

Static Analysis

1. Virus Total Analysis

Hash Analysis

- File Hash:
 - MD5: 4ab35d36922cb1eff9ce2a0bd86088ca
 - SHA-1: 0dab981c732975a2bdbbf577cfbd90434b6cfc2b
 - SHA-256: 171bebac610031563942c73669f95151c9edbc2392b2b6cea1493507cf6c7e8
- Method of hash acquisition:
 - Found on VirusTotal and verified with Detect-It-Easy
- [Link to VirusTotal results]
 - <https://www.virustotal.com/gui/file/171bebac610031563942c73669f95151c9edbc2392b2b6cea1493507cf6c7e8/detection>

Vendor Analysis

- Number of vendors flagging as malicious: 44/72
- Analysis of vendor results:
 - Discuss patterns in detection
 - peexe
 - detect-debug-environment
 - calls-wmi
 - 64bits
 - upx
 - corrupt
 - persistence
 - [Common malware names identified]
 - stealer
 - gensteal
 - trojanstealer
 - TMPNstealer
 - Win64EvoGen

File History

- First Submission Date: 2025-04-07 19:28:37 UTC
- File Creation Date from Windows: unknown

Community Score

- [Link to your VirusTotal community contribution]
 - <https://www.virustotal.com/gui/file/171bebac610031563942c73669f95151c9edbc2392b2b6cea1493507cf6c7e8/community>
- Username:sshinn
 - It bypasses User Account Control using fodhelper.exe to gain admin rights. UAC bypass via fodhelper is a common malware technique to gain admin privileges. It changes the registry to make itself run automatically when the system starts. It uses system tools like cmd.exe, wmic.exe, and attrib.exe to change system settings and hide itself. It checks for the computer's

external IP address—common behavior in malware that reports to a command-and-control (C2) server. It likely steals sensitive information and modifies system settings for persistence.

2. Detect It Easy (DIE) Analysis

File information

- File type: PE64
- Architecture: AMD64
- Additional relevant information:
 - [List notable file characteristics]
 - File names:
 - FREE AI Homework Helper Week11.exe
 - Week11.exe
 - SecurityHealthSystray.exe
 - Packer: UPX (3.91+) [modified]
 - (Heur)Language: ASMx64
 - [Unusual headers or structures]
 - UPX0
 - UPX1
 - UPX2

Memory Map Analysis

- Section breakdown:
 - UPX0: 4096 8040448
 - Raw size:0
 - Entropy: 0
 - Permissions: RWE
 - UPX1:
 - Raw size: 752844
 - Entropy: 8
 - Permissions: RWE
 - UPX2:
 - Raw size: 512
 - Entropy: 1.37
 - Permissions: RW
 - .rsrc:
 - Raw size:183808
 - Entropy: 5.11
 - Permissions: R
- Notable findings:
 - Read Write Execute Permissions in UPX0 and UPX1 suggest that these sections have full access

String Analysis

- Notable strings discovered:
 - KERNEL32.DLL: can be used by malware for system operations.
 - ExitProcess: commonly used in malware to terminate itself or other processes.

- LoadLibraryA: used to load DLLs into memory. Malware often uses this to load malicious code into a process's memory, it could indicate that a malicious payload is being injected.
- VirtualProtect: Malware may use this to inject code into memory by changing permissions
- 040904E4: This is a locale code, which represents "English - United States (Windows)."
- University of Arizona Malware Analysis: Created for CYBV454
- GetProcAddress

Entropy Analysis

- Overall entropy score: 7.99143[
- Section-specific entropy:
 - UPX1: 7.999 Entropy
- Packing analysis:
 - [Packed/Unpacked determination]
 - This file is packed
 - [Packer identified (if applicable)]
 - UPX packer
 - [Unpacking methodology (if attempted)]
 - I used the Detect-It-Easy extractor and it unpacked to a .PNG file and a .zlib file
 - FREE AI Homework Helper Week11.exe.00_0075b600.exe
 - FREE AI Homework Helper Week11.exe.0075623c_4f55.png
 - FREE AI Homework Helper Week11.exe.00756272_4f0f.zlib
 - FREE AI Homework Helper Week11.patch.JSON

4. Disassembly Analysis

- Found entry point in function
- Found some malicious apis such as VirtualProtect and GetProcAddress
- Apphelp.dll which seemed suspicious
- Used Ghidra and x64dbg
- In Ghidra, imports are as follows
 - KERNEL32.DLL
 - ExitProcess
 - GetProcAddress
 - LoadLibraryA
 - VirtualProtect

4. Static Analysis Summary

- Key findings from static analysis:
 - The file appears to be malicious. One of the most significant indicators is that 44 out of 72 antivirus vendors flagged this file as dangerous on VirusTotal. The file has been linked to known types of malware, such as "stealer" and "trojanstealer," which are programs designed to steal personal information. The

file also uses some suspicious system functions, like VirtualProtect and GetProcAddress, which are often used by malware to manipulate or inject malicious code into running programs. These behaviors suggest the file could try to alter other programs or system processes.

- Potential functionality:

- Based on the analysis, it looks like the file is designed to be malicious once executed. The fact that it is packed using a tool called UPX, which is often used to hide malicious code, means it is trying to avoid detection by security tools. When the file runs, it might try to inject malicious code into other processes or alter system settings to make itself harder to find. The file may also be trying to steal personal data, as indicated by the "stealer" label found in its detection. Additionally, the file seems to have mechanisms that allow it to stay on the computer even after a restart, which is typical of malware that tries to stay hidden and keep running in the background.

- Risk indicators:

- There are several warning signs that suggest this file is a significant security risk. First, the fact that 44 antivirus vendors flagged it as malicious is a strong indication that it is harmful. The file's use of UPX to pack and hide its contents is another red flag, as this is often done to prevent security tools from analyzing the file. Furthermore, the file has been identified as a trojanstealer, meaning it is likely designed to steal sensitive information from the user's computer. The use of system functions like LoadLibraryA, which allows the file to load other harmful code, and ExitProcess, which can terminate or crash programs, are also typical behaviors of malware. These factors all point to the file being a dangerous threat that could cause damage if run on a computer.

Dynamic Analysis

1. Analysis Environment

Environment Setup

- Virtual Machine specifications:

- [OS version]
- [Memory allocation]
- [Network configuration]

- Monitoring tools deployed:

- [Process monitoring]
 - Ensure you use RegShot, Process Monitor, Process Explorer
- [Network monitoring]
 - Ensure you use Wireshark
- [File system monitoring]

- Safety measures implemented:

- [Network isolation]
 - Try the analysis with and without Fakenet
- [Snapshot configuration]
- [Additional protections]

2. Runtime Observations

Initial Execution

- Malicious:
 - Bypass User Account Control (Modify registry)
 - FREE AI Homework Helper Week11.exe (PID: 4756)
 - Bypass User Account Control (fodhelper)
 - fodhelper.exe (PID: 5048)
 - Changes the autorun value in the registry
 - FREE AI Homework Helper Week11.exe (PID: 5892)
- Suspicious:
 - Changes default file association
 - FREE AI Homework Helper Week11.exe (PID: 4756)
 - Starts CMD.EXE for commands execution
 - FREE AI Homework Helper Week11.exe (PID: 4756)
 - Creates or modifies Windows services
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - Uses ATTRIB.EXE to modify file attributes
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - Executable content was dropped or overwritten
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - Adds/modifies Windows certificates
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - Uses WMIC.EXE to obtain Windows Installer data
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - Accesses product unique identifier via WMI (SCRIPT)
 - WMIC.exe (PID: 5376)
 - Checks for external IP
 - FREE AI Homework Helper Week11.exe (PID: 5892)
 - svchost.exe (PID: 2196)
- [Process creation]
 - PID: 5048, C:\WINDOWS\system32\fodhelper.exe
 - cmd.exe
 - WMIC.exe
- [Registry modifications]
 - Total events: 5321
 - Read events: 5309
 - Write events: 9
 - Delete events: 3
 - (4756) FREE AI Homework Helper Week11.exe
 - Key: HKEY_CLASSES_ROOT\ms-settings\shell\open\command
 - Operation: DelegateExecute
 - (4756) FREE AI Homework Helper Week11.exe
 - Key: HKEY_CLASSES_ROOT\ms-settings\shell\open\command

- Operation: delete value
- Name: DelegateExecute
- (5048) fodhelper.exe
- Key:HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer
- Operation: write
- Name: SlowContextMenuEntries
- Value:6024B221EA3A6910A2DC08002B30309D0A010000BD0E0C47735D584D9CEDE91E22E23282770100000114020000000000C0000000000000468D0000006078A409B011A54DAFA526D86198A780390100009AD298B2EDA6DE11BA8CA68E55D895936E000000
- (5048) fodhelper.exe
- Key:HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings\5.0\Cache\Content
- Operation: write
- Name: CachePrefix
- HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings\5.0\Cache\Cookies
- Network activity summary:
 - ET INFO External IP Address Lookup Domain (ipify .org) in TLS SNI
 - (ip.addr == 104.26.12.205 && tcp.port == 443) && (ip.addr == 192.168.100.10 && tcp.port == 49743)
 - Src IP: 192.168.100.10
 - Dst IP:104.26.12.205
 - ET INFO External IP Lookup Domain (ipify .org) in DNS Lookup
 - Src IP: 192.168.100.10
 - Dst IP: 192.168.100.2
 - Domain: api.ipify.org
 - Device Retrieving External IP Address Detected, ET INFO External IP Lookup ip-api.com
 - Src IP: 192.168.100.10
 - Dst IP: 208.95.112.1
 - INFO [ANY.RUN] External IP Check (ip-api .com)
 - Src IP: 192.168.100.10
 - Dst IP: 192.168.100.2
 - Domain: ip-api.com

Impact Analysis

Home Users

- Potential impact: Personal info like passwords could be stolen
- Risk level: High.
- Data compromise potential: Yes - identity theft or data leaks

Business Users

- Operational impact: Systems may slow down or crash
- Data security concerns: Sensitive company data could be stolen
- Financial implications: Possible financial loss or reputation damage

Government Users

- Security implications: Could lead to leaks of confidential information
- Data sensitivity concerns: National security data might be at risk

- Operational disruption potential: Services could be interrupted

2. Mitigation Strategy

Immediate Response

- Initial containment steps: Stop running the infected file immediately
- System isolation procedures: Disconnect the device from the internet/network
- Data preservation methods: Save memory dumps, logs, and the file for investigation

Long-term Prevention

- Security control recommendations: Use antivirus and endpoint protection; block packed executables.
- Policy modifications: Block unknown programs and restrict admin privileges.
- Training requirements: Teach users not to download strange or unknown files.

Conclusion

1. Analysis Reflection

- Summary of findings: The file is malware, flagged by 44 antivirus tools. It can steal info, change system settings, and stay hidden.
- Unusual characteristics: Packed with UPX
- Learning outcomes: Learned about packing and how malware checks for network access.

2. Evidence Documentation

- Screenshot descriptions and relevance: Screenshots of VirusTotal results, RegShot registry changes, and Wireshark network logs showing external IP access.
- Tool output documentation: Logs from DIE (packing info), Process Monitor (PID actions), and RegShot (registry changes).
- Additional supporting materials: Unpacked .PNG and .zlib files, JSON patch, autorun registry edits, and process tree screenshots.

Your Report Should Answer:

What is this malware doing behind the scenes?

- It bypasses User Account Control using fodhelper.exe to gain admin rights.
 - UAC bypass via fodhelper is a common malware technique to gain admin privileges
- It changes the registry to make itself run automatically when the system starts.
- It uses system tools like cmd.exe, wmic.exe, and attrib.exe to change system settings and hide itself.
- It checks for the computer's external IP address—common behavior in malware that reports to a command-and-control (C2) server.
- It likely steals sensitive information and modifies system settings for persistence.

What kind of threat does this malware represent (e.g., spyware, info-stealer,

trojan, etc.)?

- Info-Stealer: It's flagged as a stealer and trojanstealer, meaning it's likely trying to steal data like usernames, passwords, and system info.
- Trojan: It acts like a normal program (FREE AI Homework Helper), but secretly performs malicious actions.

What are the options for containment and recovery?

- Containment:
 - Disconnect the infected computer from the network immediately.
 - Kill the process and stop any associated services.
 - Do not delete the file right away—preserve it for investigation.
- Recovery:
 - Restore from a clean backup made before the infection.
 - Reinstall the operating system if necessary.
 - Change all passwords and monitor for suspicious activity.

When during execution do key actions take place (before/after error)?

execution before error

- Gains admin access using fodhelper.exe
- Edits registry keys to run at startup
- Changes default file settings and drops extra payloads

after error

- Connects to the internet to check IP
- May attempt to send stolen data or receive instructions from a C2 server

How does this malware attempt to deceive users or avoid detection?

- Packed with UPX to hide its real code and confuse antivirus scanners.
- Uses names like "FREE AI Homework Helper" to trick users into trusting and running it.
- Uses legit system tools (cmd, wmic, attrib) to blend in with normal Windows behavior.
- Alters registry keys (using fodhelper.exe)...

Your report must include:

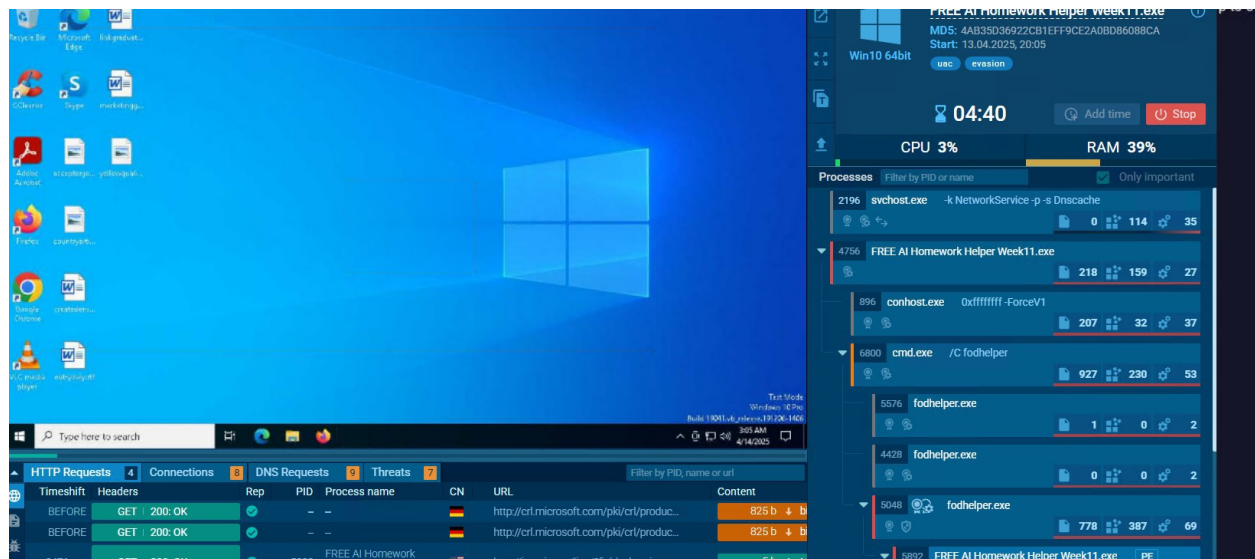
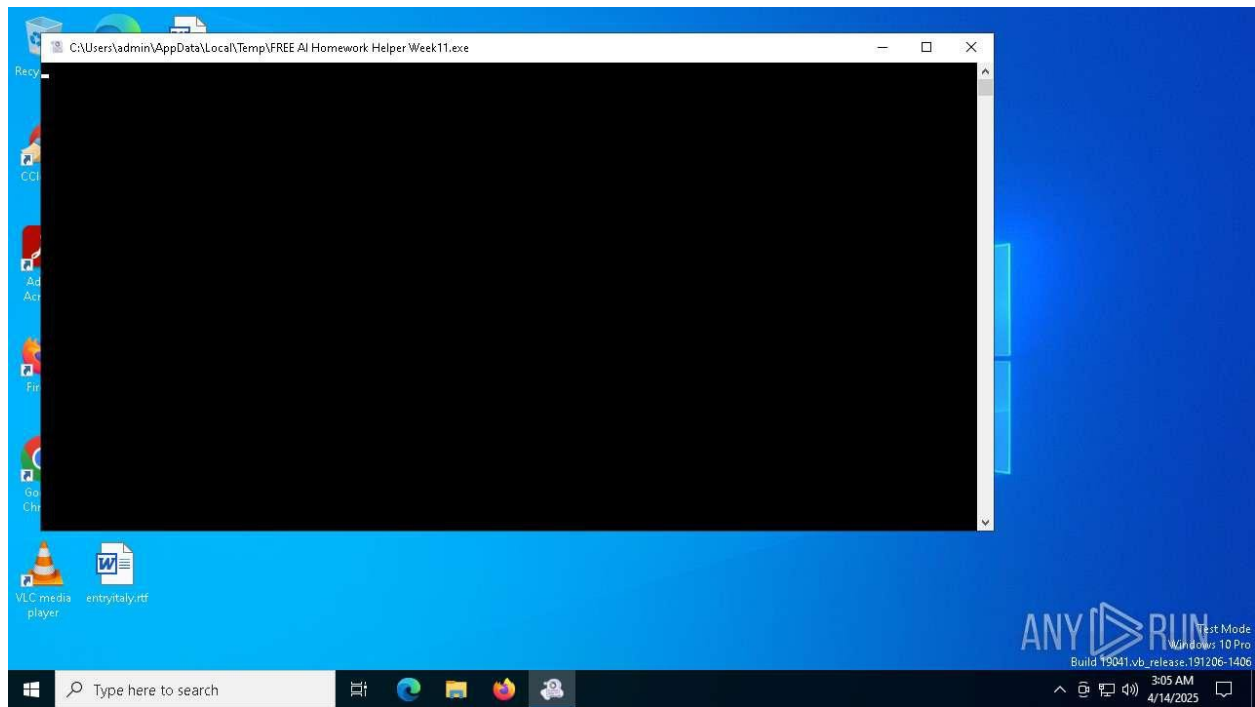
Evidence from x64dbg/x86dbg shows function calls, memory writes, or suspicious behavior.

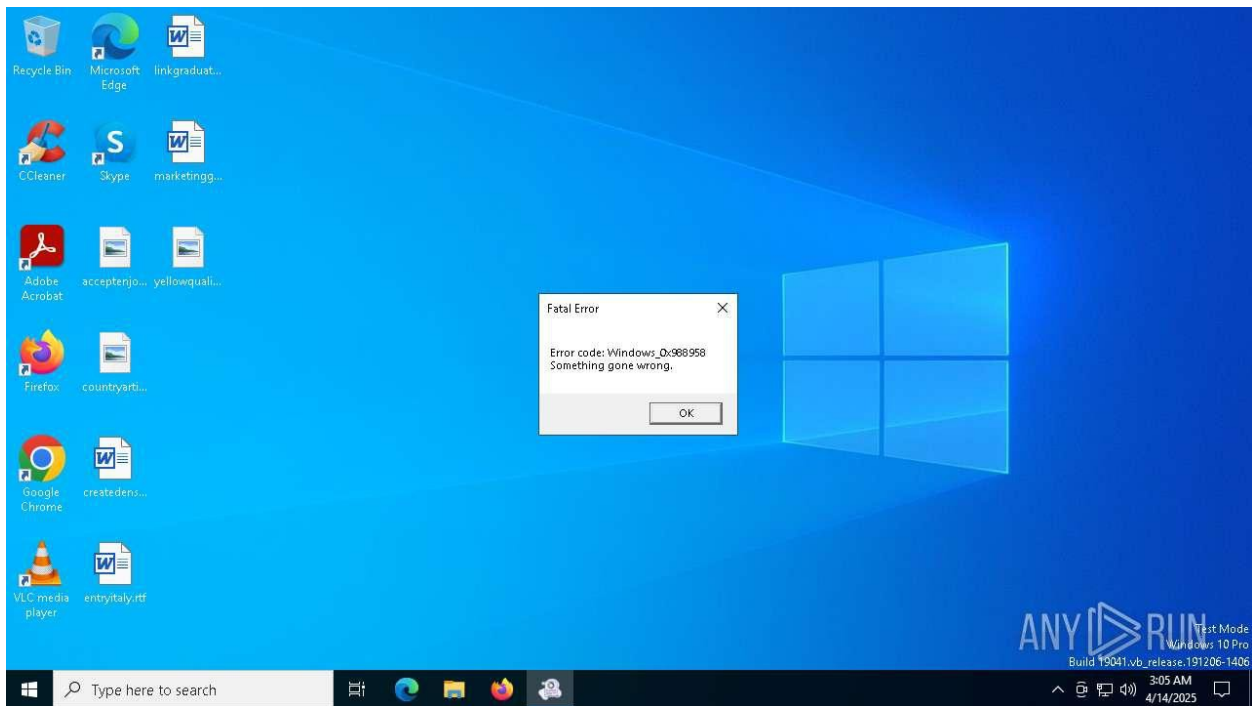
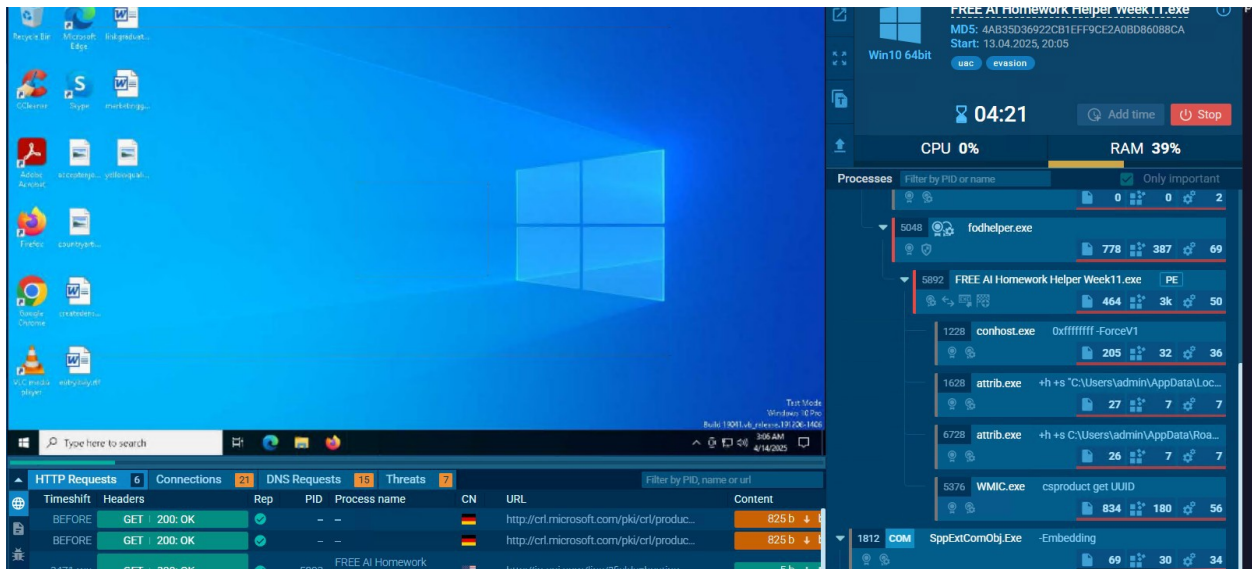
At least one disassembly screenshot or analysis from your preferred tool.

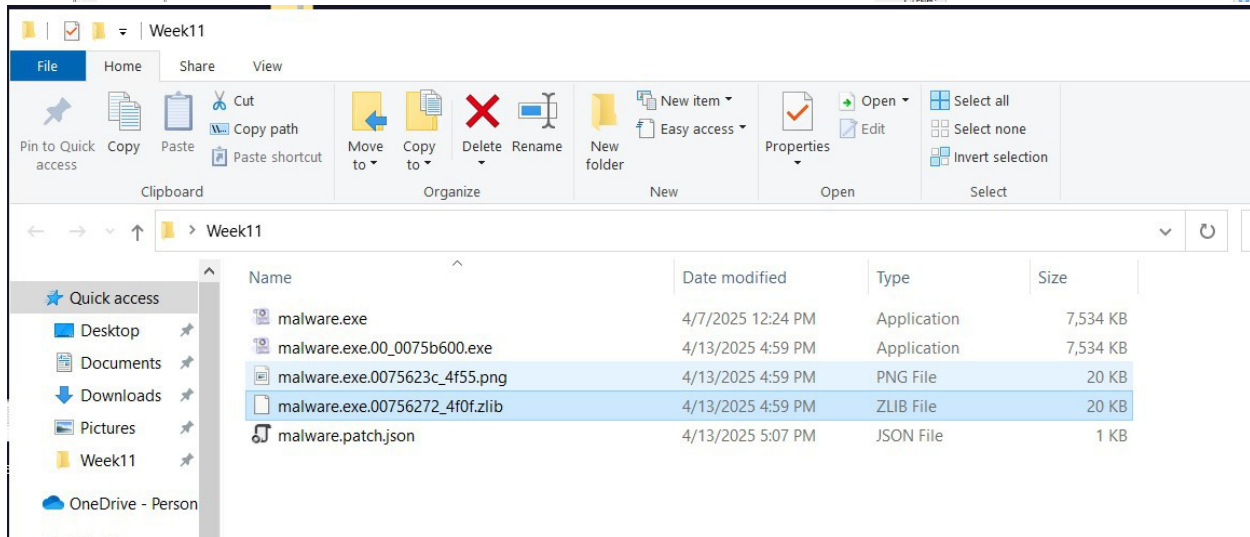
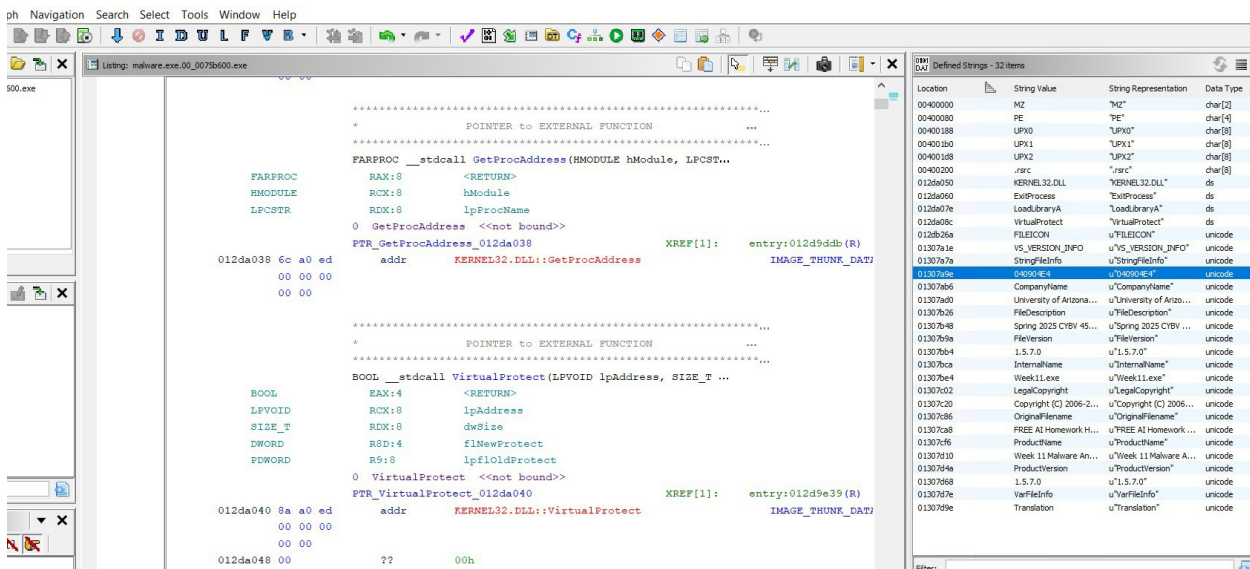
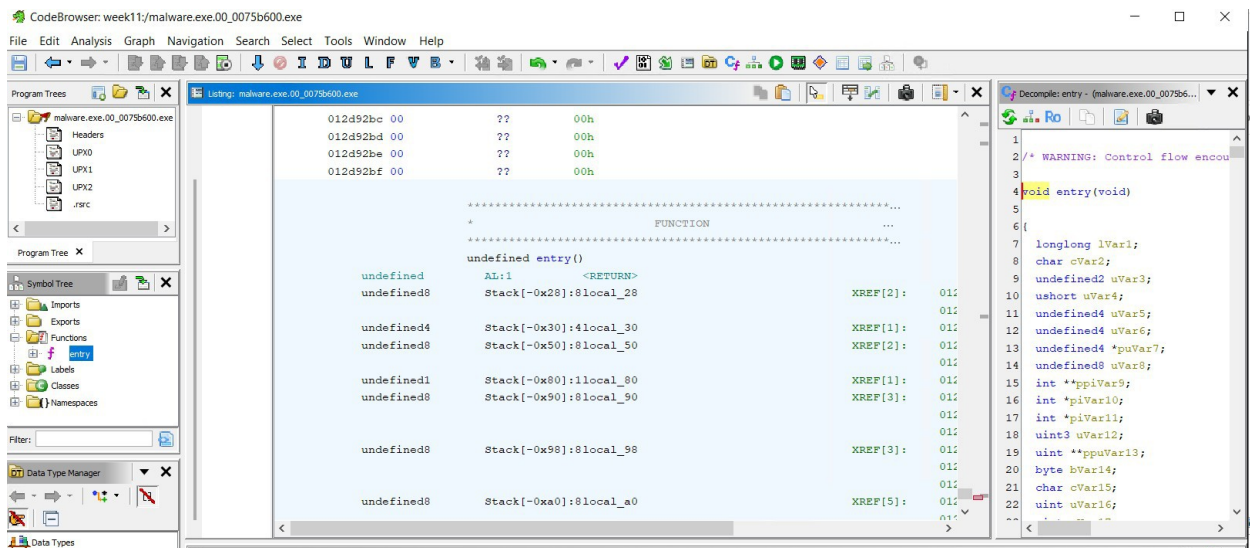
Examination of relevant import/export tables, strings, and execution flow.

Documentation of at least four Indicators of Compromise (IoCs), including but not limited to:

1. The malware modified the HKEY_CLASSES_ROOT\ms-settings\shell\open\command registry key and removed the DelegateExecute value to exploit fodhelper.exe for UAC bypass and gain elevated privileges.
2. The executable altered the autorun registry settings, ensuring it would automatically launch during system startup
3. It spawned multiple suspicious processes such as cmd.exe, wmic.exe, and attrib.exe, and it was heavily packed
4. The malware contacted external IP lookup services like ipify.org and ip-api.com, indicating potential command-and-control (C2) communication









sshinn

a moment ago



It bypasses User Account Control using fodhelper.exe to gain admin rights. UAC bypass via fodhelper is a common malware technique to gain admin privileges. It changes the registry to make itself run automatically when the system starts. It uses system tools like cmd.exe, wmic.exe, and attrib.exe to change system settings and hide itself. It checks for the computer's external IP address—common behavior in malware that reports to a command-and-control (C2) server. It likely steals sensitive information and modifies system settings for persistence.

FREE AI Homework Helper Week11.exe.00_0075b600.exe - PID: 7656 - Module: free ai homework helper week11.exe.00_0075b600.exe - Thread: Main Thread 6640 - ...									
File View Debug Tracing Plugins Favourites Options Help Mar 15 2025 (TitanEngine)									
CPU Log Breakpoints Memory Map Call Stack SEH Script Symbols Source References Threads Handles Trace									
Address	Size	Party	Info	Content	Type	Protection	Initial		
000000007FFE0000	00000000000001000	User	KUSER_SHARED_DATA		PRV	-R---	-R---		
000000007FFEC000	00000000000001000	User	Reserved		PRV	-R---	-R---		
00000038E4800000	00000000000199000	User	Reserved		PRV	-RW--	-RW--		
00000038E4999000	0000000000003000	User	PEB, TEB (6640)		PRV	-RW--	-RW--		
00000038E499C000	00000000000064000	User	Reserved (00000038E4800000)		PRV	-RW--	-RW--		
00000038E4A00000	000000000001F9000	User	Reserved		PRV	-RW--	-RW--		
00000038E4BF9000	0000000000007000	User	Stack (6640)		PRV	-RW--	-RW--		
000001609E550000	00000000000010000	User	Heap (ID 1)		PRV	-RW--	-RW--		
000001609E560000	0000000000003000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E570000	0000000000001E000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E590000	0000000000004000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E5A0000	0000000000002000	User	\Device\Harddiskvolume1\windows\		PRV	-RW--	-RW--		
000001609E5B0000	00000000000011000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E5D0000	00000000000011000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E5F0000	0000000000003000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E600000	00000000000011000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E620000	00000000000011000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E640000	00000000000001000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E650000	00000000000001000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
000001609E660000	00000000000001000	User	Heap (ID 0)		MAP	-R---	-R---		
000001609E670000	00000000000015000	User	Reserved (000001609E670000)		PRV	-RW--	-RW--		
000001609E685000	000000000000E8000	User	\Device\Harddiskvolume1\windows\		PRV	-RW--	-RW--		
000001609E770000	000000000000C9000	User	\Device\Harddiskvolume1\windows\		MAP	-R---	-R---		
00007FF42D880000	0000000000005000	User	Reserved (00007FF42D880000)		MAP	-R---	-R---		
00007FF42D885000	000000000000F8000	User	Reserved		MAP	-R---	-R---		
00007FF42D980000	0000000100020000	User	Reserved		PRV	-RW--	-RW--		
00007FF52D9A0000	0000000002000000	User	Reserved		PRV	-RW--	-RW--		
00007FF52F9A0000	00000000000001000	User	Reserved		PRV	-RW--	-RW--		
00007FF52F9B0000	00000000000001000	User	Reserved		MAP	-R---	-R---		
00007FFDC05F0000	00000000000001000	System	apphelp.dll		IMG	-R---	ERWC		
00007FFDC05F1000	0000000000004E000	System	".text"		IMG	-R---	ERWC		
00007FFDC063F000	00000000000022000	System	".rdata"		IMG	-R---	ERWC		
00007FFDC0661000	00000000000003000	System	".data"		IMG	-RW--	ERWC		
00007FFDC0664000	00000000000004000	System	".pdata"		IMG	-R---	ERWC		
00007FFDC0668000	00000000000001000	System	".didat"		IMG	-R---	ERWC		
00007FFDC0669000	000000000000017000	System	".rsrc"		IMG	-R---	ERWC		
00007FFDC0680000	00000000000001000	System	".reloc"		IMG	-R---	ERWC		
00007FFDC3030000	00000000000001000	System	kernelbase.dll		IMG	-R---	ERWC		
00007FFDC3031000	000000000000177000	System	".text"		IMG	-R---	ERWC		
00007FFDC31A8000	000000000001A8000	System	".rdata"		IMG	-R---	ERWC		
00007FFDC3353000	00000000000005000	System	".data"		IMG	-RW--	ERWC		
00007FFDC3358000	000000000000018000	System	".pdata"		IMG	-R---	ERWC		
00007FFDC3370000	00000000000001000	System	".didat"		IMG	-R---	ERWC		
00007FFDC3371000	00000000000001000	System	".rsrc"		IMG	-R---	ERWC		
00007FFDC3372000	00000000000001000	System	".reloc"		IMG	-R---	ERWC		

FREE AI Homework Helper Week11.exe.00_0075b600.exe - PID: 7656 - Module: free ai homework helper week11.exe.00_0075b600.exe - Thread: Main Thread 6640 - x64dbg [Elevated]

File View Debug Tracing Plugins Favourites Options Help Mar 15 2025 (TitanEngine)

CPU Log Notes Breakpoints Memory Map Call Stack SEH Script Symbols Source References Threads Handles Trace

00000000012DA013 42:95 xchg ebp,eax
00000000012DA017 9C pushfq
00000000012DA018 5D pop rbp
00000000012DA019 3C D2 cmp al,02
00000000012DA01B 3ACEB 9C06DDE9 cmp ebp,dword ptr ds:[rbx+rbp*8-1622F96]
00000000012DA022 67:FEBF CCA4340F dec byte ptr ds:[edi+F34A4CC]
00000000012DA029 CE
00000000012DA02A A5 movsd
00000000012DA02B 1396 8AD7915E adc edx,dword ptr ds:[rsi+5E91D78A]
00000000012DA031 58 pop rax
00000000012DA032 4D46:B0 D9 mov al,09
00000000012DA036 1941 FD sbd dword ptr ds:[rcx-3],eax
00000000012DA039 F4 rdt
00000000012DA03A 57 push rdi
00000000012DA03B CE
00000000012DA03C C2 DCE7
00000000012DA03F 89E7
00000000012DA041 EE dx,al
00000000012DA042 05 3FABA0FC add eax,FCADAB3F
00000000012DA047 FB stl
00000000012DA048 3F
00000000012DA049 210A and dword ptr ds:[rdx],ecx
00000000012DA04B 8AEA
00000000012DA04D 9A
00000000012DA04E FC
00000000012DA04F 74 E8
00000000012DA051 82
00000000012DA052 FB stl
00000000012DA053 43:90
00000000012DA055 - 2E1E9 CE6E9229 jmp 2AC0DF29
00000000012DA05B 86CE
00000000012DA05D 24 C8
xchg dh,cl
and al,C8

rcx-03:NtQueryInformationThread+11
rdi:"minkernel\ntdll\ldrinit.c"

Hide FPU
RAX 0000000000000000
RBX 00007FFDC578F728
RCX 00007FFDC56FFE34
RDX 0000000000000000
RBP 0000000000000000
RSP 00000038E48FF040
RSI 00000038E4999000
RDI 00007FFDC578ADD8
R8 00000038E48FF038
R9 0000000000000000
R10 0000000000000000
R11 0000000000000246
R12 0000000000000000
R13 0000000000000001
R14 000001609E5A0000
R15 0000000000000040
RIP 00007FFDC5734465
RFLAGS 0000000000000246
ZF 1 PF 1 AF 0
OF 0
Default (x64 fastcall)
1: rcx 00007FFDC56FFE34 ntdll!
2: rdx 0000000000000000 ntdll!
3: r8 00000038E48FF038 000000
4: r9 0000000000000000 000000
5: [rsp+28] 00000000E48F0000

es1=E4999000

UPX1:00000000012DA028 free ai homework helper week11.exe.00_0075b600.exe:\$92A028 #17E428

Dump 1 Dump 2 Dump 3 Dump 4 Dump 5 Watch 1 Locals Struct

Address Hex ASCII
00000000009B0000 4B 5A 90 00 03 00 00 00 04 00 00 00 FF 00 00 MZ.....yy..
00000000009B0010 8E 00 00 00 00 00 00 00 40 00 00 00 00 00 008.....
00000000009B0020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00000000009B0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00000000009B0040 0E 1F 8A 0E 00 84 09 CD 21 B8 01 4C CD 21 54 68! .L!1Th
00000000009B0050 69 73 20 70 72 6F 67 72 61 60 20 63 61 6E 6E 6F is program cannot
00000000009B0060 74 20 62 65 20 72 75 6E 20 69 6E 20 44 4F 53 20 t be run in DOS

00000038E48FF040 0000000000000000
00000038E48FF048 00007FFDC56E48B5 return to ntdll.RtlQueryElevationFlag
00000038E48FF050 00007FFD00000000
00000038E48FF058 00007FFDC578F728 ntdll!_fltused+23A0
00000038E48FF060 0000000000000000
00000038E48FF068 00000000E48F0000
00000038E48FF070 00007FFDC578ADD8 ntdll.RtlNtdllName+37D8
00000038E48FF078 00007FFDC5736D8A return to ntdll.LdrInitShimEngineDynamic
00000038E48FF080 00007FFDC578F700 ntdll!_fltused+2378
00000038E48FF088 00000038E4999000
00000038E48FF090 00000038E4999000