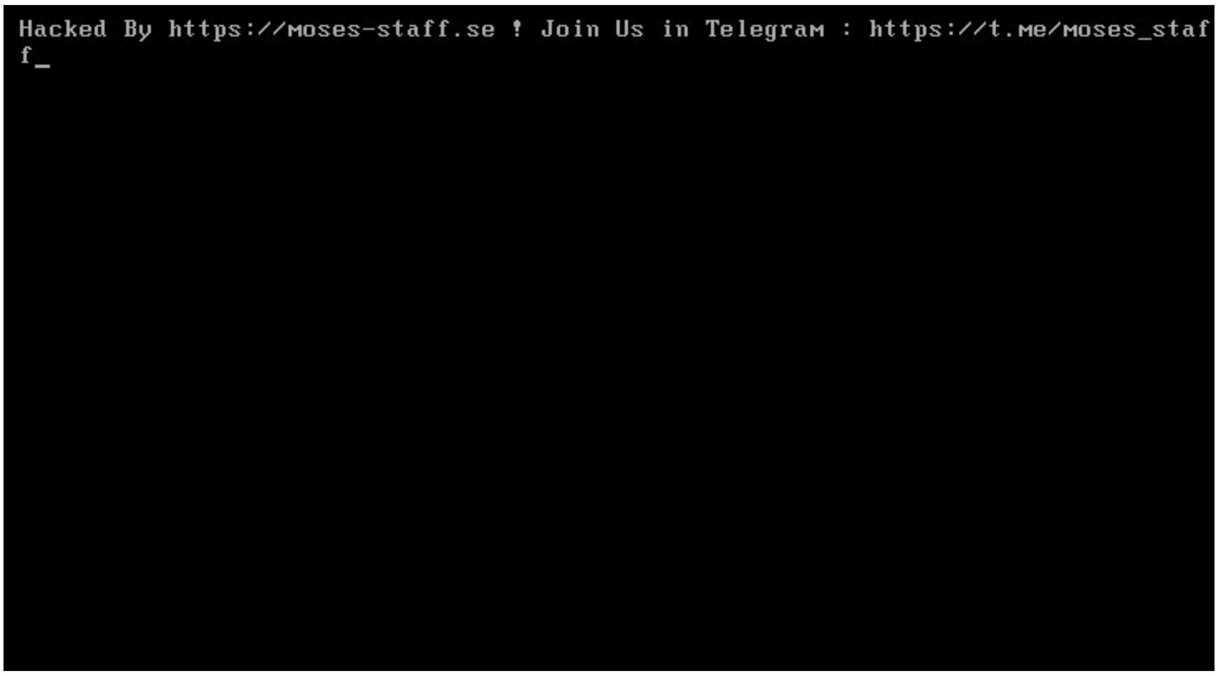
Uncovering MosesStaff techniques: Ideology over Money

November 15, 2021

Introduction

In September 2021, the hacker group MosesStaff began targeting Israeli organizations, joining a wave of attacks which was started about a year ago by the Pay2Key and BlackShadow attack groups. Those actors operated mainly for political reasons in attempt to create noise in the media and damage the country's image, demanding money and conducting lengthy and public negotiations with the victims.

MosesStaff behaves differently. The group openly states that their motivation in attacking Israeli companies is to cause damage by leaking the stolen sensitive data and encrypting the victim's networks, with no ransom demand. In the language of the attackers, their purpose is to "Fight against the resistance and expose the crimes of the Zionists in the occupied territories."



```
Hacked By https://moses-staff.se ! Join Us in Telegram : https://t.me/moses_staf
f_
```

Figure 1: Screenshot from a computer encrypted by MosesStaff.

In this article, we share our investigation of several incidents involving the MosesStaff group. We provide their tactics, techniques and procedures (TTPs), analyze their two main tools `PyDCrypt` and `DCSrv`, describe their encryption scheme and its possible flaws, and provide several keys for attribution.

Key Findings

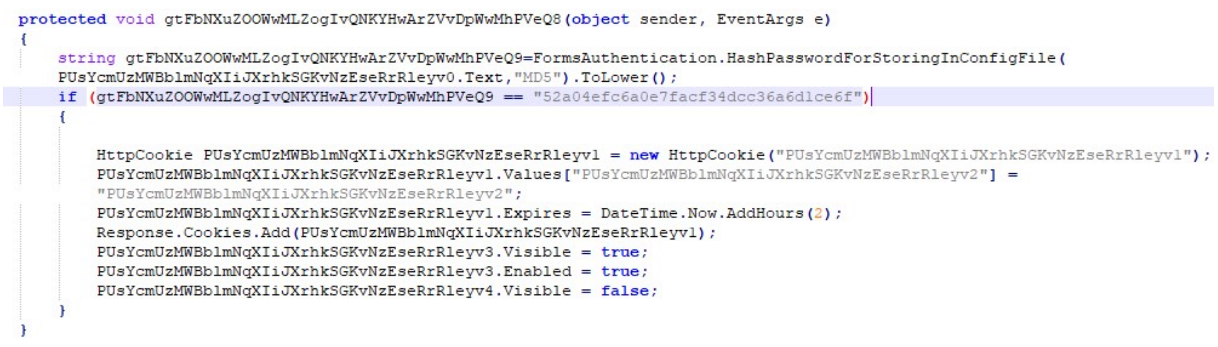
- MosesStaff carries out targeted attacks against Israeli companies, leaks their data, and encrypts their networks. There is no ransom demand and no decryption option; their motives are purely political.
- Initial access to victims' networks is presumably achieved through exploiting known vulnerabilities in publicly facing infrastructure such as Microsoft Exchange Servers.
- The lateral movement within the infected networks is made using basic tools: PsExec, WMIC, and Powershell.
- The attacks utilize the open-source library DiskCryptor to perform volume encryption and lock the victims' computers with a bootloader that won't allow the machines to boot without the correct password.
- The group's current encryption method may be reversible under certain circumstances.

Infection Chain

To get initial access, the attackers exploited known vulnerabilities in an external-facing infrastructure. As a result, a webshell was dropped to the following path:

`C:\inetpub\wwwroot\aspnet_client\system_web\IISpool.aspx`

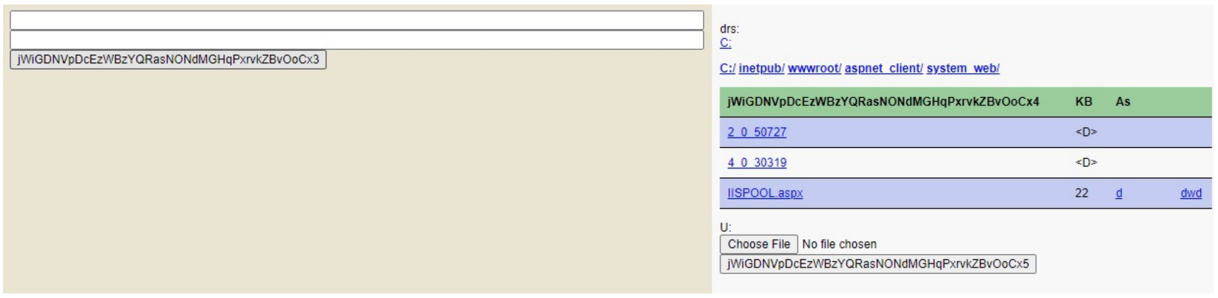
It's a basic password-protected shell, where the MD5 of the entered password is compared with the hardcoded value `52a04efc6a0e7facf34dcc36a6d1ce6f` (MD5 hash of `joker123`). The webshell is obfuscated and based on one of webshells available in Github.



```
protected void gtFbNXuZOOWwMLZogIvQNKYHwArZVvDpWwMhPVeQ8(object sender, EventArgs e)
{
    string gtFbNXuZOOWwMLZogIvQNKYHwArZVvDpWwMhPVeQ9=FormsAuthentication.HashPasswordForStoringInConfigFile(
    PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv0.Text,"MD5").ToLower();
    if (gtFbNXuZOOWwMLZogIvQNKYHwArZVvDpWwMhPVeQ9 == "52a04efc6a0e7facf34dcc36a6d1ce6f")
    {

        HttpCookie PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv1 = new HttpCookie("PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv1");
        PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv1.Values["PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv2"] =
        "PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv2";
        PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv1.Expires = DateTime.Now.AddHours(2);
        Response.Cookies.Add(PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv1);
        PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv3.Visible = true;
        PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv3.Enabled = true;
        PUsYcmUzMWBblmNqXIiJXrhkSGKvNzEseRrRleyv4.Visible = false;
    }
}
```

Figure 2: Obfuscated Webshell password authentication code.



jWiGDNVpDcEzWBzYQRasNONdMGHqPxrvkZBvOoCx3

drs:
C:

C:/ inetpub/ wwwroot/ aspnet_client/ system_web/

jWiGDNVpDcEzWBzYQRasNONdMGHqPxrvkZBvOoCx4	KB	As	
2_0_50727	<D>		
4_0_30319	<D>		
IISPOOL.aspx	22	d	dwd

U:
Choose File No file chosen
jWiGDNVpDcEzWBzYQRasNONdMGHqPxrvkZBvOoCx5

Figure 3: Screenshot of obfuscated webshell after a successful authentication.

The actors also uploaded several additional tools to the same folder:

- Multiple batch scripts which can enable SMB or disable the Windows firewall on specific remote machines.
- A copy of `PsExec`, a portable tool from Microsoft that allows running processes remotely with any user's credentials.
- `OICe.exe`, a small Go executable which receives a command via its command-line arguments, and executes it. This tool might be used on the compromised server in the early steps of the attack to avoid executing suspicious child processes like cmd or PowerShell.

After the attackers are inside the victims' network, they collect information on the machines in the network and combine it into a `victim_info` list. This contains a domain name, machine names, and administrator credentials that are later used to compile a specially-crafted `PyDCrypt` malware.

This malware is usually run from the `C:\Users\Public\csrss.exe` path and is responsible for replicating itself inside the network and unleashing the main encryption payload, `DCSrv`.

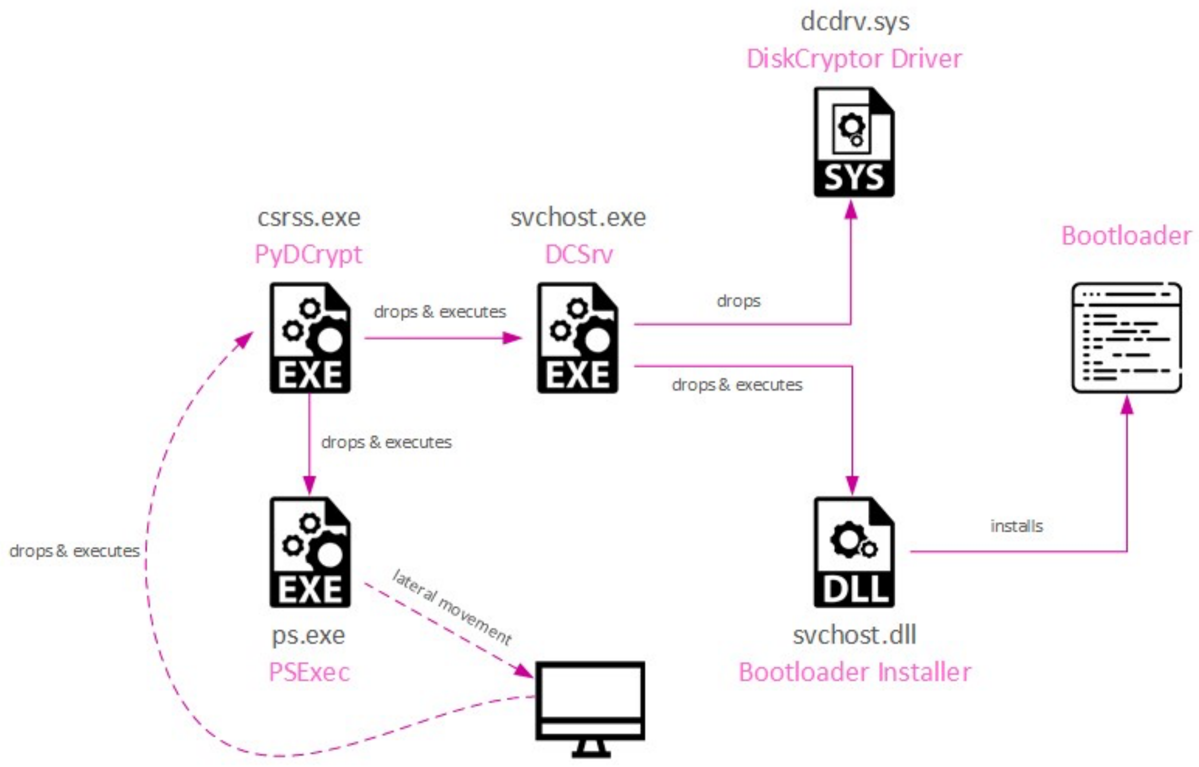


Figure 4: Infection Chain.

Technical Analysis

PyDCrypt

The main goals of `PyDCrypt` are to infect other computers and to make sure the main payload, `DCSrv`, is executed properly. The executable is written in Python and compiled with PyInstaller with encryption, using the `--key` flag during the build phase. As we mentioned previously, the attackers build a new sample for each infected organization, and hardcode the parameters collected from the victim's environment:

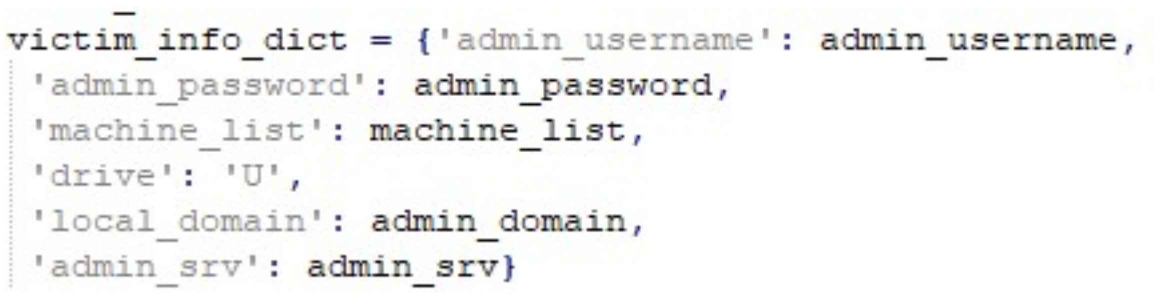

```
victim_info_dict = {'admin_username': admin_username,
 'admin_password': admin_password,
 'machine_list': machine_list,
 'drive': 'U',
 'local_domain': admin_domain,
 'admin_srv': admin_srv}
```

Figure 5: A dictionary hardcoded in the `PyDCrypt` sample shows what information the attackers collect from victims' environment at the reconnaissance stage.

`PyDCrypt` can receive 2 or 3 arguments.

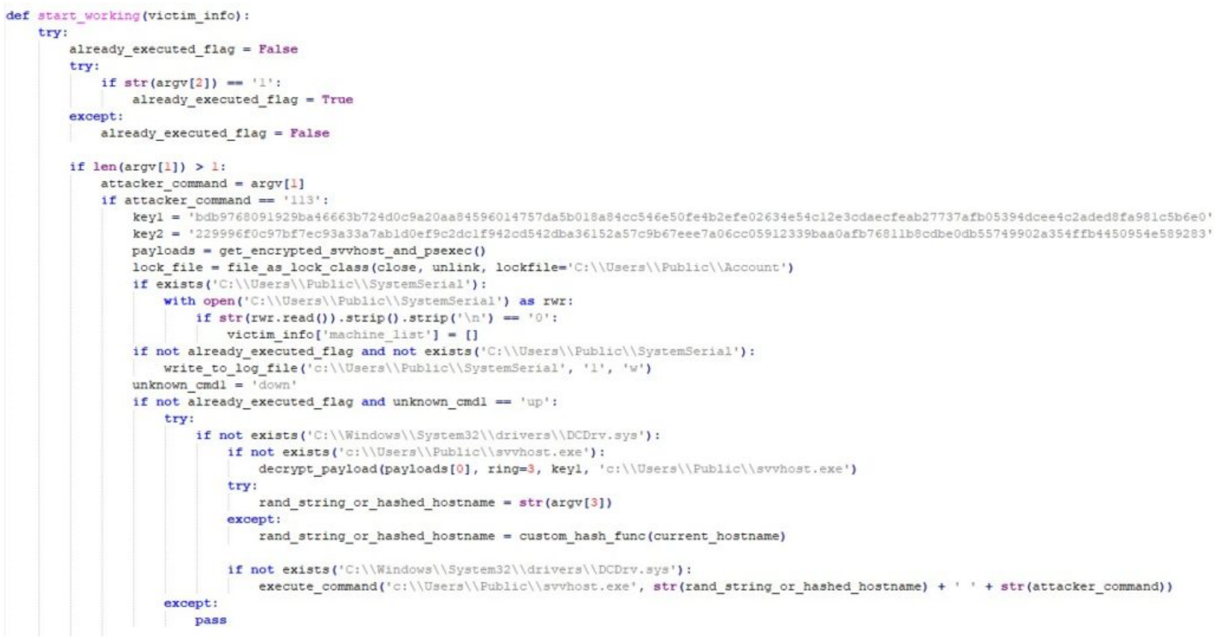
The first argument expected is 113. The malware checks and if the argument is different, it does not proceed to the execution and removes itself.

The second argument can be 0 or 1, indicating if `PyDCrypt` has already run previously.

The third argument is optional. If provided, it is used as the encryption key that is later passed to `DCSrv` as a parameter.

The main workflow of the malware:

- Create a lock file to prevent multiple instances of malware from running at the same time.
- Decrypt and drop `DCSrv` (named `C:\Users\Public\svchost.exe`) to the disk and execute it. The encryption algorithm is based on XOR and multiple Base64 encoding operations, provided in Appendix A.



```python
def start_working(victim_info):
    try:
        already_executed_flag = False
        try:
            if str(argv[2]) == '1':
                already_executed_flag = True
        except:
            already_executed_flag = False

        if len(argv[1]) > 1:
            attacker_command = argv[1]
            if attacker_command == '113':
                key1 = 'bdb9768091929ba46663b724d0c9a20aa84596014757da5b018a84cc546e50fe4b2efe02634e54c12e3cdaecfeab27737afb05394dcee4c2aded8fa981c5b6e0'
                key2 = '229996f0c97bf7ec93a33a7ab1d0ef9c2dc1f942cd542dba36152a57c9b67eee7a06cc05912339baa0afb76811b8cdbe0db55749902a354ffb4450954e589283'
                payloads = get_encrypted_svvhost_and_psexec()
                lock_file = file_as_lock_class(close, unlink, lockfile='C:\\Users\\Public\\Account')
                if exists('C:\\Users\\Public\\SystemSerial'):
                    with open('C:\\Users\\Public\\SystemSerial') as rwr:
                        if str(rwr.read()).strip().strip('\n') == '0':
                            victim_info['machine_list'] = []
                if not already_executed_flag and not exists('C:\\Users\\Public\\SystemSerial'):
                    write_to_log_file('c:\\Users\\Public\\SystemSerial', '1', 'w')
                unknown_cmd1 = 'down'
                if not already_executed_flag and unknown_cmd1 == 'up':
                    try:
                        if not exists('C:\\Windows\\System32\\drivers\\DCDrv.sys'):
                            if not exists('c:\\Users\\Public\\svvhost.exe'):
                                decrypt_payload(payloads[0], ring=3, key1, 'c:\\Users\\Public\\svvhost.exe')
                            try:
                                rand_string_or_hashed_hostname = str(argv[3])
                            except:
                                rand_string_or_hashed_hostname = custom_hash_func(current_hostname)

                            if not exists('C:\\Windows\\System32\\drivers\\DCDrv.sys'):
                                execute_command('c:\\Users\\Public\\svvhost.exe', str(rand_string_or_hashed_hostname) + ' ' + str(attacker_command))
                    except:
                        pass
```

Figure 6: Deobfuscated code of PyDCrypt responsible for DCSrv execution.

- Decrypt and drop PSExec (named ps.exe). The decoding method is the same as for DCSrv.
- Modify firewall rules to allow incoming SMB, Netbios and RPC connections using netsh.exe on remote machines:

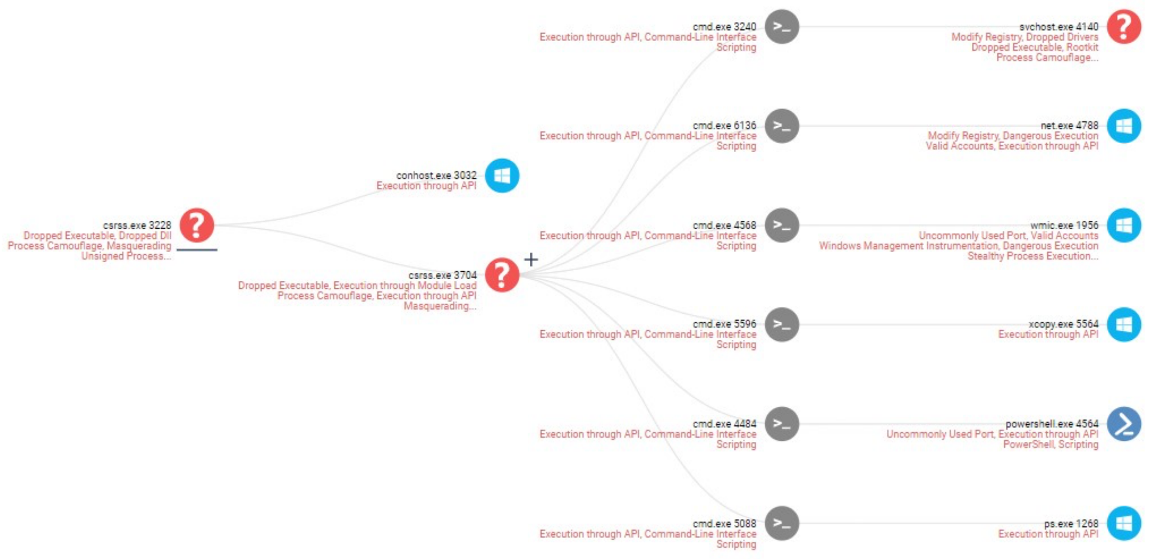
```
netsh advfirewall firewall add rule name=SMB dir=in action=allow
protocol=TCP localport=445

netsh advfirewall firewall add rule name=NETBIOS dir=in action=allow
protocol=TCP localport=135

netsh advfirewall firewall add rule name=FileShare1 dir=in action=allow
protocol=TCP localport=139

netsh advfirewall firewall add rule name=FileShare2 dir=in action=allow
protocol=TCP localport=138
```

- Iterate over machines in the network and infect each of them: the malware attempts to copy and execute csrss.exe (PyDCrypt) remotely with Powershell, PSExec, or WMIC (whatever is available), using compromised administrator credentials. Probing for each method is done by running whoami or echo 1233dsfassad on the destination machines.
- Remove all created artifacts such as the ps.exe binary and the PyDCrypt executable.



csrss.exe 3228
Dropped Executable, Dropped Dll
Process Camouflage, Masquerading
Unsigned Process...
conhost.exe 3032
Execution through API
csrss.exe 3704
Dropped Executable, Execution through Module Load
Process Camouflage, Execution through API
Masquerading...
cmd.exe 3240
Execution through API, Command-Line Interface
Scripting
cmd.exe 6136
Execution through API, Command-Line Interface
Scripting
cmd.exe 4568
Execution through API, Command-Line Interface
Scripting
cmd.exe 5596
Execution through API, Command-Line Interface
Scripting
cmd.exe 4484
Execution through API, Command-Line Interface
Scripting
cmd.exe 5088
Execution through API, Command-Line Interface
Scripting
svchost.exe 4140
Modify Registry, Dropped Drivers
Dropped Executable, Rootkit
Process Camouflage...
net.exe 4788
Modify Registry, Dangerous Execution
Valid Accounts, Execution through API
wmic.exe 1956
Uncommonly Used Port, Valid Accounts
Windows Management Instrumentation, Dangerous Execution
Stealthy Process Execution...
xcopy.exe 5564
Execution through API
powershell.exe 4564
Uncommonly Used Port, Execution through API
PowerShell, Scripting
ps.exe 1268
Execution through API

Figure 7: Example of Forensics report for single execution tree of `PyDCrypt`.

DCSrv

This malicious process masquerades as a legitimate `svchost.exe` process and has a single purpose: to encrypt all computer volumes, and deny any access to the computer.

It contains several resources:

- Resource `1` – Contains an encrypted configuration, and depending on the code, can also contain a hardcoded encryption key. Some of the configuration values are:
    - Boot loader custom message: `Hacked By <https://moses-staff.se> ! Join Us in Telegram : <https://t.me/moses_staff>`
    -
    - Time to wait before restarting the computer after installing the DiskCryptor driver.
    - Time to wait before restarting the computer after encrypting the volumes.
    - Detonation time – The exact minute when the encryption should start.
- Resource `2` – Signed `DCDrv.sys` driver for 64 bit.
- Resource `3` – Signed `DCDrv.sys` driver for 32 bit.
- Resource `4` – Encrypted DLL for installing the boot loader.

In addition to the configuration, the execution flow can also be controlled by the command line parameters received for this tool, and it can take from 0 to 2 parameters.

If the first one exists, it is the encryption key, and if the second one exists, it is an identifier that is also compared with the string saved in the malware configuration. An example for it would be string “`113`” which was used in both the `DCSrv` and `PyDCrypt` parameters. However, the standard execution chain, as we mentioned previously, is `PyDCrypt` passing its parameters (including the encryption key) to `DCSrv`.

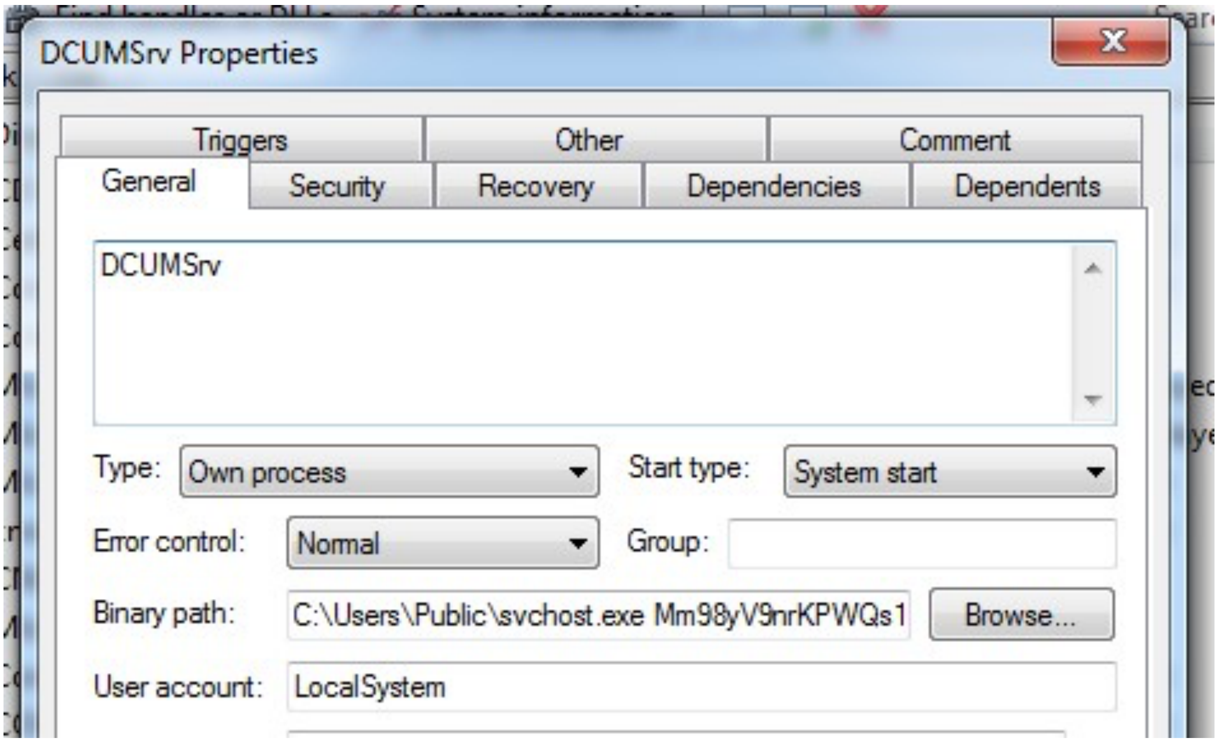
The complete encryption tool is based on a powerful 3rd party open-source tool called DiskCryptor. MosesStaff used several parts of that tool, primarily the signed driver and custom boot loaders.

The execution flow of this tool can be divided into three parts: **driver installation**, **volume encryption**, and **boot loader installation**.

Installing the driver

The first action is to create two services named `DCUMSrv` and `DCDrv`. Each of these has different purposes.

`DCUMSrv` is used solely for the persistence mechanism to run the same executable, `svchost.exe`, on startup with the originally provided parameters. `DCDrv` runs the supplied filter driver `DCDrv.sys`. For the installation, it extracts the embedded driver from resources 2 or 3 (depending on whether it is running on a 32-bit system or 64-bit), and writes its content into `C:\windows\system32\drivers\DCDrv.sys`. It then configures its registry parameters the same way the DiskCryptor open-source project did.


DCUMSrv Properties

Triggers | Other | Comment
General | Security | Recovery | Dependencies | Dependents

DCUMSrv

Type: Own process
Start type: System start
Error control: Normal
Group:
Binary path: C:\Users\Public\svchost.exe Mm98yV9nrKPWQs1
User account: LocalSystem

Figure 8: Service used for persistence mechanism.

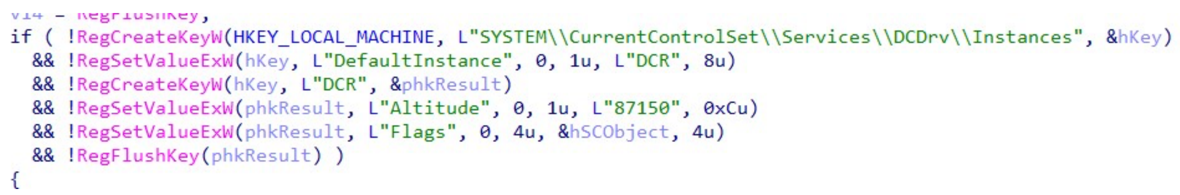
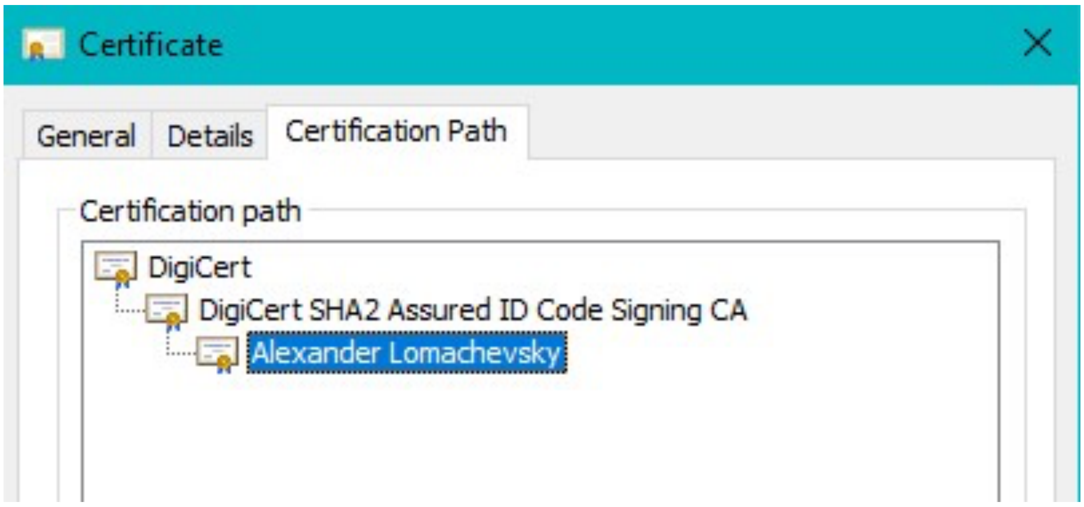

```
if ( !RegCreateKeyW(HKEY_LOCAL_MACHINE, L"SYSTEM\\CurrentControlSet\\Services\\DCDrv\\Instances", &hKey)
  && !RegSetValueExW(hKey, L"DefaultInstance", 0, 1u, L"DCR", 8u)
  && !RegCreateKeyW(hKey, L"DCR", &phkResult)
  && !RegSetValueExW(phkResult, L"Altitude", 0, 1u, L"87150", 0xCu)
  && !RegSetValueExW(phkResult, L"Flags", 0, 4u, &hSCObject, 4u)
  && !RegFlushKey(phkResult) )
{
```

Figure 9: Installation of `DCSrv.sys` filter driver.

Due to the valid signature of the drivers, as we can see below, the DSE (Driver Signature Enforcement) feature does not stop its installation.


Certificate

General | Details | Certification Path

Certification path

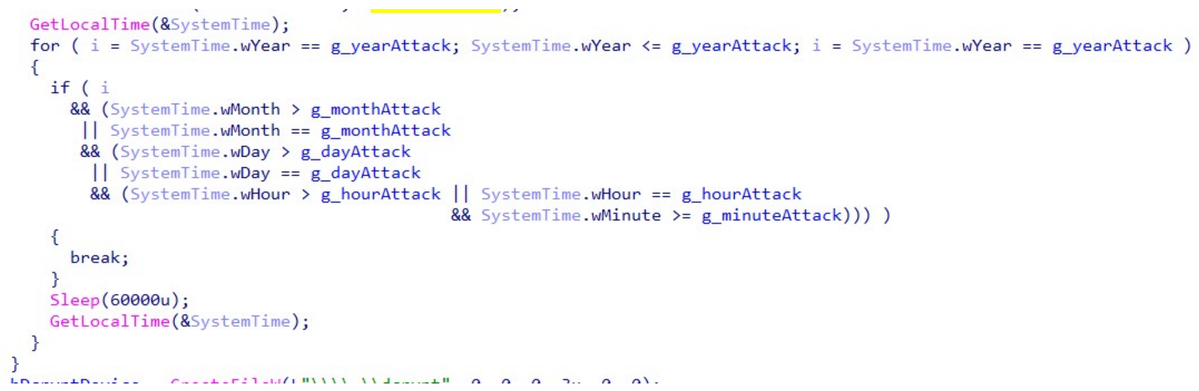
DigiCert
DigiCert SHA2 Assured ID Code Signing CA
Alexander Lomachevsky

Figure 10: DCDrv.sys valid signature.

When the malware finishes installing the driver, it performs a reboot after a few minutes to make the driver operational.

Encrypting the volumes

On the second run, the malware waits for the exact time given in the configuration before it detonates its encryption mechanism. This is yet another proof that the payloads are targeted and created per victim.



```
  GetLocalTime(&SystemTime);
  for ( i = SystemTime.wYear == g_yearAttack; SystemTime.wYear <= g_yearAttack; i = SystemTime.wYear == g_yearAttack )
  {
    if ( i
      && (SystemTime.wMonth > g_monthAttack
       || SystemTime.wMonth == g_monthAttack
      && (SystemTime.wDay > g_dayAttack
       || SystemTime.wDay == g_dayAttack
       && (SystemTime.wHour > g_hourAttack || SystemTime.wHour == g_hourAttack
                                           && SystemTime.wMinute >= g_minuteAttack))) )
    {
      break;
    }
    Sleep(60000u);
    GetLocalTime(&SystemTime);
  }
}
```

Figure 11: Code that checks the current time and compares it with the value provided in the configuration.

When the specific time arrives, the program iterates over all available drives, from `C:` to `Z:`, and encrypts them simultaneously using several threads.

As we mentioned previously, the core encryption mechanism is based on the DiskCryptor driver. Therefore, all it has to do is to initiate the right IOCTL messages with the proper parameters which are packaged into `dc_ioctl` struct:

```
typedef struct _dc_ioctl {
dc_pass passw1; /* password */
dc_pass passw2; /* new password (for changing pass) */
wchar_t device[MAX_DEVICE + 1];
u32 flags; /* mount/unmount flags */
int status; /* operation status code */
int n_mount; /* number of mounted devices */
crypt_info crypt;
} dc_ioctl;
```

There are several communication methods between user-mode applications and kernel-mode drivers. The most popular method is to send special codes called IO Control Codes (IOCTL) using the Windows API `DeviceIoControl`.

In our case, the relevant IOCTL codes for encrypting the drives are `DC_CTL_ENCRYPT_START` and `DC_CTL_ENCRYPT_STEP`, and the parameters are: the key from the command line in `passw1` field, the iterated device in `device` field, and `CF_AES` encryption mode in `crypt` field.

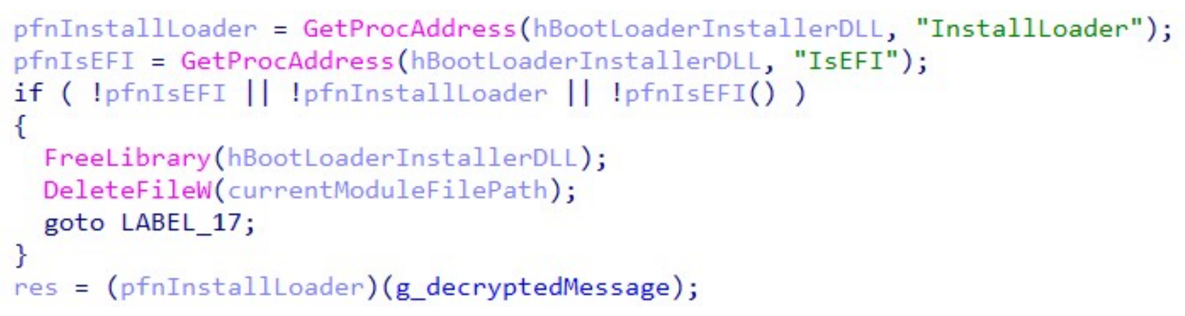
This process could take a while, so the malware has a two hour sleep period before rebooting with the custom boot loaders.

Installing DiskCryptor bootloader

This is usually done before the encryption process but depending on the configuration values, can also wait for it to end. The incentive for overwriting the boot-loader beforehand is clear, as even if the encryption wasn't finished, the damage to the organization is done by locking their computers.

The bootloader installer is embedded as resource `4` in the executable and is decrypted before it is dropped as `<executable_directory>/<executable_name>.dll`. This DLL file has two export functions named `IsEFI` and `InstallLoader` and their names pretty much describe their functionality.

The malware dynamically loads the dropped library and calls `InstallLoader` with the boot loader text message as a parameter:



```
pfnInstallLoader = GetProcAddress(hBootLoaderInstallerDLL, "InstallLoader");
pfnIsEFI = GetProcAddress(hBootLoaderInstallerDLL, "IsEFI");
if ( !pfnIsEFI || !pfnInstallLoader || !pfnIsEFI() )
{
  FreeLibrary(hBootLoaderInstallerDLL);
  DeleteFileW(currentModuleFilePath);
  goto LABEL_17;
}
res = (pfnInstallLoader)(g_decryptedMessage);
```

Figure 12: Loading of the bootloader installer.

We didn't find any custom malicious changes introduced into the bootloader itself. Therefore, it contains the exact functionality we expect to see in volume disk encryption software with a bootloader to decrypt the main volume.

Encryption scheme

The most notorious ransomware gangs (e.g. Conti, Revil, Lockbit etc.), almost without exception, always ensure that their encryption system is well-designed and unassailable. They do their due diligence and at the very least, dutifully copy the hybrid approach of symmetric and asymmetric encryption that has been the staple of well-designed ransomware since the mid-10's; they know a serious mistake can end up costing them hundreds of thousands of dollars in potential revenue. For whatever reasons, including non-financial motivation, lack of experience with ransomware, or amateur coding skills, the MosesStaff group didn't make as much of an effort.

When we add the fact that MosesStaff didn't negotiate for money, we can assume that this malware strain isn't ransomware, but an attempt to cause irreversible damage for Israelis organizations.

Using this knowledge, let us dig deeper into their method of key generation, and how can we potentially reverse it.

Key Generation

MosesStaff uses three methods for generating the symmetric keys used by the encryption mechanism:

- As a command-line parameter generated automatically by `PyDCrypt`.
- As a command-line parameter given by the user.
- If a certain bit in the configuration is turned on, the key is hardcoded in the executable.

The most common method is running `PyDCrypt`, and sending exclusive encryption keys per hostname, based on MD5 hash, and crafted salt. The code which generates the keys looks like this:

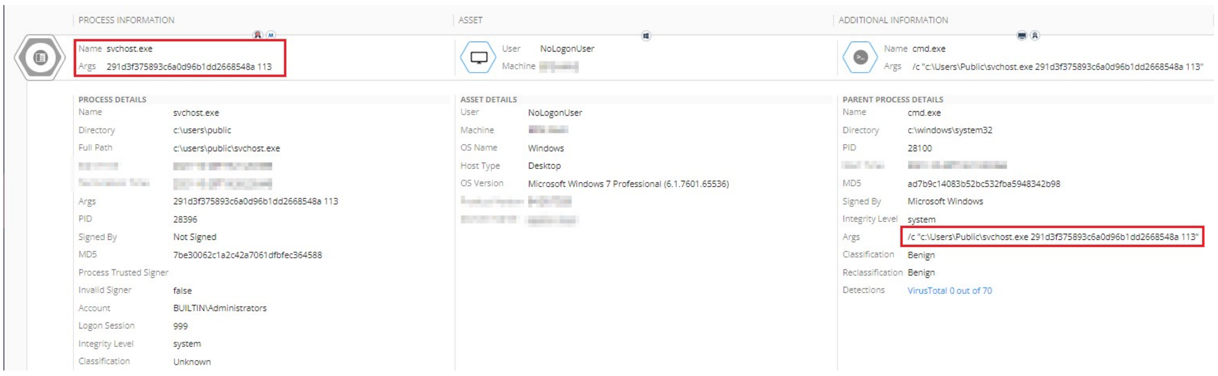
```
from hashlib import md5
# Salt may vary between samples ('Facebook5' and '4Skype4' strings)
def custom_hash_func(hostname, ring=10):
m1 = 'Facebook5' + md5(hostname.encode()).hexdigest() + '4Skype4'
for x in range(ring):
```

```
m1 = md5(m1.encode()).hexdigest()
return m1[0:31]
```

Decryption Process

As we mentioned previously, simple symmetric-key-based encryption is usually not sufficient to make a bulletproof, hard-to-reverse encryption scheme. By using the analysis above, we do have several options to potentially reverse the encryption.

The first and foremost option is to look at the EDR product logs if they were installed in the environment. A properly designed EDR records all process creations, together with their command line parameters, which are the keys in our case.



PROCESS INFORMATION

Name	svchost.exe
Args	291d3f375893c6a0d96b1dd2668548a 113

PROCESS DETAILS

Name	svchost.exe
Directory	c:\users\public
Full Path	c:\users\public\svchost.exe
[redacted]	[redacted]
[redacted]	[redacted]
Args	291d3f375893c6a0d96b1dd2668548a 113
PID	28396
Signed By	Not Signed
MD5	7be30062c1a2c42a7061dfbfec364588
Process Trusted Signer	
Invalid Signer	false
Account	BUILTIN\Administrators
Logon Session	999
Integrity Level	system
Classification	Unknown

ASSET

User	NoLogonUser
Machine	[redacted]

ASSET DETAILS

User	NoLogonUser
Machine	[redacted]
OS Name	Windows
Host Type	Desktop
OS Version	Microsoft Windows 7 Professional (6.1.7601.65536)
[redacted]	[redacted]
[redacted]	[redacted]

ADDITIONAL INFORMATION

Name	cmd.exe
Args	/c "c:\Users\Public\svchost.exe 291d3f375893c6a0d96b1dd2668548a 113"

PARENT PROCESS DETAILS

Name	cmd.exe
Directory	c:\windows\system32
PID	28100
[redacted]	[redacted]
MD5	ad7b9c14083b52bc532fba5948342b98
Signed By	Microsoft Windows
Integrity Level	system
Args	/c "c:\Users\Public\svchost.exe 291d3f375893c6a0d96b1dd2668548a 113"
Classification	Benign
Reclassification	Benign
Detections	VirusTotal 0 out of 70

Figure 13: Screenshot from an EDR solution replicating the attack with `svchost.exe` parameters used for decryption.

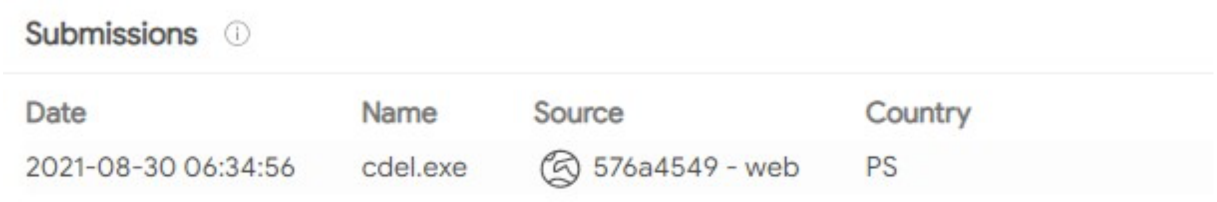
The second option is to extract and reverse the `PyDCrypt` malware which attacked the victim in the first place. This method is a little trickier due to the code deleting itself after finishing running. From the `PyDCrypt` sample, we can extract the crafted hashing function which generates the keys per computer.

By using the extracted keys from each of these methods, we can insert them into the boot login screen, and unlock the computer. This way we can restore access to the operating system, but the disks remain encrypted and the DiskCryptor boot loader is active on every restart. This can be solved by creating a simple program that initiates proper IOCTL to the DiskCryptor driver, and eventually, removes it from the system.

Attribution

Attributing politically motivated cyberattacks is always complicated. Currently, with all the information we have available, we can't draw any definitive conclusions. However, a couple of artifacts caught our attention:

- One of the tools used in the attack, `OICe.exe`, was submitted to VT from Palestine a few months before the group began an active phase (encryption and public leaks) of their activity.



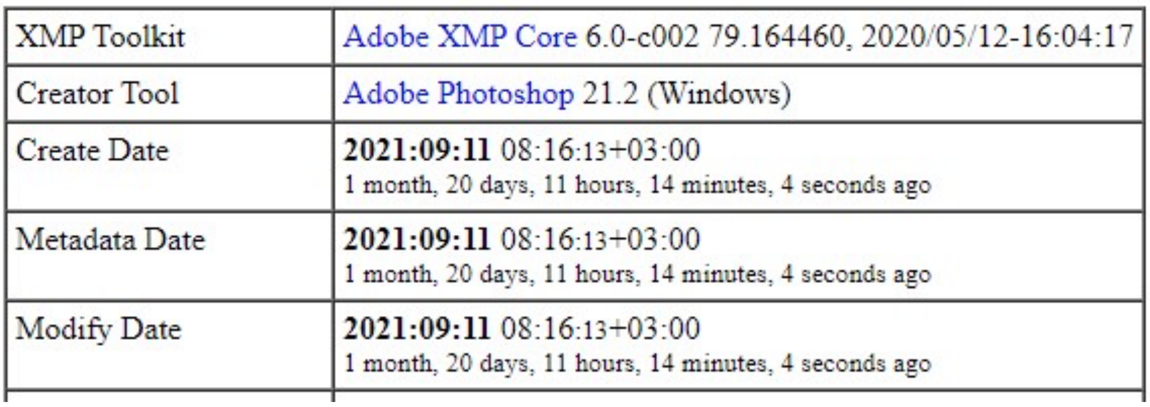
Submissions

Date	Name	Source	Country
2021-08-30 06:34:56	cdel.exe	576a4549 - web	PS

Figure 14: Screenshot of VT submission of command proxy tool left by attackers on the compromised server.

Although this is not a strong indication, it might betray the attackers' origins; sometimes they test the tools in public services like VT to make sure they are stealthy enough.

- The background and logo PNG image files used on the site `moses-staff[.]se` (all of whom had metadata available) were created and/or modified a few days after the domain was registered on the machine with the time zone `GMT+3`. That is the time zone of Israel and the Palestinian territories at that time of the year.



XMP Toolkit	Adobe XMP Core 6.0-c002 79.164460, 2020/05/12-16:04:17
Creator Tool	Adobe Photoshop 21.2 (Windows)
Create Date	**2021:09:11** 08:16:13+03:00 1 month, 20 days, 11 hours, 14 minutes, 4 seconds ago
Metadata Date	**2021:09:11** 08:16:13+03:00 1 month, 20 days, 11 hours, 14 minutes, 4 seconds ago
Modify Date	**2021:09:11** 08:16:13+03:00 1 month, 20 days, 11 hours, 14 minutes, 4 seconds ago

Figure 15: Example of metadata of the images from MosesStaff site.

Conclusion

As we described above, MosesStaff has a specific modus operandi of exploiting vulnerabilities in public-facing servers, then using a combination of unique tools and living-off-the-land maneuvers to leave the targeted network encrypted, with encryption used solely for destruction purposes. Like the Pay2Key and BlackShadow gangs before them, the MosesStaff group is motivated by politics and ideology to target Israeli organizations. Unlike those predecessors, however, they made an outright mistake when they put together their own encryption scheme, which is honestly a surprise in today's landscape where every two-bit cybercriminal seems to know at least the basics of how to put together functioning ransomware.

MosesStaff are still active, pushing provocative messages and videos in their social network accounts. As the saying goes, "a clever person solves a problem, a wise person avoids it." The vulnerabilities exploited in the group's attacks are not zero days, and therefore all potential victims can protect themselves by immediately patching all publicly-facing systems.

Check Point products block this attack with the following signatures: `Ransomware.Wins.DCSrv.A`, `Ransomware.Win.MosesStaff.A`, `Ransomware.Win.MosesStaff.B`, `Ransomware.Win.MosesStaff.C`.

IOCs

Hashes

Hash	Description	Name
680ce7d56fc427ee2fbedb5baea59d68	MosesStaff Webshell V1	IISpool.aspx
1094aa25e2d637e7f5795edd6c0f60e4	MosesStaff Webshell V2	IISpool.aspx
5ffc25555779651279861 7ae61c4274d	MosesStaff Webshell V2	IISpool.aspx
3dde69212234c98b503081d64b9beb52	MosesStaff Webshell V2	IISpool.aspx
a44775e7568b790505bbcaadbd61c993	MosesStaff Webshell V2	IISpool.aspx
3649c106c6edd7ef47acd46586c74d8e	MosesStaff Webshell V2	warn.aspx
c1bc20a9bbebbbdd19869999b9cec03b	MosesStaff Webshell V2	IISpool.aspx
a06c125e6da566be67aacf6c4e44005e	CMD wrapper	OICe.exe
e776c4e24c00fa3eeba68cde38ae24f3	PyDCrypt	csrss.exe
3dfb7626dbe46136bc19404b63c6d1dc	PyDCrypt	csrss.exe
7be30062c1a2c42a7061dfbfec364588	DCSrv	svchost.exe
93c19436e6e5207e2e2bed425107f080	DCSrv	svvhost.exe
2372c7639e70820f253a098dfcaf5060	Bootloader Installer	svchost.dll

File paths

`c:\users\public\svchost.exe`

```
c:\users\public\svvhost.exe

c:\users\public\svchost.dll

c:\users\public\svchost.bat

c:\users\public\csrss.exe

c:\users\public\ps.exe

c:\users\dc1\dcl.txt

c:\users\public\account

c:\users\public\systemserial

c:\windows\system32\drivers\dcdrv.sys

C:\inetpub\wwwroot\aspnet_client\system_web\IISpool.aspx
```