Revix Linux Ransomware

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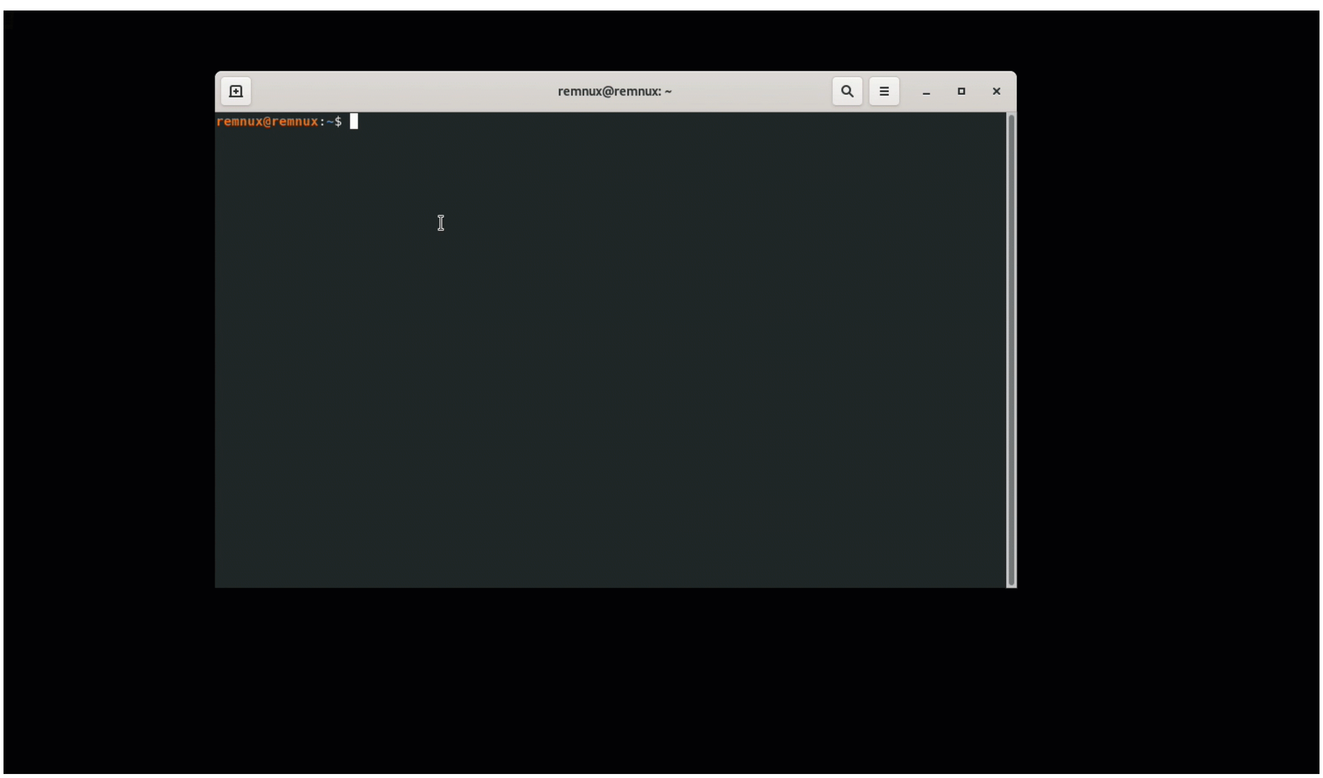
In the first half of 2021, we started to see the REvil ransomware operators targeting Linux-based systems with a new Linux version of the more commonly seen Windows version of the same ransomware. There have been a few versions of this Linux-based malware since then.

In this publication, we take a look at the latest version, 1.2a.



Malpedia link

YouTube link

YARA Rulesets

https://github.com/YaraExchange/yarasigs/blob/master/ransomware/crime_lin_revil.yar
https://github.com/YaraExchange/yarasigs/blob/master/ransomware/crime_lin_revix.yar

Quick Snapshot

```
Class: ELF64Type: Dynamically Linked Machine: X86-64Number of section headers:
28Entry Point: 0x401650callq: __libc_start_main@plt MD5:
c83df66c46bcbc05cd987661882ff061
```

Introduction

The execution of this malware is straight forward. It traverses through the directories targeted by it and encrypts the files present in those directories. Once encryption is complete, it drops a ransom note in the directory with the usual ransom message and instructions on how to pay the bad actors to get the decryption key.

This malware requires a couple of parameters to be passed to it in order for it to successfully execute. It also requires to be run with escalated privileges in order to be able to successfully encrypt files on the disk.

One of the main targets for this malware is VMware's ESX platform, which we've seen before in a different Linux ransomware, Darkside.

This malware is not able to encrypt data if being executed by a non-privileged user. It also checks the files in the target directories to see if they are already encrypted.

Analysis

For the purpose of this publication, we analyse this malware both statically and dynamically. We switch between the two methodologies as we go through the analysis process.

A quick look at section .init:

```
0000000000401268 <.init>:
  401268:       48 83 ec 08             sub    rsp,0x8
  40126c:       48 8b 05 85 4d 21 00 mov     rax,QWORD PTR [rip+0x214d85]        # 615ff8
<usleep@plt+0x2149b8>
  401273:       48 85 c0                test   rax,rax
  401276:       74 05                   je     40127d <free@plt-0x23>
  401278:       e8 03 02 00 00          call   401480 <__gmon_start__@plt>
  40127d:       48 83 c4 08             add    rsp,0x8
  401281:       c3                ret
```

Section .text:

```
0000000000401650 <.text>:
  401650:       31 ed                   xor    ebp,ebp
  401652:       49 89 d1                mov    r9,rdx
  401655:       5e                      pop    rsi
  401656:       48 89 e2                mov    rdx,rsp
  401659:       48 83 e4 f0             and    rsp,0xfffffffffffffff0
  40165d:       50                      push   rax
  40165e:       54                      push   rsp
  40165f:       49 c7 c0 90 02 41 00    mov    r8,0x410290
  401666:       48 c7 c1 20 02 41 00    mov    rcx,0x410220
  40166d:       48 c7 c7 7f 68 40 00    mov    rdi,0x40687f
  401674:       e8 b7 fd ff ff          call   401430 <__libc_start_main@plt>
0000000000401430 <__libc_start_main@plt>:
  401430:       ff 25 aa 4c 21 00       jmp    QWORD PTR [rip+0x214caa]        # 6160e0
<usleep@plt+0x214aa0>
  401436:       68 19 00 00 00          push   0x19
  40143b:       e9 50 fe ff ff          jmp    401290 <free@plt-0x10>
```

Functions

The malware loads a number of functions upon initialisation. Following some of the interesting ones we are able to extract useful information that can be used to understand the flow of execution and write some detections as we'll see later in this article.

```
(gdb) c
Continuing.

Breakpoint 3, 0x0000000000401320 in puts@plt ()
(gdb) x/20i $pc
=> 0x401320 <puts@plt>: jmpq   *0x214d32(%rip)        # 0x616058 <puts@got.plt>
   0x401326 <puts@plt+6>:       pushq  $0x8
   0x40132b <puts@plt+11>:      jmpq   0x401290
   0x401330 <fread@plt>:        jmpq   *0x214d2a(%rip)        # 0x616060 <fread@got.plt>
   0x401336 <fread@plt+6>:      pushq  $0x9
   0x40133b <fread@plt+11>:     jmpq   0x401290
   0x401340 <pthread_cond_wait@plt>:    jmpq   *0x214d22(%rip)        # 0x616068 <pthread_cond_wait@got.plt>
   0x401346 <pthread_cond_wait@plt+6>:  pushq  $0xa
   0x40134b <pthread_cond_wait@plt+11>: jmpq   0x401290
   0x401350 <fclose@plt>:       jmpq   *0x214d1a(%rip)        # 0x616070 <fclose@got.plt>
   0x401356 <fclose@plt+6>:     pushq  $0xb
   0x40135b <fclose@plt+11>:    jmpq   0x401290
   0x401360 <opendir@plt>:      jmpq   *0x214d12(%rip)        # 0x616078 <opendir@got.plt>
   0x401366 <opendir@plt+6>:    pushq  $0xc
   0x40136b <opendir@plt+11>:   jmpq   0x401290
   0x401370 <strlen@plt>:       jmpq   *0x214d0a(%rip)        # 0x616080 <strlen@got.plt>
   0x401376 <strlen@plt+6>:     pushq  $0xd
   0x40137b <strlen@plt+11>:    jmpq   0x401290
   0x401380 <getopt_long@plt>:  jmpq   *0x214d02(%rip)        # 0x616088 <getopt_long@got.plt>
   0x401386 <getopt_long@plt+6>:        pushq  $0xe
(gdb)
```

Malware functions loaded upon initialisation

```
00000000:004014d0 ff 25 5a 4c 21 00    jmp qword [rel 0x616130]
00000000:004014d6 68 23 00 00 00       push 0x23
00000000:004014db e9 b0 fd ff ff       jmp 0x401290
00000000:004014e0 ff 25 52 4c 21 00    jmp qword [rel 0x616138]
00000000:004014e6 68 24 00 00 00       push 0x24
00000000:004014eb e9 a0 fd ff ff       jmp 0x401290
00000000:004014f0 ff 25 4a 4c 21 00    jmp qword [rel 0x616140]
00000000:004014f6 68 25 00 00 00       push 0x25
00000000:004014fb e9 90 fd ff ff       jmp 0x401290
00000000:00401500 ff 25 42 4c 21 00    jmp qword [rel 0x616148]
00000000:00401506 68 26 00 00 00       push 0x26
00000000:0040150b e9 80 fd ff ff       jmp 0x401290
00000000:00401510 ff 25 3a 4c 21 00    jmp qword [rel 0x616150]
00000000:00401516 68 27 00 00 00       push 0x27
00000000:0040151b e9 70 fd ff ff       jmp 0x401290
00000000:00401520 ff 25 32 4c 21 00    jmp qword [rel 0x616158]
00000000:00401526 68 28 00 00 00       push 0x28
```

Function sequence during execution

Initialization

Let’s take a quick look at the program initialization:

```
    00000000:0040687e c3                   ret
rax 00000000:0040687f 55                   push rbp
    00000000:00406880 48 89 e5             mov rbp, rsp
    00000000:00406883 48 83 ec 30          sub rsp, 0x30
    00000000:00406887 89 7d dc             mov [rbp-0x24], edi
    00000000:0040688a 48 89 75 d0          mov [rbp-0x30], rsi
    00000000:0040688e c7 45 e8 00 00 00 00 mov dword [rbp-0x18], 0
    00000000:00406895 83 7d dc 01          cmp dword [rbp-0x24], 1
    00000000:00406899 7f 14                jg 0x4068af
    00000000:0040689b bf 58 07 41 00       mov edi, 0x410758
    00000000:004068a0 e8 7b aa ff ff       call revil.elf!puts@plt
```

Execution initialisation

```
ASCII "Revix 1.2a \r\nUsage example: elf.exe --path /vmfs/ --threads 5\r\n--silent (-s) use for not stoping
```

Parameters for the command-line arguments

Execution

When executed as a non-privileged user, the malware is not able to achieve full execution.

As we can see in the image below, the malware has been provided the directory ‘here’ for the purpose of this analysis:

```
write(1, 0xcc32a0, 13Path: here/
)                     = 13
```

The malware tries to access the data in this directory for read/write and is not successful as the image below shows:

```
openat(AT_FDCWD, 0xcc37d0, O_RDONLY|O_NONBLOCK|O_CLOEXEC|O_DIRECTORY) = 3
fstat(3, 0x7fff407d6aa0)                = 0
getdents64(3, 0xcc6640, 32768)          = 320
```

The malware also tries to encrypt the test file that we have provided for the purpose of this analysis in the target directory but the encryption process fails as that action requires higher privileges:

```
write(1, 0x88b2a0, 48Error create note in dir here//vemar-readme.txt
)                    = 48
close(3[here//test.txt] semms to be protected by os but let's encrypt anyway...
)                                       = 0
```

As a result, the execution fails to achieve the desired outcome for the malware, as shown by the result in the image below:

```
 ij.-----------.ji i
 ij| ENCRYPTED |ji i
 ij|- - - - - -|ji i
 ij|  00000000 |ji i
 ij|   FILES   |ji i
 ij|           |ji i
 ij|  00000000 |ji i
 ij|    MBs    |ji i
 ij'___________'ji i
 iji iji tYiji iji i
```

Another point of interest from this failed execution is that the malware attempted to execute a esxcli command but was not able to do so:

```
sh: 1: esxcli: not found
```

All of this changes when we run the malware with escalated privileges.

Firstly, the malware is able to access the data in the target directory:

```
openat(AT_FDCWD, "here/", O_RDONLY|O_NONBLOCK|O_CLOEXEC|O_DIRECTORY) = 3
fstat(3, {st_mode=S_IFDIR|0755, st_size=4096, ...}) = 0
getdents64(3, /* 3 entries */, 32768)   = 80
```

Next, we can see that the malware is able to perform read/write functions on the data in the target directories, resulting in successful encryption of that data:

```
Encrypting [here//test.txt]
clock_nanosleep(CLOCK_REALTIME, 0, {tv_sec=0, tv_nsec=10000}, NULL) = 0
```

We can see from the image below that the malware is able to write the ransom-note text file to the disk:

```
fstat(5, {st_mode=S_IFREG|0644, st_size=0, ...}) = 0
write(5, "---=== Welcome. Again. ===---\n\n["..., 2311) = 2311
close(5)                                = 0
close(3)                                = 0
```

And finally, we can see that the execution is completed successfully, resulting in the data present in the target directory being encrypted:

```
ij| ENCRYPTED |ji

ij|- - - - - -|ji

ij|  00000001 |ji

ij|   FILES   |ji
```

The file we provided in the target directory is now encrypted and a ransom-note is created in the same directory:

```
remnux@remnux:~/Documents$ ls here
test.txt.vemar  vemar-readme.txt
```

The malware also checks if the data in the target directory is already encrypted. To demonstrate this, we ran the malware against the same target directory one more time.

Upon execution, the malware runs a check on the data present in the target directory and identifies it to be already encrypted:

```
futex(0xd2c5e8, FUTEX_WAIT_PRIVATE, 0, NULL[here//test.txt.vemar] already encrypted
```

As a result, the execution ends up with no data being encrypted:

```
j| ENCRYPTED |j

j|- - - - - -|j

j|  00000000 |j

j|   FILES   |j
```

VMware ESX targeting

This malware also tries to use the esxcli, the command line interface for VMware ESX platform. Let’s take a quick look at the parameters passed to esx as command-line arguments.

```
esxcli --formatter=csv --format-param=fields=="WorldID,DisplayName" vm process list |
awk -F "\"*,\"*" '{system("esxcli vm process kill --type=force --world-id=" $1)}'
```

vm process list

List the virtual machines on this system. This command currently will only list running VMs on the system.

vm process kill

Used to forcibly kill Virtual Machines that are stuck and not responding to normal stop operations.

— type

There are three types of VM kills that can be attempted: [soft, hard, force].

— world-id | -w

The World ID of the Virtual Machine to kill. This can be obtained from the 'vm process list' command (required)

So basically what these esx command-line arguments are doing is shutting down all VMs running on the ESX platform.

The idea is to run the malware targeting the '/vmfs' directory and encrypt all the data present in that directory so all the VMs are rendered inoperable until the data is decrypted.

This targeting is similar to that seen in DarkSide's Linux variant.

Command-line Arguments

The malware requires the following parameters to be passed for its execution to begin:

elf.exe — path /vmfs/ — threads 5

It also allows the ' — silent' option that executes the malware without stopping the VMs

— silent (-s) use for not stoping VMs mode *

Parameter	Purpose
--path	Specifies the path of the data that needs to be encrypted
--threads	Specifies the number of threads, by default the malware uses 50 threads
--silent	Executes the malware without stopping the VMs running on ESX

Config

The config of this Linux version is similar to that of its Windows variant, only with less fields.

Field	Description
pk	Public Key
pid	ID
Sub	Tag
Dbg	Debug mode
nbody	Base64-encoded body of the ransom-note
nname	File name of the ransom-note
rdmcnt	Readme Count
ext	File extension of the encrypted files

Here’s an image showing the config we were able to extract from the sample we analysed:

"pk":"4nONu4GmaHf40RvBhHclpampcsKyZMxfSelgMmZE/nl=",
"pid":"$2a$12$D3Wk4d.cy0e0EiVqDPJe1.06OMR3duoMRIH78i7XFXbSkCLHuLoMG",
"Sub":"8639",
"Dbg":false,
"Et":0,
"nbody":"LS0tPT09IFdlbGNvbWUuIEFnYWluLiA9PT0tLS0KClstXSBXaGF0cyBIYXBwZW4/IFstXQoKWW91ciBmaWxlcyBhcmUgZW
5jcnlwdGVkLCBhbmQgY3VycmVudGx5IHVuYXZhaWxhYmxlLiBZb3UgY2FuIGNoZWNrIGl0OiBhbGwgZmlsZXMgb24geW91ciBzeX
N0ZW0gaGFzIGV4dGVuc2lvbiB7RVhUfS4KQnkgdGhlIHdheSwgZXZlcnl0aGluZyBpcyBwb3NzaWJsZSB0byByZWNvdmVyIChyZXN
0b3JlKSwgYnV0IHlvdSBuZWVkIHRvIGZvbGxvdyBvdXIgaW5zdHJ1Y3Rpb25zLiBPdGhlcndpc2UsIHlvdSBjYW50IHJldHVybiB5b3Vy
GRhdGEgKE5FVkVSKS4KClstXSBXaGF0IGd1YXJhbnRlZXM/IFstXQoKSXRzIGp1c3QgYSBidXNpbmVzcy4gV2UgYWJzb2x1dGVs
eSBkbyBub3QgY2FyZSBhYm91dCB5b3UgYW5kIHlvdXIgZGVhbHMsIGV4Y2VwdCBnZXR0aW5nIGJlbmVmaXRzLiBJZiB3ZSBkby
Bub3QgZG8gb3VyIHdvcmsgYW5kIGxpYWJpbGl0aWVzIC0gbm9ib2R5IHdpbGwgbm90IGNvb3BlcmF0ZSB3aXRoIHVzLiBJdHMgbm
90IGluIG91ciBpbnRlcmVzdHMuClRvIGNoZWNrIHRoZSBhYmlsaXR5IG9mIHJldHVybmluZyBmaWxlcywgWW91IHNob3VsZCBnbyB
0byBvdXIgd2Vic2l0ZS4gVGhlcmUgeW91IGNhbiBkZWNyeXB0IG9uZSBmaWxlIGZvciBmcmVlLiBUaGF0IGlzIG91ciBndWFyYW50Z
WUuCklmIHlvdSB3aWxsIG5vdCBjb29wZXJhdGUgd2l0aCBvdXIgc2VydmljZSAtIGZvciB1cywgaXRzIGRvZXMgbm90IG1hdHRlci4gQ
nV0IHlvdSB3aWxsIGxvc2UgeW91ciB0aW1lIGFuZCBkYXRhLCBjYXVzZSBqdXN0IHdlIGhhdmUgdGhlIHByaXZhdGUga2V5LiBJbiB
wcmFjdGljZSAtIHRpbWUgaXMgbXVjaCBtb3JlIHZhbHVhYmxlIHRoYW4gbW9uZXkuCgpbK10gSG93IHRvIGdldCBhY2Nlc3Mgb24gd
2Vic2l0ZT8gWytdCgpVc2luZyBhIFRPUiBicm93c2VyIQogIDEpIERvd25sb2FkIGFuZCBpbnN0YWxsIFRPUiBicm93c2VyIGZyb20gdG
hpcyBzaXRlOiBodHRwczovL3RvcnByb2plY3Qub3JnLwogIDIpIE9wZW4gb3VyIHdlYnNpdGU6IGh0dHA6Ly9hcGxlYnp1NDd3Z2F6Y
XBkcWtzNnZyY3Y2emNuanBwa2J4Ynl2d2tldGY1Nm5mNmFxMm5teW95ZC5vbmlvbi97VUlEfQoKV2FybmluZzogc2Vjb25kYXJ5IHd
lYnNpdGUgY2FuIGJlIGJsb2NrZWQsIHRoYXRzIHdoeSBmaXJzdCB2YXJpYW50IG11Y2ggYmV0dGVyIGFuZCBtb3JlIGF2YWlsYWJ
sZS4KCldoZW4geW91IG9wZW4gb3VyIHdlYnNpdGUsIHB1dCB0aGUgZm9sbG93aW5nIGRhdGEgaW4gdGhlIGlucHV0IGZvcm06C
ktleToKCgp7S0VZfQoKCi0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS
0tLS0tLS0tLS0tLS0tLS0tLS0tCgohISEgREFOR0VSICEhIQpET04nVCB0cnkgdG8gY2hhbmdlIGZpbGVzIGJ5IHlvdXJzZWxmLCBET
04nVCB1c2UgYW55IHRoaXJkIHBhcnR5IHNvZnR3YXJlIGZvciByZXN0b3JpbmcgeW91ciBkYXRhIG9yIGFudGl2aXJ1cyBzb2x1dGlv
bnMgLSBpdHMgbWF5IGVudGFpbCBkYW1hZ2Ugb2YgdGhlIHByaXZhdGUga2V5IGFuZCwgYXMgcmVzdWx0LCBUaGUgTG9zcyB
hbGwgZGF0YS4KISEhICEhISAhISEKT05FIE1PUkUgVElNRTogSXRzIGluIHlvdXIgaW50ZXJlc3RzIHRvIGdldCB5b3VyIGZpbGVzIGJ
hY2suIEZyb20gb3VyIHNpZGUsIHdlIChhaGUgYmVzdCBzcGVjaWFsaXN0cykgbWFrZSBldmVyeXRoaW5nIGZvciByZXN0b3Jpbmcsl
GJ1dCBwbGVhc2Ugc2hvdWxkIG5vdCBpbnRlcmZlcmUuCiEhISAhISEgISEhAA==",
"nname":"{EXT}-readme.txt",
"Rdmcnt":0,
"ext":".vemar"}

Profiling

The malware also gathers information about the victim machine which is gathered by running this command:

uname -a && echo “ | “ && hostname

```
RAX 00000000004110a8  ASCII "uname -a && echo \" | \" && hostname"
RCX 0000000000000072
RDX 000000000000002c
RBX 0000000000410220
RSP 00007ffc29fe2068
RBP 00007ffc29fe20a0
RSI 00000000004110cb
RDI 00000000004110a8  ASCII "uname -a && echo \" | \" && hostname"
R8  000000000080ca10  ASCII "4nONu4GmaHf40RvBhHclpampcsKyZMxfSelgMmZE/nI="
R9  000000000080d3e0
```

And we can see the result in the stack:

```
0000000000405b61 a[@..... return to 0x0000000000405b61
000000000080ccb0 ......  ASCII "Linux remnux 5.4.0-72-generic #80-Ubuntu SMP Mon Apr 12 17:35:00 UTC
000000000080c8c0 ......
```

The info is then passed through the registers:

```
RDX 000000000080cb00  ASCII "BRCu0S8WVoNHOt5LRPQzvUgP/6vWUnx2FYqbfTrVqvybgAndwMKrWwpwHJHUsPeSF0tFZ7Cx6ZYGFiorKnR
RBX 00007fc439b4bc93
RSP 00007ffc29fe1878
RBP 00007ffc29fe1df0
RSI 00007ffc29fe1db8
RDI 000000000080cb00  ASCII "BRCu0S8WVoNHOt5LRPQzvUgP/6vWUnx2FYqbfTrVqvybgAndwMKrWwpwHJHUsPeSF0tFZ7Cx6ZYGFiorKnR
R8  00000000ffffffff
R9  00000000000000b0
R10 0000000000410fbc  ASCII "s\",\"os\":\"%s\",\"ext\":\"%s\"}"
R11 000000000080cb00  ASCII "BRCu0S8WVoNHOt5LRPQzvUgP/6vWUnx2FYqbfTrVqvybgAndwMKrWwpwHJHUsPeSF0tFZ7Cx6ZYGFiorKnR
R12 00007ffc29fe1e00
R13 0000000000410f80  ASCII "{\"ver\":%d,\"pid\":\"%s\",\"sub\":\"%s\",\"pk\":\"%s\",\"uid\":\"%s\",\"sk\":\"%s\"
R14 00007ffc29fe1f40
```

And the end-result is created in the form of this config with the victim information:


```
{"ver":512,
"pid":"$2a$12$D3Wk4d.cy0e0EiVqDPJe1.06OMR3duoMRIH78i7
"Sub":"8639",
"pk":"4nONu4GmaHf40RvBhHclpampcsKyZMxfSelgMmZE/nI=",
"uid":"7E73E5407E73E540",
"sk":"BRCu0S8WVoNHOt5LRPQzvUgP/6vWUnx2FYqbfTrVqvybg
UuNGEKZv5FH7XwzXXu36tLCA==",
"Os":"linux",
"Ext":"vemar"}
```


Encryption

The malware uses Salsa20 encryption algorithm (just like its Windows variant) to encrypt the data and here’s the pseudocode for the function that implements it:

```
void FUN_00401ad3(uint *param_1,uint *param_2,int param_3)

{
  uint *local_18;

  param_1[1] = *param_2;
  param_1[2] = param_2[1];
  param_1[3] = param_2[2];
  param_1[4] = param_2[3];
  if (param_3 == 0x100) {
    local_18 = param_2 + 4;
    DAT_0061a318 = "expand 32-byte kexpand 16-byte kvmx-*";
  }
  else {
    DAT_0061a318 = "expand 16-byte kvmx-*";
    local_18 = param_2;
  }
  param_1[0xb] = *local_18;
  param_1[0xc] = local_18[1];
  param_1[0xd] = local_18[2];
  param_1[0xe] = local_18[3];
  *param_1 = (int)DAT_0061a318[1] << 8 | (int)*DAT_0061a318 | (int)DAT_0061a318[2] << 0x10 |
             (int)DAT_0061a318[3] << 0x18;
  param_1[5] = (int)DAT_0061a318[5] << 8 | (int)DAT_0061a318[4] | (int)DAT_0061a318[6] << 0x10 |
               (int)DAT_0061a318[7] << 0x18;
  param_1[10] = (int)DAT_0061a318[9] << 8 | (int)DAT_0061a318[8] | (int)DAT_0061a318[10] << 0x10 |
                (int)DAT_0061a318[0xb] << 0x18;
  param_1[0xf] = (int)DAT_0061a318[0xd] << 8 | (int)DAT_0061a318[0xc] |
                 (int)DAT_0061a318[0xe] << 0x10 | (int)DAT_0061a318[0xf] << 0x18;
  return;
}
```

Mitigation

Detections

The malware runs this command to determine machine info:

```
uname -a && echo " | " && hostname
```

The malware tries to query this directory:

```
/dev/urandom
```

The malware runs this command to stop VMs running on the ESX platform in order to encrypt the data on those VMs:

```
esxcli --formatter=csv --format-param=fields=="WorldID,DisplayName" vm process list |
awk -F "\"*,\"*" '{system("esxcli vm process kill --type=force --world-id=" $1)}'
```

Typos:

In some instances, typos that malware authors commit to the code are useful in detection of the malware or similar code used in other malware. These are a couple of typos we found in this variant of Revix:

```
--silent (-s) use for not  VMs mode to be protected by os but let's encrypt anyway…
```

Conclusion

As we can see in the analysis notes above, the execution is a bit clunky in this variant and requires multiple conditions to be met before the ransomware is successful in encrypting data. The malware needs to be executed as a command-line argument with elevated privileges and specified target directories and number of threads. If the malware is not run in silent mode, it will try to stop the VMs which could trigger off a detection and quite possibly fail to encrypt data on the VMs due to reduced/restricted access.

References

ESXi 7.0 U3 ESXCLI Command Reference

DarkSide on Linux: Virtual Machines Targeted — Naiim, M.,2021

getdents64(2) — Linux man page

Code Analysis details by Intezer Analyse