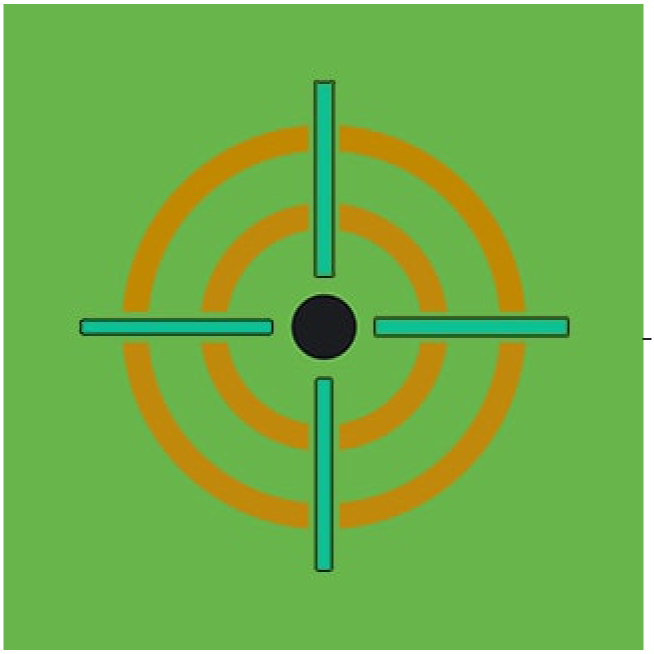
DarkSide Ransomware: Splunk Threat Update and Detections

splunk.com/en_us/blog/security/darkside-ransomware-splunk-threat-update-and-detections.html

May 17, 2021



By Splunk Threat Research Team May 17, 2021

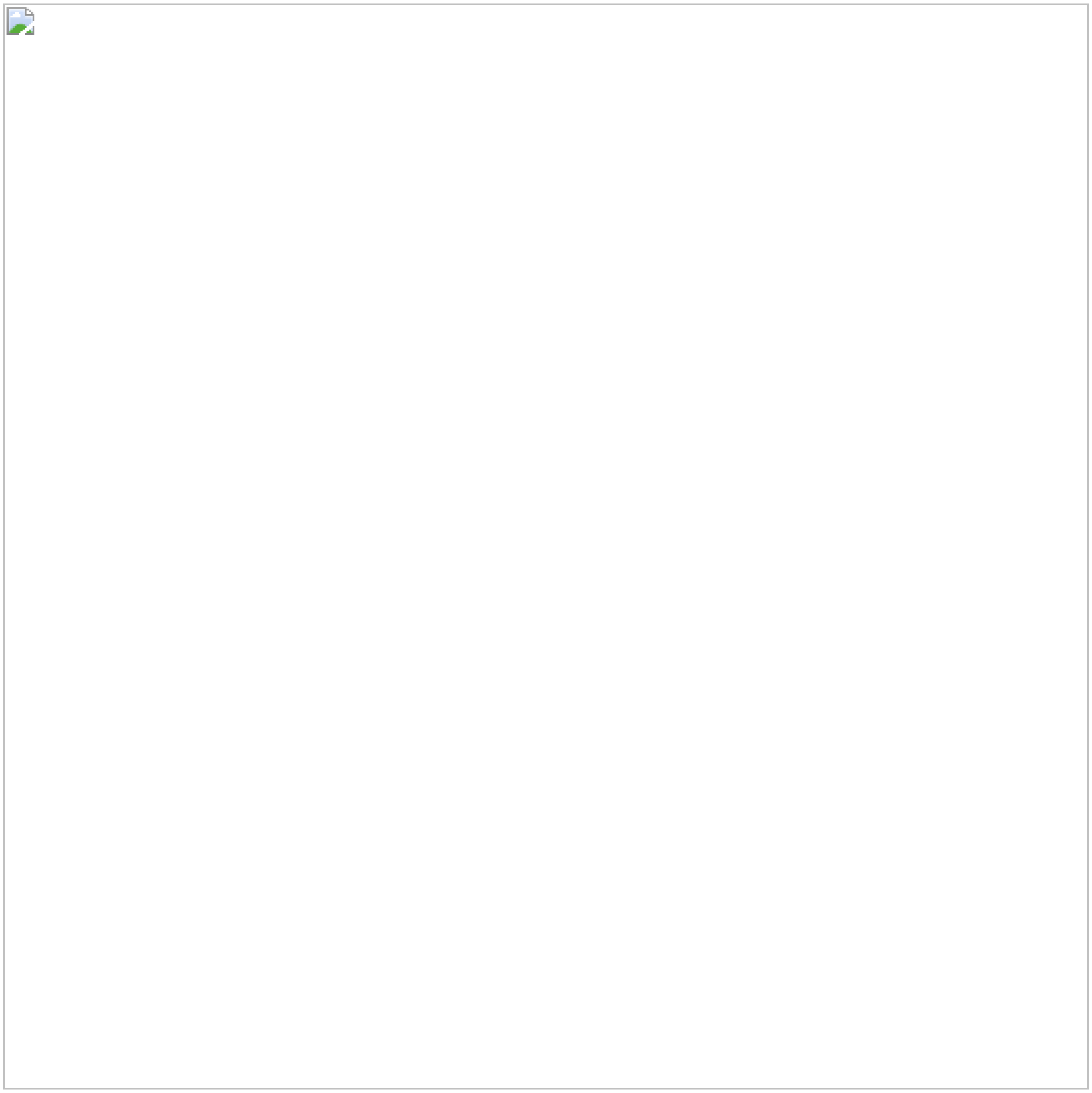
The ransomware campaign against the Colonial Pipeline highlights the dangers and real-life consequences of cyberattacks. If you want to understand how to use Splunk to find activity related to the DarkSide Ransomware, we highly recommend you first read "The DarkSide of the Ransomware Pipeline" from Splunk's Security Strategist team. In short, according to the FBI, the actors behind this campaign are part of the "DarkSide" group. The effects of this campaign against Colonial Pipeline are remarkable. Colonial Pipeline voluntarily shut down its operations, and some estimates indicate around 45% of the East Coast of the United States fuel supply is affected.

A regional state of emergency has been declared, it is important to note that this pipeline not only supplies automotive vehicles fuel but jet fuel as well, so not only land transportation is affected but air transportation as well. Another possible effect of this cyberattack is the increase of fuel prices all along the chain of affected goods and services.

https://twitter.com/GasBuddy/status/1392107671889850370

Replicating the DarkSide Ransomware Attack

The Splunk Threat Research Team (STRT) has addressed this threat and produced an Analytic Story with several detection searches directed at community shared IOCs. STRT was able to replicate the execution of this payload via the attack range. The following screens show the initial execution of this malicious payload.

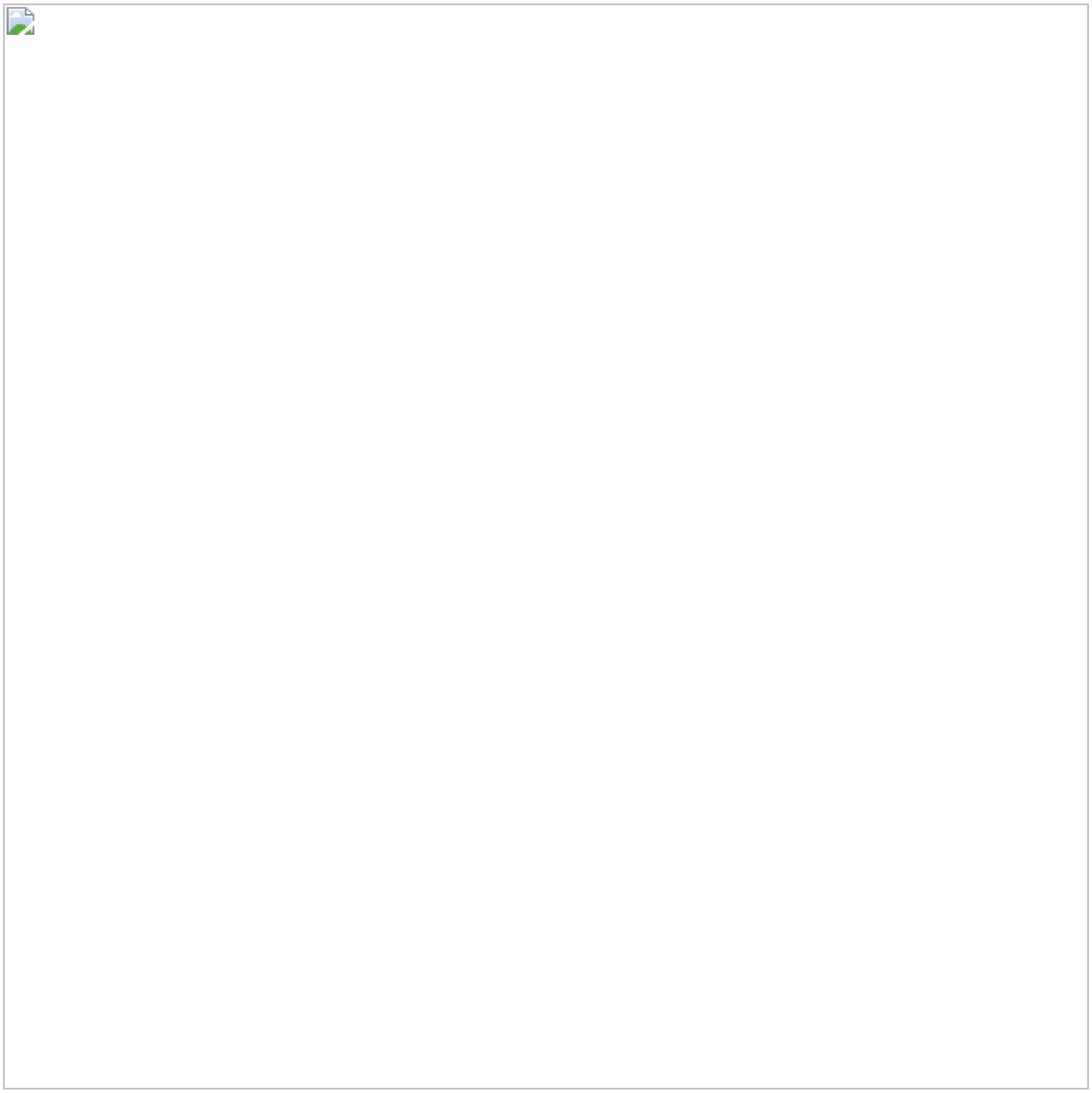


The execution of this file as many other ransomware payloads creates a note where it explains to the victim what happened, demands a ransom payment, and also threatens to publish sensitive information extracted during the attack in what is known as double extortion.

The ransomware note also presents a personal leak page where partial exfiltrated information is shown and presents a web page to input a key to receive further instructions.

This ransomware payload also includes a log that shows current execution items as the following screenshot shows.

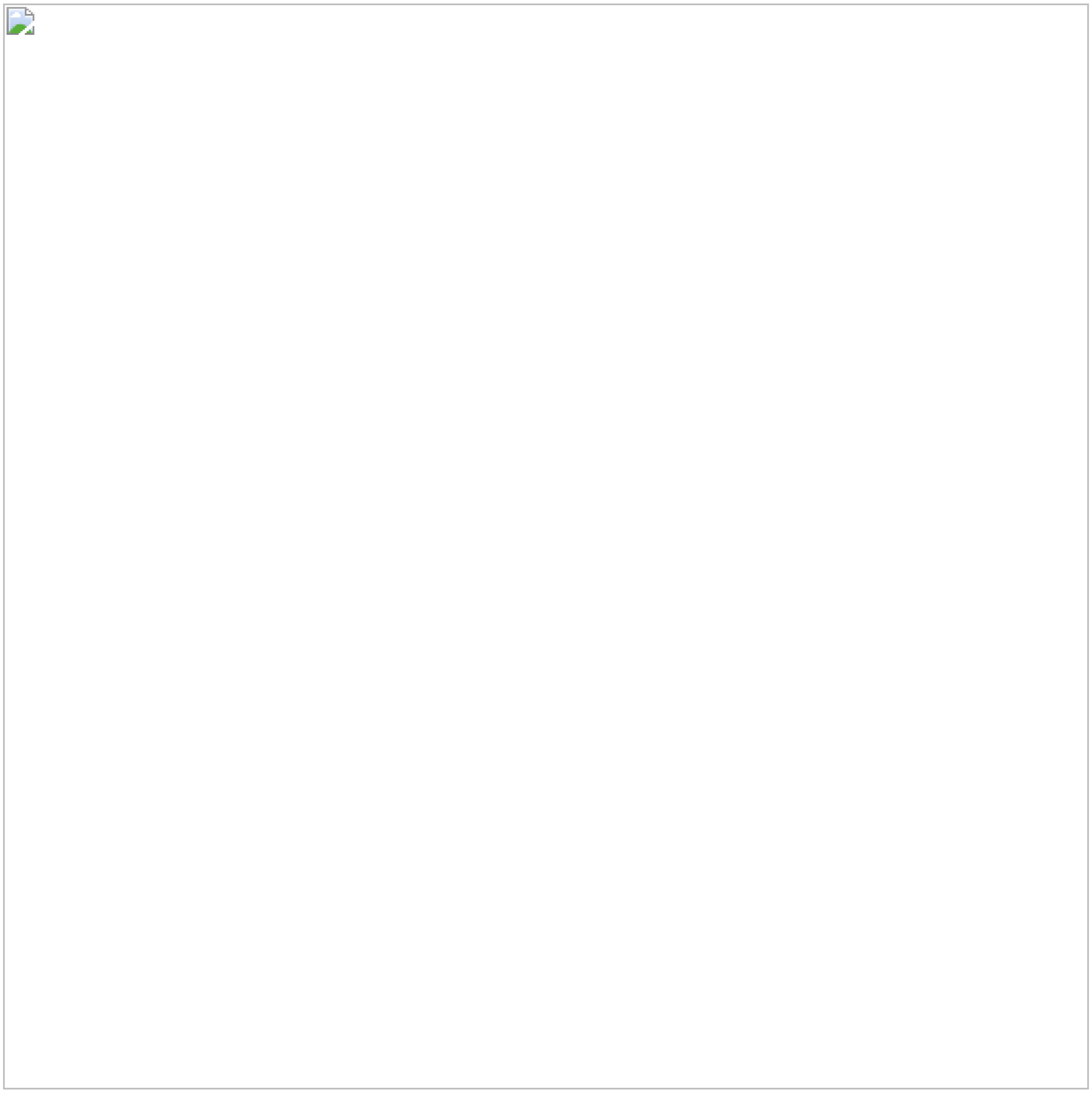
One of the TOR URI addresses presented in the note appears to be targeted to the victim, we found that the site to input key was similar in different samples. The DarkSide group had a website on the dark web accessible via TOR or TOR Proxy. Several company logos were found on this site and in what appears to be sensitive information made public from their campaigns.



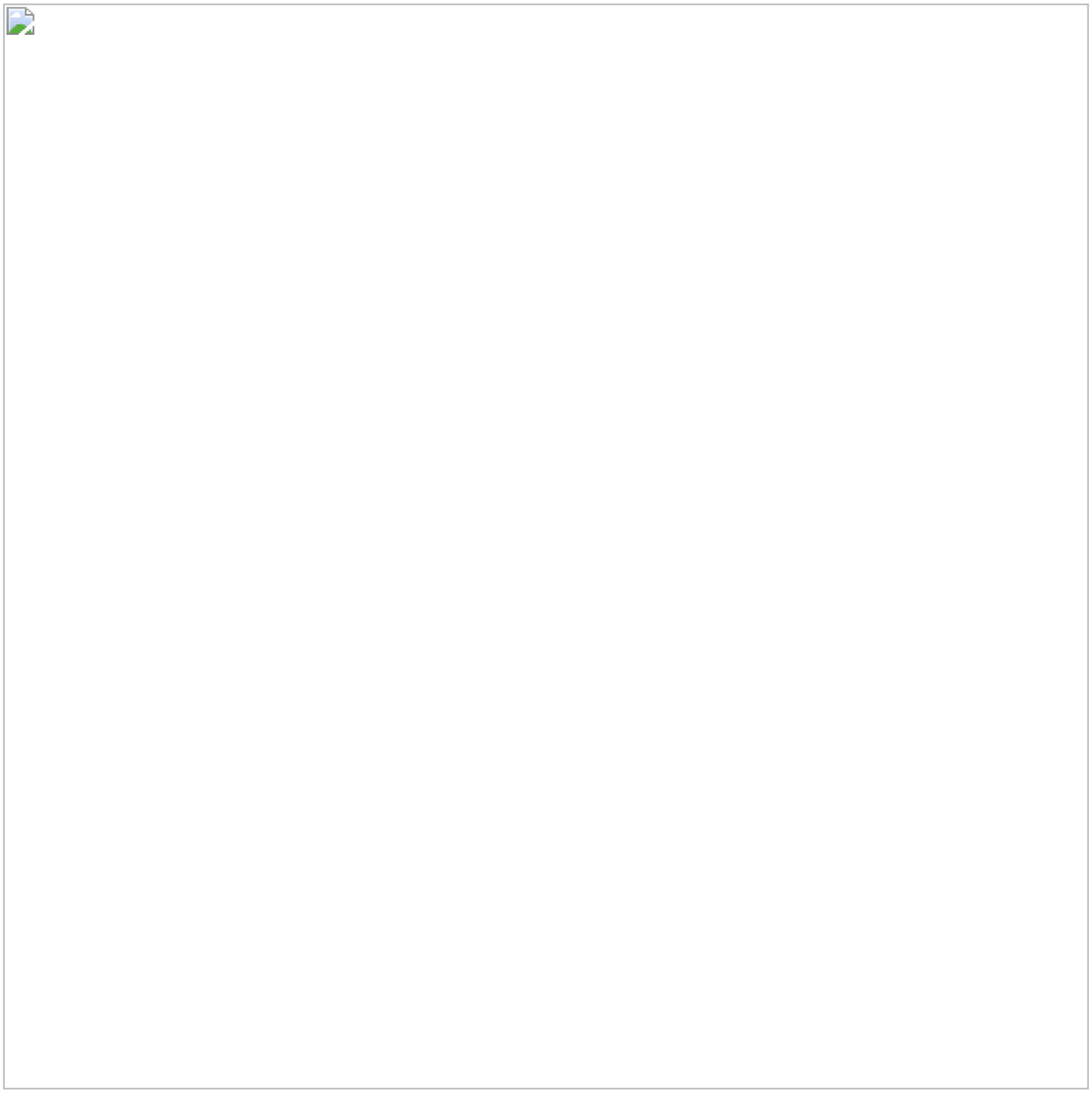
File Encryption:

This ransomware is capable of encrypting files in the network shares and local drive of the compromised host.

Enumerates network shares



Enumerates local and removable drives

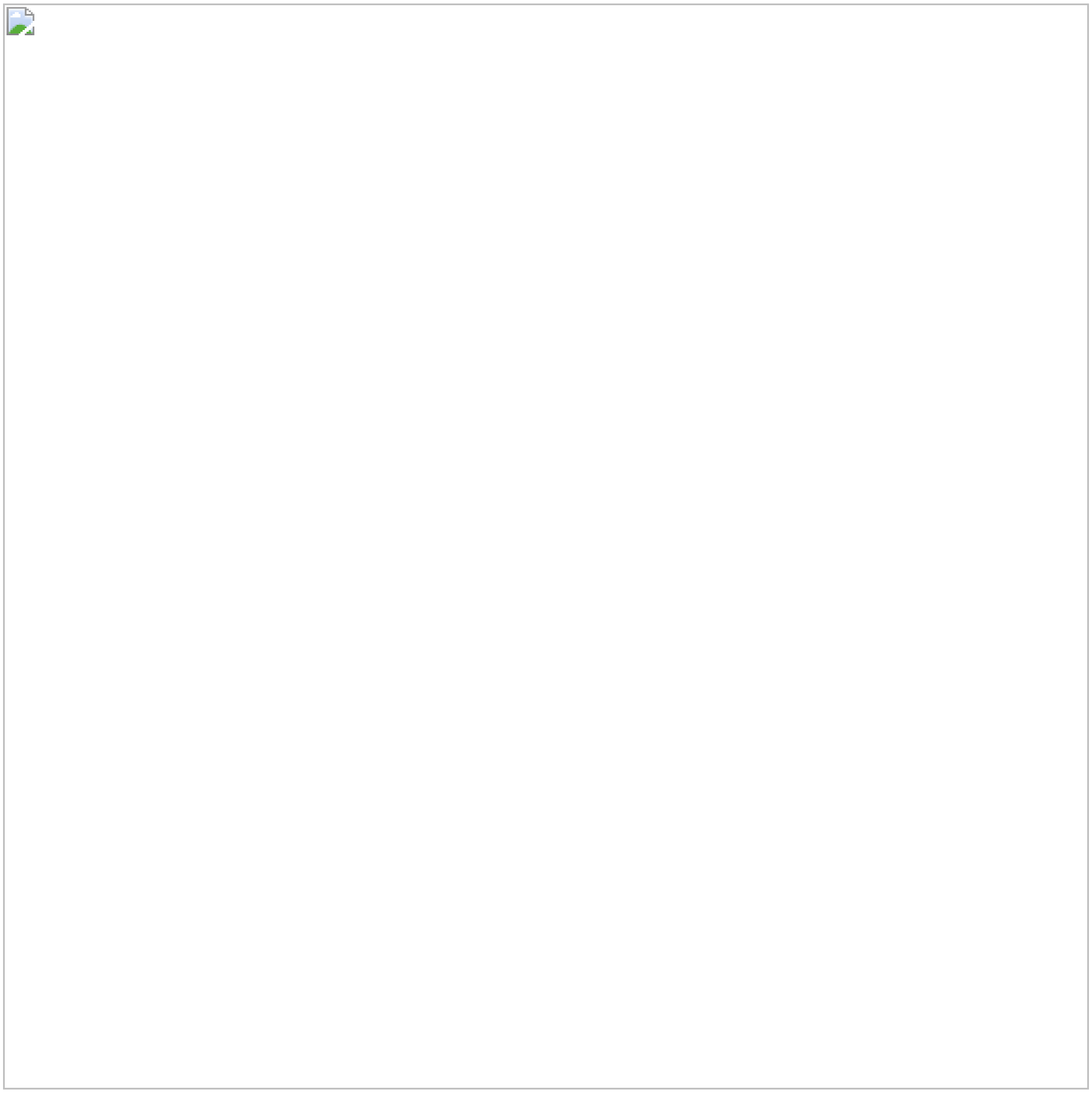


Whitelisted Folders, Files, and File Extension

This ransomware payload has a configuration feature consisting of a list of folder names, files, and file extensions it skips during encryption.

Folder names skipped during the encryption process

Files and File Extensions skipped during the encryption process

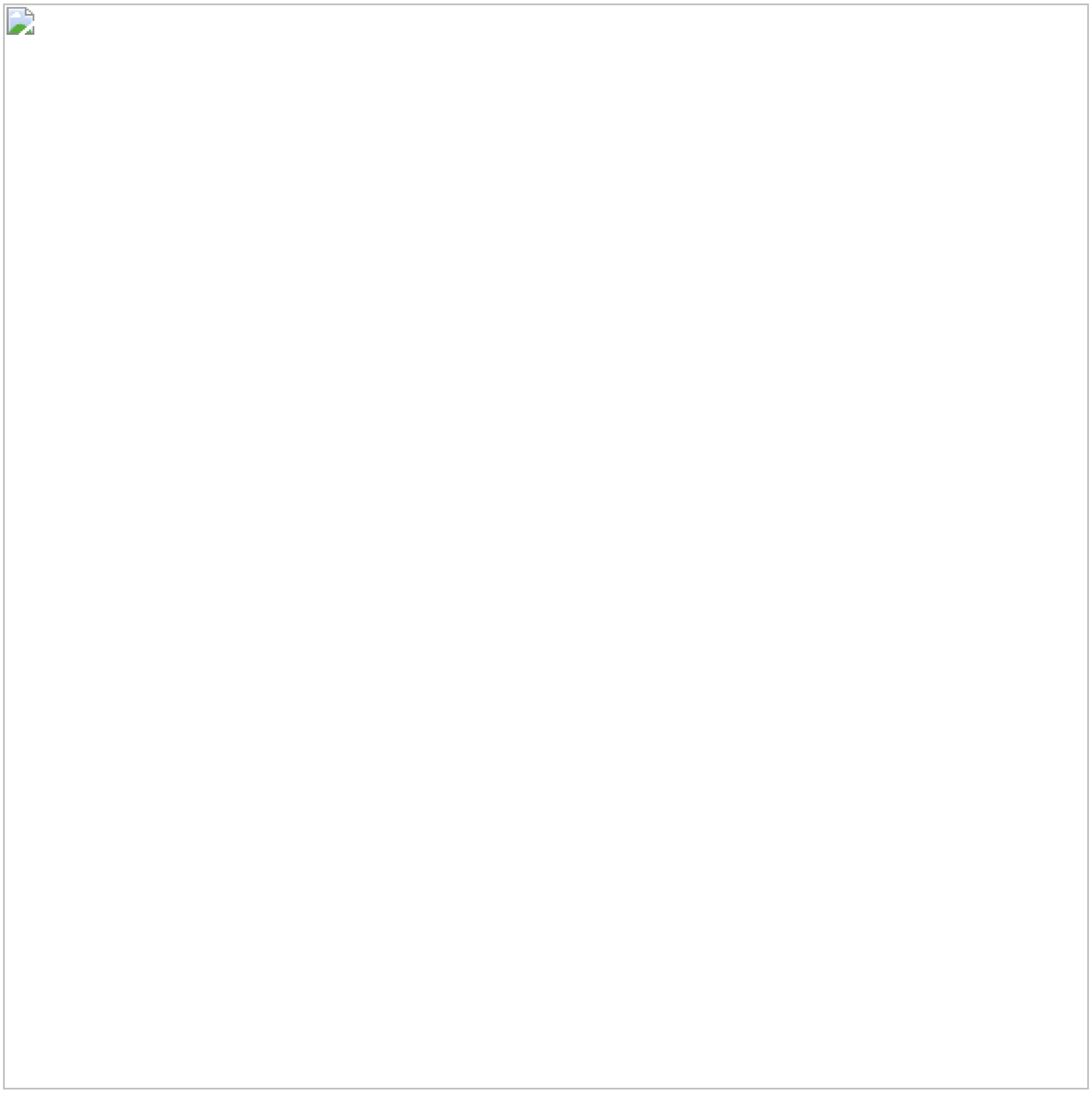


Terminating Processes and Services

Similar to other ransomware payloads it also tries to kill processes or services that may cause access failure to the files targeted for encryption. Below is the decrypted list of strings related to the process name and service name targeted for termination.

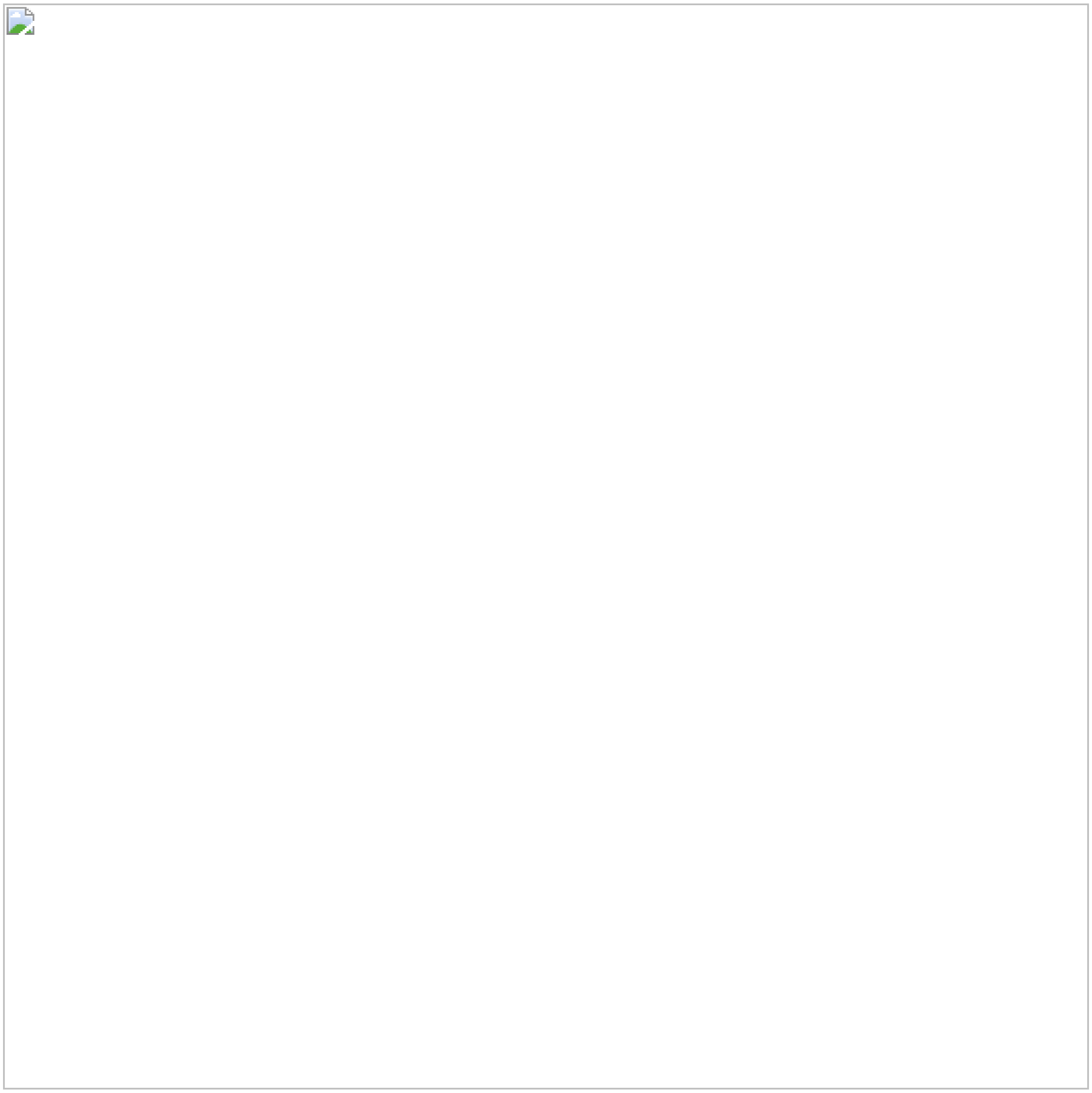
Process names list targeted for termination

Service name it terminates:

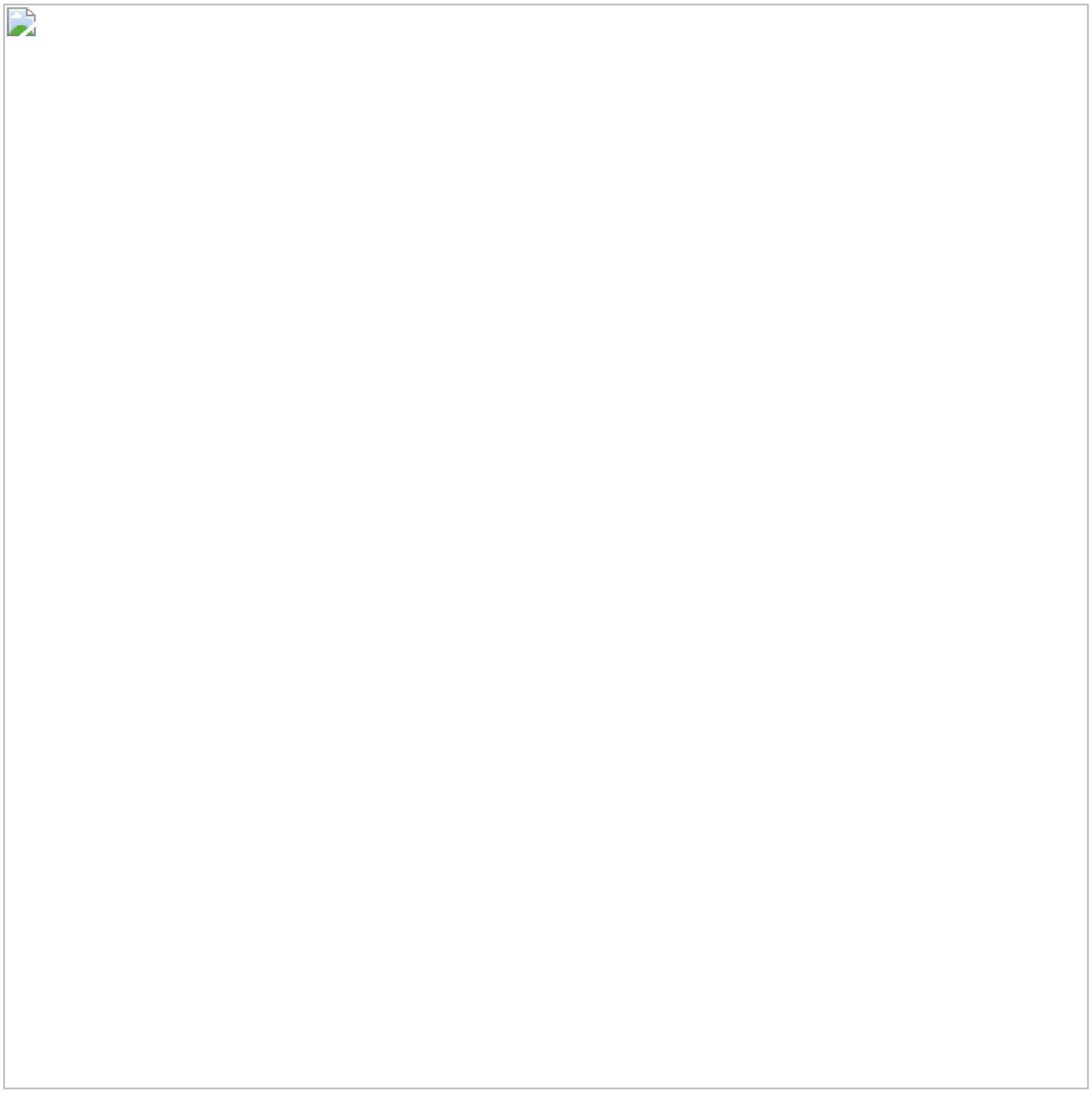


Privilege Escalation

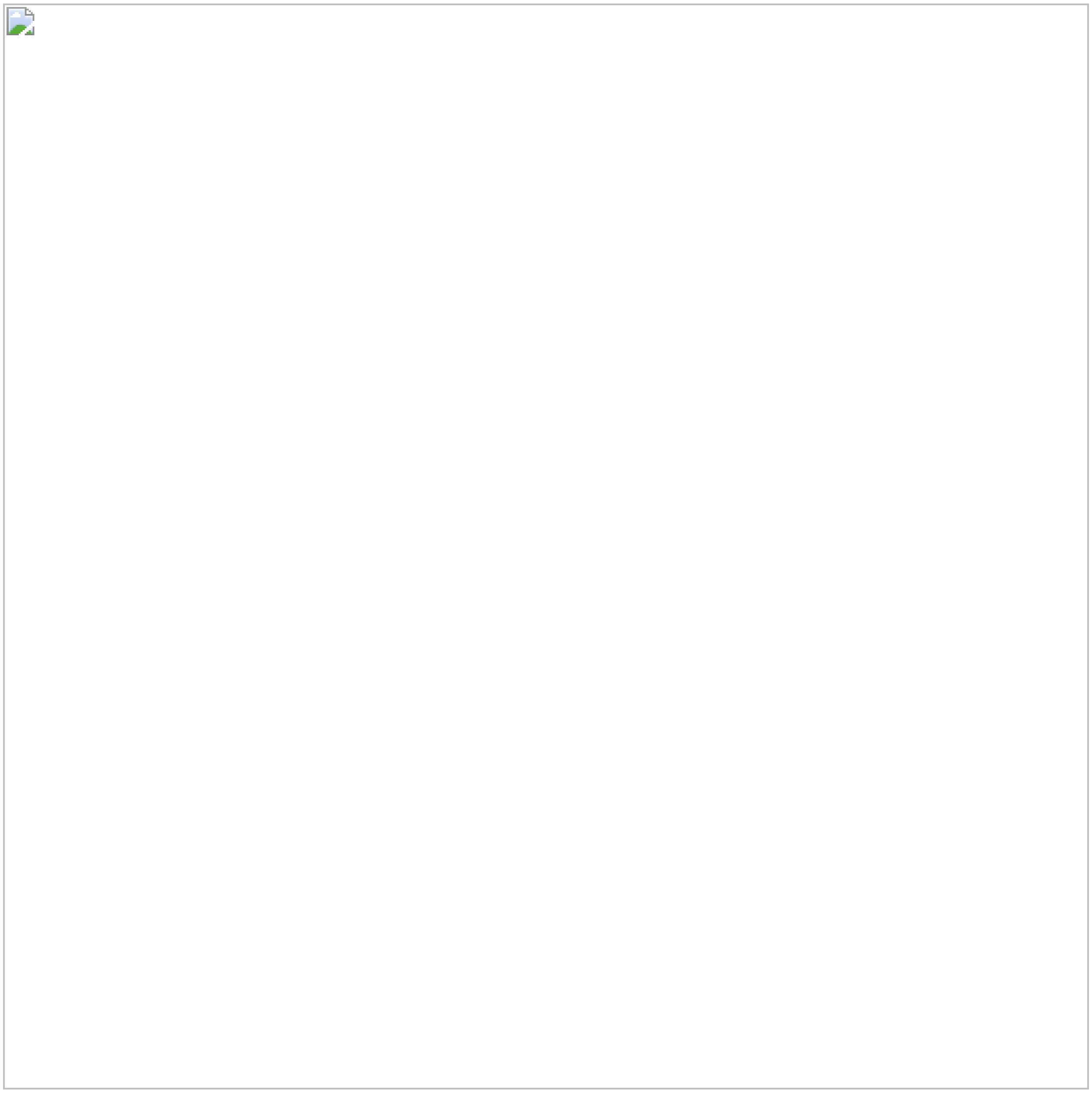
This ransomware checks if its process instance is running under admin privileges, if not, it will try to elevate privileges by using cmstplua.dll COM OBJECT CLSID to elevate its privileges.



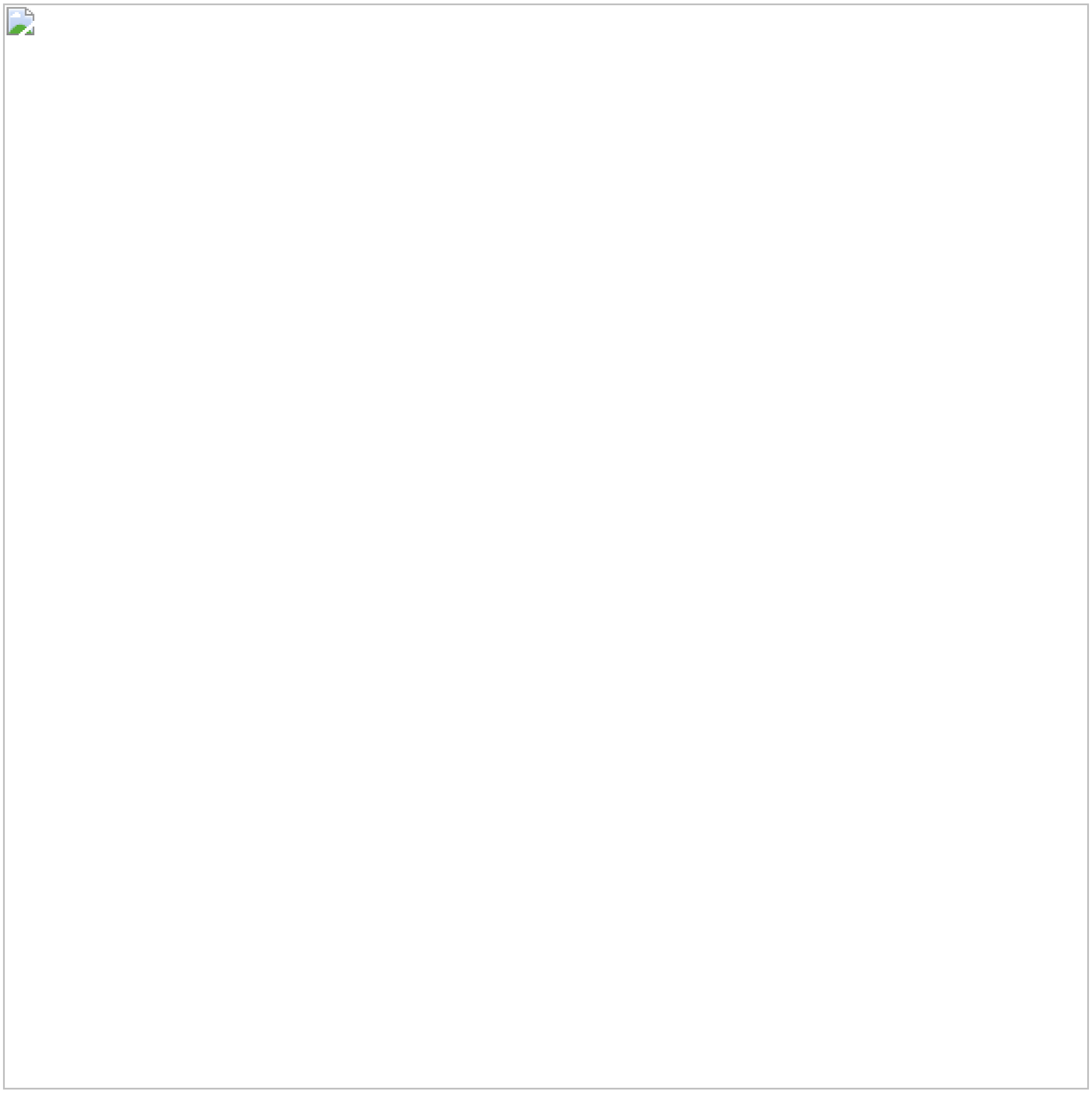
Aside from encrypting files, killing processes, services, and elevating privileges it will also delete files in the recycle bin, as seen in the following screenshot.



It also has a feature where it runs a hex-encoded PowerShell script to delete the shadow copy in the compromised machine. Below is the screen capture of the decrypted PowerShell command.



The DarkSide Ransomware also used the machine guid of the compromised host to generate a (4 rounds) crc32 checksum that will be used as a file extension of the encrypted files.

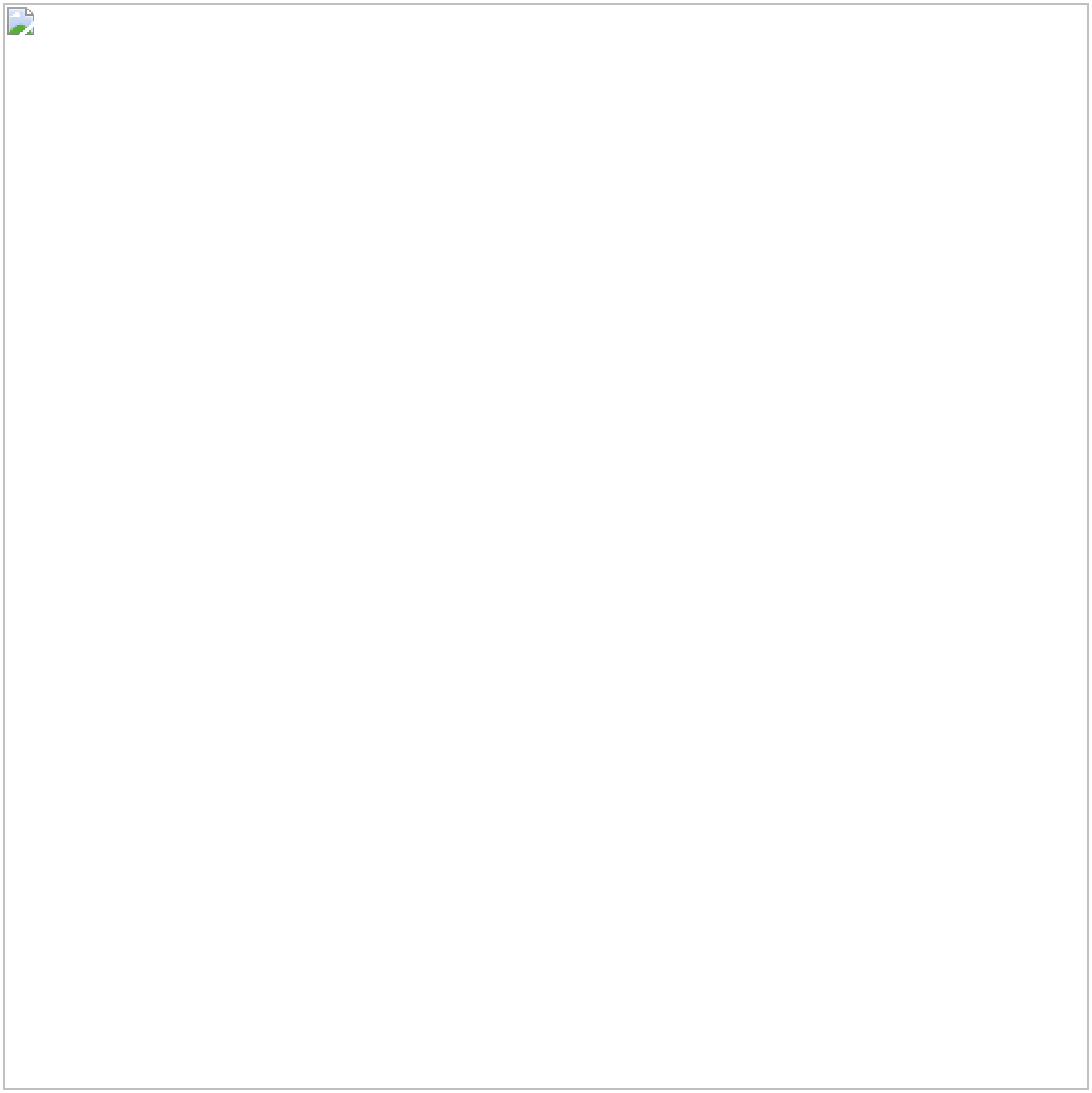


Using the DarkSide Ransomware Analytic Story

As seen above in the replication of this threat via the attack range, we used a specific sysmon configuration to get the data needed to create these detections. The new Analytic Story “DarkSide Ransomware” is composed of the following searches from current analytical stories and new detection searches:

Modified Ransomware Notes Bulk Creation

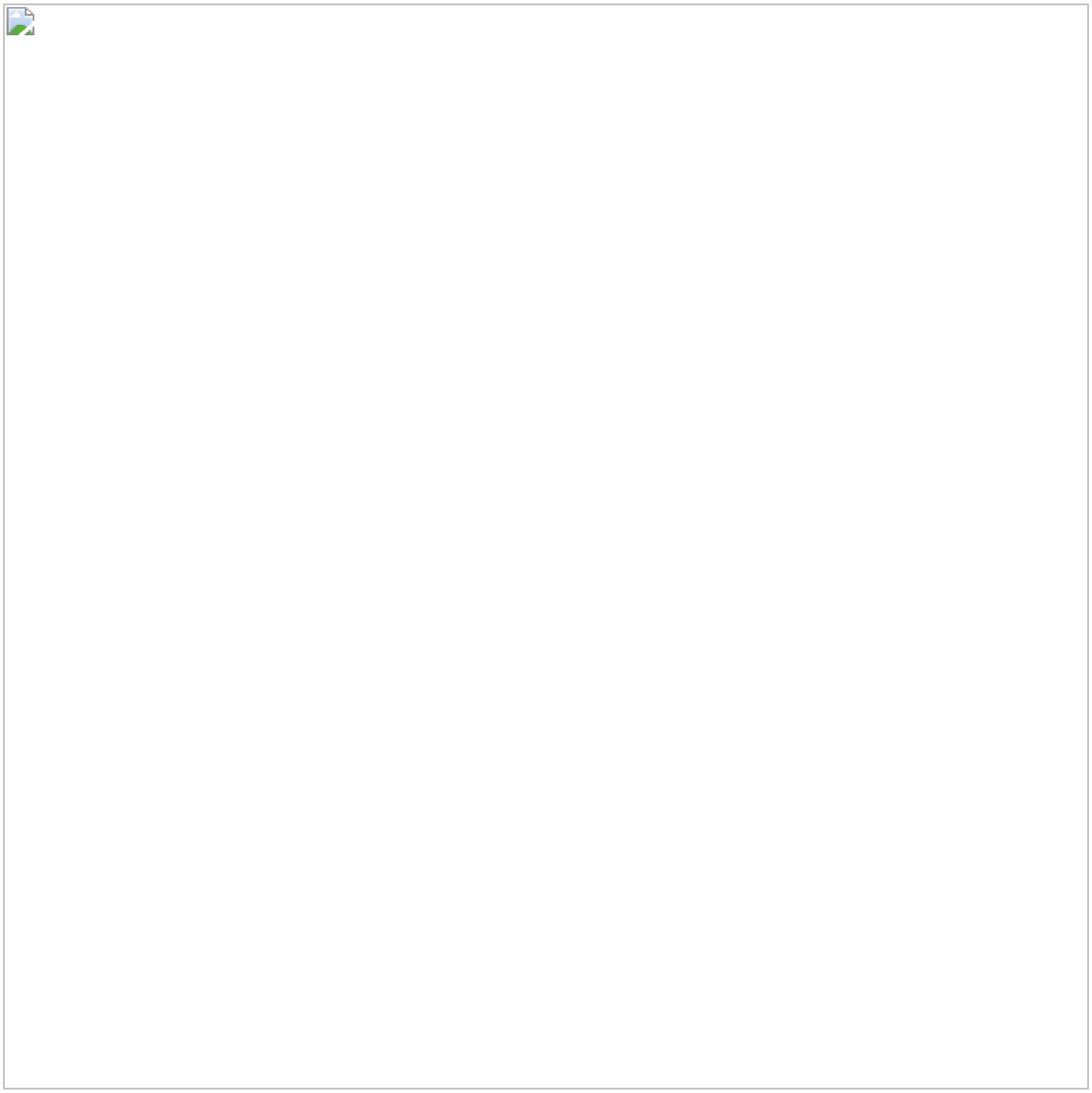
```
`sysmon` EventCode=11 file_name IN ("*\.txt","*\.html","*\.hta") |bin _time
  span=10s | stats min(_time) as firstTime max(_time) as lastTime dc(TargetFilename)
  as unique_readme_path_count values(TargetFilename) as list_of_readme_path by
Computer
  Image file_name | where unique_readme_path_count >= 15 |
`security_content_ctime(firstTime)`
  | `security_content_ctime(lastTime)`
```



New detections:

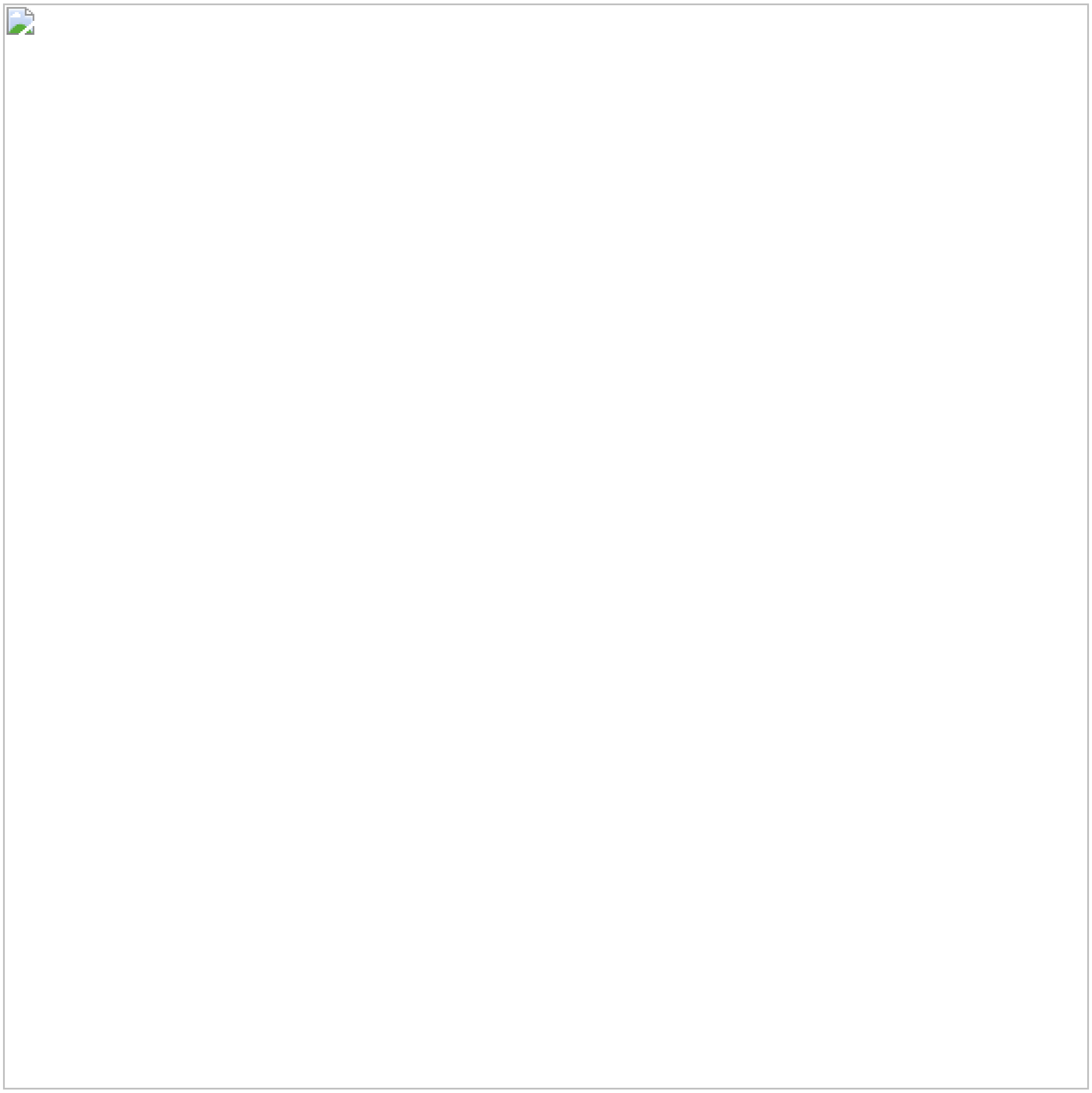
Delete Shadow copy with Powershell (Detects deletion of shadow copy)

```
powershell` EventCode=4104 Message= "*ShadowCopy*" Message = "*Delete*"
  stats count min(_time) as firstTime max(_time) as lastTime by EventCode Message
ComputerName User
  | `security_content_ctime(firstTime)`
  | `security_content_ctime(lastTime)`
```



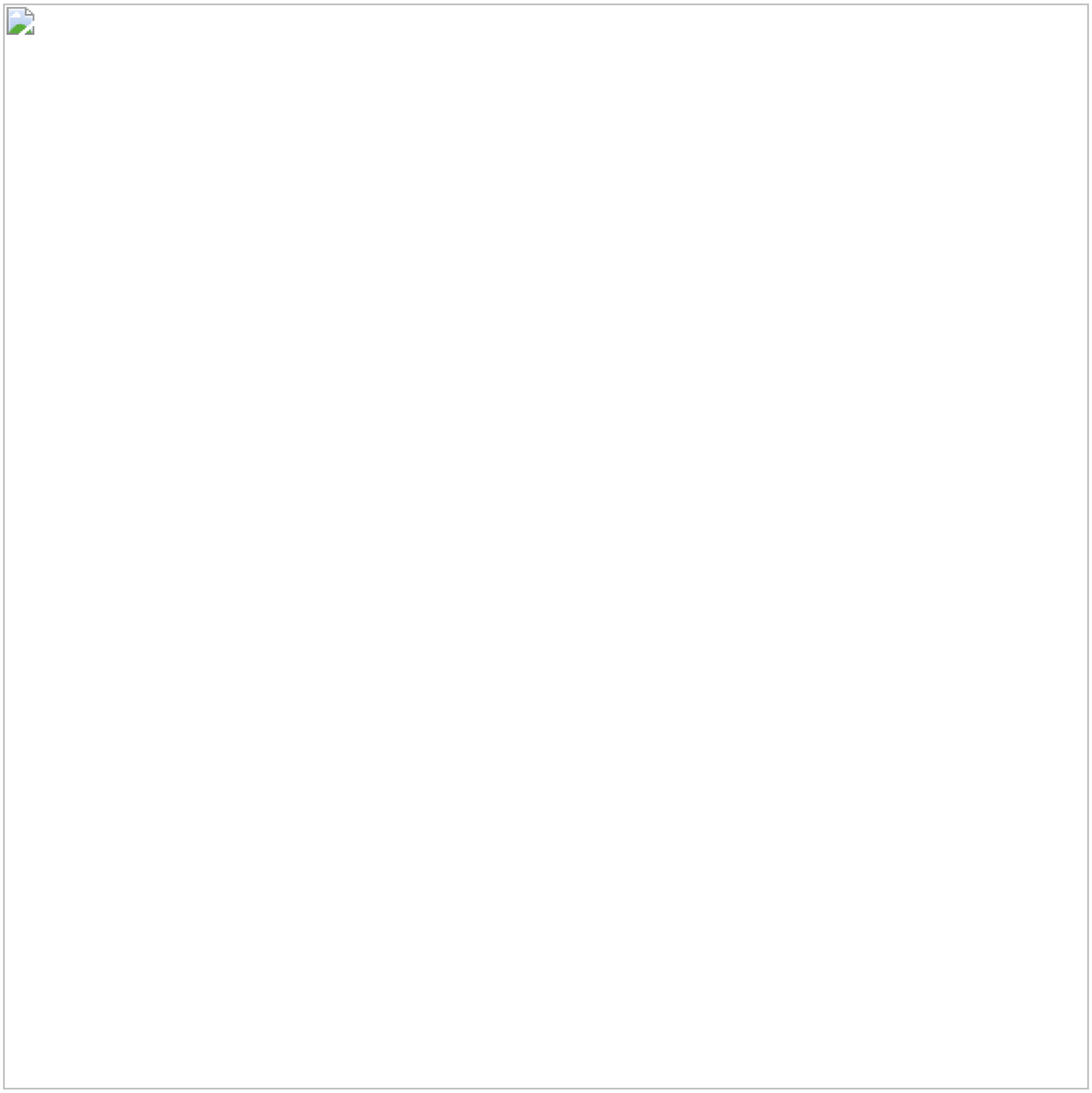
CMLUA or CMSTPLUA UAC bypass (Detects privilege escalation)

```
`sysmon` EventCode=7  ImageLoaded IN ("*\\CMLUA.dll", "*\\CMSTPLUA.dll",
"*\\CMLUAUTIL.dll") NOT(process_name IN("CMSTP.exe", "CMMGR32.exe"))
  NOT(Image IN("*\\windows\\*", "*\\program files*"))
  | stats count min(_time) as firstTime max(_time) as lastTime by Image ImageLoaded
process_name Computer EventCode Signed ProcessId
  | `security_content_ctime(firstTime)`
  | `security_content_ctime(lastTime)`
```



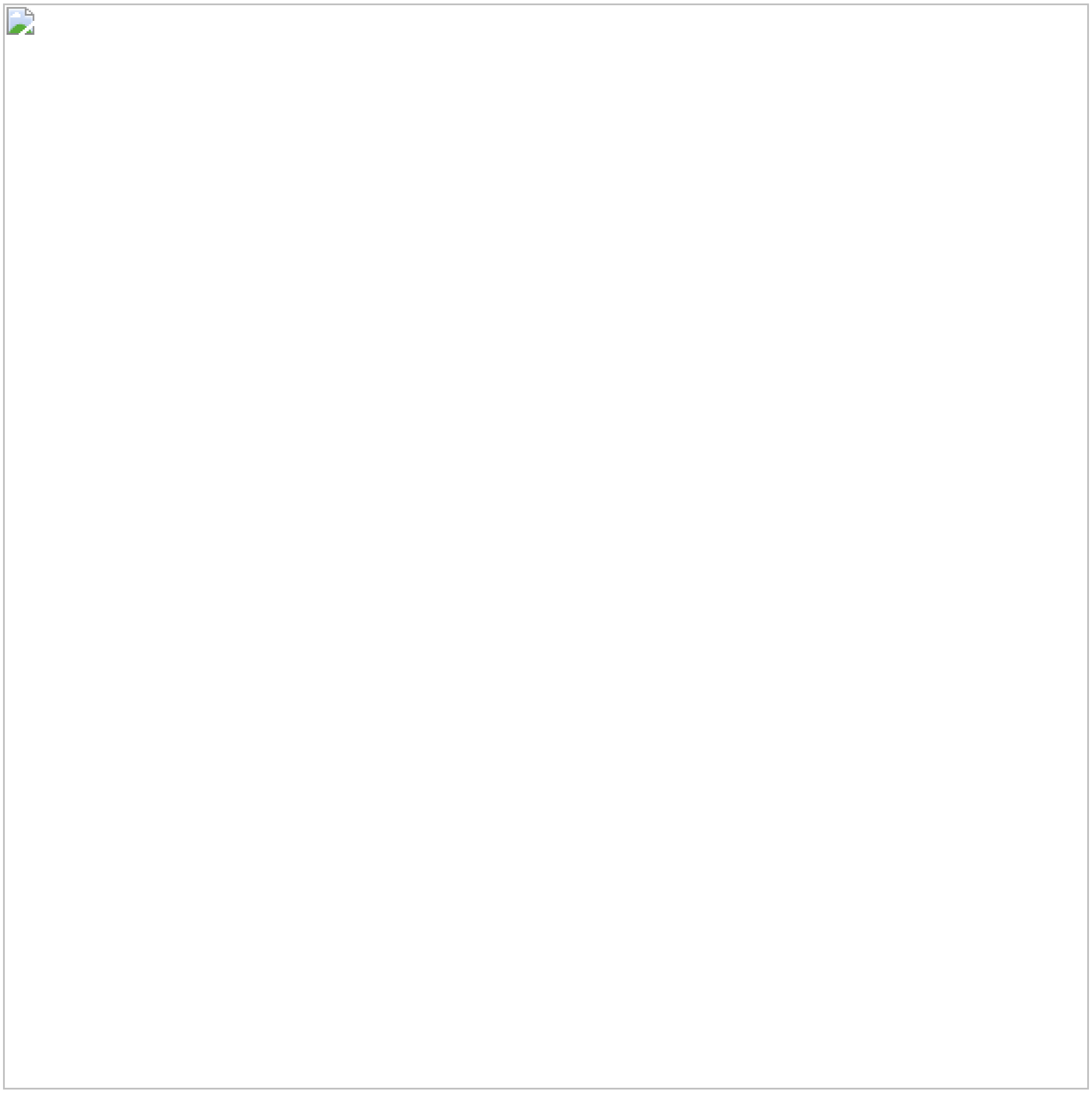
Detect RClone Command-Line Usage

```
| tstats `security_content_summariesonly` count min(_time) as firstTime
  max(_time) as lastTime from datamodel=Endpoint.Processes where Processes.process
IN ("*copy*", "*mega*", "*pcloud*", "*ftp*", "*--config*", "*--progress*", "*--no-
check-certificate*", "*--ignore-existing*", "*--auto-confirm*", "*--transfers*", "*-
-multi-thread-streams*")  by Processes.dest Processes.user Processes.parent_process
Processes.process_name
  Processes.process   Processes.process_id Processes.parent_process_id
  | `drop_dm_object_name(Processes)` | `security_content_ctime(firstTime)`|
`security_content_ctime(lastTime)`
```



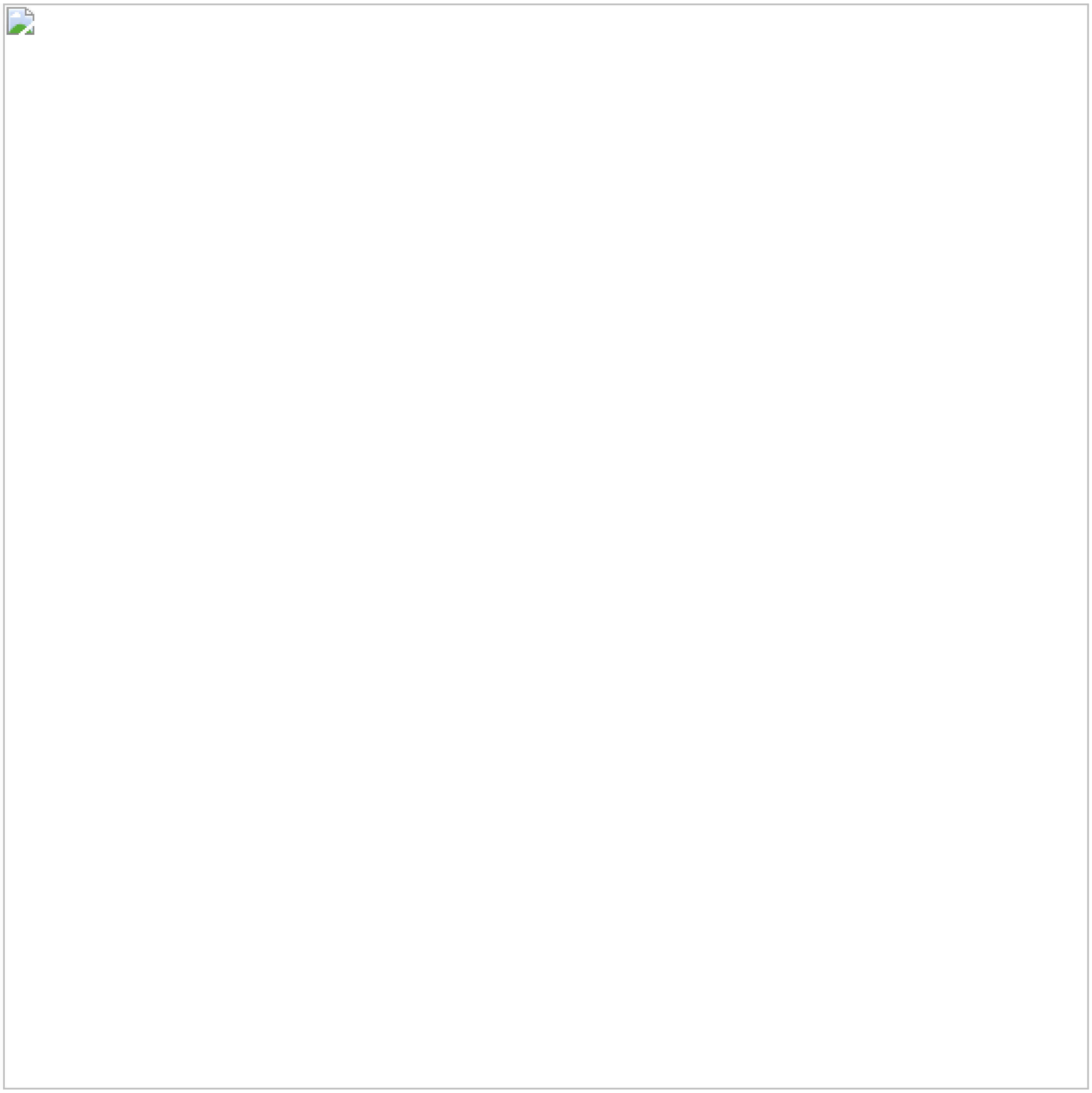
Detect Renamed RClone

```
`sysmon` EventID=1 OriginalFileName=rclone.exe NOT process_name=rclone.exe | stats
  count min(_time) as firstTime max(_time) as lastTime by Computer, User,
parent_process_name,
  process_name, OriginalFileName, process_path, CommandLine | rename Computer as
dest
  | `security_content_ctime(firstTime)` | `security_content_ctime(lastTime)`
```



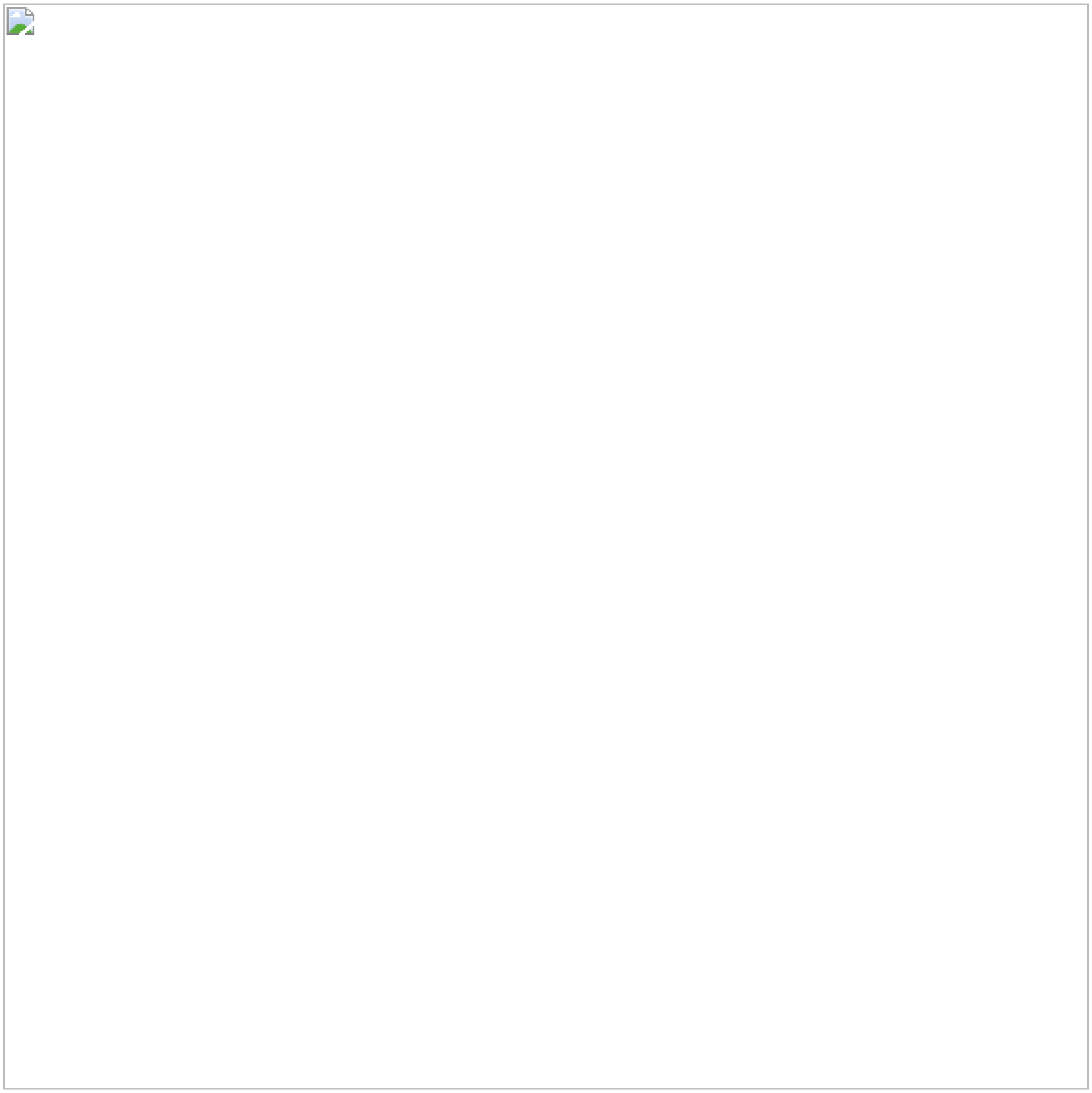
Extract SAM from Registry

```
| tstats `security_content_summariesonly` count min(_time) as firstTime max(_time)

  as lastTime from datamodel=Endpoint.Processes where Processes.process_name=reg.exe
(Processes.process=*save* OR Processes.process=*export*) AND
(Processes.process=*sam* OR Processes.process=*system* OR
Processes.process=*security*) by Processes.dest Processes.user
Processes.parent_process Processes.process_name Processes.process
Processes.process_id Processes.parent_process_id

  | `drop_dm_object_name(Processes)`

  | `security_content_ctime(firstTime)`

  | `security_content_ctime(lastTime)`
```



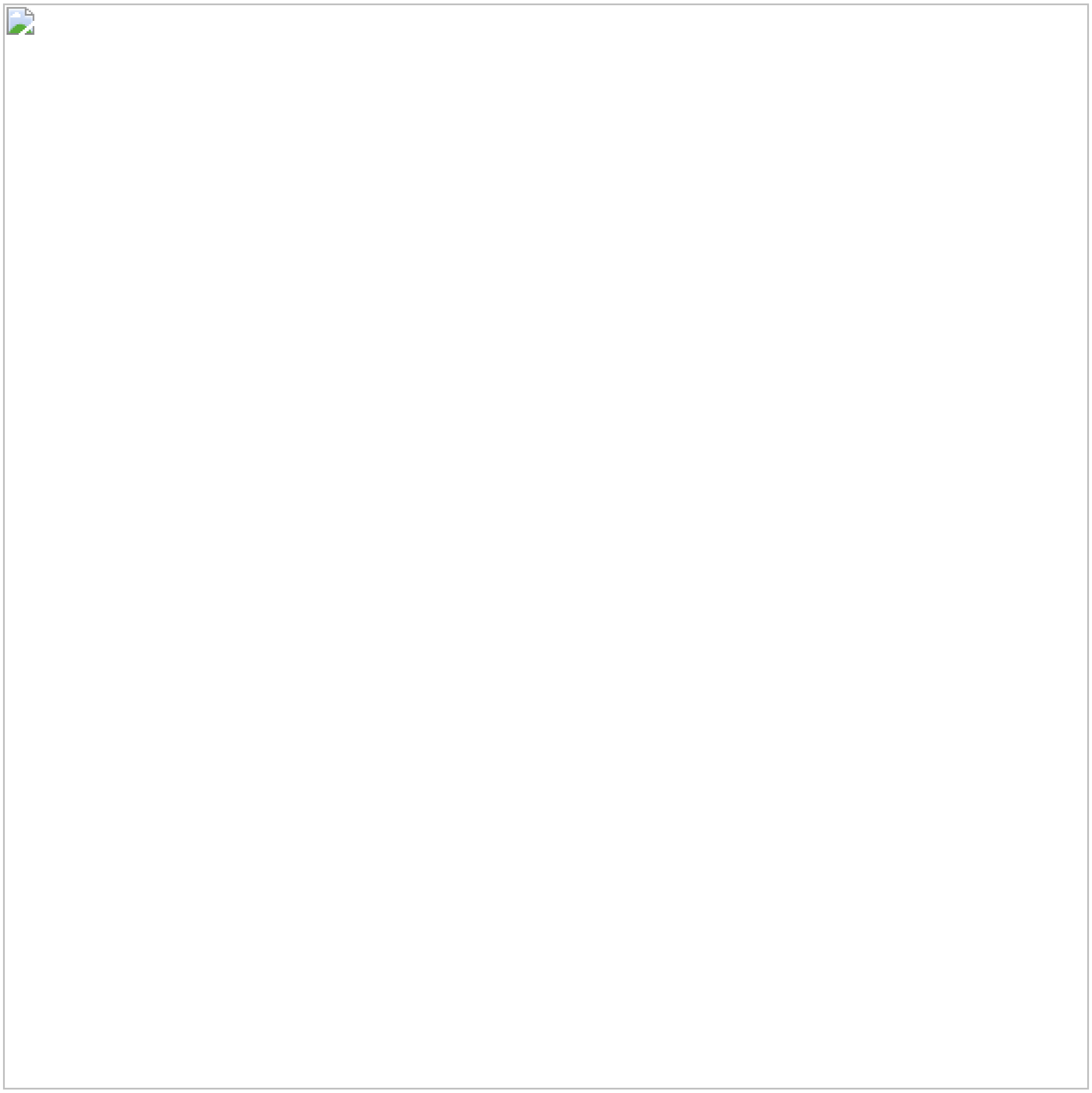
SLUI RunAs Elevated

```
| tstats `security_content_summariesonly` count min(_time) as firstTime max(_time)

  as lastTime from datamodel=Endpoint.Processes where
Processes.process_name=slui.exe

  (Processes.process=*-verb* Processes.process=*runas*) by Processes.dest

  Processes.user Processes.parent_process Processes.process_name Processes.process

  Processes.process_id Processes.parent_process_id |
`drop_dm_object_name(Processes)`

  | `security_content_ctime(firstTime)`| `security_content_ctime(lastTime)`
```



SLUI Spawning a Process

```
| tstats `security_content_summariesonly` count min(_time) as firstTime max(_time)

  as lastTime from datamodel=Endpoint.Processes where
Processes.parent_process_name=slui.exe

  (Processes.process_name!=*slui* OR Processes.process_name=!firefox.exe OR
Processes.process_name!=chrome.exe OR Processes.process_name!=iexplore.exe OR
Processes.process_name!=msedge.exe) by Processes.dest

  Processes.user Processes.parent_process Processes.process_name Processes.process

  Processes.process_id Processes.parent_process_id |
`drop_dm_object_name(Processes)`

  | `security_content_ctime(firstTime)`| `security_content_ctime(lastTime)`
```



Detection	Technique ID	Tactic(s)	Notes
Ransomware Notes bulk creation	T1486	Impact	Detects bulk creation of ransomware notes
High Process Termination Frequency	T1486	Impact	Detects high frequency of process termination, associated with ransomware execution

CertUtil Download With URLCache and Split Arguments	T1105	Command And Control	Detects Download files by using Certutils
Any Powershell DownloadFile	T1059.001	Execution	Detects download file using PowerShell
Malicious PowerShell Process - Execution Policy Bypass	T1059.001	Execution	Detects PowerShell processes started with parameters used to bypass the local execution policy for scripts.
Process Deleting Its Process File Path	T1070.004	Impact	Detects process deleting its related process file path.
CMLUA Or CMSTPLUA UAC Bypass (New)	T1218.003	Defense Evasion	Detects a UAC Bypassed using cmstp and cmlua com object.
Extract SAM from Registry (New)	T1003.002	Credential Dumping	Detections the use of reg.exe extracting SAM from the registry.
SLUI RunAs Elevated (New)	T1548.002	Privilege Escalation	Detects the usage of SLUI.exe with the verb RunAs used to elevate permissions.
SLUI Spawning a Process (New)	T1548.002	Privilege Escalation	Detects SLUI.exe spawning a process, indicative of UAC Bypass.
Detect Renamed RClone (New)	T1020	Exfiltration	Detects the usage of rclone.exe renamed.
Detect RClone Command-Line Usage (New)	T1020	Exfiltration	Detects common command-line arguments used by Rclone.exe.
Cobalt Strike (Story)	Several	Several	

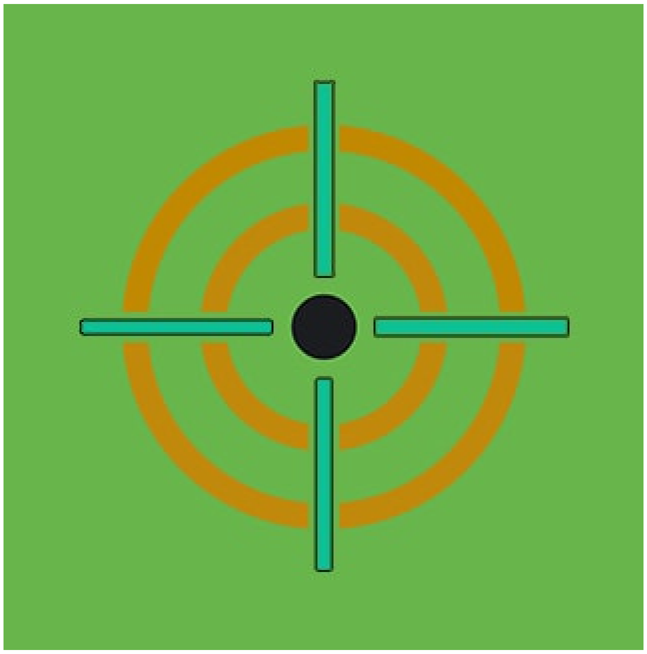
Hashes:

Sample A:
Sha1: 03c1f7458f3983c03a0f8124a01891242c3cc5df
Sha256: 6931b124d38d52bd7cdef48121fda457d407b63b59bb4e6ead4ce548f4bbb971

Sample B:
Sha1: d1dfe82775c1d698dd7861d6dfa1352a74551d35
Sha256: 9cee5522a7ca2bfca7cd3d9daba23e9a30deb6205f56c12045839075f7627297

About the Splunk Threat Research Team

The Splunk Threat Research Team will continue updating our detection content and addressing the threat of ransomware payloads as these campaigns continue affecting different verticals, especially those involving critical infrastructure. For our newest content please download Splunk Security Essentials, Splunk ES Content Update application, or visit Splunk Threat Research page.



Posted by

Splunk Threat Research Team

The Splunk Threat Research Team is an active part of a customer's overall defense strategy by enhancing Splunk security offerings with verified research and security content such as use cases, detection searches, and playbooks. We help security teams around the globe strengthen operations by providing tactical guidance and insights to detect, investigate and respond against the latest threats. The Splunk Threat Research Team focuses on understanding how threats, actors, and vulnerabilities work, and the team replicates attacks which are stored as datasets in the Attack Data repository.

Our goal is to provide security teams with research they can leverage in their day to day operations and to become the industry standard for SIEM detections. We are a team of industry-recognized experts who are encouraged to improve the security industry by sharing our work with the community via conference talks, open-sourcing projects, and writing white papers or blogs. You will also find us presenting our research at conferences such as Defcon, Blackhat, RSA, and many more.

Read more Splunk Security Content.