdstrike, go to Quarantined file winPEAS.ps1:



https://falcon.us-2.crowdstrike.com/activity/quarantined-files?filter=sha256%3A%20%27ff2e458903bf052f3ccf2a0bee20c74e526be74fb4d71e587e82e79990b2e8da%27%2Bhostname.raw%3A%27VMI1146645%27%2Busername%3A%27Administrator%27



Go to that link https://falcon.us-2.crowdstrike.com/activity/detections/?filter=quarantined_file_hash%3A%27ff2e458903bf052f3ccf2a0bee20c74e526be74fb4d71e587e82e79990b2e8da%27&groupBy=none to view all the detections related with **winPEAS.ps1.**

Description: The PowerShell script **winPEAS.ps1** appears to be launching \Device\HarddiskVolume2\Users\Administrator**Desktop**\mimikatz.exe and \Device\HarddiskVolume2\Users\Administrator**Documents**\mimikatz.exe, a password dumping utility.

Capabilities of winPEAS.ps1 malicious powershell script file: Windows Privilege Escalation (Privilege Escalation (PrivEsc) in Windows is a process that get the Administrator credential and login.)

Source Code of winPEAS.ps1: https://github.com/carlospolop/PEASS-ng/blob/master/winPEAS/winPEASps1/winPEAS.ps1

ACTIONS TAKEN: Operation blocked, Files (**winPEAS.ps1**) quarantined

Disk Operations:

\Device\HarddiskVolume2\Windows\System32\ntdll.dll

\Device\HarddiskVolume2\Users\Administrator\Desktop\mimikatz.exe

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Fourth Event (Sep. 12, 2023 10:59:23): **net.exe** executable file, which is normally a legitimate file in Windows to deal with accounts, was executed suspiciously and it might be related with *Lateral Movement via Windows Remote Management*

Command Line: `"C:\Windows\system32\net.exe" user /domain`

Filename: net.exe

Hash - SHA-256:
f540747022e0d67722989765b5db268707e4e71538ae0764110eec7b8d9aeef6

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Fifth Event (Sep. 12, 2023 11:03:34): A suspicious executable file was executed after the incident.

Command Line: `\??\C:\Windows\system32\conhost.exe 0xffffffff -ForceV1`

Filename: conhost.exe

Hash - SHA-256:
1169576411670c9305b921d2c2c1500ebbae0158fb9cc3e43a5042237a3d00d9
Virus Total Result:
https://www.virustotal.com/gui/file/1169576411670c9305b921d2c2c1500ebbae0158fb9cc3e43a5042237a3d00d9/community
Brief Community Comments: -
Security Vendors' Analysis from Virus Total: **51 security vendors and 1 sandbox flagged this file as malicious**
SRC URL reported to urlhaus.abuse.ch #malicious
Popular threat label: trojan.dloadr/xmrminer

https://any.run/report/1169576411670c9305b921d2c2c1500ebbae0158fb9cc3e43a5042237a3d00d9/4eb598a7-03b8-4c74-8826-afba114c03d7

https://answers.microsoft.com/en-us/windows/forum/all/im-experiencing-random-high-cpu-usage-up-to-30-by/be7fb2f9-a742-4352-baf7-f4771cd717e6

https://answers.microsoft.com/en-us/windows/forum/all/suspicious-conhostexe/a7842ec3-3e17-4ad5-93d4-cf80262ccfb5

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.Observed Suspicious DNS Activity:

Domain: bazaar.abuse.ch
Virus Total Result: [here|https://www.virustotal.com/gui/domain/bazaar.abuse.ch]
Brief Community Comments: MalwareBazaar is a site for sharing malware samples with the community. It is safe to visit, but be careful when downloading malware samples.
Security Vendors' Analysis from Virus Total: **1 security vendor flagged this domain as malicious**

.Observed Registry Operations: There is no registry operations.

.Impact Assessment: The potential impact of this activity includes unauthorized access to sensitive credentials, potential compromise of user accounts, and a higher risk of lateral movement.

.Responses: The execution of the command "C:\Windows\system32\wsmprovhost.exe -Embedding" and "\??\C:\Users\Administrator\Desktop\winPEAS.ps1" have been blocked and files were quarantined, however the command "\Device\HarddiskVolume2\Users\Administrator\Desktop\mimikatz.exe" by the user **Administrator** has been executed followed by being blocked and the file was quarantined.

The final command `\??\C:\Windows\system32\conhost.exe 0xffffffff -ForceV1` was executed. This process "meets the machine learning-based on-sensor AV protection's high confidence threshold for malicious files". And there is no sign of blocking or quarantining action from the Crowdstrike.

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Recommended Actions:

a. **Contain** affected endpoint VMI1146645
b. **Isolate** affected endpoint from the network to prevent further potential harm and lateral movement infections**.**
c. **Patch** the OS with the latest version.
d. **Restore** the server from clean backups.
e. The server should be **fully scanned**.
f. Apply **performance testing** to verify there is no high usage of CPU and other resources in the machine due to malware artifacts.
g. **Reset/Lock** the account Administrator
h. **Check the exploitable file** \Device\HarddiskVolume2\Windows\System32\wsmprovhost.exe against vulnerabilities. **Removing** wsmprovhost.exe and then configuring the host for allowing only VPN or SSH remote connections could be a proper option.
i. Check out any **spam emails** against phishing attacks.
j. **Educate** users on identifying phishing attempts.
k. **Block** the malicious multicast IP address 239.255.255.250. Also block any multicast traffic to or from the server.

Ticket Priority:

7. Assigned Analyst: Medrkmostafaei (L1 SOC Analyst)