

Lab 3: Malware analysis

Name: Mohamad Nour Shahin

Group number: B22-CBS-01

Questions to Answer

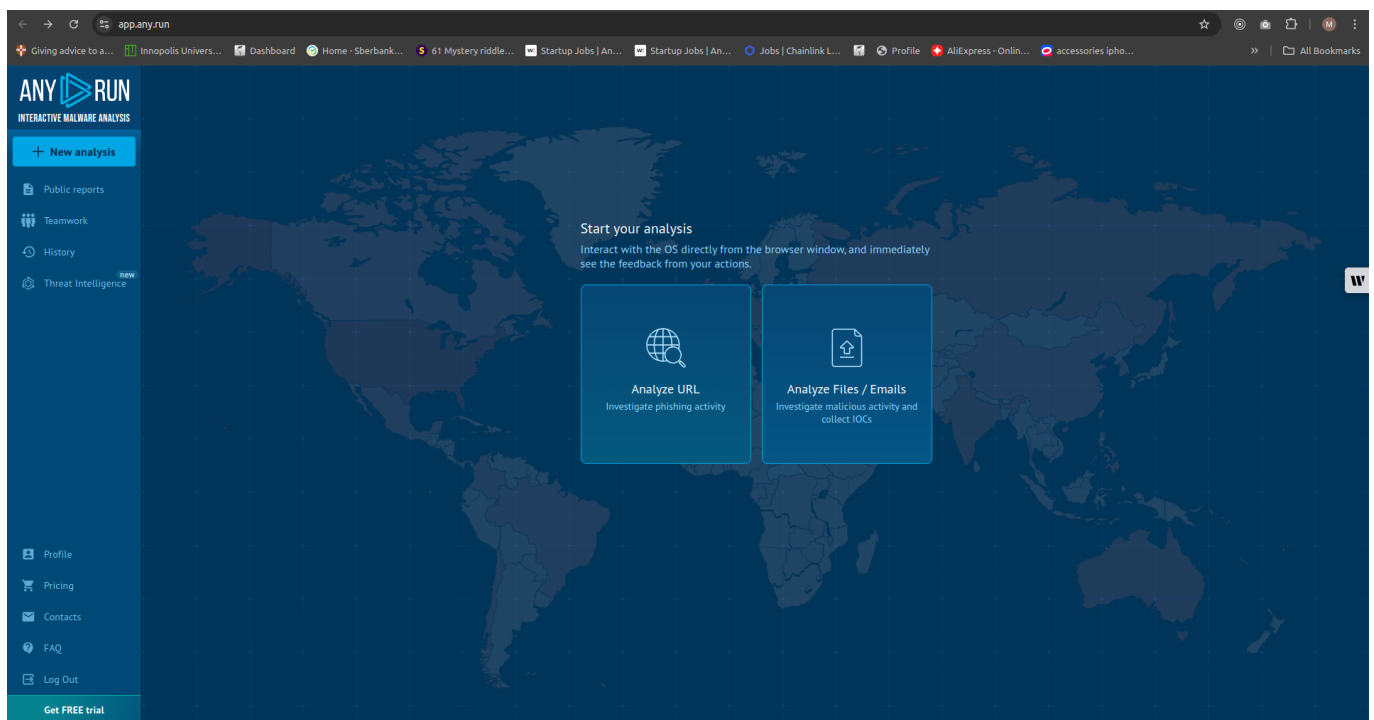
1. Preparation

Choose a sandboxing solution, some recommended ones includes the following.

- Cuckoo (Bonus point if you set up Cuckoo in an isolated VM)
- Hybrid Analysis
- Any.run
- Intezer Analyze
- Joe Sandbox

Solution:

I will choose third choice [Any.run](#) as we practice with it during lab. I created an account on it. here is the screenshot of it:



2. Let's get some malware

Select a malware that you want to analyse in the sandbox selected in step 1.

- You can download some malware/ransomware from the internet. For example [TheZoo](#), [MalwareBazaar Database](#). You can also check your email for any spam with malicious attachment.
- Don't select the same malware used in the classwork.
- Be careful when you run them, these are real malware.

Solution:

I searched in the [MalwareBazaar Database](#), and I will use this [Malware](#)

Database Entry

TrickBot

Vendor detections: 14

Intelligence	IOCs	YARA	File information	Comments	Actions
SHA256 hash:	01ec7b1066d7c55e262dc375bf5fd13a1fc9706c3db4b3522ac8b9d2453b52				
SHA3-384 hash:	173e395d3d496e77a8708d3a5c662a4d3db47a29904009b57acbf2320d027541fae162c4dc051118d08288753f3				
SHA1 hash:	76c5317147306c477d793dc6aaa9e146811182e				
MD5 hash:	9c7e97eb3958d430e6ba38bb1a99471				
humanhash:	black-tailed-skyark-winter				
File name:	GST INVOICE.exe				
Download:	download sample				
Signature	TrickBot				
File size:	689152 bytes				
First seen:	2023-12-05 16:00:47 UTC				
Last seen:	2023-12-05 17:18:03 UTC				
File type:	exe				
MIME type:	application/x-dosexec				
imphash	f34d52d4577ed6d9c5c516c15a744 (46733 x AgentTesla, 16490 x Formbook, 10467 x SnakeKeylogger)				
ssdeep	12288:OCB5nF8MC6PlgyUgypMVU7dAbzbn4nHx0XKqRo8WONXzofm:zPDlgFNHzYztR3HvV2XNofm				
TLSH	T1C4E4126031AD7C98D88E02FD1931E008A362FE794495E3C96C275DB45E9FE0462293				
TrID	63.0% (.EXE) Generic CIL Executable (.NET, Mono, etc.) (73123/413) 11.2% (.SCR) Windows screen saver (13617/503) 9.0% (.EXE) Win64 Executable (generic) (10523/124) 5.6% (.DLL) Win32 Dynamic Link Library (generic) (6578/252) 3.8% (.EXE) Win32 Executable (generic) (4505/51)				
Reporter	zocaman				

MalwareBazaar Database

This page let you download the following malware sample: **SHA256 01ec7b1066d7c55e262dc375bf5fd13a1fc9706c3db4b3522ac8b9d2453b52**

Caution!

You are about to download a malware sample. By clicking on "download", you declare that you have understood what you are doing and that MalwareBazaar can not be held accountable for any damage caused by downloading this malware sample!

ZIP password: infected

Download

© abuse.ch 2024

3. Sandbox analysis

Run your malware in the sandbox.

- See what kind of traces, artifacts, connections your sandbox detects.
- Analyze the behavior of the malware, and write about what the malware does and the goals of the malware.

- Does the malware have some sandbox detection? If yes, try to detect and defeat the techniques used for that.

Solution:

1. Firstly I downloaded the malware as zip, unzip, upload the file to the [Any.run](#) , and I will set the configuration:

MalwareBazaar Database

This page let you download the following malware sample: **SHA256 01ec7b1066df7c55e262dc375bff5fd13a1fc9706c3db4b3522ac8b9d2453b52**

Caution!

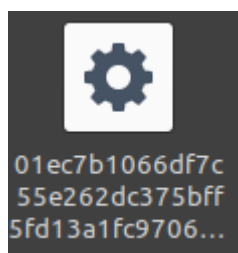
You are about to download a malware sample. By clicking on "download", you declare that you have understood what you are doing and that MalwareBazaar can not to be held accountable for any damage caused by downloading this malware sample!

ZIP password: **infected**

Download

© abuse.ch 2024

- after unzip it:



New analysis

Simple mode

Pro mode

New VM video streaming

beta

URL or file upload

01ec7b1066df7c55e262dc375bff5fd13a1fc9706c3db4b3522ac8b9d2453b52.exe

Start object from

Open in browser

Temp directory

Microsoft Edge

Change extension to valid

On

Hide source

Command line

Type or choose a preset

Duration, sec

10

15

30

45

60

Network

Connected

HTTPS MITM PROXY

Fake net

Route internet traffic through (optional):

Route via TOR

Residential proxy

User VPN (0/100)

Fastest geo

Choose

Add a confi

Privacy

Only me

Team

Who has a link

Public

The report will be deleted in

2 weeks

Preset configuration (1/100)

Default

+

Autosave changes

Operating system

Windows 10 (64 bit)

Auto confirm UAC

On

Pre-installed soft set

Complete

Locale (OS Language)

United States (en-US)

Applications

Hot fixes

Tools collection

CCleaner	6.20
Mozilla Firefox (x64 en-US)	123.0
Mozilla Maintenance Service	123.0
Notepad++ (64-bit x64)	7.9.1
Microsoft OneNote - en-us	16.0.16026.20146
Microsoft Office Professional 2019 - de-de	16.0.16026.20146
Microsoft Office Professional 2019 - en-us	16.0.16026.20146
Microsoft Office Professional 2019 - es-es	16.0.16026.20146
Microsoft Office Professionnel 2019 - fr-fr	16.0.16026.20146
Microsoft Office Professional 2019 - it-it	16.0.16026.20146
Microsoft Office Professional 2019 - ja-jp	16.0.16026.20146

Additional settings

Automated Interactivity (ML)

new

ChatGPT Access

Run a public analysis

- we add more time for analyzing.

Win10 64 bit

Complete

01ec7b1066df7c55e262dc375bff5fd13a1fc9706c3db4b3522ac8b9d2453b52.exe

MD5: 9C7B97EB3958D4309E6BA38BB1A99471

Start: 11.09.2024, 13:23

01:54

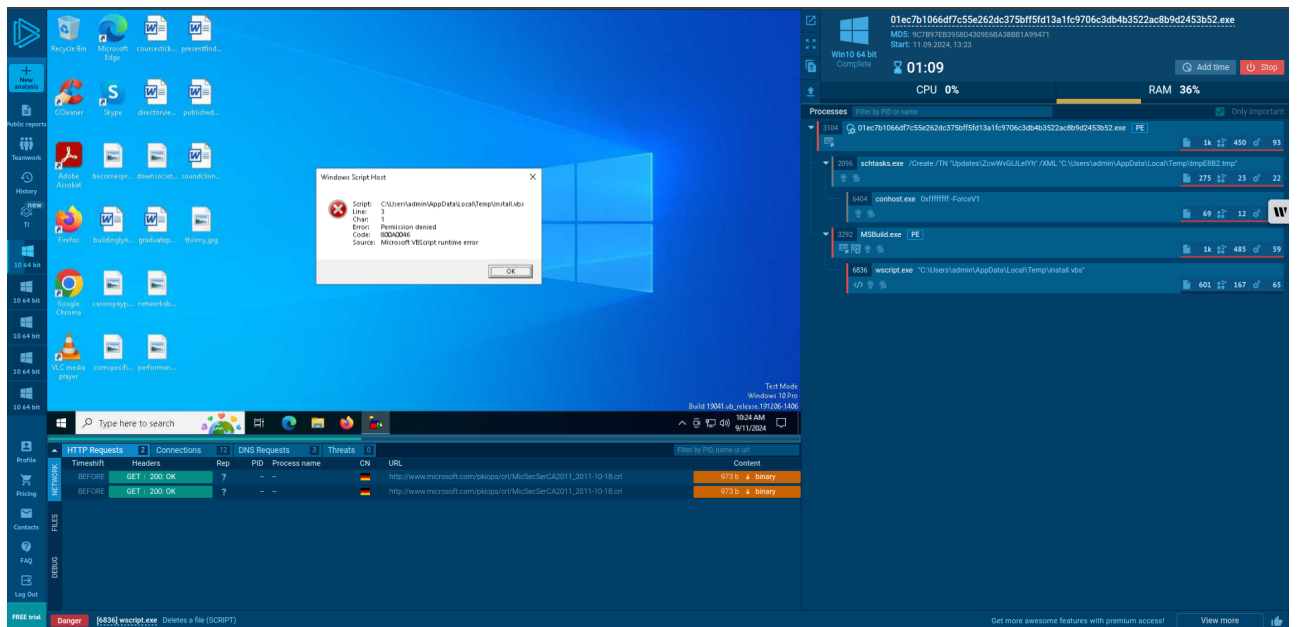
Add time

Stop

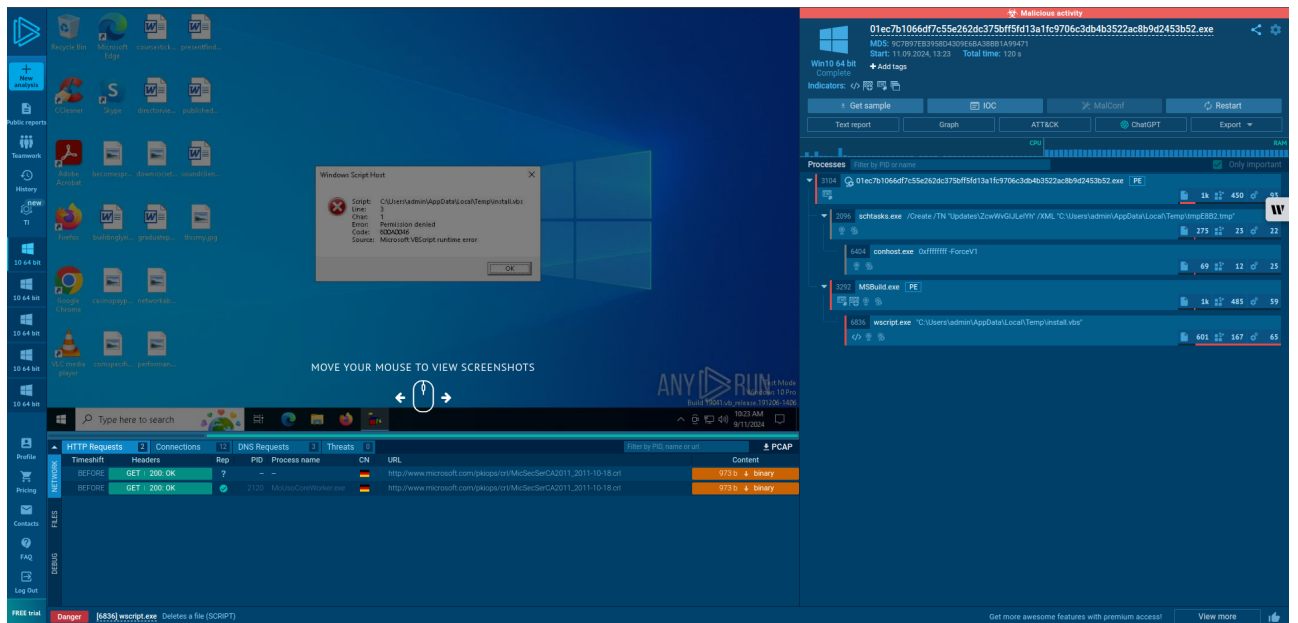
CPU 0%

RAM 36%

- processing:



- after processing:



1. connections:

	Timeshift	Headers	Rep	PID	Process name	CN	URL	Content
NETWORK	BEFORE	GET 200: OK	✓	-	-		http://www.microsoft.com/pkiops/cr/MicSecSerCA2011_2011-10-18.crl	973 b ↓ binary
	BEFORE	GET 200: OK	✓	-	-		http://www.microsoft.com/pkiops/cr/MicSecSerCA2011_2011-10-18.crl	973 b ↓ binary
	BEFORE	GET 200: OK	✓	-	-		http://www.microsoft.com/pkiops/cr/MicSecSerCA2011_2011-10-18.crl	973 b ↓ binary

FILES	BEFORE	TCP	✓	-	-	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 731 B ↓ 7.64 Kb
	BEFORE	UDP	✓	4	System	192.168.100.255	138	-	-	↑ 2.47 Kb ↓ -
	BEFORE	TCP	✓	-	-	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 888 B ↓ 4.18 Kb
	BEFORE	TCP	✓	-	-	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.31 Kb ↓ 4.22 Kb
	BEFORE	TCP	✓	-	-	23.33.233.193	80	www.microsoft.com	AKAMAI-AS	↑ 209 B ↓ 1.43 Kb
	BEFORE	TCP	✓	2120	MoUsCoreWorker.exe	23.33.233.193	80	www.microsoft.com	AKAMAI-AS	↑ 209 B ↓ 1.43 Kb
	BEFORE	TCP	✓	-	-	23.33.233.193	80	www.microsoft.com	AKAMAI-AS	↑ 209 B ↓ 1.43 Kb
	BEFORE	TCP	✓	2120	MoUsCoreWorker.exe	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 860 B ↓ 4.22 Kb
	BEFORE	TCP	✓	2400	svchost.exe	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.66 Kb ↓ 7.80 Kb
	731 ms	TCP	✓	2120	MoUsCoreWorker.exe	40.127.240.158	443	settings-win.data.microsoft.com	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.09 Kb ↓ 17.8 Kb

Timeshift	Status	Rep	Domain	IP
BEFORE	Responded	✓	settings-win.data.microsoft.com	40.127.240.158
BEFORE	Responded	✓	www.microsoft.com	23.33.233.193
BEFORE	Responded	✓	google.com	142.250.75.238
6331 ms	Responded	✓	settings-win.data.microsoft.com	52.137.106.217

MITRE ATT&CK Matrix

Tactics 5 | Techniques 13 | Events 22

<

2. while monitoring the process:

- first process:

Advanced details of process

100 OUT OF 100

Threat Verdict

Malicious

The score is an approximate value calculated by ANY.RUN algorithm based on process and user actions

Indicators: 0

Main information

Code signing

Process dump 0

Events

Modified files 2

Registry changes 0

Synchronization 27

HTTP requests 0

Connections 0

Network threats 0

Modules 93

Debug 0

Process information

Username: admin

SID: S-1-5-21-1693882860-607145093-2874071422-1001

RL: MEDRM

Start: 5.68 s

File information

Company: Microsoft Corporation

Description: Shell Extension

Version: 1.0.0.0

Command line

"C:\Users\admin\AppData\Local\Temp\01ec7b1066df7c55e262dc375bf5fd13a1fc9706c3db4b3522ac8b9d2453b52.exe"

Timeline of the process

0 s 5.68 s 24.43 s 76.81 s

5.68 s 24.43 s

View Group Deep

Danger 2

T1053.005 Scheduled Task (1)

Uses Task Scheduler to run other applications

T1492.003 Time Based Evasion (1)

Uses Task Scheduler to run other applications

Warning 4

Executable content was dropped or overwritten

T1012 Query Registry (1)

Reads security settings of Internet Explorer

Starts a Microsoft application from unusual location

T1036.002 Rename System Utilities (1)

Process drops legitimate windows executable

Other 6

T1514 System Location Discovery (1)

Process checks computer location settings

Create files in a temporary directory

Creates files or folders in the user directory

The process uses the downloaded file

T1012 Query Registry (3)

Reads the machine GUID from the registry

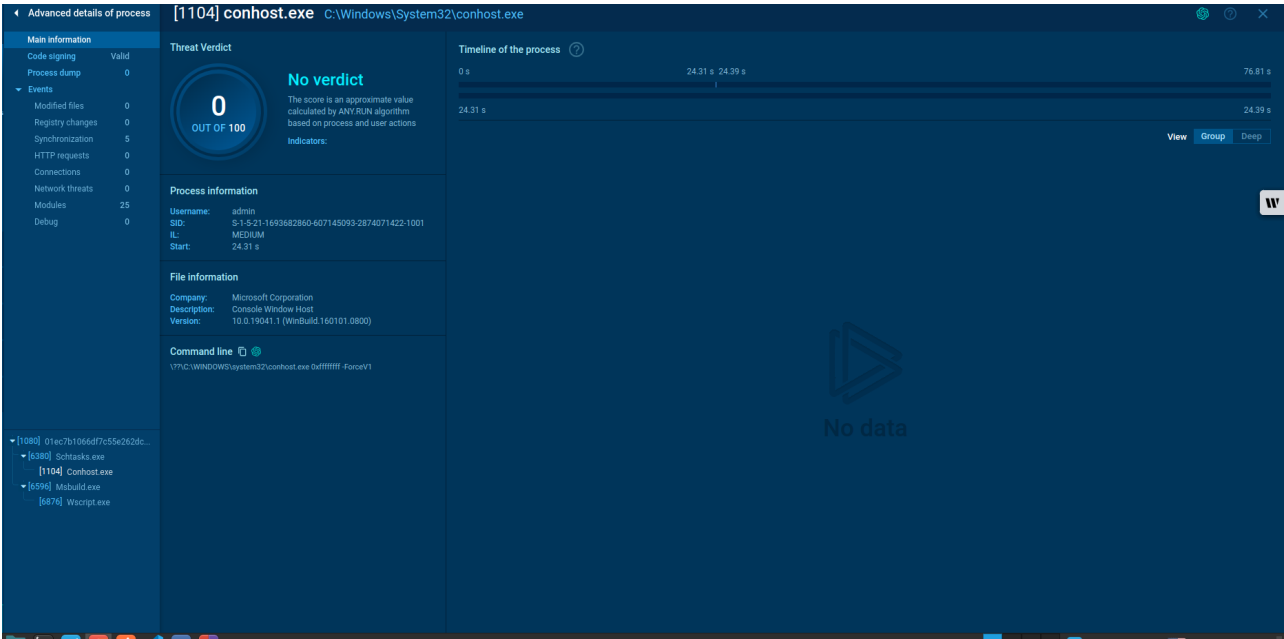
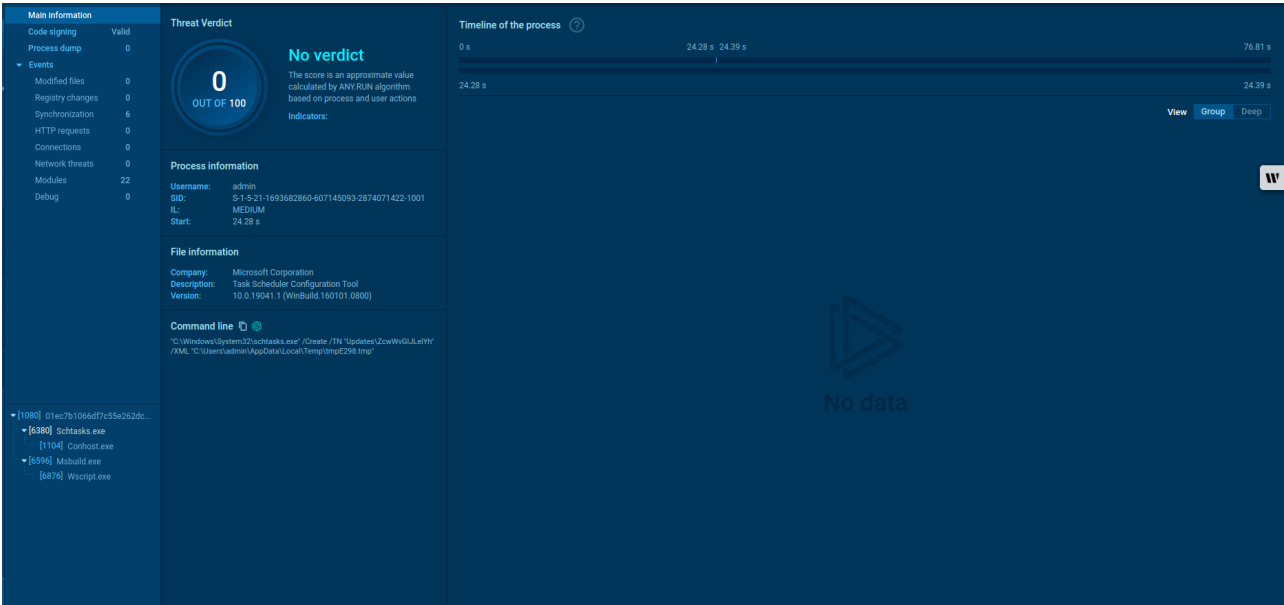
Reads the computer name

Checks supported languages

T1082 System Information Discovery (3)

- second and third process:

6 / 11



- fourth process:



- fifth process it's trying to sleep to evasion detection, but we got it with increasing the time and without it:

Advanced details of process [6876] wscript.exe C:\Windows\SysWOW64\wscript.exe

Main information

- Code signing: Valid
- Process dump: 0
- Script tracer: 4
- YScript: 4
- Events: 0
- Modified files: 0
- Registry changes: 0
- Synchronization: 19
- HTTP requests: 0
- Connections: 0
- Network threats: 0
- Modules: 64
- Debug: 0

Threat Verdict

100 OUT OF 100

Malicious

The score is an approximate value calculated by ANY.RUN algorithm based on process and user actions

Indicators: <>

Process information

Username: admin
SID: S-1-5-21-1693682860-607145092-28740371422-1001
RL: MEDIUM
Start: 24.64 s

File information

Company: Microsoft Corporation
Description: Microsoft ® Windows Based Script Host
Version: 5.812.10240.16384

Command line

"C:\WINDOWS\system32\WScript.exe" "C:\Users\admin\AppData\Local\Temp\Uninstall.vbs"

Timeline of the process

0 s 24.64 s 76.81 s

Danger 2

- T1070.004 File Deletion (1)
 - Deletes a file (SCRIPT)
- T1497.003 Time Based Evasion (1)
 - Uses sleep, probably for evasion detection (SCRIPT)

Warning 2

- Deletes system .NET executable
- Creates FileSystem object to access computer's file system (SCRIPT)

3. I run it without more time, and I got same results. So the malware didn't have sandbox detection.

Windows Defender Security Center

01ec7b1066df7c5e262dc375bfff5d13a1fc9706c3db4b3522ac8b9d2453b52.exe

MD5: 9C7B07E2B99580A209E6BA38801A99471

Start: 11/09/2024, 13:44

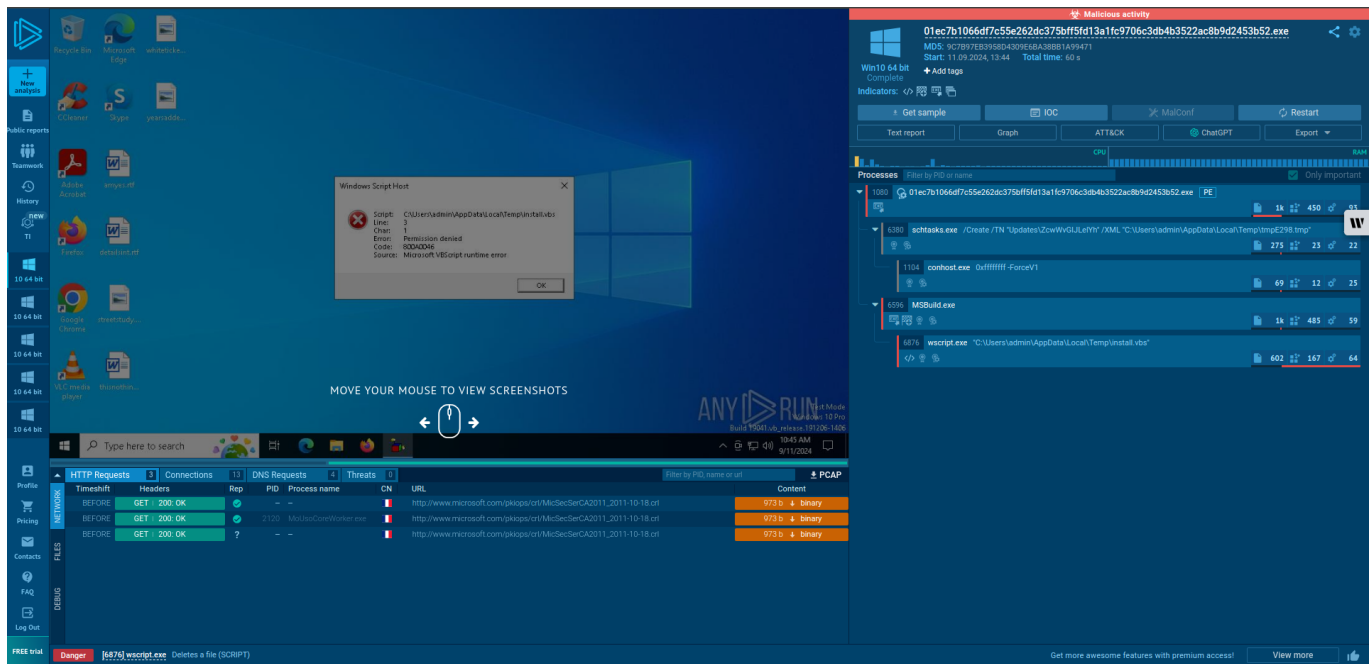
CPU 36% RAM 38%

Processes (sorted by PID)

PID	Process name	Content
1080	01ec7b1066df7c5e262dc375bfff5d13a1fc9706c3db4b3522ac8b9d2453b52.exe	0 0 0 0

HTTP Requests

Timeshift	Headers	Rep	PID	Process name	CN	URL	Content
BEFORE	GET	200 OK	-	-	-	http://www.microsoft.com/pepope/pe/McSecSerCA2011_2011-10-18.caf	973 B Binary
BEFORE	GET	200 OK	-	-	-	http://www.microsoft.com/pepope/pe/McSecSerCA2011_2011-10-18.caf	973 B Binary
BEFORE	GET	200 OK	-	-	-	http://www.microsoft.com/pepope/pe/McSecSerCA2011_2011-10-18.caf	973 B Binary



4. Links to reports generated by the tool:

[Any.run](#)

Without increasing the time With increasing the time

4. Remediation

- Suggest remediation actions for eradicating the malware from compromised endpoints. Include this in your malware analysis report.

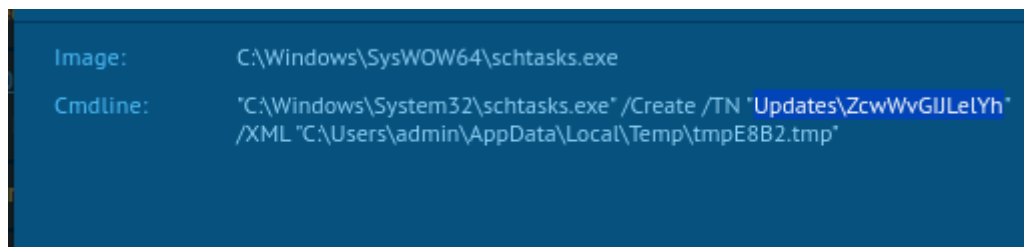
Note that generic recommendations will not be accepted. You need to suggest very specific steps that align with the results from your analysis.

For example:

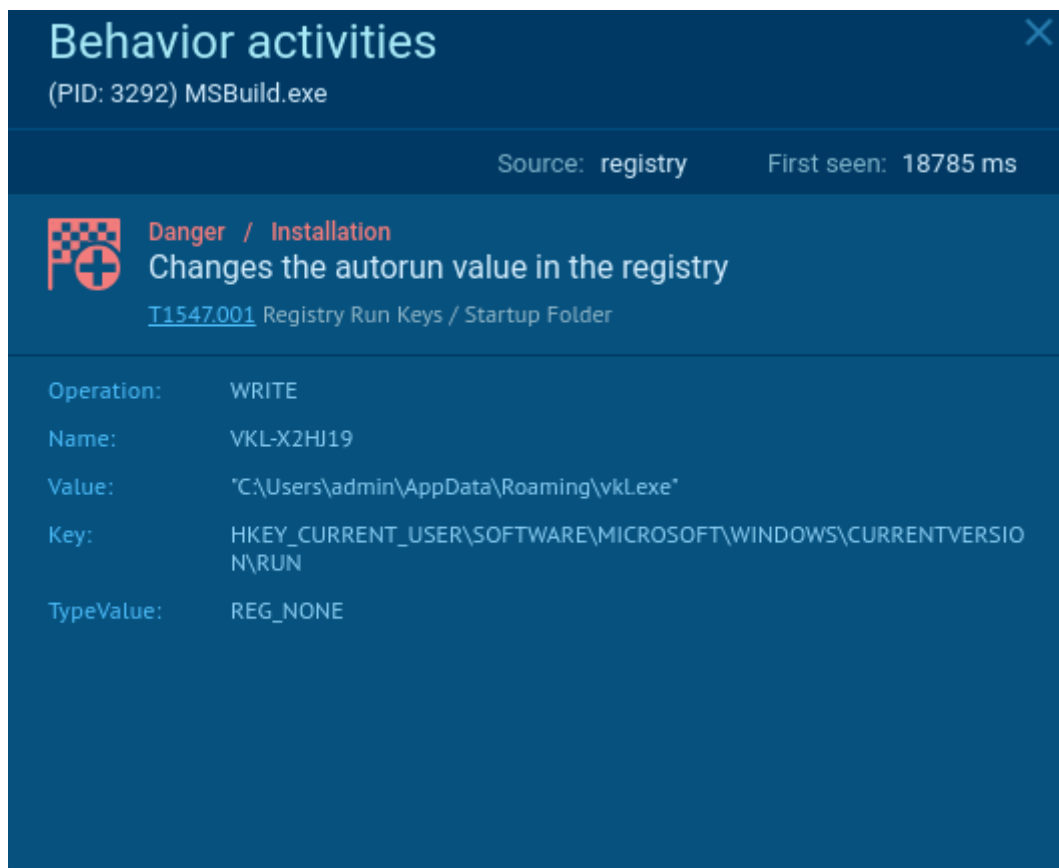
- Remove the executable dropped at C:\Program Files\dotnet\malware.exe ✓
- Remove the dropped executable ✗ Another example:
- Create a rule on the network firewall to block IP address xx.xx.xx.xx ✓
- Create a firewall rule ✗

Solution:

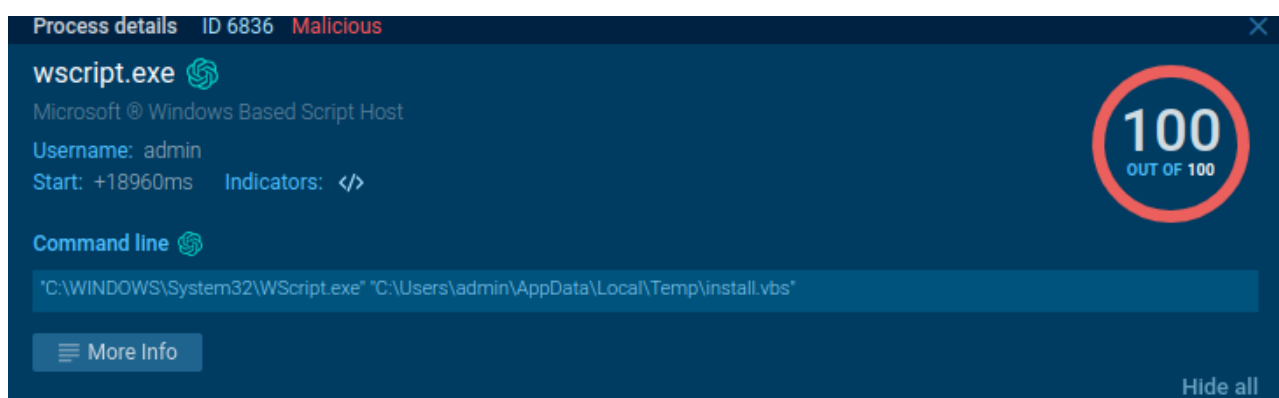
- Remove the executable dropped at
C:\Users\admin\AppData\Local\Temp\01ec7b1066df7c55e262dc375bff5fd13a1fc9706c3db4b3522ac8b9d2453b52.exe
- kill this secduled task Updates\ZcwWvGIJLeYh



3. restart the configuration C:\Users\admin\AppData\Roaming\vkL.exe" to its previous value or default one.



4. Remove the script files "C:\Users\admin\AppData\Local\Temp\install.vbs"



5. Create a rule on the network firewall to block IP address 40.127.240.158 which has unknown Rep with process name: svchost.exe or null

NETWORK	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	4	System		192.168.100.255	138	-	-	-	↑
FILES	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	✓	-	-		104.107.161.181	80	www.microsoft.com	-	AKAMAI-AS	↑
DEBUG	BEFORE	TCP	✓	2120	MoUsCoreWorker.exe		104.107.161.181	80	www.microsoft.com	-	AKAMAI-AS	↑
	BEFORE	TCP	?	6880	svchost.exe		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	3888	svchost.exe		239.255.255.250	1900	-	-	-	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	3888	svchost.exe		239.255.255.250	1900	-	-	-	↑ 411 b ↓ -
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.66 Kb ↓ 7.80 Kb
	9411 ms	TCP	✓	6880	svchost.exe		4.231.128.59	443	settings-win.data.microsoft.com	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.64 Kb ↓ 4.18 Kb
	21722 ms	UDP	✓	4	System		192.168.100.255	137	-	-	-	↑ 544 b ↓ -

6. Create a rule on the network firewall to block IP address 239.255.255.250 which has unkown CN with process name: svchost.exe or null

NETWORK	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	4	System		192.168.100.255	138	-	-	-	↑
FILES	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	✓	-	-		104.107.161.181	80	www.microsoft.com	-	AKAMAI-AS	↑
DEBUG	BEFORE	TCP	✓	2120	MoUsCoreWorker.exe		104.107.161.181	80	www.microsoft.com	-	AKAMAI-AS	↑
	BEFORE	TCP	?	6880	svchost.exe		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	3888	svchost.exe		239.255.255.250	1900	-	-	-	↑
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑
	BEFORE	UDP	✓	3888	svchost.exe		239.255.255.250	1900	-	-	-	↑ 411 b ↓ -
	BEFORE	TCP	?	-	-		40.127.240.158	443	-	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.66 Kb ↓ 7.80 Kb
	9411 ms	TCP	✓	6880	svchost.exe		4.231.128.59	443	settings-win.data.microsoft.com	-	MICROSOFT-CORP-MSN-AS-BLOCK	↑ 1.64 Kb ↓ 4.18 Kb
	21722 ms	UDP	✓	4	System		192.168.100.255	137	-	-	-	↑ 544 b ↓ -