



ThreatMon
Under Cyber Wings



CYBERVOLK RANSOMWARE TECHNICAL & MALWARE ANALYSIS

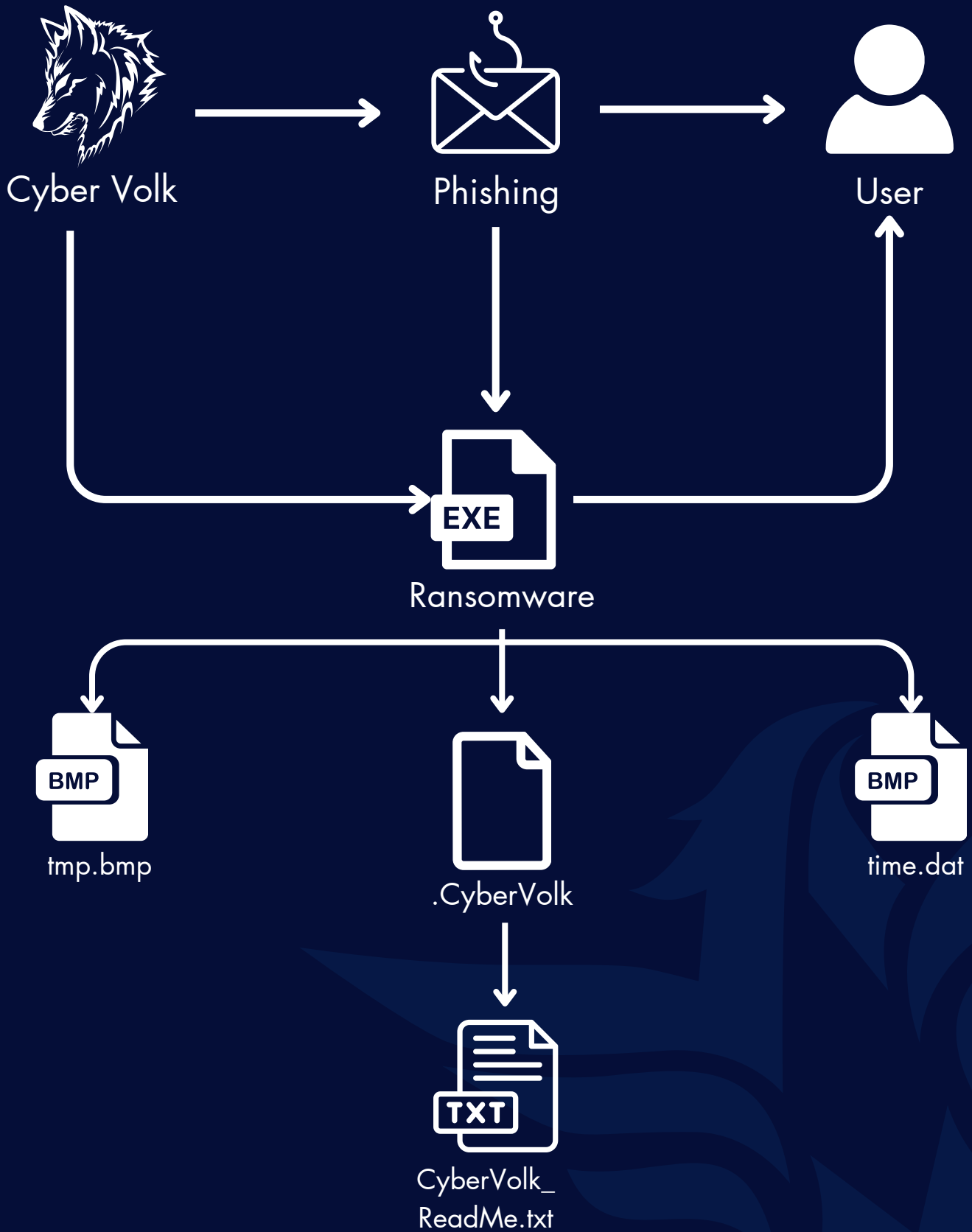




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ATTACK CHAIN



DIAMOND MODEL



Executive Summary & Key Findings

As ThreatMon, we strive to prevent potential malicious activities by informing individuals, companies, firms, institutions, and organizations about current threats through our reports, posts, and analyses.

CyberVolk Group is a threat actor group originating from India and is one of the members of the Holy League organization, established by APT 44 and other Russian/Russian-aligned hackers to carry out attacks against NATO, Ukraine, and states opposing Russia. Such formations pose a global threat.

CyberVolk Ransomware was developed by the CyberVolk Financially Motivated Threat Actor Group and released for sale as Ransomware-as-a-Service (RaaS) on July 1, 2024. After the initial version of the ransomware was leaked on VirusTotal, the CyberVolk group developed a new version and continued their RaaS services with this new version on July 10, 2024.

Operates in an offline structure, encrypts files with the .CyberVolk extension and demands a payment of \$1,000 for the decryption key.

The ransomware employs ChaCha20-Poly1305, AES, RSA, and quantum-resistant algorithms for encryption, making it highly secure. If an incorrect decryption key is provided, instead of indicating that the key is wrong, it initiates the decryption process, and at the end, it writes 0-byte data into the encrypted files, leading to severe data loss.

CyberVolk ransomware has been found to block TaskManager in order to prevent the encryption process from terminating. By opening the task manager, the user cannot terminate the running ransomware through the task manager. However, as ThreatMon Malware team, we have identified critical vulnerabilities in CyberVolk ransomware that affect the encryption process and summarized them in detail.

The ransomware developed by the CyberVolk group is a current threat to all windows users (individuals, companies, institutions, organizations, etc.). Especially according to the intelligence information collected, the +20.000\$ that the cybervolk group admin claims to have earned through this ransomware demonstrates the seriousness of this threat level.

You can find more information and a technical analysis of the CyberVolk ransomware in the continuation of the report.



About Cybervolk Group

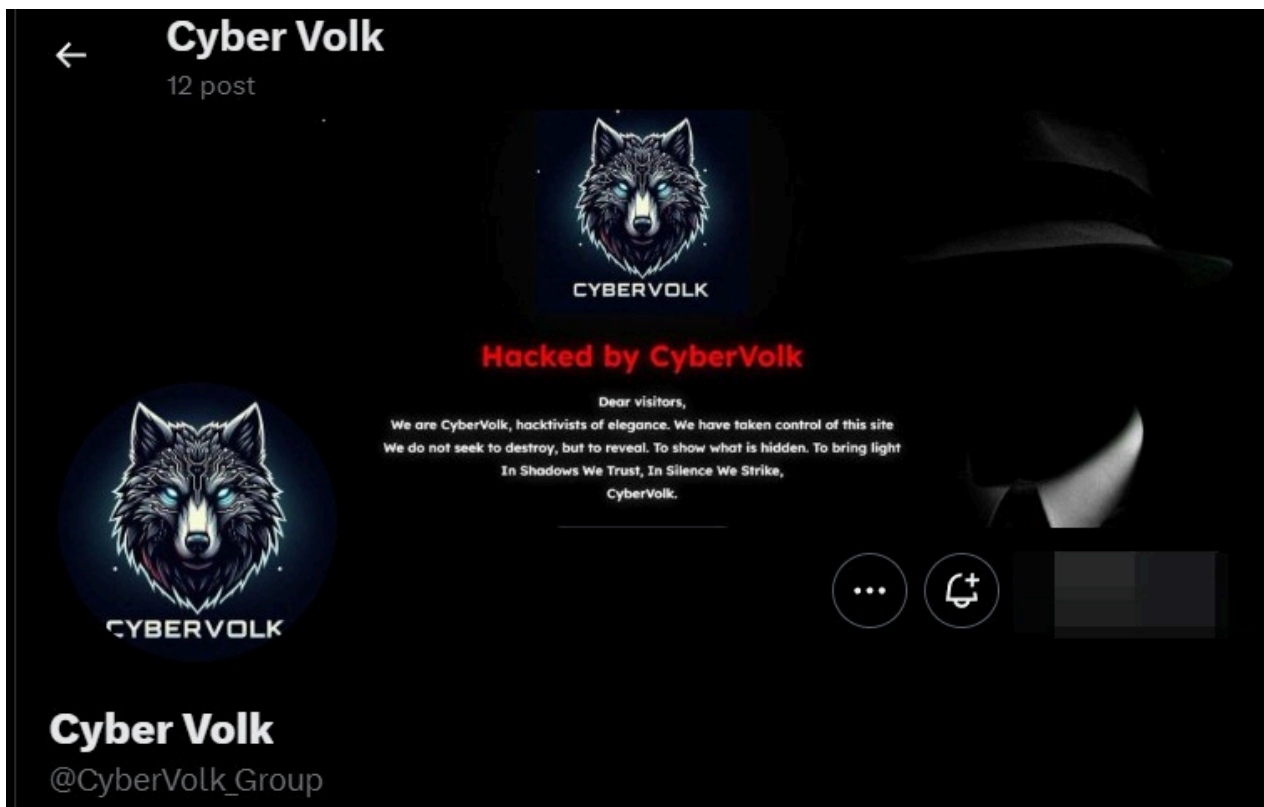


Image of Cybervolk Group Twitter Account

Cybervolk Hacker Group is an Indian cyber crime organization that was founded on March 28 2024 under the name GLORIAMIST India and later changed to Cybervolk.

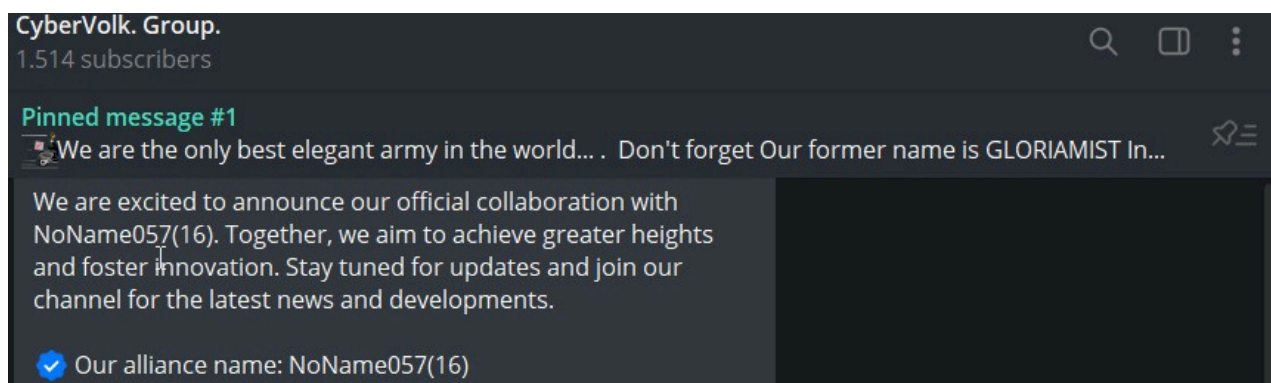


Image of Cybervolk Group Twitter Account

It was first identified by ThreatMon after their partnership with **Noname057(16)**.

Russian-based hacker groups (**Noname057(16)**) and the **cyber arm of russia**) have been attracting newly founded cybercrime organizations that can do successful work, and Cybervolk is one of these groups.



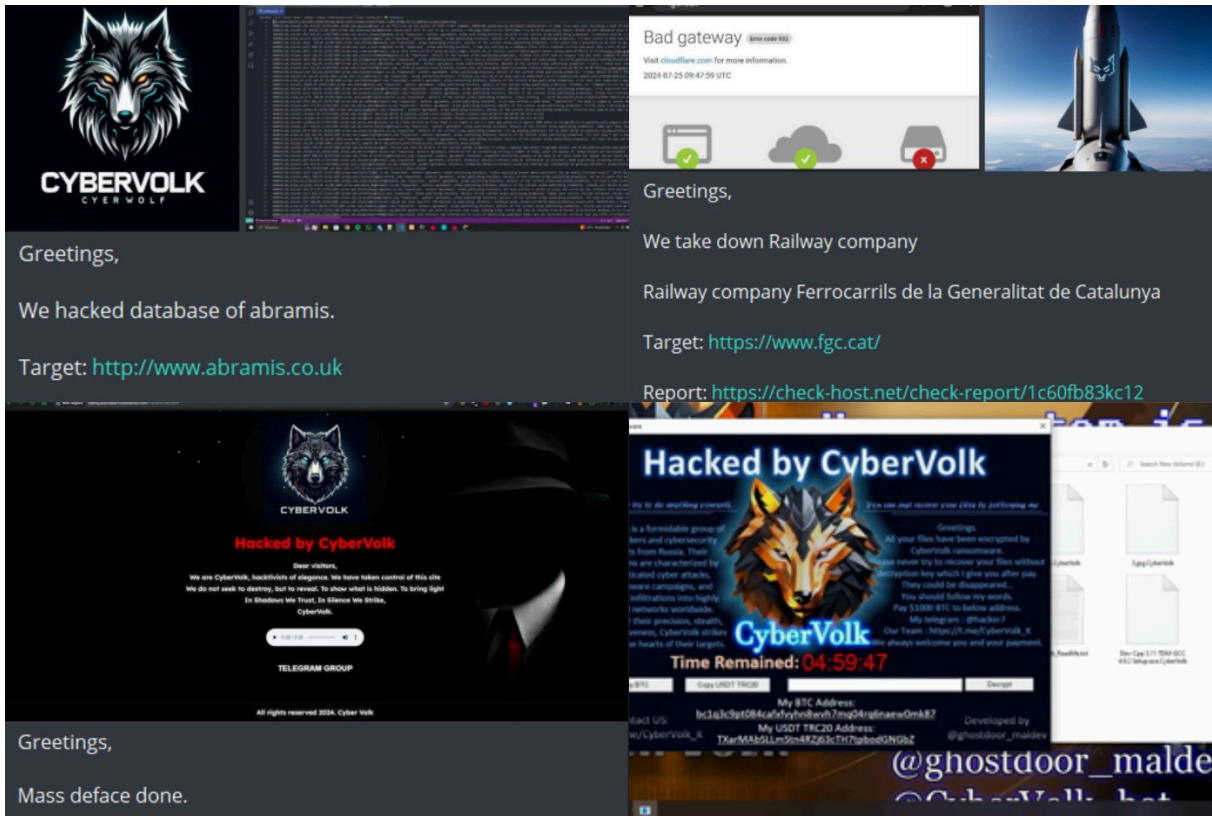


Image of Cybervolk Group Activities

According to the intelligence obtained by ThreatMon, the Cybervolk group has so far been involved in DDoS attacks, Website Defacement attacks, Data Leak attacks, Network Breach attacks and Ransomware attacks.

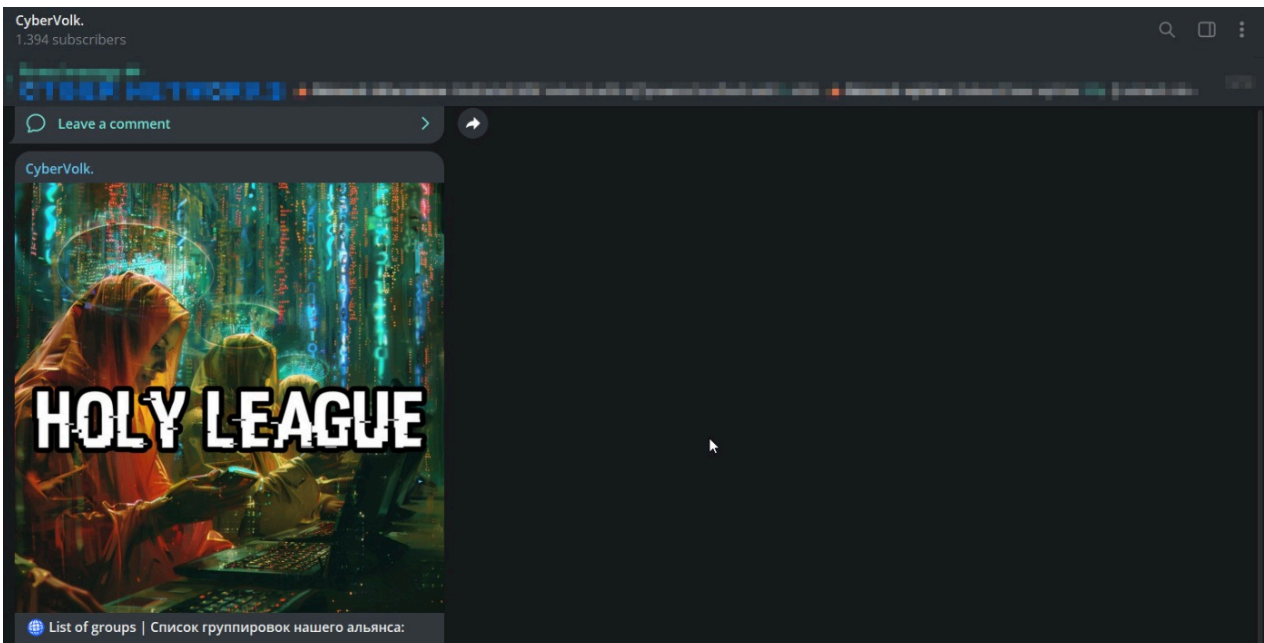


Image of Holy League Organization

At the same time, the Cybervolk group has been identified as one of the 45 hacker groups of the **Holy League** organization, which was recently created by Russian threat actors to attack **NATO**, **Ukraine** and **Israel**.



About CyberVolk Ransomware

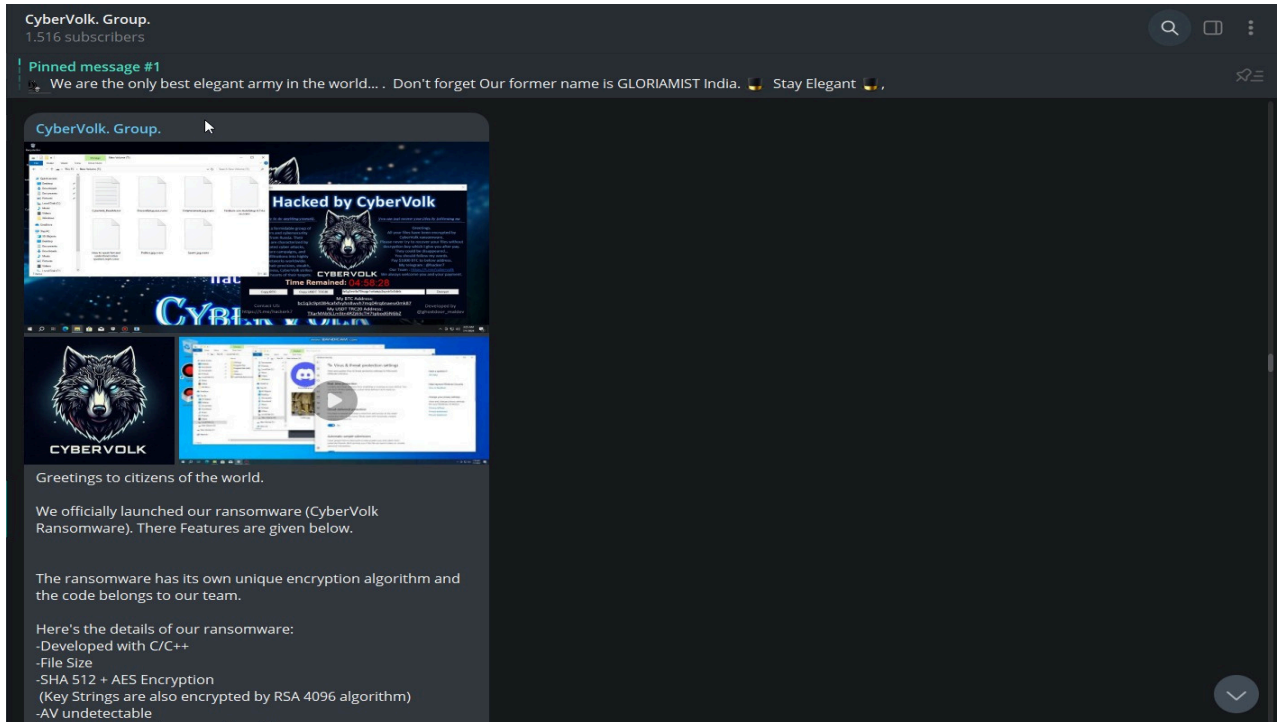


Image of CyberVolk Group Telegram Post

CyberVolk Ransomware was first completed on July 1, 2024, and it was detected being marketed as RaaS (Ransomware as a Service) on the dark web and Telegram on July 3, 2024. The initial ransomware was developed in the C++ language and, like most ransomware, uses the AES encryption algorithm. The SHA512 hash algorithm is used for AES key generation.

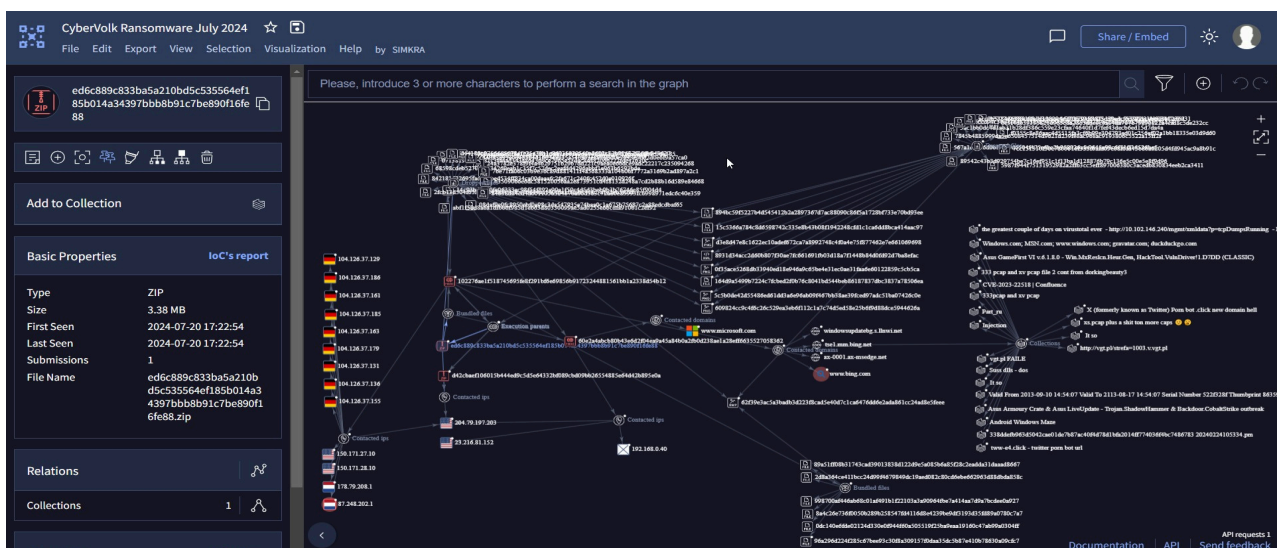


Image of CyberVolk Ransomware VirusTotal Leak

However, the initial ransomware (with the .cvenc extension) was leaked on VirusTotal and rendered non-functional. Consequently, CyberVolk subjected the ransomware to a significant update, making many changes within the ransomware.



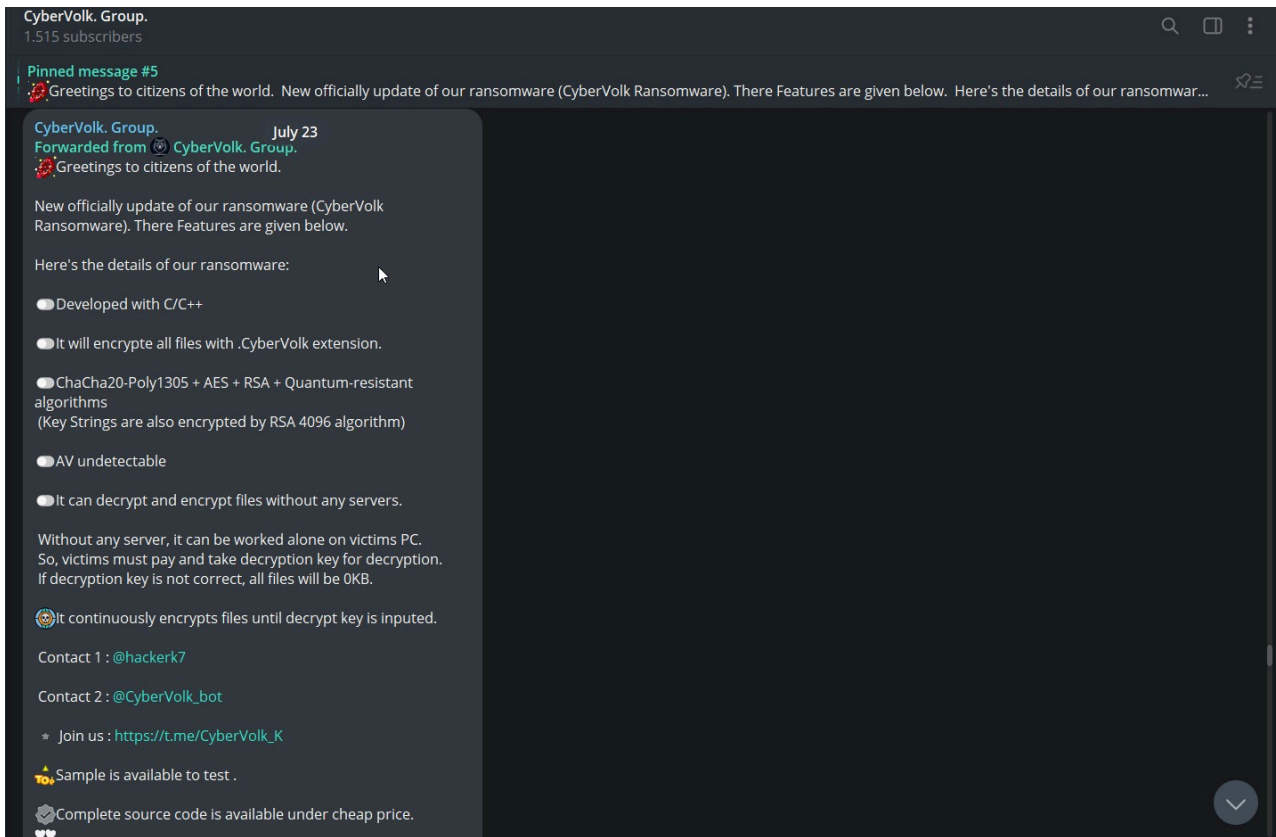


Image of CyberVolk Ransomware Telegram Post

According to the CyberVolk Group's post on Telegram, on July 23 2024, significant updates occurred in the ransomware after the leak on VirusTotal.

The .cvenc extension has been replaced by the .CyberVolk extension.

The AES encryption algorithm has been replaced by ChaCha20-Poly1305 + AES + RSA + Quantum resistant algorithms.

It is claimed to be FUD (Fully UnDetectable).

It can encrypt and decrypt without the need for a C2 (Command and Control) server (offline ransomware).

If the wrong key is entered, the contents of the encrypted files are deleted, and if there is no backup of the data, it is lost forever.



What Sets CyberVolk Ransomware Apart from the Others?

In general, PQC/Quantum-resistant algorithms are not commonly used by ransomware. These algorithms are employed to be secure against cryptanalytic attacks by quantum computers. This is the first time a quantum-resistant algorithm has been observed being used within ransomware.

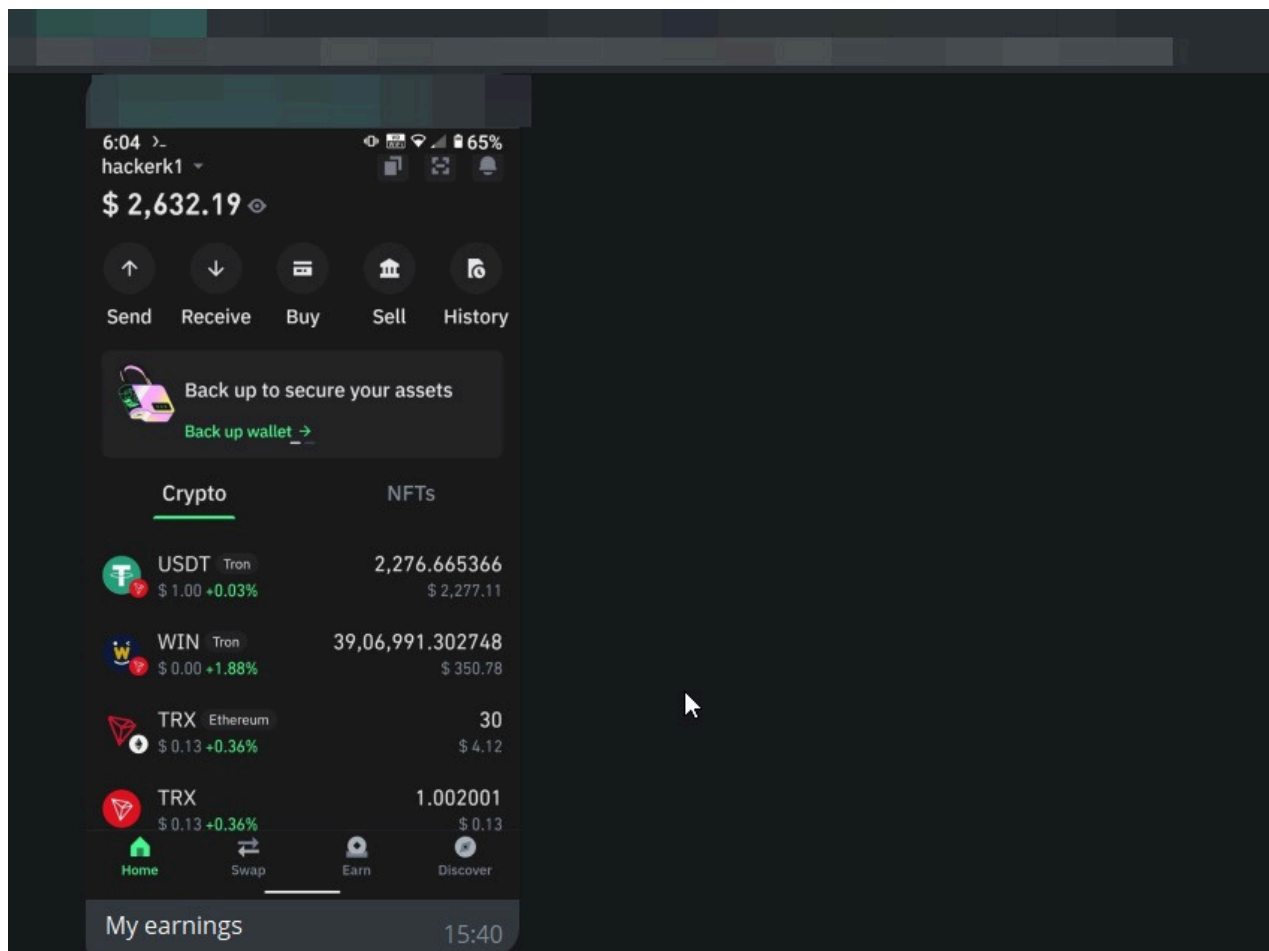


Image of CyberVolk Admin Leaked Telegram Chat

According to the intelligence obtained, it has been determined that the CyberVolk admin made a profit of **\$2632** from the ransomware in the past.

However, it is now claimed that this profit has exceeded over **\$20,000**. This situation highlights the high-level threat posed by CyberVolk ransomware in the black-market (Screenshot not shared knowingly).



CyberVolk Ransomware Contributors

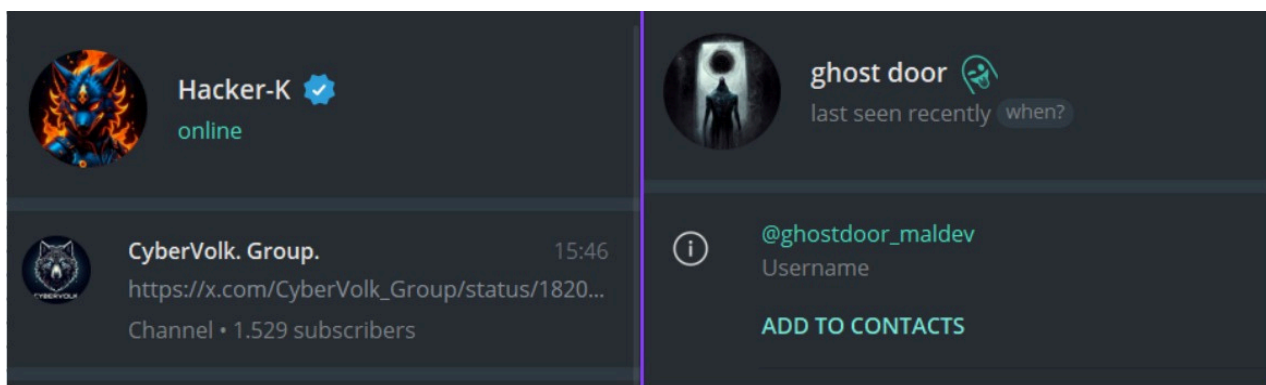


Image of CyberVolk Ransomware Contributors

The threat actor known by the alias Hacker-K is known to be of Indian origin and is the leader of the CyberVolk group.

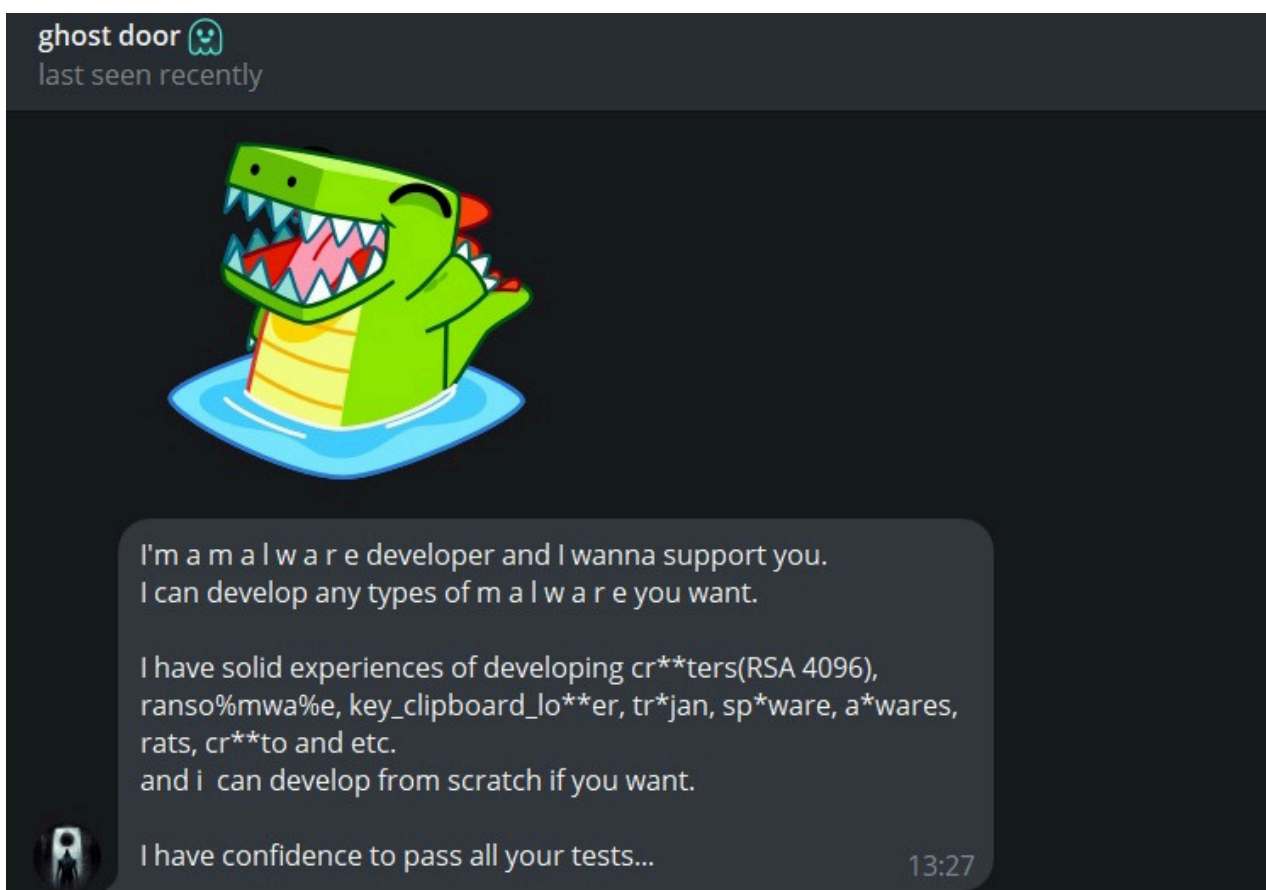


Image of Ghost Door Leaked Telegram Chat

The threat actor known by the alias **ghostdoor_maldev** is of china origin and is not directly associated with any group. This actor finds threat actor groups and makes requests for malware development to them. It has been identified as a threat actor in the expert class, particularly in the areas of cryptography and ransomware.



A Quick Look into the CyberVolk Ransomware

After the successful unpacking of AzzaSec Ransomware, its basic characteristics have changed as follows:



Image of CyberVolk Ransomware

After running on the system, CyberVolk ransomware directly displays the payment screen and begins encrypting all files by restricting user activities within the system. It prevents applications like Task Manager from opening to ensure the encryption process is not interrupted, and it encrypts all files in a short time.

The ransomware gives the user a 5-hour window to make the payment. Additionally, it creates a Readme.txt file within the system.

```
Greetings.
All your files have been encrypted by CyberVolk ransomware.
Please never try to recover your files without decryption key which I give you after pay.
They could be disappeared?
You should follow my words.
Pay $1000 BTC to below address.
My telegram : @hacker7
Our Team : https://t.me/cubervolk
We always welcome you and your payment.
```

Image of CyberVolk Ransomware Readme.txt

In the [Readme.txt](#), it is observed that a payment of **\$1,000** is demanded within this 5-hour.

If the **\$1,000** payment is not made, data loss occurs within the infected system.



Technical Malware Analysis

Basic Characteristics of CyberVolk Ransomware

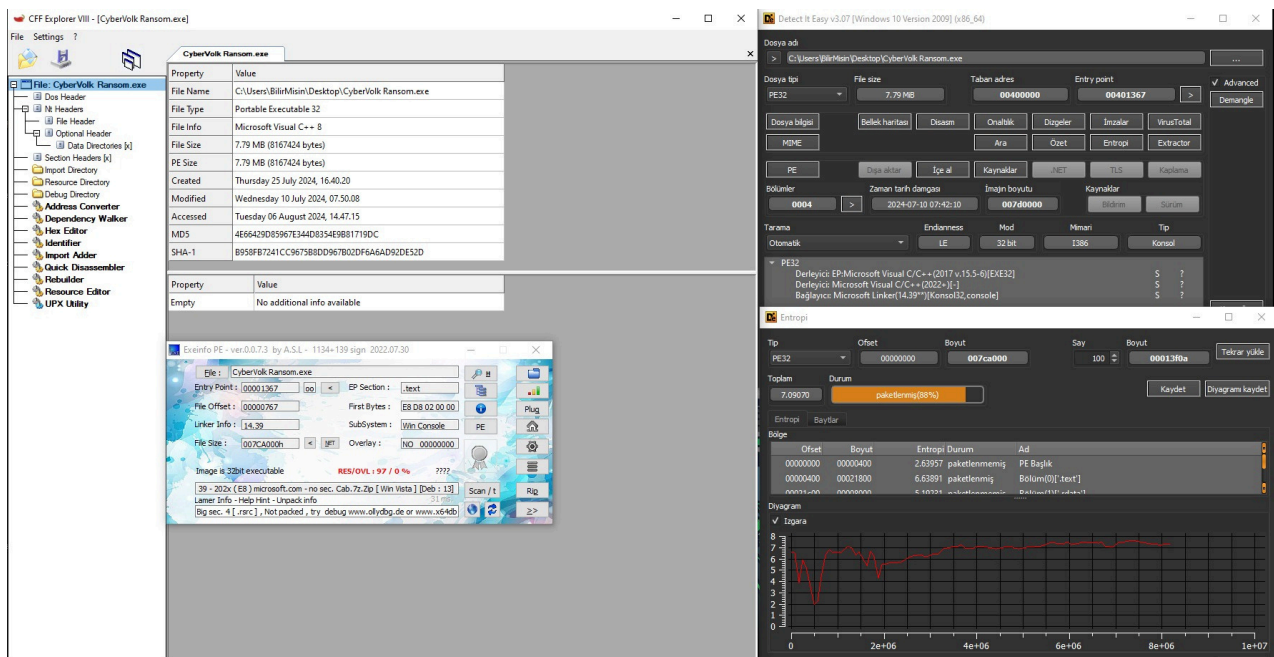


Image of CyberVolk Ransomware Characteristics

When examining the file features of the CyberVolk Ransomware, it is observed that it is developed in C++, has a size of 7.79MB, and does not use any packer.

FileType	Portable Executable 32
Language	C++
FileSize	7.79 MB 8167424 bytes
PeSize	7.79 MB 8167424 bytes
Packer	Not Packed
MD5	4E66429D85967E344D8354E9B81719DC
SHA1	B958FB7241CC9675B8DD967B02DF6A6AD92DE52D
Sha256	de0b74917fe24c2b38e2d1172b7352f88bf8b3df64b6d44ca5f317db85aeb324
IMPHash	0982e392aba6a868dc7bda8b61e977ab



Dynamic Analysis of CyberVolk Ransomware

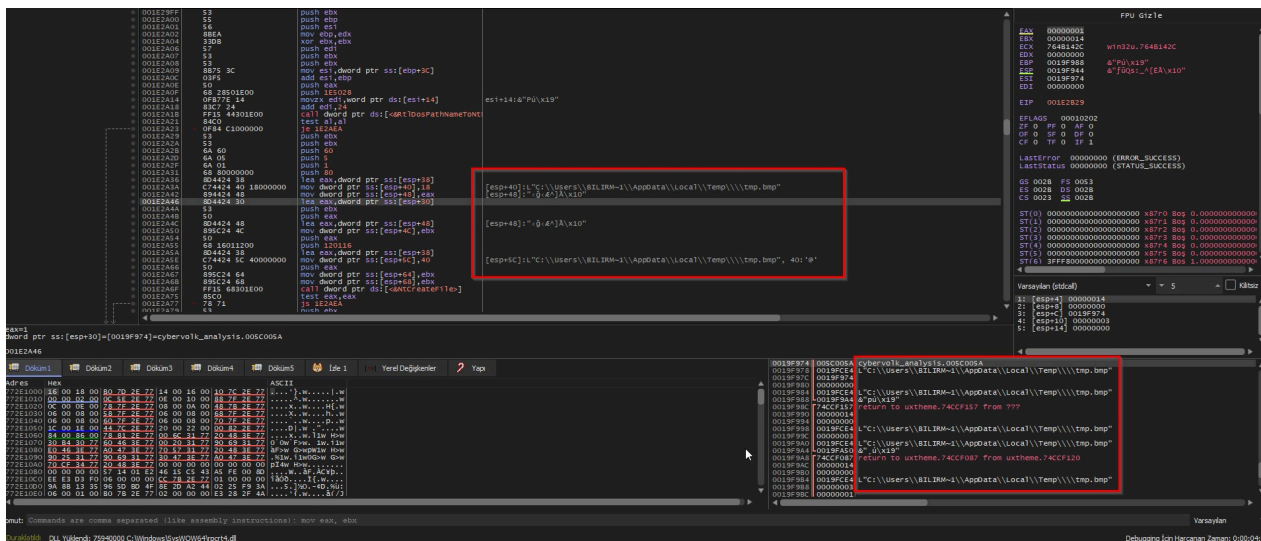


Image of CyberVolk Ransomware Dynamic Analysis I

It is observed that CyberVolk ransomware starts its process by writing a BMP file to the \$HOME\AppData\Temp directory. The BMP file is then set as the background image.

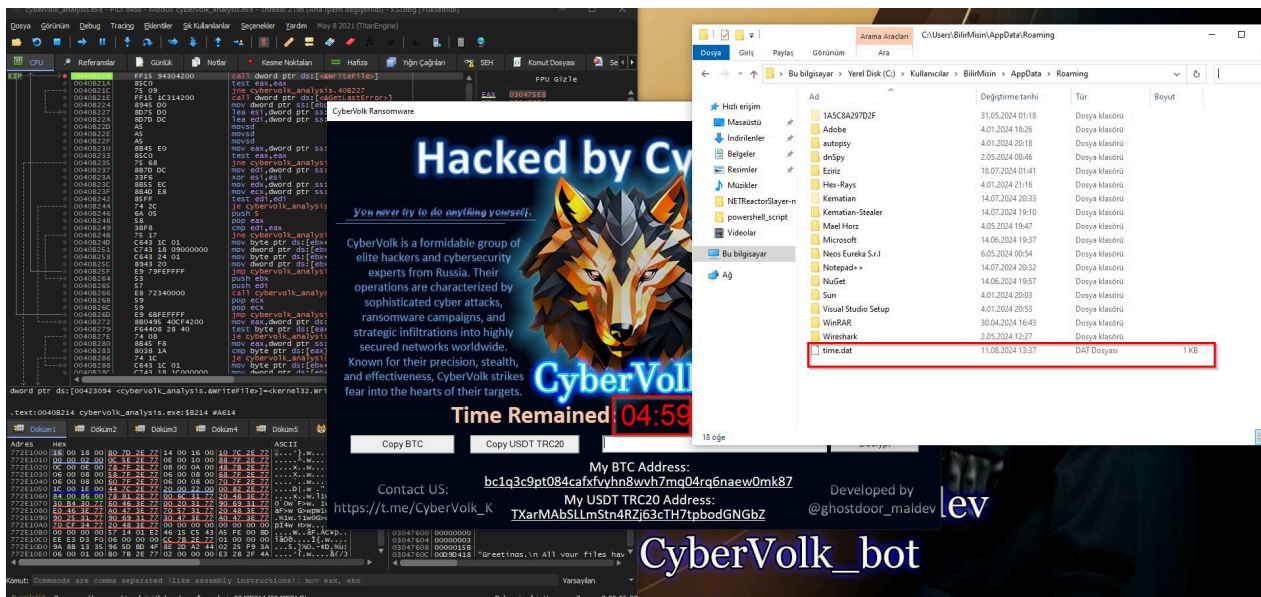


Image of CyberVolk Ransomware Dynamic Analysis II

Then it prints the "time.dat" file to the system and starts the GUI. A time of 5 hours is specified in "time.dat" and a timer is set on the GUI according to the data written there.



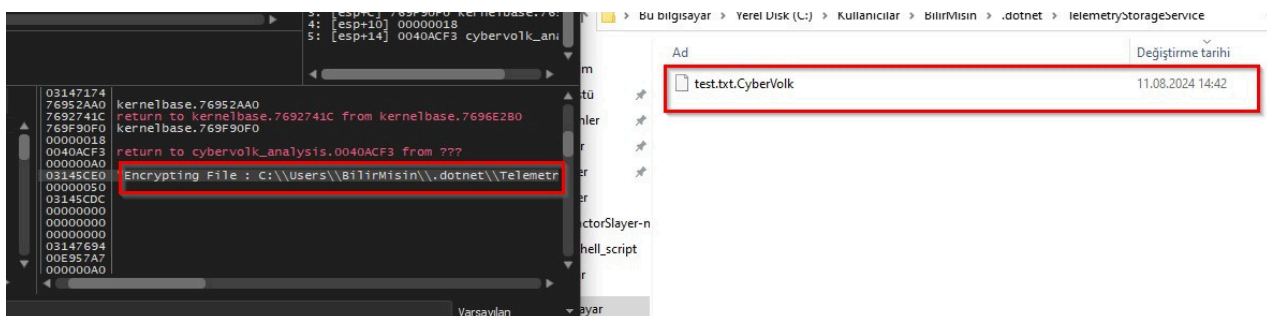
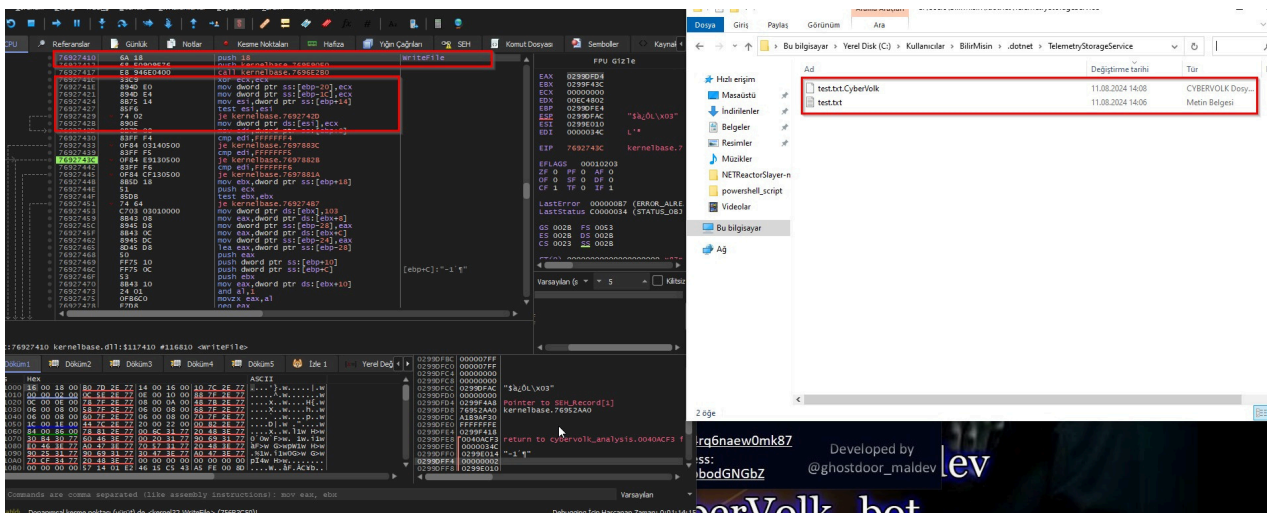


Image of CyberVolk Ransomware Dynamic Analysis III

After creating the **time.dat** file, it starts encryption from the first directory of the **\$HOME** directory. Firstly, it creates a file with **.CyberVolk** extension and then encrypts it by reading the contents of the file, then writes the encrypted data into the file with **.CyberVolk** extension. Then it deletes the unencrypted file from the system.

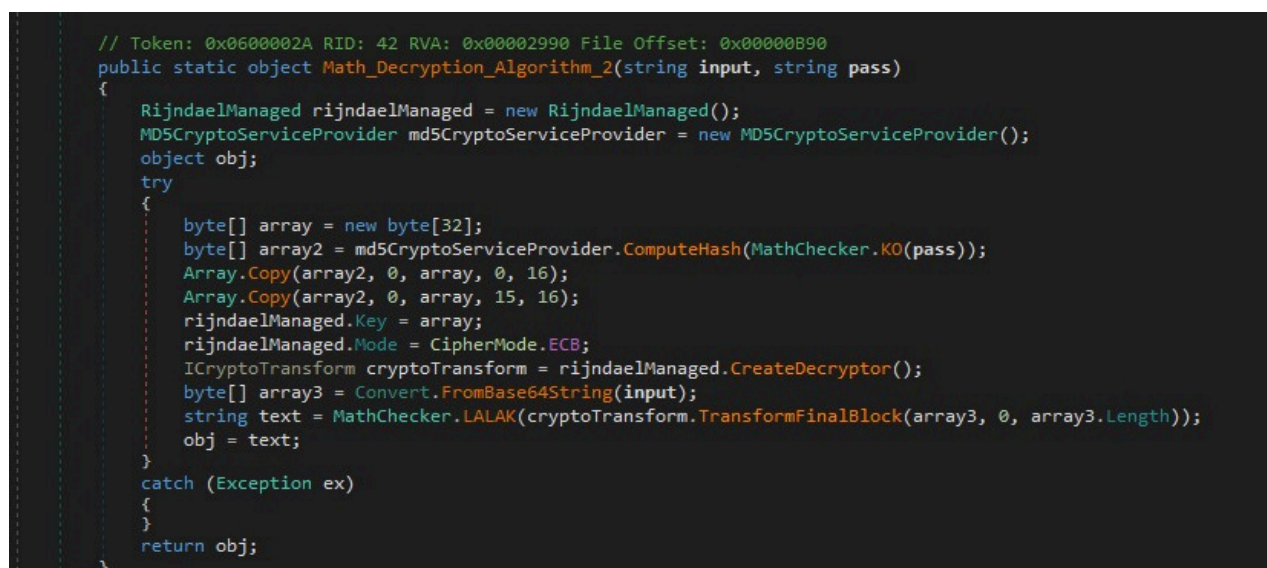


Image of CyberVolk Ransomware Dynamic Analysis IV



According to the CyberVolk Group's post on Telegram, on July 23 2024, significant updates occurred in the ransomware after the leak on VirusTotal.

"Greetings.

All your files have been encrypted by CyberVolk ransomware.

Please never try to recover your files without decryption key which I give you after pay.

They could be disappeared?

You should follow my words.

Pay \$1000 BTC to below address.

My telegram : @hacker7

Our Team : <https://t.me/cubervolk>

We always welcome you and your payment."

Time	Process	Operation	Path	Result	Details
5:19:...	cybervolk_analysis.exe	Process Start		SUCCESS	Parent PID: 4100, ...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\RaiseExceptionOnPossibleDeadlock	NAME NOT FOUND	Length: 80
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\Segment Heap	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager\Segment Heap	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\ResourcePolicies	NAME NOT FOUND	Length: 24
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\Software\Microsoft\Wow64\86	SUCCESS	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\SOFTWARE\Microsoft\Wow64\86\cybervolk_analysis.exe	NAME NOT FOUND	Length: 520
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\SOFTWARE\Microsoft\Wow64\86\Default	SUCCESS	Type: REG_SZ, Le...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\RaiseExceptionOnPossibleDeadlock	NAME NOT FOUND	Length: 80
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\Segment Heap	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager\Segment Heap	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager	SUCCESS	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\System\CurrentControlSet\Control\Session Manager\ResourcePolicies	NAME NOT FOUND	Length: 24
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\Conhost.exe	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Services\bam\State\UserSettings\S-1-5-21-1690830767-3441749873-8510784...	SUCCESS	Desired Access: All...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\System\CurrentControlSet\Services\bam\State\UserSettings\S-1-5-21-1690830767-3441749873-8510784...	SUCCESS	Type: REG_BINARY...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\BAM	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Session Manager\BAM	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	Process Create	C:\Windows\System32\Conhost.exe	SUCCESS	PID: 1876, Comma...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\StateSeparation\RedirectionMap\Keys	REPARSE	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\StateSeparation\RedirectionMap\Keys	NAME NOT FOUND	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\SafeBoot\Option	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\SafeBoot\Option	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Srp\GP\DLL	REPARSE	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\Srp\GP\DLL	NAME NOT FOUND	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\Software\WOW6432Node\Policies\Microsoft\Windows\Safer\CodeIdentifiers	REPARSE	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\SOFTWARE\Policies\Microsoft\Windows\Safer\CodeIdentifiers	SUCCESS	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegQueryValue	HKLM\SOFTWARE\Policies\Microsoft\Windows\Safer\codeidentifiers\TransparentEnabled	NAME NOT FOUND	Length: 80
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKCU\Software\Policies\Microsoft\Windows\safer\CodeIdentifiers	NAME NOT FOUND	Desired Access: Q...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\FileSystem	REPARSE	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\FileSystem	SUCCESS	Desired Access: R...
5:19:...	cybervolk_analysis.exe	RegOpenKey	HKLM\System\CurrentControlSet\Control\FileSystem	SUCCESS	Type: REG_DWORD

Image of CyberVolk Ransomware Dynamic Analysis V

When the process operations are monitored in the dynamic analysis, it is observed that the console "**conhost.exe**" for GUI support is started depending on the main process. No additional potentially harmful process, network connection, persistence or any other methods/techniques were detected.

During the observation process, the "**SafeBoot**" key draws attention. CyberVolk ransomware is observed to be tampering with the safe mode settings of the windows device. It is also observed that it reads dec_key.dat in the **\$HOME\AppData\Roaming** directory. The file is not created because it does not write.



```

kernelbase.76927453
mov dword ptr ds:[ebx],103
mov eax,dword ptr ds:[ebx+8]
mov dword ptr ss:[ebp-28],eax
mov eax,dword ptr ds:[ebx+c]
mov dword ptr ss:[ebp-24],eax
lea eax,dword ptr ss:[ebp-28]
push eax
push dword ptr ss:[ebp+10]
push dword ptr ss:[ebp+c] ; [ebp+c]:"Decrypting File : C:\\Users\\Bilirmisin\\.ghidra\\.ghidra_10.3.3_PUBLIC\\o
push ebx
mov eax,dword ptr ds:[ebx+10]
and al,1
movzx eax,al
neg eax
sbb eax,eax
not eax,ebx
and eax,ebx
push eax
push ecx
push dword ptr ds:[ebx+10]
push edi
call dword ptr ds:[<NtWriteFile>]
mov ecx,eax
mov edx,C0000000 ; edx:"\niu9go1o9do8ix9uonhugjkjnj1jrongoxdzx01gXuukjzouk1pn9jhzgxoh1uzkizjdup1oh9rrrggx8jn1x
and ecx,edx ; edx:"\niu9go1o9do8ix9uonhugjkjnj1jrongoxdzx01gXuukjzouk1pn9jhzgxoh1uzkizjdup1oh9rrrggx8jn1x1dno8
cmp eax,103
jne kernelbase.769274F0

```

Image of CyberVolk Ransomware Dynamic Analysis VI

During the decryption process, the situation of checking with the original key was examined in detail, but no such comparison was found. CyberVolk ransomware does not compare the provided decryption key with the original decryption key.

Instead, after acquiring the key from the dec_key.dat file, it uses the WriteFile API to create an empty file with the actual name of the .CyberVolk extension file. For example, for the file file.txt.CyberVolk, it writes an empty file named file.txt on the disk. Then, using the NtWriteFile API, it processes the decryption key and writes the decrypted content of the encrypted file into file.txt. However, during this process, the buffer memory is not checked. If the provided key is incorrect, instead of writing corrupted data into the file, it writes 0-byte data. But if the provided key is correct, since the generated data won't be corrupted, it writes the decrypted file content correctly.

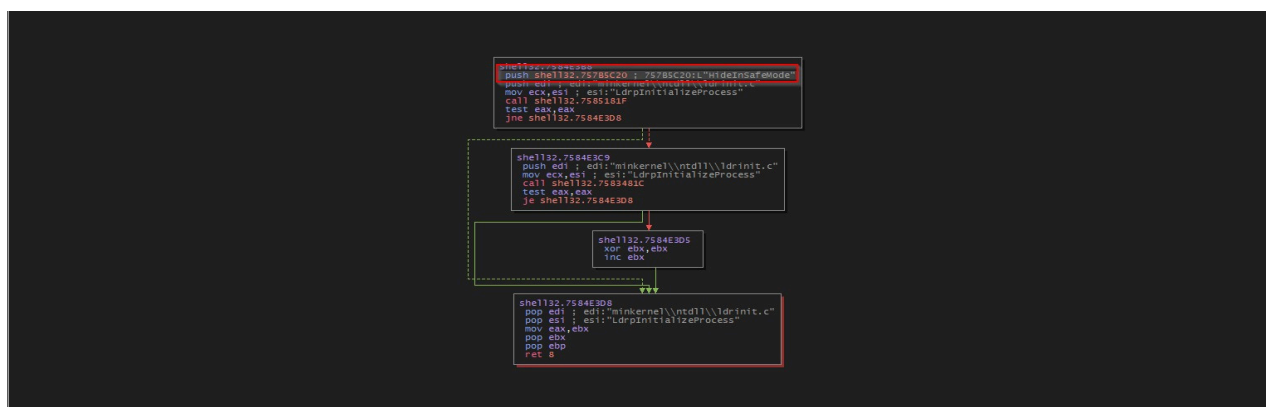


Image of CyberVolk Ransomware Dynamic Analysis VII

CyberVolk Ransomware detects whether it is running in safe mode using **GetOSSafeBootMode** and the **SafeBoot** registry key. The **HideInSafeMode** function is used to hide or stop certain functions when safe mode is detected.



CyberVolk Ransomware Static Analysis

Image of CyberVolk Ransomware Static Analysis II

The function, for the string "**Decryption Key is Not Correct**" was analyzed due to its potential relation to the encryption key. It was found that it does not check the actual encryption key. Instead, it calculates a **36-character value**. If the entered value is not exactly 36 characters, it shows the "**Decryption Key is Not Correct**" message and returns 0. However, if the string is 36 characters, it proceeds with the decryption process without validating the actual encryption key.

Image of CyberVolk Ransomware Static Analysis III

When it detects a 36-digit value, it is observed that it starts the decryption process. At the same time, a write operation is performed in the **_fopen** code structure. Here, the 36 byte of value received as input from the user is printed on **dec_key.dat**, which was displayed within the **dynamic analysis**.



```

01 00 01 00
00401765 8b 40 fc MOV EAX,dword ptr [EAX + local_4]
00401768 6a 58 PUSH 0x58
0040176a 89 85 90 MOV dword ptr [EBP + local_274],EAX
fd ff ff
004017c0 8d 45 a8 LEA EAX=>local_5c,[EBP + -0x58]
004017c3 6a 00 PUSH 0x0
004017c5 50 PUSH EAX
004017c6 e8 05 0c CALL _memset
0000
004017cb 8b 45 04 MOV EAX,dword ptr [EBP + local_res0]
004017ce 83 c4 0c ADD ESP,0xc
004017d1 c7 45 a8 MOV dword ptr [EBP + local_5c],0x40000015
15 00 00 40
004017d8 c7 45 ac MOV dword ptr [EBP + local_58],0x1
004017df 89 45 b4 MOV dword ptr [EBP + local_50],EAX
004017e2 ff 15 f4 CALL dword ptr [->KERNEL32.DLL::IsDebuggerPresent]
0000
004017e8 8b f0 MOV ESI,EAX
004017ea 8d 45 a8 LEA EAX=>local_5c,[EBP + -0x58]
004017ed 89 45 f8 MOV dword ptr [EBP + local_c],EAX
004017f0 8d 85 dc LEA EAX=>local_328,[EBP + 0xfffffcdc]
fc ff ff
004017f6 6a 00 PUSH 0x0
004017f8 89 45 fc MOV dword ptr [EBP + local_8],EAX
004017fb ff 15 fc CALL dword ptr [->KERNEL32.DLL::SetUnhandledExcepti...
30 42 00
7 LONG LVar3;
8 undefined4 local_328 [39];
9 EXCEPTION_RECORD local_5c;
10 _EXCEPTION_POINTERS local_c;
11
12 BVar2 = IsProcessorFeaturePresent(0x17);
13 if (BVar2 != 0) {
14 pcVar1 = (code * swi(0x29);
15 (*pcVar1)();
16 }
17 resetGlobalVariable();
18 _memset(local_328,0,0x2cc);
19 local_328[0] = 0x10001;
20 _memset(&local_5c,0,0x50);
21 local_5c.ExceptionCode = 0x40000015;
22 local_5c.ExceptionFlags = 1;
23 BVar2 = IsDebuggerPresent();
24 local_c.ExceptionRecord = &local_5c;
25 local_c.ContextRecord = (PCONTEXT)local_328;
26 SetUnhandledExceptionFilter((LPTOP_LEVEL_EXCEPTION_FILTER)0x0);
27 LVar3 = UnhandledExceptionFilter(&local_c);
28 if ((LVar3 == 0) & (BVar2 != 1)) {
29 resetGlobalVariable();
30 }
31 return;
32 }
33
Cy Decompile: HandleProce... x Defined Strings x

```

Image of CyberVolk Ransomware Static Analysis IV

It is observed that CyberVolk Ransomware can detect debuggers with the "**IsDebuggerPresent**" API. If the debugger is detected, the function is terminated, but if the debugger is not detected, the program continues with the **resetGlobalVariable()** function.

```

00401aa0 6a 0a PUSH 0xa
00401aa2 ff 15 04 CALL dword ptr [->KERNEL32.DLL::IsProce...
31 42 00
00401aa8 85 c0 TEST EAX,EAX
00401aaa 0f 84 ac JZ LAB_00401c5c
01 00 00
00401ab0 83 65 f0 00 AND dword ptr [EBP + local_14],0x0
00401ab4 33 c0 XOR EAX,EAX
00401ab6 53 PUSH EBX
00401ab7 56 PUSH ESI
00401ab8 57 PUSH EDI
00401ab9 33 c9 XOR ECX,ECX
00401abb 8d 7d dc LEA EDI=>local_28,[EBP + -0x24]
00401abe 53 PUSH EBX
00401abf 0f a2 CPUID
00401ac1 8b f3 MOV ESI,EBX
00401ac3 5b POP EBX
00401ac4 90 NOP
00401ac5 89 07 MOV dword ptr [EDI]=>local_28,EAX
00401ac7 89 77 04 MOV dword ptr [EDI + local_24],ESI
00401aca 89 4f 08 MOV dword ptr [EDI + local_20],ECX
00401acd 33 c9 XOR ECX,ECX
00401acf 89 57 0c MOV dword ptr [EDI + local_1c],EDX
00401ad2 8b 45 dc MOV EAX,dword ptr [EBP + local_28]
00401ad5 8b 7d e0 MOV EDI,dword ptr [EBP + local_24]
00401ad8 89 45 f4 MOV dword ptr [EBP + local_10],EAX
00401adb 81 f7 47 XOR EDI,0x756e6547
70 DAT_0042c9dc = 0;
71 DAT_0042b010 = DAT_0042b010 | 1;
72 BVar4 = IsProcessorFeaturePresent(10);
73 UVar5 = DAT_0042b010;
74 if (BVar4 != 0) {
75 piVar1 = (int *)cpuid_basic_info(0);
76 puVar2 = (uint *)cpuid_version_info(1);
77 UVar6 = puVar2[3];
78 if (((piVar1[2] ^ 0x49656e69u | piVar1[3] ^ 0x6c65746eu | piVar1[1] ^ 0x756e6547u) == 0) &&
79 (((uVar5 == *puVar2 & 0xffff3fff, uVar5 == 0x106c0 || (uVar5 == 0x20660) ||
80 (uVar5 == 0x20670) || ((uVar5 == 0x30650 || (uVar5 == 0x30660))) || (uVar5 == 0x30670))))
81 ) {
82 DAT_0042c9e0 = DAT_0042c9e0 | 1;
83 }
84 }
85 if (*piVar1 < 7) {
86 uVar7 = 0;
87 }
88 }
89 iVar3 = cpuid_Extended_Feature_Enumeration_info(7);
90 UVar7 = *(uint *)(iVar3 + 4);
91 if ((uVar7 & 0x200) != 0) {
92 DAT_0042c9e0 = DAT_0042c9e0 | 2;
93 }
94 }
95 DAT_0042c9dc = 1;
96 UVar5 = DAT_0042b010 | 2;

```

Image of CyberVolk Ransomware Static Analysis V

"**IsProcessorFeaturePresent**" API determines whether the specific processor feature is supported by the computing environment in which it is running.

It is also observed that the Ransomware accesses information related to the CPU. the **CPUID** instruction is utilized to distinguish between virtual and physical environments. **CPUID** queries the processor's attributes and checks virtualization indicators to determine if the environment is a virtual machine.




```

004216ed bf 61 00 MOV EDI,0x61
00 00
004216f2 c7 45 ec MOV dword ptr [EBP + local_18],0x3a0063
004216f9 9f 57 c0 XORPS xmm0,xmm0
004216fc c7 45 f0 MOV dword ptr [EBP + local_14],0x5c
5c 00 00 00
00421703 66 0f d6 MOVQ qword ptr [EBP + local_10],xmm0
45 f4
00421708 8b df MOV EBX,EDI
0042170a c7 45 fc MOV dword ptr [EBP + local_8],0x0
00 00 00 00

LAB_00421711 XREF
00421711 8d 45 ec LEA EAX=>local_18,[EBP + -0x14]
00421714 66 89 7d ec MOV word ptr [EBP + local_18],DI
00421718 50 PUSH EAX
00421719 ff 15 dc CALL dword ptr [->KERNEL32.DLL::GetDriveTy
30 42 00

0042171f 83 e8 02 SUB EAX,0x2
00421722 74 12 JZ LAB_00421736
00421724 83 e8 01 SUB EAX,0x1
00421727 74 00 JZ LAB_00421736
00421729 83 e8 01 SUB EAX,0x1
0042172c 74 00 JZ LAB_00421736
0042172e 8b 0d 1c MOV ECX,dword ptr [DAT_0042f81c]
f8 42 00

FUN_0040bb30(_File);
}
uVar4 = 0x61;
local_18 = 0x3a0063;
local_14 = 0x5c;
local_10 = 0;
uVar3 = 0x1;
local_8 = 0;
do {
local_18 = CONCAT22(local_18, 2, uVar4);
uVar1 = GetDriveTypeW((LPCWSTR)&local_18);
if (((uVar1 == 2) || (uVar1 == 3)) || (uVar1 == 4)) {
lpParameter = (LPCWSTR)FUN_004010f4(4);
wprintfW(lpParameter,L"%c%c",iVar3,0x65);
ppvVar2 = (HANDLE *)
CreateThread((LPSECURITY_ATTRIBUTES)0x0,0,threadRoutine,lpParameter,0,(LPDWORD)0x0)
(&lpHandles_00430c30)[DAT_0042f81c] = ppvVar2;
DAT_0042f81c = DAT_0042f81c + 1;
DAT_00430c20 = DAT_00430c20 + 1;
}
uVar4 = uVar4 + 1;
iVar3 = iVar3 + 1;
} while (uVar4 < 0x7b);
WaitForMultipleObjects(DAT_0042f81c,&lpHandles_00430c30,1,0xffffffff);
return;
}
}

```

Image of CyberVolk Ransomware Static Analysis VI

CyberVolk Ransomware has been found to include activity similar to a worm virus. It scans all drive letters between "a" and "z". If these drives are of the type where it can spread itself (removable, hard, network), it creates a multi thread to execute on these drives. This structure has an auto spread feature like a worm.

```

sub_4225C0 proc near
lpThreadParameter= dword ptr 4
push ebx
mov ebx, ds:FindWindowA
push esi
mov esi, ds:Sleep
push edi
mov edi, ds:PostMessageW

loc_422505: ; lpWindowName
push 0
push offset ClassName "TaskManagerWindow"
call ebx ; FindWindowA
test eax, eax
jz short loc_4225EB

push 0 ; lParam
push 0 ; wParam
push 10h ; Msg
push eax ; hwnd
call edi ; PostMessageW

loc_4225EB: ; dwMilliseconds
push 3E8h
call esi ; Sleep
mov short loc_4225E6

```

Image of CyberVolk Ransomware Static Analysis VII

CyberVolk ransomware continuously searches for the window named "**TaskManagerWindow**" via the "**FindWindowA**" API by waiting for 1 second in an infinite loop running as a different thread. When it finds it, it sends **0x0010 (WM_CLOSE)** via the **PostMessageW** API to close the window. This prevents the user from terminating the cybervolk ransomware process via the task manager.



The image shows a static analysis tool interface. On the left, assembly code is displayed with labels like LAB_00421e34 and LAB_00421e56. On the right, the decompiled C++ code for the function HandleMessageAndDecrypt is shown. A red box highlights the MessageBox call: `MessageBox((HWND)0x0, (LPCWSTR)&lpText_00428f08, L"Decrypt Completed", 0);`. Below it, a comment reads: `/* WARNING: Subroutine does not return */`. The function ends with `_exit(1);`.

Image of CyberVolk Ransomware Static Analysis VIII

When the decryption process is completed, the program terminates itself using the `_exit(1);` function. However, since it does not involve any persistence, writing itself to a process, or utilizing any other technique/method, it does nothing else in the self-cleaning stage other than terminating itself.

CyberVolk Ransomware Vulnerabilities

ThreatMon Malware Team has identified several vulnerabilities in the CyberVolk ransomware that have a critical impact on its infection process.



Image of CyberVolk Ransomware Vulnerabilities I

Unlike most ransomware, CyberVolk ransomware first launches the GUI and then starts encrypting the system with multithreads. In this time, it was found that the task manager was blocked to prevent the process from being interrupted, but powershell was not blocked.



```

FLARE-VM 08/13/2024 01:13:47
PS C:\Users\ > Get-Process

Handles  NPM(K)  PM(K)  WS(K)  CPU(s)  Id  SI  ProcessName
-----  -
227      12      2816   22672   20,70   7044  1  CyberVolk_odz9rjs5efm3yat2vb7w40cq16nx8hkpilug

FLARE-VM 08/13/2024 01:13:49
PS C:\Users\ > Stop-Process -Name CyberVolk_odz9rjs5efm3yat2vb7w40cq16nx8hkpilug
FLARE-VM 08/13/2024 01:13:56
PS C:\Users\ >

```

Image of CyberVolk Ransomware Vulnerabilities II

As soon as the GUI is launched and the necessary commands are given in PowerShell to terminate the process, the encryption process is interrupted.

Additionally, since it does not contain any persistence features within its structure, the CyberVolk ransomware does not reactivate or attempt to re-encrypt files if the device is restarted.

Command	Get-Process
Command	Stop-Process -Name <CyberVolk_Ransomare.exe>

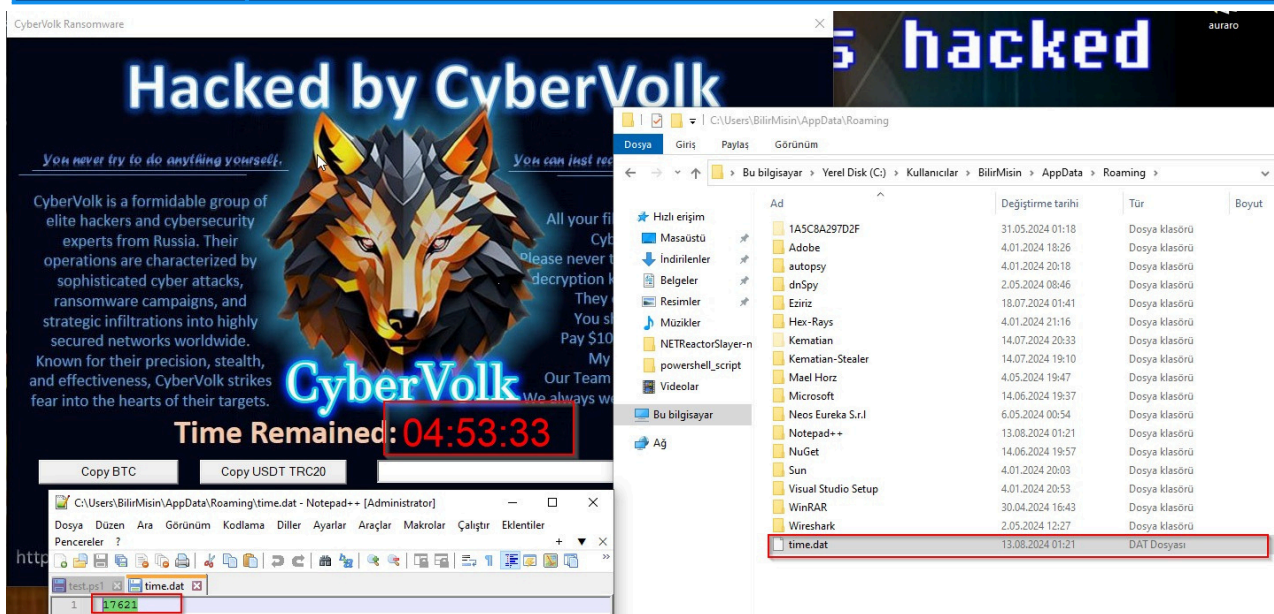


Image of CyberVolk Ransomware Vulnerabilities III

Additionally, the CyberVolk ransomware operates by continuously counting down from 18,000 seconds, as written in the time.dat file. The timer can be manually adjusted by modifying the time.dat file, which allows the countdown to be extended indefinitely. This capability can facilitate the work of reverse engineering, forensic, and malware analysis teams by providing more time for analysis.



MITIGATION

- ✦ Ensure that data is backed up regularly, and keep multiple copies, including one offline or in a cloud service.
- ✦ Educate employees on recognizing phishing emails, suspicious links, and social engineering tactics.
- ✦ Keep all systems, software, and firmware up-to-date with the latest security patches.
- ✦ Deploy and regularly update security software across all endpoints.
- ✦ Use CTI to set up early warning alerts for ransomware campaigns that are targeting your industry or region. These alerts can help your organization prepare for potential attacks before they reach you.
- ✦ Use advanced spam filtering to reduce the risk of phishing emails reaching end users.
- ✦ Enforce the principle of least privilege (PoLP) to limit user access to only what is necessary for their role.
- ✦ Subscribe to threat intelligence feeds that provide information on emerging ransomware threats.
- ✦ Implement application whitelisting to allow only approved programs to run on your systems, preventing unauthorized or malicious software from executing.

Categorization

APT Group	It is not an APT group, but it has affiliations with APT 44
Threat Category	Ransomware
Malware Family	GandCrab Ransomware

Mitre Att&ck Table

Tactics	Technique ID	Technique Name
Initial Access	T1566	Phishing
Execution	T1106 T1204.002	Native API User Execution: Malicious File
Defense Evasion	T1562.001 T1562.009	Impair Defenses: Disable or Modify Tools Impair Defenses: Safe Mode Boot
Discovery	T1010 T1622 T1083 T1012 T1124 T1497	Application Window Discovery Debugger Evasion File and Directory Discovery Query Registry System Time Discovery Virtualization / Sandbox Evasion
Impact	T1486 T1485 T1565	Data Encrypted For Impact Data Destruction Data Manipulation

Yara Rule

Download the Yara Rule From ThreatMon [Github](#) Page.

```
rule CyberVolk_Ransomware_Yara{
  meta:
    description = "Yara rule for detecting CyberVolk Ransomware"
    author = "Aziz Kaplan"
    email = "aziz.kaplan@threatmonit.io"
    file_hash = "d08243e976e01baa5479a134577a1407daf4bec89a5f47bf2b803c0919917f5b"
  strings:
    $OP1 = {8d 84 24 b0 04 00 00 ?? ?? ?? ?? ?? ?? ?? ?? 6a 00}
    $OP2 = {8b 7d 08 6a 24 68 5c 90 42 00}
           //8b7d086a24 |MOVEDI,dwordptr[EBP+arg]
           //685c904200 |PUSH<start_of_encryption>
    $OP3 = {6a 24 68 5c 90 42 00}
           //6a24 |PUSH0x24
           //685c904200 |PUSH<start_of_decryption>
    $OP4 = {8d 51 01 ?? ?? ?? ?? ?? ?? ?? 2b ca 83 f9 24 74 1b}
           //Check of "if" condition of decryption process
           //8d5101 |LEAEDX,[ECX+0x1]
           //2bca |SUBECX,EDX
           //83f924741b |CMPECX,0x24
    $OP5 = {ff 15 d0 31 42 00}
           //Call of API after the if condition
           //ff15d0314200 |dwordptr[->USER32.DLL::MessageBoxA]
    $OP6 = {8d 4c 24 30 e8 2b 02 00}
           //Character replacment after the decryption key is provided
           //8d4c2430 |LEAECX,[ESP+0x30]
           //e82b0200 |character_replacement
    $OP7 = {8d 84 24 20 01 00 00 ?? ?? ?? ?? ?? ?? e8 c7 9c fe ff}
    $OP8 = {8d 44 24 38 ?? ?? ?? e8 23 a2 fe ff}
           //File Creation dec_key.dat
           //8d842420010000 |LEAEAX,[ESP+0x120]
           //e8c79cfeff |CALL_fopen
           //8d442438 |LEAEAX,[ESP+0x38]
           //e823a2feff |file_operation
    $OP9 = {68 80 0d 00 00 ff 75 08 ff 15 e8 31 42 00}
           //Timer Killer
           //68800d0000 |PUSH0xd80
           //ff7508 |PUSHdwordptr[EBP+param_1]
           //ff15e8314200 |CALLdwordptr[->USER32.DLL::KillTimer]
    $OP10 = {83 f8 0f ?? ?? 3d 10 01 00 00}
           //Conditions for decryption process
           //83f80f7468 |CMPEAX,0xf
           //3d10010000 |CMPEAX,0x110
    $OP11 = {84 c0 74 10 ff 75 08 ff 15 08 31 42 00 ?? ff 15 0c 31 42 00}
           //Terminating itself if a condition is met
    $OP12 = { 54 61 73 6b 4d 61 6e 61 67 65 72 57 69 6e 64 6f 77 00 00 00 }
           //TaskManagerWindow
    $OP13 = { 25 73 5c 74 69 6d 65 2e 64 61 74 00 }
           //time.dat
    $OP14 = { 25 73 5c 64 65 63 5f 6b 65 79 2e 64 61 74 00 }
           //dec_key.dat
  condition:
    uint32(uint32(0x3C)) == 0x00004550 or
    (filesize > 4 and uint32(0) == 0x464C457F) or
    (uint32(0) == 0xCEFAEDFE or uint32(0) == 0xCFFAEDFE) and
    (11 of ($OP*))
}
```



IOC List

Sha256	de0b74917fe24c2b38e2d1172b7352f88bf8b3df64b6d44ca5f317db85aeb324 70257c48ed8e1a3b57a7d6a5bed17837f60d630bdda0b22b048a3721569fe038 7d294c60c44b8b776c45e46e904a2de70ff4820e7e7863adb9f191c6554f9fb5 74b5a0ed14c7b8e26d51d4b9242e73686bad2e63cd11d9cbdb52e08fa34158c1
---------------	--

Sigma Rules

Download the Sigma Rules From ThreatMon Github Page.

```
title: Suspicious File Creation Detected
id: 8a5a94e2-5a2e-4b1a-bb97-03c7d5cf9a93
status: experimental description: |

    Checks for BMP and DAT file creation within specific directories.

author: Aziz Kaplan <aziz.kaplan@threatmonit.io>
logsource:
  category: file_access
  product: windows
detection:
  selection:
    FileName|contains:
      - '\AppData\Local\'
      - '\AppData\Roaming\'
      - '\AppData\Local\Temp\'
    FileName|endswith:
      - '.bmp'
      - '.dat'
  filter_system_folders:
    Image|startswith:
      - 'C:\Program Files\' -
      'C:\Windows\' - 'C:\Program
      Files (x86)\' -
      'C:\Windows\system32\' -
      'C:\Windows\SysWOW64\'
  condition: selection and not 1 of filter_system_folders
falsepositives:
  - Legitimate software installed that creates BMP file in Temp directory
level: medium
```



```
title: .CyberVolk Extension Detected
id: 37b2c73a-f147-4d93-842e-0b853b55de49
status: stable
description: Detects changes in file extensions where files are renamed to use
the .CyberVolk extension, typical in ransomware activity.
author: Aziz Kaplan <aziz.kaplan@threatmonit.io>
logsource:
  category: file_event
  product: windows
detection:
  selection:
    TargetFilename|endswith: '.CyberVolk'
  condition: selection
falsepositives:
  - Unlikely
level: critical
```

```
title: CyberVolk Ransomware ImpHash Detected
id: e45cf64a-8af9-4e69-9b55-278f44f2b1d1
status: test
description: Detects CyberVolk Ransomware from import hash (imphash)
author: Aziz Kaplan <aziz.kaplan@threatmonit.io>
logsource:
  category: process_creation
  product: windows
detection:
  selection:
    - Imphash:
      - 0982e392aba6a868dc7bda8b61e977ab # CyberVolk

    - Hashes|contains:
      - IMPHASH=0982e392aba6a868dc7bda8b61e977ab

  condition: selection
falsepositives:
  - Legitimate use
level: high
```

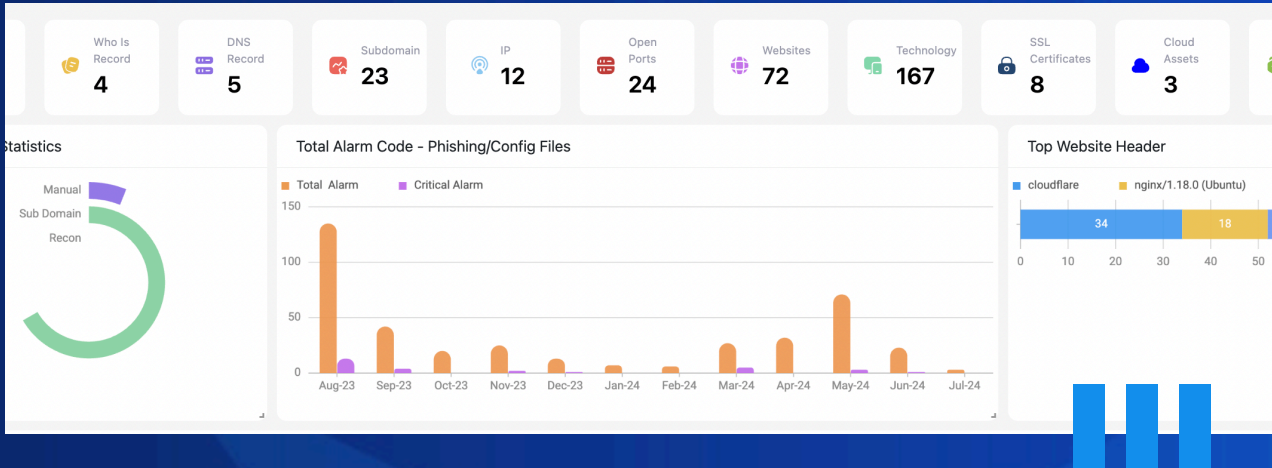




ThreatMon

Under Cyber Wings

More Information About ThreatMon



One Platform for all intelligence needs.

ThreatMon End-to-end intelligence is a cutting-edge, cloud-based SaaS platform that continuously monitors the dark and surface web, providing early warnings and actionable insights into emerging threats.

We are a SaaS platform designed to help businesses proactively detect and address threats before a cyber attack occurs. Unlike traditional cyber threat intelligence, we provide comprehensive and holistic cyber intelligence.

- *Attack Surface Intelligence*
- *Fraud Intelligence*
- *Dark and Surface Web Intelligence*
- *Threat Intelligence*



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