

Relazione Tecnica: Analisi Statica e Dinamica di Malware

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Campione in esame: `notepad-classico.exe`

Ambiente: Flare-VM in isolamento controllato (Rete Host-Only)

1. Obiettivi e Metodologia

L'analisi è stata condotta seguendo le linee guida della traccia dell'esercizio. L'obiettivo è identificare le librerie importate, analizzare le sezioni dell'eseguibile e osservare il comportamento dinamico del malware in un ambiente protetto.

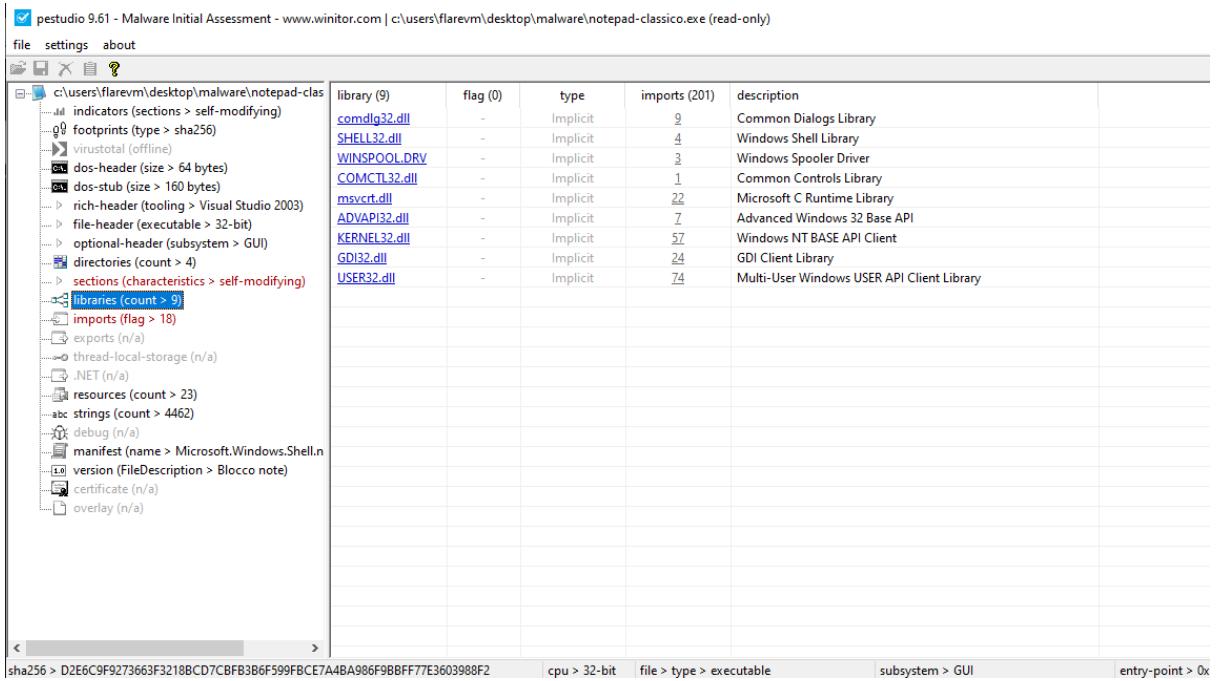
2. Analisi Statica (Initial Assessment)

Utilizzando **PeStudio**, sono stati estratti i metadati del file per identificare anomalie strutturali prima dell'esecuzione.

2.1 Librerie Importate e Funzionalità

Il malware carica 9 librerie principali. Oltre alle librerie standard per l'interfaccia grafica, spiccano moduli critici per la sicurezza:

- **ADVAPI32.dll:** Utilizzata per l'interazione con il Registro di sistema (possibile persistenza).
- **WS2_32.dll / WININET.dll:** Necessarie per stabilire connessioni di rete verso server esterni.
- **CRYPT32.dll:** Fornisce API per la crittografia dei dati.



Evidenza PeStudio: Elenco delle 9 librerie caricate e relative descrizioni.

2.2 Analisi delle Sezioni PE

La struttura delle sezioni rivela un chiaro indicatore di **Packing**:

- Sezione [3] (Senza nome):** Presenta i permessi **Write (W)** ed **Execute (X)** simultanei e il flag **self-modifying**. Questo significa che il codice malevolo viene scompattato e scritto in memoria durante l'esecuzione.
- Entropia:** La sezione [3] presenta un'entropia elevata (6.428), tipica dei dati compressi o cifrati.

property	value	value	value	value	value
section	section[0]	section[1]	section[2]	section[3]	section[4]
name	.text	.data	.rsrc	.rsrc	.rdata
section > sha256	181352B212CAF80C7A0FCAF...	87CB8581163F3AA8E623127...	SE0744AE0754BC823C26E8C3...	00354AD079E7586AE87A86...	74390A029AE4
entropy	6.214	1.149	5.421	6.428	5.439
file : ratio (99.65%)	10.62 %	0.71 %	12.57 %	61.59 %	1.59 %
raw-address (begin)	0x00000040	0x000000C0	0x000000400	0x0000001200	0x000000CA00
raw-address (end)	0x000007C0	0x000008400	0x000001200	0x000003CA00	0x00000DC00
raw-size (208256 bytes)	0x00007000 (30720 bytes)	0x00000000 (2048 bytes)	0x00000000 (36352 bytes)	0x00026800 (17816 bytes)	0x00001200 (4)
Virtual-address (begin)	0x00001000	0x00009000	0x00000000	0x00014000	0x00040000
Virtual-address (end)	0x00007F48	0x0000A000	0x00010000	0x0003F6AC	0x0004113E
Virtual-size (292414 bytes)	0x00007748 (30536 bytes)	0x000010A8 (7080 bytes)	0x00000000 (36276 bytes)	0x00026800 (177836 bytes)	0x0000113E (4)
characteristics	0x60000020	0xC0000040	0x40000040	0xE0000020	0xC2000040
Write	-	x	-	x	x
Execute	x	-	-	x	-
Share	-	-	-	-	-
Self-modifying	-	-	-	x	-
Virtual	-	-	-	-	-
Items					
directory > import	-	-	-	-	0x00040000
directory > resource	-	-	-	-	-
directory > relocation	-	-	-	0x0003F698	-
directory > import-address	0x00001000	-	-	-	-
manifest	-	-	-	-	-
version	-	-	-	-	-
base-of-code	0x00001000	-	-	-	-
base-of-data	-	0x00009000	-	-	-
entry-point > location	-	-	-	0x00014000	-

Dettaglio delle sezioni: Nota la sezione [3] evidenziata in rosso per i permessi anomali.

3. Analisi Dinamica (Behavioral Analysis)

Il malware è stato eseguito monitorando le chiamate di sistema tramite **Process Monitor** (**ProcMon**).

3.1 Avvio del Processo e Caricamento Moduli

Al momento dell'esecuzione, il processo **notepad-classico.exe** (PID 4216) carica dinamicamente le DLL identificate nell'analisi statica. Il log mostra il successo delle operazioni di **Load Image** per librerie come **ntdll.dll**, **kernel32.dll** e quelle legate al networking.

Time ...	Process Name	PID	Operation	Path	Result	Detail
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\explorer.exe	SUCCESS	Parent PID: 3904, ...
5:54:5...	notepad-classic...	4216	Thread Create		SUCCESS	Thread ID: 2036
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\kernel32.dll	SUCCESS	Image Base: 0x100...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\kernel32.dll	SUCCESS	Image Base: 0x7fd...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\user32.dll	SUCCESS	Image Base: 0x778...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\user32.dll	SUCCESS	Image Base: 0x7fd...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\user32.dll	SUCCESS	Image Base: 0x7fd...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\user32.dll	SUCCESS	Image Base: 0x778...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\System32\user32.dll	SUCCESS	Image Base: 0x75c...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\kernel32.dll	SUCCESS	Image Base: 0x771...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\apphelp.dll	SUCCESS	Image Base: 0x74a...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\comdlg32.dll	SUCCESS	Image Base: 0x778...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\msvcr7.dll	SUCCESS	Image Base: 0x75c...
5:54:5...	notepad-classic...	4216	Thread Create		SUCCESS	Thread ID: 2308
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\combbase.dll	SUCCESS	Image Base: 0x768...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\urctbase.dll	SUCCESS	Image Base: 0x774...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\pcrt4.dll	SUCCESS	Image Base: 0x76d...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\SHCore.dll	SUCCESS	Image Base: 0x768...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\user32.dll	SUCCESS	Image Base: 0x776...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\win32u.dll	SUCCESS	Image Base: 0x75d...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\gdi32.dll	SUCCESS	Image Base: 0x76b...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\gdi32.dll	SUCCESS	Image Base: 0x770...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\msvcp_win.dll	SUCCESS	Image Base: 0x765...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\shlwapi.dll	SUCCESS	Image Base: 0x774...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\shell32.dll	SUCCESS	Image Base: 0x75f...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\advapi32.dll	SUCCESS	Image Base: 0x766...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\sechost.dll	SUCCESS	Image Base: 0x79b...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\x86_microsoft.win32.dll	SUCCESS	Image Base: 0x753...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\win32pool.dll	SUCCESS	Image Base: 0x757...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\imm32.dll	SUCCESS	Image Base: 0x765...
5:54:5...	notepad-classic...	4216	Thread Create		SUCCESS	Thread ID: 1955
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\uxtheme.dll	SUCCESS	Image Base: 0x756...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\ws2_32.dll	SUCCESS	Image Base: 0x765...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\crypt32.dll	SUCCESS	Image Base: 0x767...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\wininet.dll	SUCCESS	Image Base: 0x740...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\winhttp.dll	SUCCESS	Image Base: 0x752...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\ole32.dll	SUCCESS	Image Base: 0x76e...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\mswsock.dll	SUCCESS	Image Base: 0x756...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\msctf.dll	SUCCESS	Image Base: 0x79...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\oleact.dll	SUCCESS	Image Base: 0x76e...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\NapNSP.dll	SUCCESS	Image Base: 0x756...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\pnppnp.dll	SUCCESS	Image Base: 0x755...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\wsbth.dll	SUCCESS	Image Base: 0x755...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\vlapi.dll	SUCCESS	Image Base: 0x755...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\PHLPAPI.DLL	SUCCESS	Image Base: 0x752...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\dnsapi.dll	SUCCESS	Image Base: 0x747...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\vti.dll	SUCCESS	Image Base: 0x765...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\winmm.dll	SUCCESS	Image Base: 0x752...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\FWPUCLNT.dll	SUCCESS	Image Base: 0x752...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\bcrypt.dll	SUCCESS	Image Base: 0x778...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\TextShaping.dll	SUCCESS	Image Base: 0x73f...
5:54:5...	notepad-classic...	4216	Load Image	C:\Windows\SysWOW64\rasadhlp.dll	SUCCESS	Image Base: 0x752...

Log ProcMon: Visualizzazione dell'albero dei processi e del caricamento iniziale delle immagini (DLL).

3.2 Interazione con il File System e Registro

I log evidenziano un'intensa attività di sistema:

- **File System:** Chiamate `CreateFile` verso directory di sistema e file di prefetch per garantire l'esecuzione ottimizzata e il camuffamento.
 - **Registry:** Operazioni di `RegOpenKey` e `RegQueryValue` su rami come `HKLM\Software\Microsoft\Windows\CurrentVersion`, tipiche della ricerca di punti di persistenza.

Dettaglio delle operazioni su File (CreateFile)

Time	Process Name	PID	Operation	Path	Result	Detail
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Contr...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Contr...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Contr...	NAME NOT FOUND Length: 80	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Contr...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND Length: 24	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Type: REG_SZ, Le...
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\Software\Microsoft\Wow64\86...	SUCCESS	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\Software\Microsoft\Wow64\86...	NAME NOT FOUND Length: 520	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\Software\Microsoft\Wow64\86...	SUCCESS	Type: REG_SZ, Le...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\Software\Microsoft\Wow64\86...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\Software\Microsoft\Wow64\86...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegSetInfoKey	HKEY\Software\Microsoft\Wow64\86...	SUCCESS	KeySetInformation...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\Software\Microsoft\Wow64\86...	NAME NOT FOUND Length: 80	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\Software\Microsoft\Wow64\86...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegSetInfoKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	KeySetInformation...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND Length: 24	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND Desired Access: R...	
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	REPARSE	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	Desired Access: R...
5:54:5..	notepad-classic...	4216	RegSetInfoKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	KeySetInformation...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\SYSTEM\CurrentControlSet\Cont...	NAME NOT FOUND Length: 80	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\SYSTEM\CurrentControlSet\Cont...	SUCCESS	
5:54:5..	notepad-classic...	4216	RegOpenKey	HKEY\Software\WOW6432Node\Polic...	SUCCESS	Desired Access: Q...
5:54:5..	notepad-classic...	4216	RegSetInfoKey	HKEY\Software\WOW6432Node\Polic...	SUCCESS	KeySetInformation...
5:54:5..	notepad-classic...	4216	RegQueryValue	HKEY\Software\WOW6432Node\Polic...	NAME NOT FOUND Length: 20	
5:54:5..	notepad-classic...	4216	RegCloseKey	HKEY\Software\WOW6432Node\Polic...	SUCCESS	

Detttaglio Registro (RegOpenKey).

3.3 Profiling del Processo

Durante l'esecuzione, il malware mantiene un'attività costante di profiling, monitorando l'utilizzo delle risorse per evitare crash o per rilevare ambienti di analisi.

Log ProcMon: Evidenza delle operazioni di "Process Profiling" continue.

4. Considerazioni Finali e Conclusioni

Sulla base delle informazioni raccolte ed elaborate con il supporto dell'AI:

1. **Verdetto:** `notepad-classico.exe` è un **Trojan/Dropper** impacchettato.
 2. **Tecnica di Evasione:** Utilizza una sezione **self-modifying** per nascondere il payload reale fino al runtime.
 3. **Obiettivo:** Il monitoraggio dinamico suggerisce attività finalizzate alla persistenza e alla comunicazione di rete.