SystemBC, PowerShell version

By Jason Reaves

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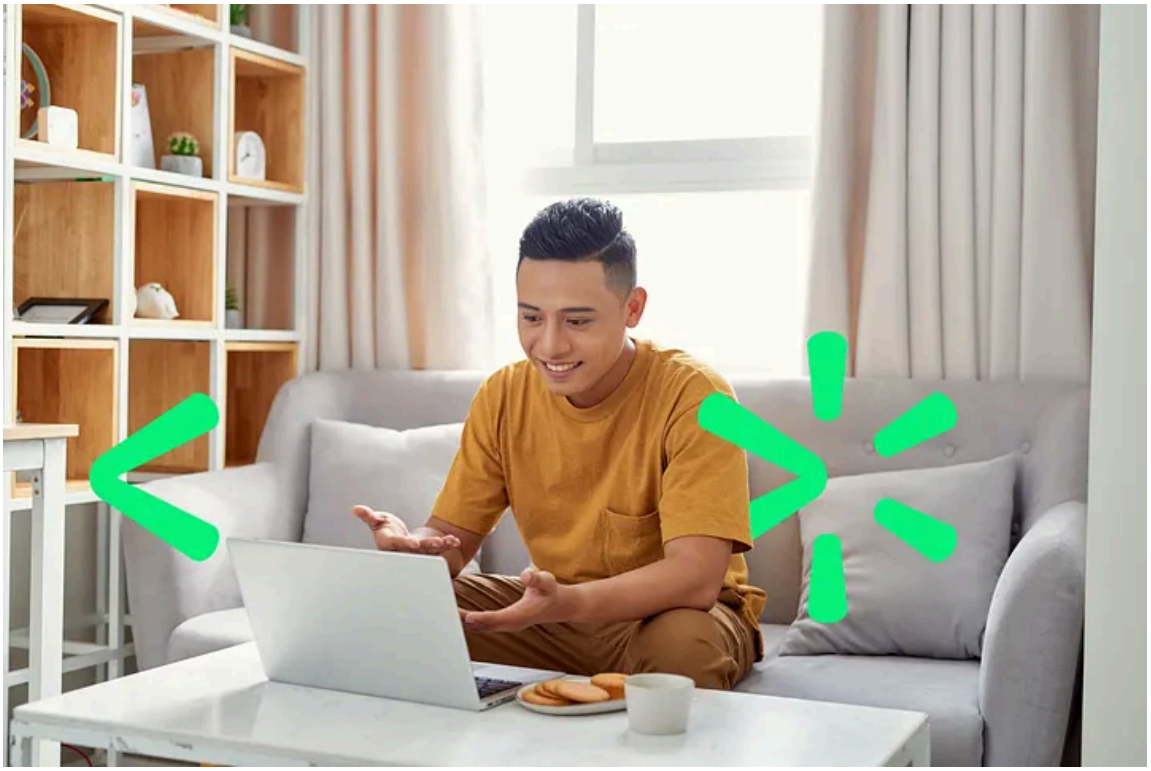

Some of the most effective malware leveraged over the past few years against enterprise environments has incorporated scripting. AV detections for script based malware have historically lagged behind those of binary based detections. The SystemBC Malware-as-a-Service we previously outlined[1], has been leveraged by prolific crimeware groups involved in ransomware operations against enterprises[1,3,4,5] for a while now. Earlier this year a researcher on twitter[2] found and uploaded a copy of an open directory containing a SystemBC package containing the elements of a SystemBC package along with an interesting powershell file:

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Index of /

Name	Last modified	Size	Description
dll/	2021-11-19 02:18	-	
install.txt	2021-08-17 03:56	4.0K	
server.exe	2021-11-19 02:18	23K	
server.out	2021-11-19 02:18	14K	
socks.out	2021-11-19 02:18	6.7K	
socks5.ps1	2021-11-29 10:33	14K	
systembc/	2020-05-23 11:38	-	

Apache/2.4.41 (Ubuntu) Server at 185.158.155.175 Port 80

The uploaded packaged can be found on VirusTotal:

Press enter or click to view image in full size

Ref: https://www.virustotal.com/gui/file/c860ccfeb7072133bf8fe0f9aab56c6dcbe10c83a3bda7e98ff6375ad6c1a06c/details

The PowerShell script ‘socks5.ps1’ has no detections:

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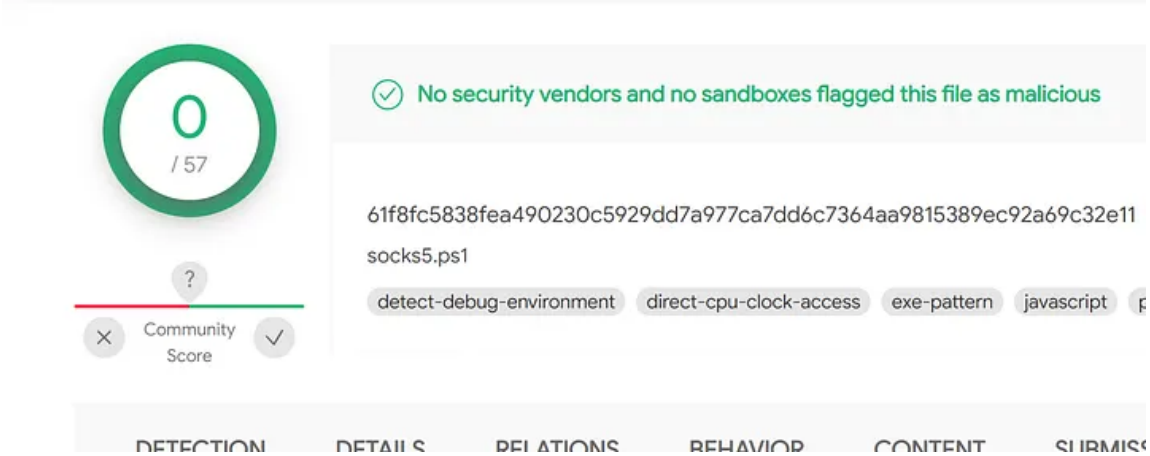

Ref: https://www.virustotal.com/gui/file/61f8fc5838fea490230c5929dd7a977ca7dd6c7364aa9815389ec92a69c32e11/details

The powershell script has a header containing a C2 server and a port number to connect to before then setting up a block of 50 bytes called ‘xordata’ which will be later passed to the ‘Rc4_crypt’ function

```
$xordata = New-Object byte[] 50For ($i=0; $i -ne 50; $i++) { $xordata[$i] =  $i }
```

Using a traffic example from VirusTotal:

```
00000000  00 01 02 03 04 05 06 07  08 09 0a 0b 0c 0d 0e 0f   ........ ........
00000010  10 11 12 13 14 15 16 17  18 19 1a 1b 1c 1d 1e 1f   ........ ........
00000020  20 21 22 23 24 25 26 27  28 29 2a 2b 2c 2d 2e 2f    !"#$%&' ()*+,-./
00000030  30 31 82 2e d9 e1 18 f7  d1 66 21 f6 9b ae 10 32   01...... .f!....2
00000040  21 57 6f 07 58 08 75 e0  33 86 43 b2 9c c5 97 e5   !Wo.X.u. 3.C.....
00000050  07 fa aa 90 c8 72 6b 0e  e6 08 14 4b 18 e4 b5 7f   .....rk. ...K....
00000060  a5 64 f1 3a                                       .d.:
```

Decrypting:

```
>>> a = '000102030405060708090a0b0c0d0e0f101112131415161718191a1b1c1d1e1f202122232425262728292a2b2c2d2e2f303
>>> import binascii
>>> b = binascii.unhexlify(a)
>>> b
'\x00\x01\x02\x03\x04\x05\x06\x07\x08\t\n\x0b\x0c\r\x0e\x0f\x10\x11\x12\x13\x14\x15\x16\x17\x18\x19\x1a\x1b\
>>> from Crypto.Cipher import ARC4
>>> len(b)
100
>>> b[:50]
'\x00\x01\x02\x03\x04\x05\x06\x07\x08\t\n\x0b\x0c\r\x0e\x0f\x10\x11\x12\x13\x14\x15\x16\x17\x18\x19\x1a\x1b\
>>> rc4 = ARC4.new(b[:50])
>>> rc4.decrypt(b[50:])
'\xb1\x1d\x00\x01PS\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\x00\
```

The first word is the build number for Windows:

```
$osn = [system.environment]::osversion.version.build

         $os0 = $osn -band 0x000000ff
$os1 = [math]::Floor(($osn -band 0x0000ff00) * [math]::Pow(2,-8))

                 $buffer0[50] = $os0 -as[byte]
$buffer0[51] = $os1 -as[byte]
```

In our decrypted example this is ‘7601’, the next word value is bit check:

```
$int64 = 0

         if ([IntPtr]::Size -eq 8) {$int64 = 1}

                 $buffer0[53] = $int64 -as[byte]
```

The PS value is hardcoded:

```
$buffer0[54] = 0x50 -as[byte]
$buffer0[55] = 0x53 -as[byte]
```

After checking in, the bot receives IPs and port numbers and each one is assigned to their own job in a pool thread which will handle proxying traffic.

```
[void]$ps.AddScript($new_connection)
[void]$ps.AddParameter("stream", $stream)
[void]$ps.AddParameter("writer", $writer)
[void]$ps.AddParameter("reader", $reader)
[void]$ps.AddParameter("SocketArray", $SocketArray)
[void]$ps.AddParameter("ebx", $ebx)               [void]$ps.AddParameter("domain", $domain)
    $jobs[$i] = [PSCustomObject]@{
        PowerShell = $ps
        AsyncResult = $ps.BeginInvoke()
    }
```

With the current method chosen by the developer (to hardcode the key generation), we can assume this version is still in a developmental stage. This makes network and endpoint detections easier for the time being.

IOCs

Powershell version:

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c860ccfeb7072133bf8fe0f9aab56c6dcbe10c83a3bda7e98ff6375ad6c1a06c

185.158.155[.]175

SystemBC Full C2 list:

```
185.61.138.59
172.106.86.12
sweetcloud.link
asdfghjkl.host
bitdesk.online
ordercouldhost.com
hcwakententx2.com
proxybro.top
195.123.241.38
92.53.90.70
bmwsocksmozg.top
fmk7kux2dsxowkks.onion
rarlabarchiver.ru
servx278x.xyz
cp.nod32clients.com
dwuhpii.bit
108.61.245.154
masonksmith.me
193.109.69.17
165.227.204.91
185.222.202.66
march-socat01.xyz
tvtmhltd.org
5.132.191.105
185.215.113.78
179.43.178.96
protoukt.com
socksbswfjhofnbu.onion
admex175x.xyz
185.70.184.5
194.5.250.151
91.213.50.135
generalnetworking.net
185.215.113.32
5.34.178.172
soks5.icu
178.20.41.173
94.103.95.115
sadfsdfjj4838377aa.cc
amendingnoum.xyz
efydniaemviuxkfo.onion
mydomain47294.xyz
46.166.161.93
45.156.26.59
```

```
predatorhidden.xyz
usmostik.com
185.125.230.131
kvarttet.com
vpnstart.chickenkiller.com
s2.avluboy.xyz
fahrrados.de
socks5.in
137.74.151.42
rastreio-correios.com
188.212.22.165
arbetfrolli.pw
reserveupdate.com
statistiktrafiktrubest.net
tbueguicsrwo64i7.onion
www.bullioncdn.com
176.123.6.150
farfisada.ga
80.66.88.165
146.70.44.168
proxysteu5m36rdt.onion
srv1619541516.hosttoname.com
e6rldxwjc4jeb72c.onion
s1.freesocksvpn.xyz
66.42.91.161
217.182.46.152
138.197.141.150
systemhomeupdate.com
core-networking.com
74.125.46.143
109.201.140.54
verguliosar.com
xxxxxxtnuhffpbep.onion
185.193.91.234
37.49.229.138
fresher.at
45.86.162.14
maka.bit
79.141.160.156
188.209.52.188
cashnet-server.com
tik-tak.club
jjj.rop.dev
bljxlgj4h4yuxkju.onion
45.141.87.60
63bwf6zdrgsmagpt.onion
92.63.197.143
fragrant.digital
infodialsxbz.com
78.47.64.46
```

```
91.212.150.113
artkalyan.shop
you.bit
95.217.132.79
217.8.117.18
108.62.141.227
jmlor.com
upteambuilding.com
140.82.16.134
45.77.65.72
dragonfire.ac.ug
proxybum.xyz
74.125.112.7
coinupdater.bit
qtrader.club
maniodaris.com
95.216.118.223
tdsstats.mooo.com
45.134.26.93
h4yk5u554epyhhen.onion
system.proredirector.com
s1.freevpnsocks.xyz
scserv2.info
hcwakentent.com
185.209.30.232
172.105.16.113
217.8.117.24
31337.hk
gambinos.space
ns2.vic.au.dns.opennic.glue
data.servicestatus.one
gosigoji.bit
manillarout.com
mydomain47267.xyz
5.132.191.104
194.61.24.117
185.159.82.73
master-socks.cc
139.60.161.58
23hfdne.xyz
brabulco.ac.ug
80.233.248.109
4renewdmn.biz
5.206.224.199
ncordercreatetest.com
socks5.eu
sdkfjjkfasdjfiu435dzz.cc
74.125.74.6
5.188.60.95
tik-tak-super-puper.xyz
```

```
135.181.37.144
93.187.129.249
185.197.74.227
lisnm.com
scserv1.info
s.avluboy.xyz
217.8.117.65
149.28.201.253
t6xhk2j3iychxc2n.onion
shellcon.pro
criminal-records.life
185.191.32.191
aitchchewcdn.online
176.111.174.63
ns1.vic.au.dns.opennic.glue
joiasbella.com.br
78.141.210.78
dktigsgquxihyrik.onion
coinsdoctor.bit
3q5d4sgdxdxkkzhl.onion
185.119.57.126
92.163.33.248
23.249.163.103
199.247.25.132
prorequestops.com
arbetfroll.pw
r55q2zj8sb89b33k.bit
31337r.hk
whatimnot.sc.ug
23hfdne.com
statistiktrafiktrubest.com
arhi-lab.com
jlayxnzzin5y335h.onion
zghiexdgwfzi44b5.onion
84.38.129.162
masonksmith.tech
46.166.176.247
37.1.204.96
93.114.128.189
socks5v7v2snlwr7.onion
206.189.120.27
35.246.186.86
199.19.225.233
149.248.18.56
march-socat01.com
45.153.186.243
5.79.124.201
fhaaaggs.ml
176.123.8.226
217.8.117.42
```

```
adobeupd.host
huxere.xyz
37.1.220.248
gigabitsolutions.pw
jjj2.rop.dev
31.184.218.251
bc.fgget.top
173.255.208.126
annaweber.fun
ssl.virtualpoolnet.com
213.159.213.225
hfbplsny55xcsgbn.onion
213.227.155.220
45.138.172.144
91.142.77.52
proxyshmoxy.xyz
gambinos.club
93.187.129.252
45.77.65.71
dfhg72lymw7s3d7b.onion
91.217.137.44
example.com
109.201.142.17
annaklein.fun
62.210.54.235
cleanerwors.com
65.21.93.53
185.254.121.121
fastconnectionbit.xyz
dealsbestcoupons.com
microsoftmirror.ac.ug
185.33.84.190
95.181.152.152
91.218.114.16
212.114.52.149
185.235.244.244
cheakendinner.xyz
45.145.67.170
149.28.145.240
92.53.90.84
185.233.2.50
185.215.113.114
whatshoetowear.com
80.66.88.139
185.158.155.175
91.212.150.133
185.70.186.170
23.82.141.176
134.195.14.192
buffalostores.cc
```

```
mobinetworks.xyz
185.209.30.180
23.106.223.52
195.2.73.44
5.255.97.23
185.70.184.3
185.198.56.2
185.215.113.101
185.70.184.41
91.243.44.5
mainscpnl.xyz
backpscpnl.xyz
146.70.41.133
185.118.167.155
85.25.207.68
moscow11.icu
5.39.221.47
162.33.179.20
195.133.40.103
142.132.185.13
carnessanjuanmedina.com
190.2.145.98
207.32.216.202
5.183.95.197
91.234.254.128
62.113.255.16
89.39.105.111
62.113.255.11
193.29.56.71
185.186.245.37
89.43.107.126
45.56.102.245
23.152.0.38
107.155.124.13
5.101.78.2
146.70.78.22
polidestar.com
mokkotapia.com
ctldl.com
194.93.56.214
69.61.107.218
62.113.255.29
146.0.77.21
```

Detections

Endpoint:

```
Run key:
"HKCU:\SOFTWARE\Microsoft\Windows\CurrentVersion\Run" - socks5_powershell
```

Network:

```
alert tcp $HOME_NET any -> $EXTERNAL_NET any ( msg:"SystemBC Powershell bot registration"; dsize:100; conter
```

References

1: https://medium.com/walmartglobaltech/inside-the-systembc-malware-as-a-service-9aa03afd09c6

2: https://twitter.com/r3dbU7z

3: https://news.sophos.com/en-us/2020/10/14/inside-a-new-ryuk-ransomware-attack/

4: https://twitter.com/vk_intel/status/1234891766924484609?lang=en

5: https://blogs.blackberry.com/en/2021/06/threat-thursday-systembc-a-rat-in-the-pipeline

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