SOC AUTOMATION PROJECT

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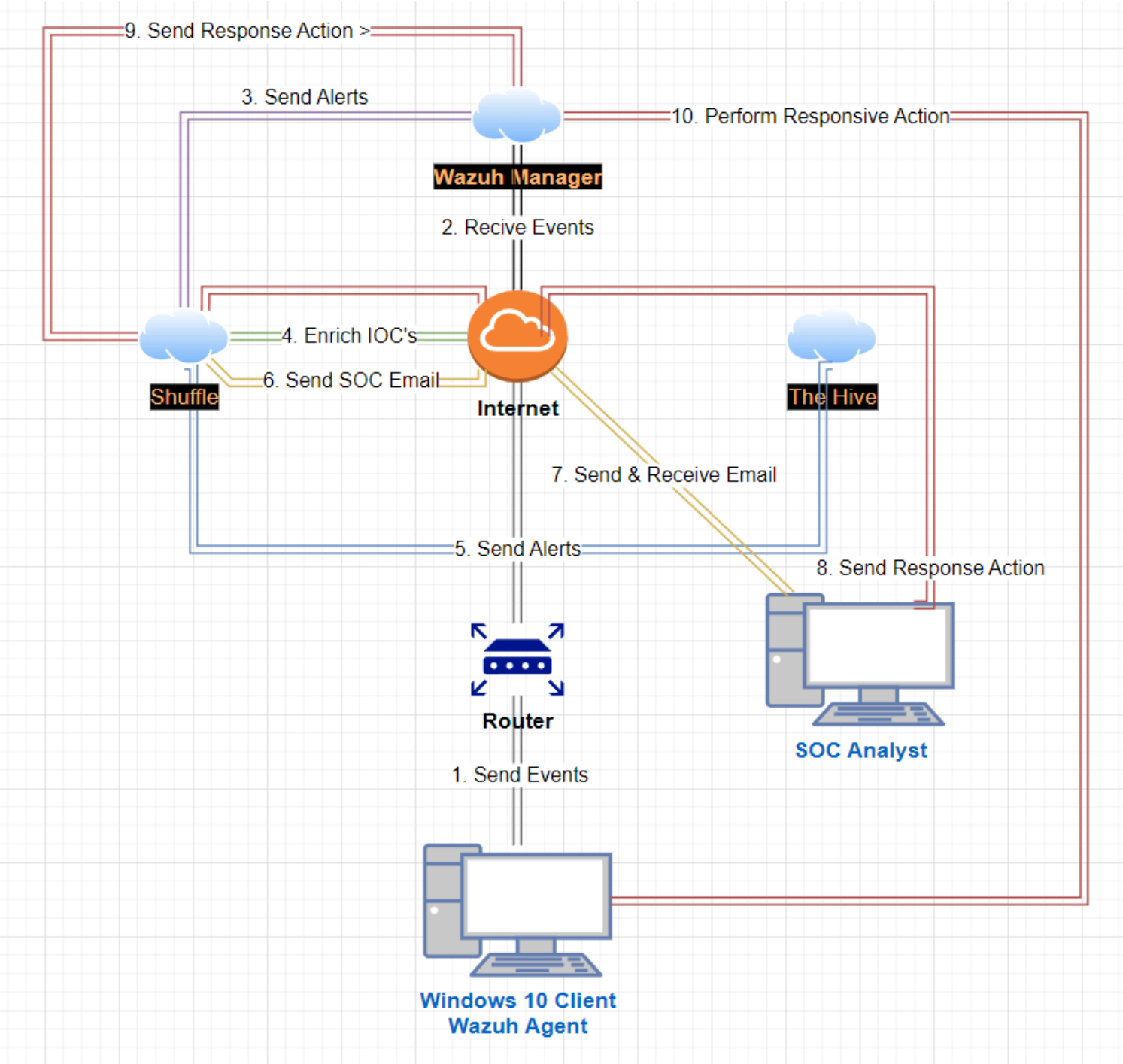
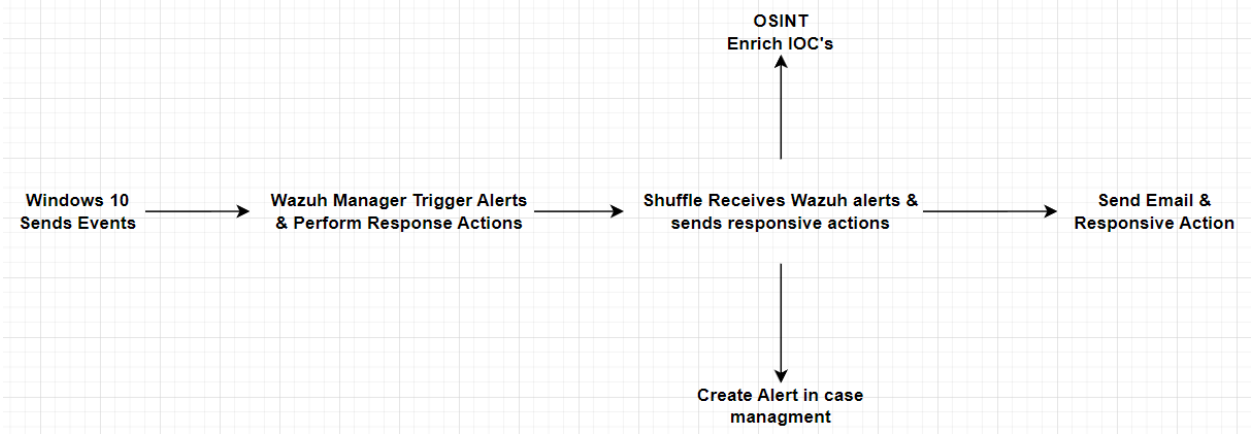
wazuh. Shuffle TheHive

Project Diagram





By the end of this SOC Automation Project, I'm going to have a fully functional live telemetry ingesting/digesting lab while implementing automation & orchestration

I'll be using:

- Wazuh (SIEM/XDR)

- Shuffle (SOAR)

- The Hive (CaseManagmentSystem)

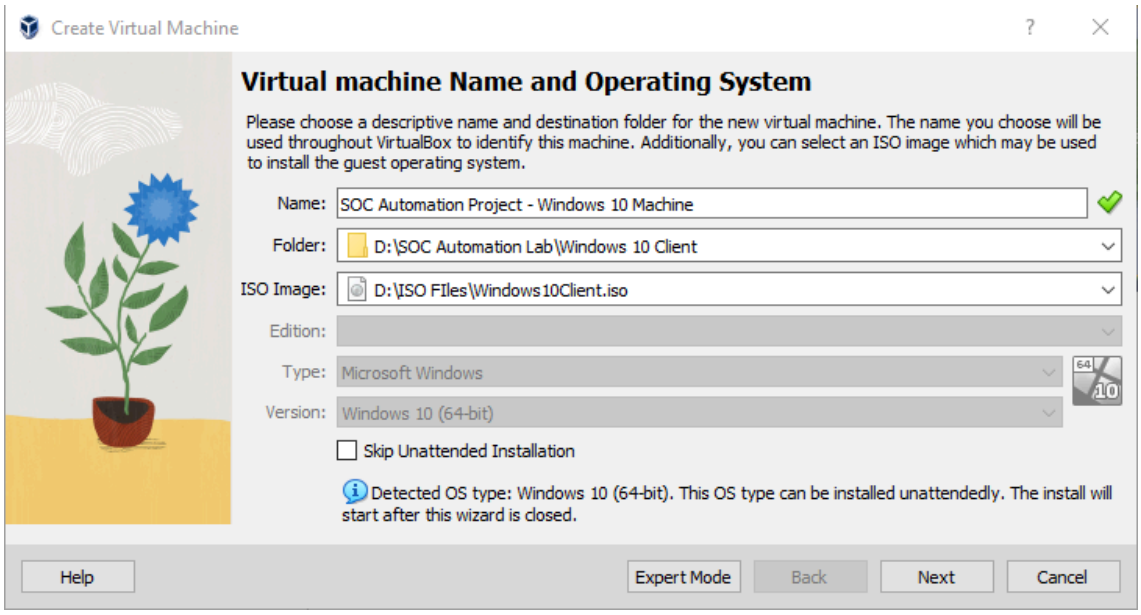
While sending alerts in real time to the SOC analyst via email

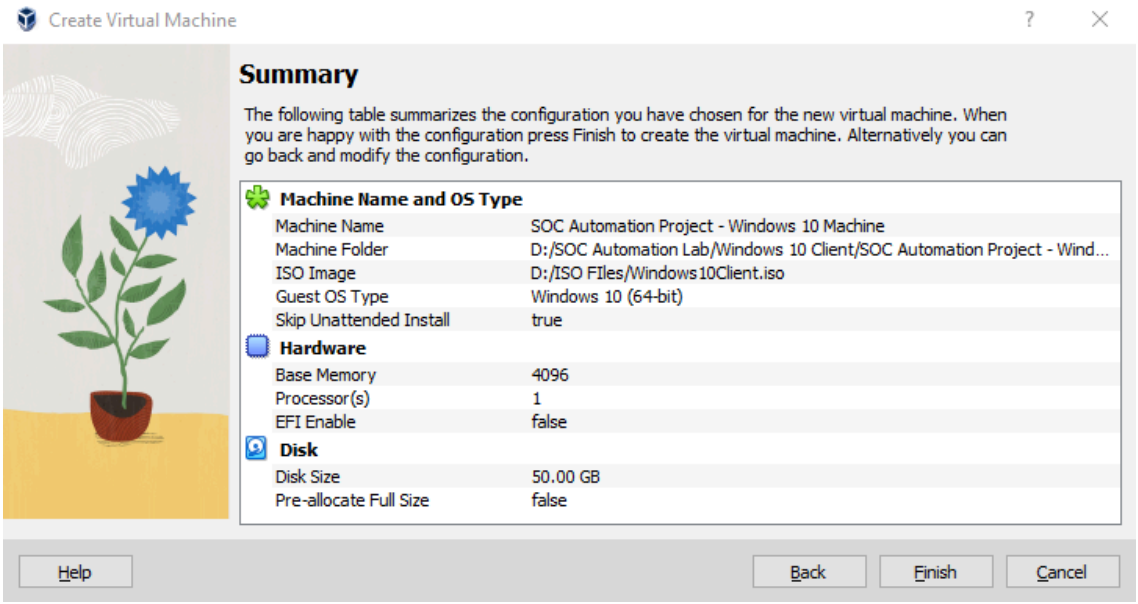
I'll also do live testing and creating custom Wazuh rules using the Mimikatz penetration testing tool & Investigating Sysmon logs

Part 1: Setting up VMs

- Windows 10 w/Sysmon
- Wazuh Server (SIEM/XDR)
- TheHive Server (IR Platform)

I'll start with the Windows 10 Client w/Sysmon using VirtualBox, this will act as the Wazuh Agent





I'll be using the Olaf Hartong Sysmon Modular config file from

https://github.com/olafhartong/sysmon-modular/blob/master/sysmonconfig.xml

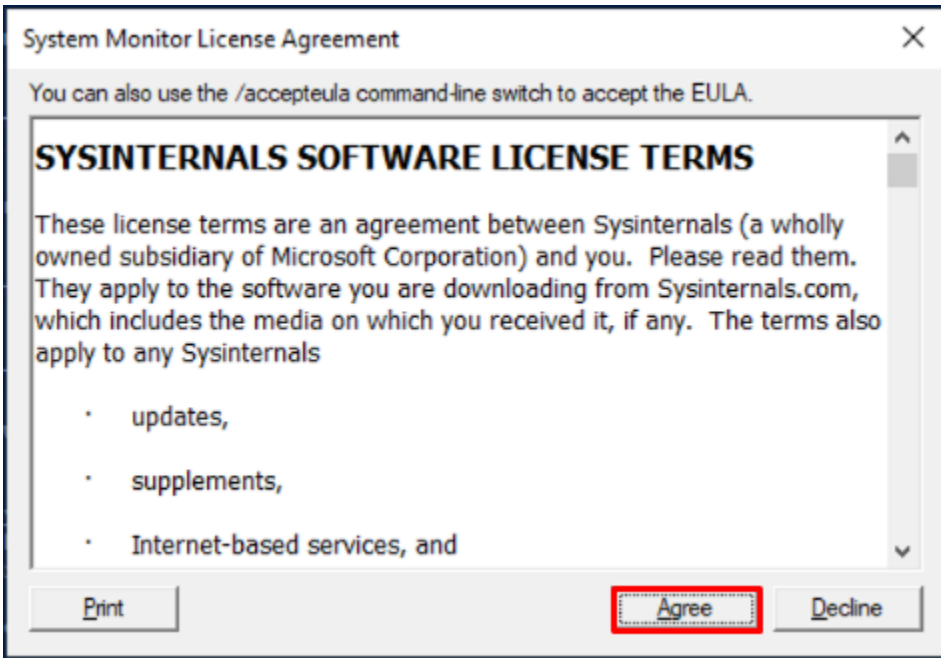
```
  ____                                                    __     __
 / __/__ _________ __  ___  ___       ___ __  ___  ___/ /_  __/ /__ _____
 \__ \/ / / / __/ __`__ \/ __ \/ __ \_____/ __`__ \/ __ \/ __  / / / / / __`/ __/
___/ / /_/ (__  ) / / / / / /_/ / / / /____/ / / / / / /_/ / /_/ / /_/ / / /_/ / /
/____/\__, /____/_/ /_/ /_/\____/_/ /_/    /_/ /_/ /_/\____/\__,_/\__,_/_/\__,_/_/
    /____/

                                                                  by Olaf Hartong
```

Running PowerShell with admin privileges to install

```
PS C:\Users\WazuhAgent\Downloads\Sysmon> dir


    Directory: C:\Users\WazuhAgent\Downloads\Sysmon


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         8/17/2024   1:02 AM           7490 Eula.txt
-a----         8/17/2024   1:02 AM        8480560 Sysmon.exe
-a----         8/17/2024   1:02 AM        4563248 Sysmon64.exe
-a----         8/17/2024   1:02 AM        4993440 Sysmon64a.exe
-a----         8/17/2024   1:06 AM         253169 sysmonconfig.xml


PS C:\Users\WazuhAgent\Downloads\Sysmon> .\Sysmon64.exe


System Monitor v15.15 - System activity monitor
By Mark Russinovich and Thomas Garnier
Copyright (C) 2014-2024 Microsoft Corporation
Using libxml2. libxml2 is Copyright (C) 1998-2012 Daniel Veillard.
Sysinternals - www.sysinternals.com

Usage:
Install:                  Sysmon64.exe -i [<configfile>]
Update configuration:     Sysmon64.exe -c [<configfile>]
Install event manifest:   Sysmon64.exe -m
Print schema:             Sysmon64.exe -s
Uninstall:                Sysmon64.exe -u [force]
```

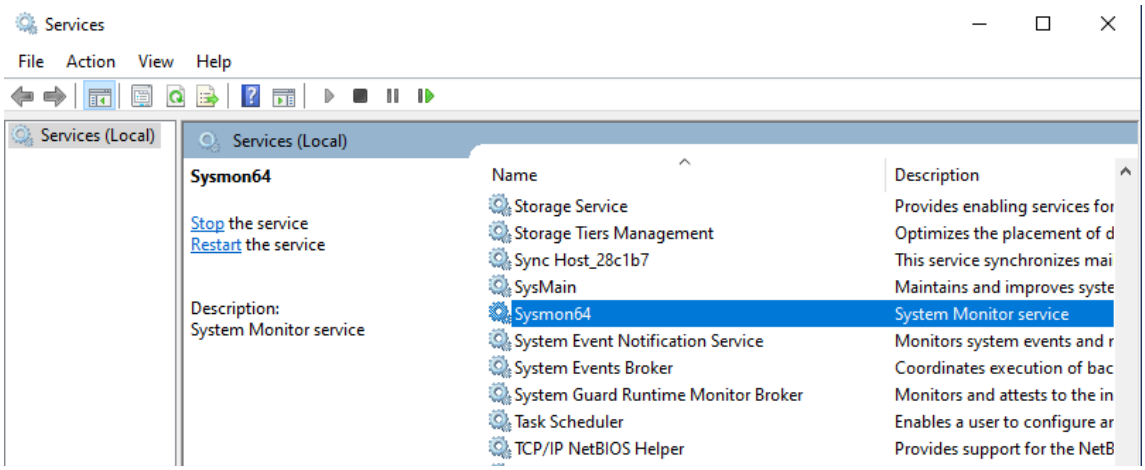
Making sure the right configurations are installed

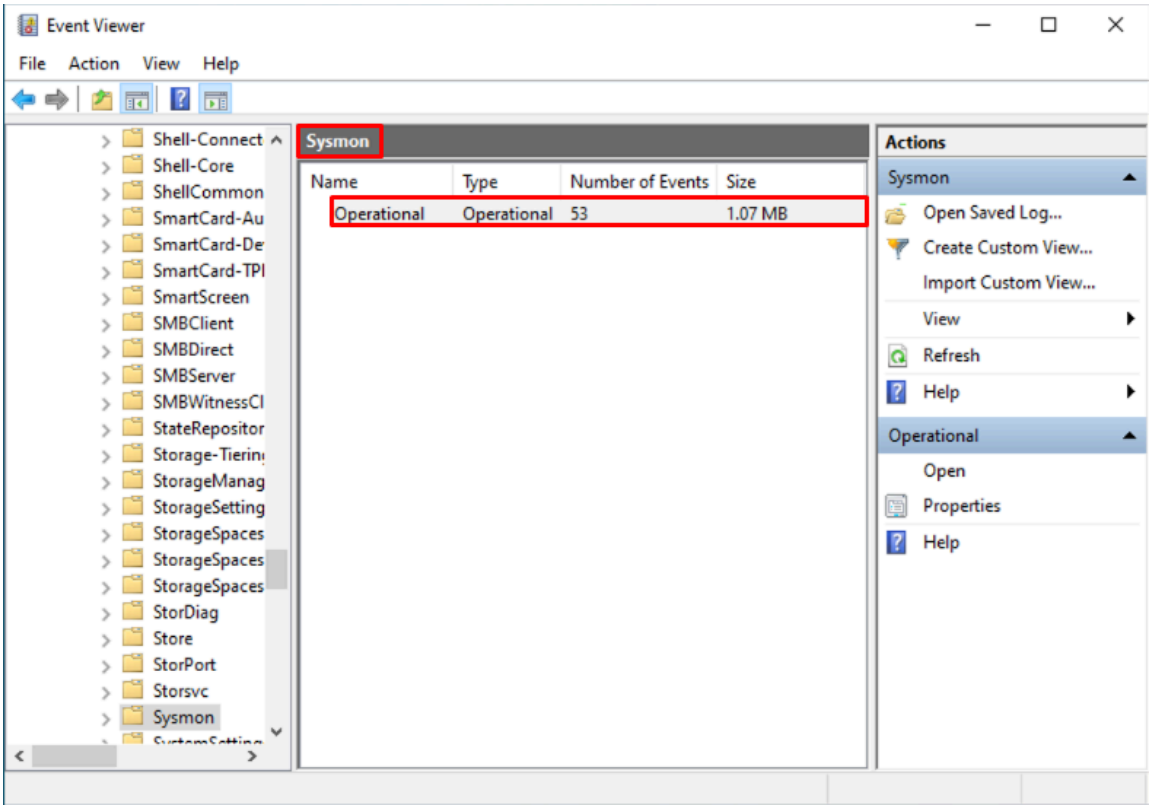
```
PS C:\Users\WazuhAgent\Downloads\Sysmon> .\Sysmon64.exe -i .\symonconfig.xml
```




```
Loading configuration file with schema version 4.90
Configuration file validated.
Sysmon64 installed.
SysmonDrv installed.
Starting SysmonDrv.
SysmonDrv started.
Starting Sysmon64..
Sysmon64 started.
PS C:\Users\WazuhAgent\Downloads\Sysmon>
```

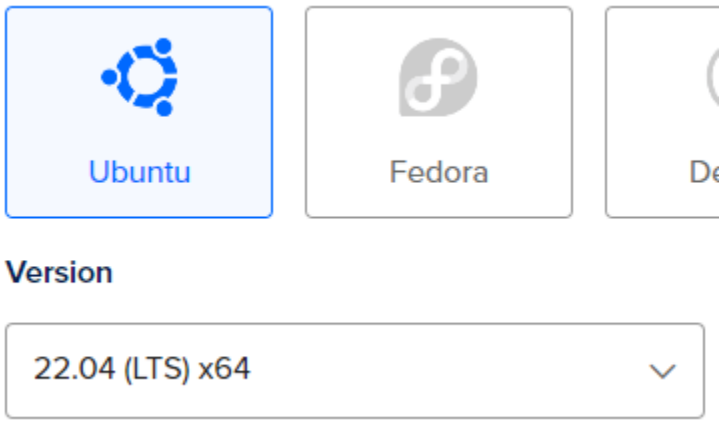
I'll make sure that Sysmon is up and running, by checking EventViewer & Services





Now that I have my Windows Client machine installed along with Sysmon, I'll start installing the Wazuh Server

I'll be using Digital Ocean, which is a cloud infrastructure provider, I'll use Ubunto 22.04



I'll configure the firewall first, I'll be blocking all inbound TCP/UDP traffic except for my personal Lab network

Name
SOC-Automation-Lab-Firewall

Inbound Rules

Set the Firewall rules for incoming traffic. Only the specified ports will accept inbound connections. All other traffi

Type	Protocol	Port Range	Sources
All TCP	TCP	All ports	[redacted]
All UDP	UDP	All ports	[redacted]
ICMP	ICMP		[redacted]

I'll link the firewall rules to the Wazuh-Server

SOC-Automation-Lab-Firewall
6 Rules / 1 Droplet

Rules Droplets Destroy

Learn

Add Droplets

Name	IP Address	State	Added	
Wazuh-Server 8 GB / 2 Intel vCPUs / 160 GB / FRA1	[redacted]	Up-to-date	Just now	More

I'll use [PuTTy]() for my SSH to IaaS Cloud connection

```
root@Wazuh-Server: ~
login as: root
root@[redacted] password:
Access denied
root@[redacted] password:
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-113-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Sat Aug 17 10:09:58 UTC 2024

  System load:  0.0                Processes:             101
  Usage of /:   1.1% of 154.88GB   Users logged in:       0
  Memory usage: 2%                 IPv4 address for eth0: [redacted]
  Swap usage:   0%                 IPv4 address for eth0: [redacted]

Expanded Security Maintenance for Applications is not enabled.

39 updates can be applied immediately.
29 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
```

I'll start by updating and upgrading

```
root@Wazuh-Server:~# dir
snap
root@Wazuh-Server:~# apt-get update && apt-get upgrade -y
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:2 http://mirrors.digitalocean.com/ubuntu jammy InRelease
Hit:3 https://repos-droplet.digitalocean.com/apt/droplet-agent main InRelease
Hit:4 http://mirrors.digitalocean.com/ubuntu jammy-updates InRelease
Hit:5 http://mirrors.digitalocean.com/ubuntu jammy-backports InRelease
Fetched 129 kB in 4s (36.2 kB/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
```

Using this curl command, I'll install Wazuh 4.7

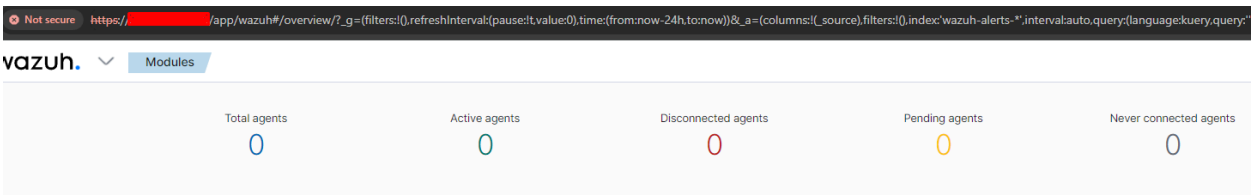
```
root@Wazuh-Server:~#
root@Wazuh-Server:~#
root@Wazuh-Server:~#
root@Wazuh-Server:~# curl -sO https://packages.wazuh.com/4.7/wazuh-install.sh &&
 sudo bash ./wazuh-install.sh -a
17/08/2024 10:34:10 INFO: Starting Wazuh installation assistant. Wazuh version:
4.7.5
17/08/2024 10:34:10 INFO: Verbose logging redirected to /var/log/wazuh-install.l
```

Post installation, I've received a Username & Password for the Wazuh dashboard

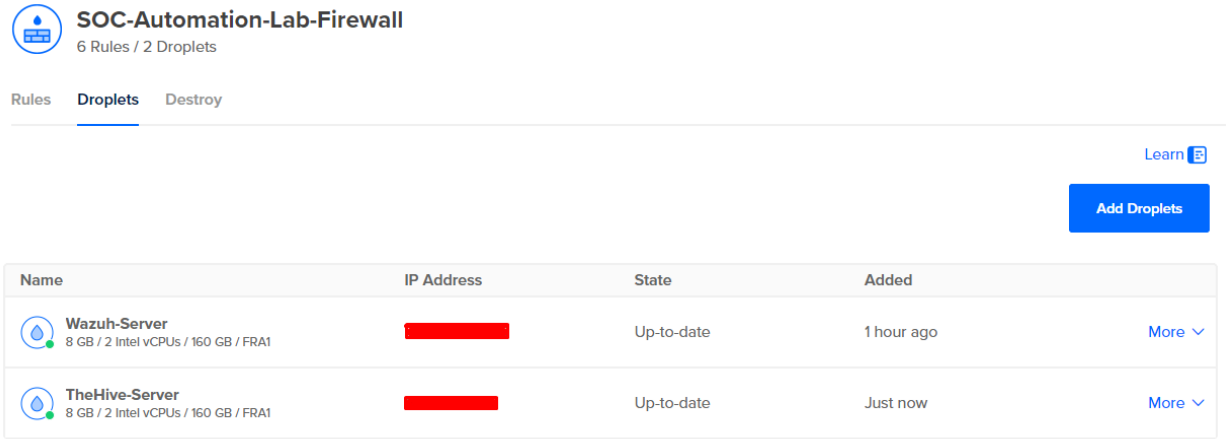
```
17/08/2024 10:38:49 INFO: Initializing Wazuh dashboard web application.
17/08/2024 10:38:49 INFO: Wazuh dashboard web application initialized.
17/08/2024 10:38:49 INFO: --- Summary ---
17/08/2024 10:38:49 INFO: You can access the web interface https://<wazuh-dashboard-ip>:443
    User: [redacted]
    Password: [redacted]
17/08/2024 10:38:49 INFO: Installation finished
root@Wazuh-Server:~#
```

Now I can log in into the dashboard of my Wazuh Server

After entering the credentials I was provided, I'm able to use the Wazuh dashboard using the public IP address of my Wazuh server



Next I'll repeat the same process for TheHive Server, and I will apply the firewall rules to it



Before installing the TheHive I’ll be installing needed dependencies, I’ll also be installing Java/Cassandra/ElasticSearch as prerequisites

Installing Dependencies:
CommandLine:

```
Dependences
apt install wget gnupg apt-transport-https git ca-certificates ca-certificates-java curl  software-properties-common python3-pip lsb-release
```

```
root@TheHive-Server:~#
root@TheHive-Server:~# apt install wget gnupg apt-transport-https git ca-certificates ca-certificates-java curl  software-properties-common python3-pip lsb-release
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lsb-release is already the newest version (11.1.0ubuntu4).
lsb-release set to manually installed.
ca-certificates is already the newest version (20230311ubuntu0.22.04.1).
git is already the newest version (1:2.34.1-1ubuntu1.11).
```

Installing Java
CommandLine:

```
wget -qO- https://apt.corretto.aws/corretto.key | sudo gpg --dearmor  -o /usr/share/keyrings/corretto.gpg
echo "deb [signed-by=/usr/share/keyrings/corretto.gpg] https://apt.corretto.aws stable main" |  sudo tee -a /etc/apt/sources.list.d/corretto.sources.list
sudo apt update
sudo apt install java-common java-11-amazon-corretto-jdk
echo JAVA_HOME="/usr/lib/jvm/java-11-amazon-corretto" | sudo tee -a /etc/environment
export JAVA_HOME="/usr/lib/jvm/java-11-amazon-corretto"
```

```
root@TheHive-Server:~#
root@TheHive-Server:~#
root@TheHive-Server:~# wget -qO- https://apt.corretto.aws/corretto.key | sudo gpg --dearmor  -o /usr/share/keyrings/corretto.gpg
echo "deb [signed-by=/usr/share/keyrings/corretto.gpg] https://apt.corretto.aws stable main" |  sudo tee -a /etc/apt/sources.list.d/corretto.sources.list
sudo apt update
sudo apt install java-common java-11-amazon-corretto-jdk
echo JAVA_HOME="/usr/lib/jvm/java-11-amazon-corretto" | sudo tee -a /etc/environment
export JAVA_HOME="/usr/lib/jvm/java-11-amazon-corretto"
```

Installing Casandra CommandLine:

```
wget -qO -  https://downloads.apache.org/cassandra/KEYS | sudo gpg --dearmor  -o /usr/share/keyrings/cassandra-archive.gpg
echo "deb [signed-by=/usr/share/keyrings/cassandra-archive.gpg] https://debian.cassandra.apache.org 40x main" |  sudo tee -a /etc/apt/sources.list.d/cassandra.sources.list
sudo apt update
sudo apt install cassandra
```

```
After this operation, 57.4 MB of additional disk space will be used.
Get:1 https://apache.jfrog.io/artifactory/cassandra-deb 40x/main amd64 cassandra all 4.0.13 [46.6 MB]
Fetched 46.6 MB in 7s (6585 kB/s)
Selecting previously unselected package cassandra.
(Reading database ... 72736 files and directories currently installed.)
Preparing to unpack .../cassandra_4.0.13_all.deb ...
Unpacking cassandra (4.0.13) ...
Setting up cassandra (4.0.13) ...
Adding group `cassandra' (GID 121) ...
```

Installing ElasticSearch CommandLine:

```
wget -qO - https://artifacts.elastic.co/GPG-KEY-elasticsearch |  sudo gpg --dearmor -o /usr/share/keyrings/elasticsearch-keyring.gpg
sudo apt-get install apt-transport-https
echo "deb [signed-by=/usr/share/keyrings/elasticsearch-keyring.gpg] https://artifacts.elastic.co/packages/7.x/apt stable main" |  sudo tee /etc/apt/sources.list.d/elastic-7.x.list
sudo apt update
sudo apt install elasticsearch
```

```
(Reading database ... 72905 files and directories currently installed.)
Preparing to unpack .../elasticsearch_7.17.23_amd64.deb ...
Creating elasticsearch group... OK
Creating elasticsearch user... OK
Unpacking elasticsearch (7.17.23) ...
Setting up elasticsearch (7.17.23) ...
```

Installing TheHive

CommandLine:

```
wget -O- https://archives.strangebee.com/keys/strangebee.gpg | sudo gpg --dearmor -o /usr/share/keyrings/strangebee-archive-keyring.gpg
echo 'deb [signed-by=/usr/share/keyrings/strangebee-archive-keyring.gpg] https://deb.strangebee.com thehive-5.2 main' | sudo tee -a /etc/apt/sources.list.d/strangebee.list
sudo apt-get update
sudo apt-get install -y thehive
```

```
root@TheHive-Server:~# wget -O- https://archives.strangebee.com/keys/strangebee.
gpg | sudo gpg --dearmor -o /usr/share/keyrings/strangebee-archive-keyring.gpg
echo 'deb [signed-by=/usr/share/keyrings/strangebee-archive-keyring.gpg] https:/
/deb.strangebee.com thehive-5.2 main' | sudo tee -a /etc/apt/sources.list.d/stra
ngebee.list
sudo apt-get update
sudo apt-get install -y thehive
--2024-08-17 13:14:21--  https://archives.strangebee.com/keys/strangebee.gpg
Resolving archives.strangebee.com (archives.strangebee.com)... 5.196.134.251
Connecting to archives.strangebee.com (archives.strangebee.com)|5.196.134.251|:4
43... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3179 (3.1K) [text/plain]
Saving to: 'STDOUT'

-                   100%[===================>]   3.10K  --.-KB/s    in 0s
```

Part 2: Configurations

- Configure TheHive Server
- Configure The Wazuh Server
- Configure Windows 10 Reporting to Wazuh Server

I'll begin with configuring the Cassandra.yaml File

Using the nano command

```
root@TheHive-Server:~# nano /etc/cassandra/
cassandra-env.sh                cassandra.yaml                  hotspot_compiler
cassandra-rackdc.properties     commitlog_archiving.properties  jvm-clients.options
cassandra-topology.properties   cqlshrc.sample                   jvm-server.options
root@TheHive-Server:~# nano /etc/cassandra/cassandra.yaml
  GNU nano 6.2

# Cassandra storage config YAML
```

I'll change the Cluster name to "SocAutoLab"

```
# The name of the cluster. This is mainly used to prevent machines in
# one logical cluster from joining another.
cluster_name: 'SocAutoLab'
```

And I'll change the Listen Address to the public IP address of TheHive Server

```
# Setting listen_address to 0.0.0.0 is always wrong.
#
listen_address:

# Set listen_address OR listen_interface, not both. Interfaces must correspond
# to a single address, IP aliasing is not supported.
# listen_interface: eth0
```

Change the RPC address to TheHive Public IP address

```
# For security reasons, you should not expose this port to the internet.  Firewall it if needed.
rpc_address: [redacted]

# Set rpc_address OR rpc_interface, not both. Interfaces must correspond
# to a single address, IP aliasing is not supported.
# rpc_interface: eth1
```

I'll do the same with the Seed Provider

```
seed_provider:
    # Addresses of hosts that are deemed contact points.
    # Cassandra nodes use this list of hosts to find each other and learn
    # the topology of the ring.  You must change this if you are running
    # multiple nodes!
    - class_name: org.apache.cassandra.locator.SimpleSeedProvider
      parameters:
          # seeds is actually a comma-delimited list of addresses.
          # Ex: "<ip1>,<ip2>,<ip3>"
          - seeds: "64.227.119.244:7000"
```

Next I'll stop Cassandra temporarily in order to remove old files

```
root@TheHive-Server:~#
root@TheHive-Server:~# systemctl stop cassandra.service
```

Removing the old files in the var/lib/cas dir

```
root@TheHive-Server:~# rm -rf /var/lib/cassandra/*
root@TheHive-Server:~#
```

Start Cassandra again after removing old files

```
root@TheHive-Server:~# systemctl start cassandra.service
root@TheHive-Server:~#
root@TheHive-Server:~#
```

Checking if its running, and it is

```
root@TheHive-Server:~# systemctl status cassandra.service
● cassandra.service - LSB: distributed storage system for structured data
     Loaded: loaded (/etc/init.d/cassandra; generated)
     Active: active (running) since Sat 2024-08-17 13:43:37 UTC; 1min 3s ago
       Docs: man:systemd-sysv-generator(8)
    Process: 16632 ExecStart=/etc/init.d/cassandra start (code=exited, status=0/SUCCESS)
      Tasks: 55 (limit: 9478)
     Memory: 2.2G
        CPU: 14.828s
     CGroup: /system.slice/cassandra.service
             └─16735 /usr/bin/java -ea -da:net.openhft... -XX:+UseThreadPriorities -XX:+HeapDumpOnOutOfMemor

Aug 17 13:43:37 TheHive-Server systemd[1]: Starting LSB: distributed storage system for structured data...
Aug 17 13:43:37 TheHive-Server systemd[1]: Started LSB: distributed storage system for structured data.
lines 1-13/13 (END)
```

Now that Cassandra is up & running and configured, I'll setup **ElasticSearch** which is used to manage querying data

```
root@TheHive-Server: ~
root@TheHive-Server:~# nano /etc/elasticsearch/elasticsearch.yml
```

Activating & Changing Cluster.Name and Node.Name And to the public IP for the HiveServer

```
# Use a descriptive name for your cluster:
#
cluster.name: SocAutoLab
#
# ------------------------------------ Node ------------------------------------
#
# Use a descriptive name for the node:
#
node.name: node-1
#
# Add custom attributes to the node:
#
#node.attr.rack: r1
#
# ---------------------------------- Paths ------------------------------------
```

```
network.host: 64.227.119.244
#
# By default Elasticsearch li
# finds starting at 9200. Set
#
http.port: 9200
```

Cluster Node will be set to 1 node, but this can be scaled but adding more nodes

```
# Bootstrap the cluster using an initial set
#
cluster.initial_master_nodes: ["node-1"]
#
```

Now I'll start and Enable ElasticSearch

```
root@TheHive-Server:~# systemctl start elasticsearch
root@TheHive-Server:~# systemctl enable elasticsearch
Synchronizing state of elasticsearch.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable elasticsearch
Created symlink /etc/systemd/system/multi-user.target.wants/elasticsearch.service → /lib/systemd/system/elasticsearch.service.
root@TheHive-Server:~#
```

Status is Running

```
root@TheHive-Server:~# systemctl status elasticsearch.service
● elasticsearch.service - Elasticsearch
     Loaded: loaded (/lib/systemd/system/elasticsearch.service; enabled; vendor preset: enabled)
     Active: active (running) since Sat 2024-08-17 13:58:28 UTC; 1min 35s ago
       Docs: https://www.elastic.co
   Main PID: 17718 (java)
      Tasks: 57 (limit: 9478)
     Memory: 4.3G
        CPU: 57.745s
     CGroup: /system.slice/elasticsearch.service
             ├─17718 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.networkaddress.cache.ttl=60 -Des.networkaddress.cache.negative
             └─17905 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/bin/controller

Aug 17 13:58:04 TheHive-Server systemd[1]: Starting Elasticsearch...
Aug 17 13:58:11 TheHive-Server systemd-entrypoint[17718]: Aug 17, 2024 1:58:11 PM sun.util.locale.provider.LocaleProviderAdapter <clinit>
Aug 17 13:58:11 TheHive-Server systemd-entrypoint[17718]: WARNING: COMPAT locale provider will be removed in a future release
Aug 17 13:58:28 TheHive-Server systemd[1]: Started Elasticsearch.
```

The Hive Configurations:

```
root@TheHive-Server:~# ls -la /opt/thp
total 12
drwxr-xr-x 3 root root 4096 Aug 17 13:14 .
drwxr-xr-x 5 root root 4096 Aug 17 13:14 ..
drwxr-xr-x 5 root root 4096 Aug 17 13:14 thehive
root@TheHive-Server:~#
```

Changing the hive root directory

```
root@TheHive-Server:~# chown -R thehive:thehive /opt/thp
root@TheHive-Server:~# ls -la /opt/thp
total 12
drwxr-xr-x 3 thehive thehive 4096 Aug 17 13:14 .
drwxr-xr-x 5 root    root    4096 Aug 17 13:14 ..
drwxr-xr-x 5 thehive thehive 4096 Aug 17 13:14 thehive
root@TheHive-Server:~#
```

Now it's TheHive user & TheHive group
Next I'll configure TheHive .conf file

```
root@TheHive-Server:~# nano /etc/thehive/application.conf
  GNU nano 6.2
# TheHive configuration - application.conf
#
```

Change ClusterName + IP Addresses

```
db.janusgraph {
  storage {
    backend = cql
    hostname = ["64.227.119.244"]
    # Cassandra authentication (if configured)
    # username = "thehive"
    # password = "password"
    cql {
      cluster-name = SocAutoLab
      keyspace = thehive
    }
  }
  index.search {
    backend = elasticsearch
    hostname = ["64.227.119.244"]
    index-name = thehive
  }
```

For the service as well

```
# Service configuration
application.baseUrl = "http://64.227.119.244:9000"
play.http.context = "/"
```

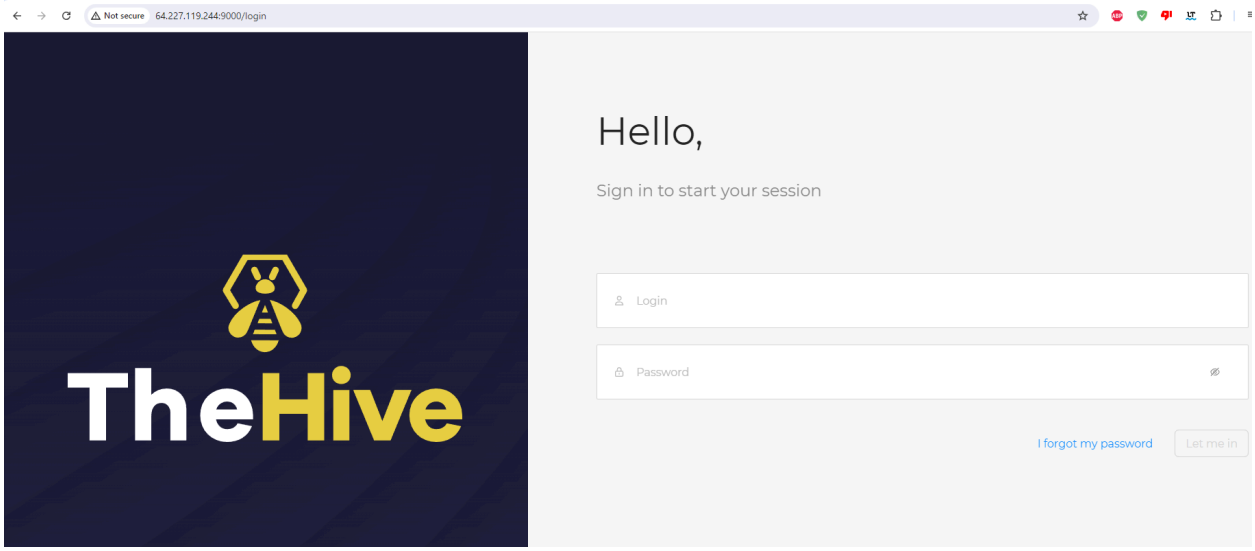
Cortex provides response capabilities
Misp Used as a CTI (CyberThreatIntelligence) Plat

```
# Both modules are enabled by default. If not used, each one can be disabled by
# commenting the configuration line.
scalligraph.modules += org.thp.thehive.connector.cortex.CortexModule
scalligraph.modules += org.thp.thehive.connector.misp.MispModule
```

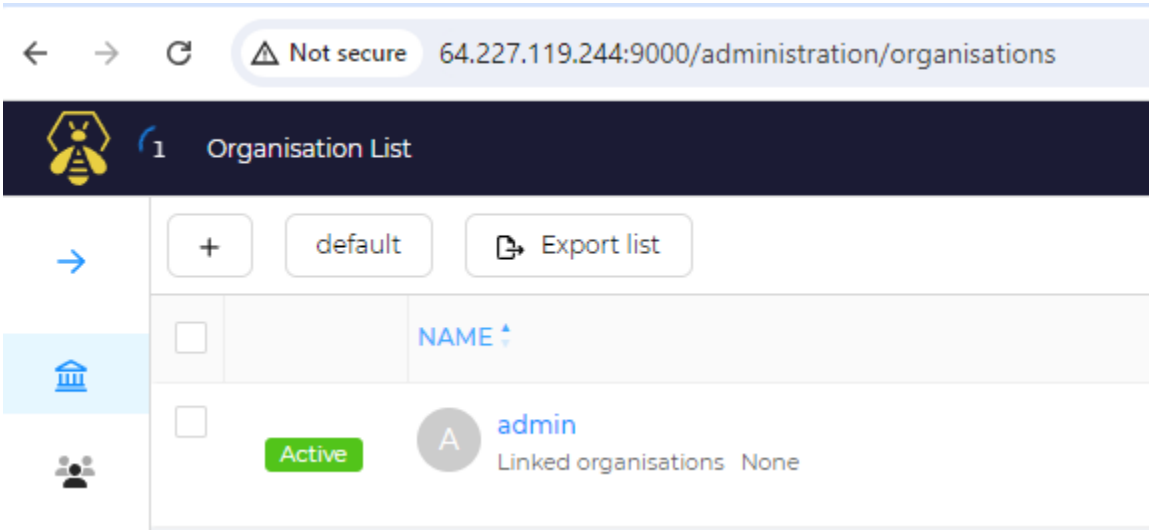
TheHive is configured and up and running

```
root@TheHive-Server:~# systemctl start thehive
root@TheHive-Server:~# systemctl enable thehive
Created symlink /etc/systemd/system/multi-user.target.wants/thehive.service → /lib/systemd/system/thehive.service.
root@TheHive-Server:~# systemctl status thehive
● thehive.service - Scalable, Open Source and Free Security Incident Response Solutions
     Loaded: loaded (/lib/systemd/system/thehive.service; enabled; vendor preset: enabled)
     Active: active (running) since Sat 2024-08-17 14:16:27 UTC; 32s ago
       Docs: https://thehive-project.org
   Main PID: 19170 (java)
      Tasks: 61 (limit: 9478)
     Memory: 568.2M
        CPU: 33.851s
     CGroup: /system.slice/thehive.service
             └─19170 java -Dfile.encoding=UTF-8 -Dconfig.file=/etc/thehive/application.conf -Dlogger.file=/etc/thehive/lo

Aug 17 14:16:27 TheHive-Server systemd[1]: Started Scalable, Open Source and Free Security Incident Response Solutions.
root@TheHive-Server:~#
```

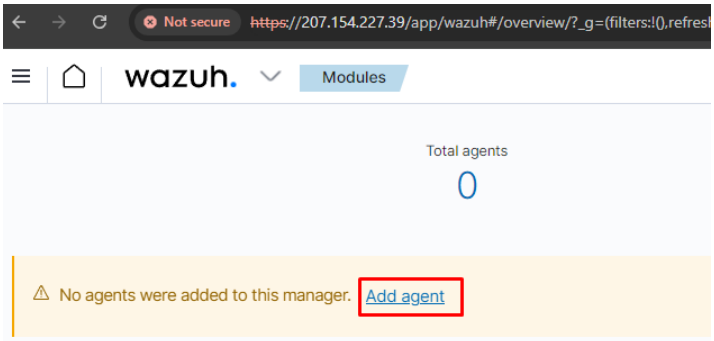
Now TheHive Dashboard is active, after activating and configuring elastic search and Cassandra

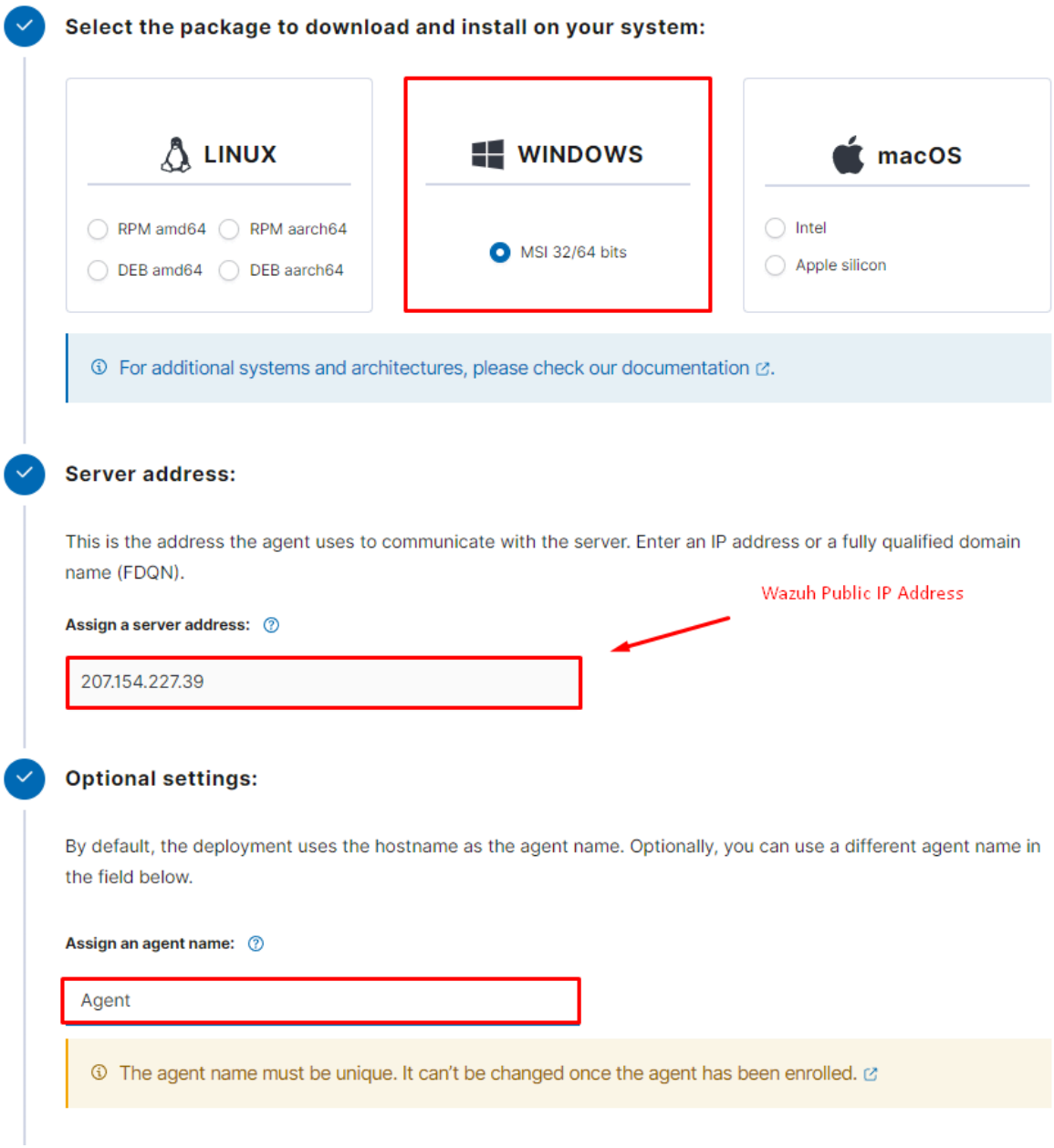


And we have a TheHive dashboard!



Now I'll configure an agent on the Wazuh Dashboard





Now I will run these following commands with AdminPriv using PowerShell on the Windows10 Client

Run the following commands to download and install the agent:

```
Invoke-WebRequest -Uri https://packages.wazuh.com/4.x/windows/wazuh-agent-4.7.5-1.msi -OutFile
${env.tmp}\wazuh-agent; msiexec.exe /i ${env.tmp}\wazuh-agent /q WAZUH_MANAGER='207.154.227.39'
WAZUH_AGENT_NAME='Agent' WAZUH_REGISTRATION_SERVER='207.154.227.39'
```

Requirements

- You will need administrator privileges to perform this installation.
- PowerShell 3.0 or greater is required.

Keep in mind you need to run this command in a Windows PowerShell terminal.

5 **Start the agent:**

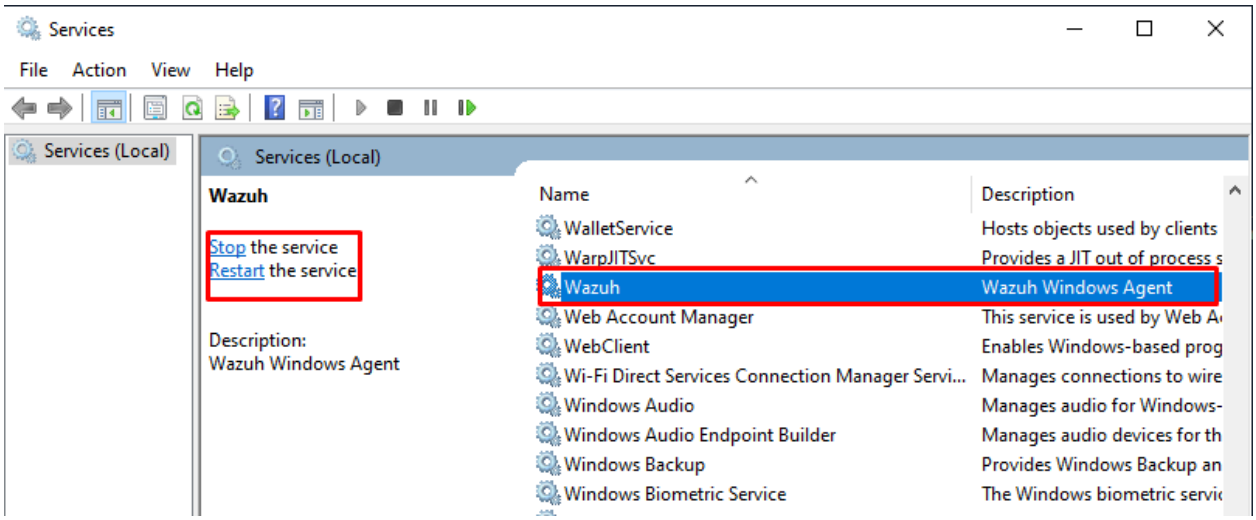
```
NET START WazuhSvc
```

Close

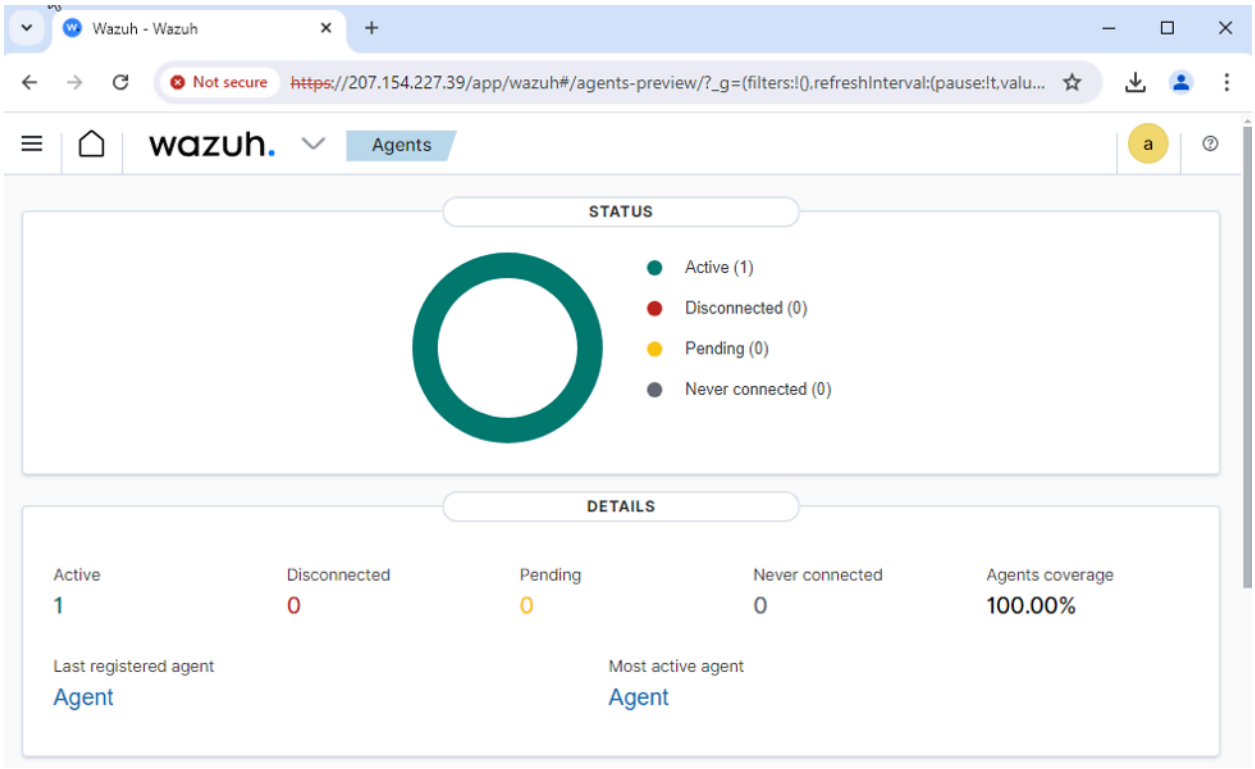
The Wazuh Service is now running on our Client

```
PS C:\Windows\system32> Invoke-WebRequest -Uri https://packages.wazuh.com/4.x/windows/wazuh-agent-4.7.5-1.msi -OutFile ${env.tmp}\wazuh-agent; msiexec.exe /i ${env.tmp}\wazuh-agent /q WAZUH_MANAGER='207.154.227.39' WAZUH_AGENT_NAME='Agent' WAZUH_REGISTRATION_SERVER='207.154.227.39'
PS C:\Windows\system32>
PS C:\Windows\system32> NET START WazuhSvc
The Wazuh service is starting.
The Wazuh service was started successfully.

PS C:\Windows\system32>
```

We can also see its running in the services



Lets check the Wazuh Dashboard

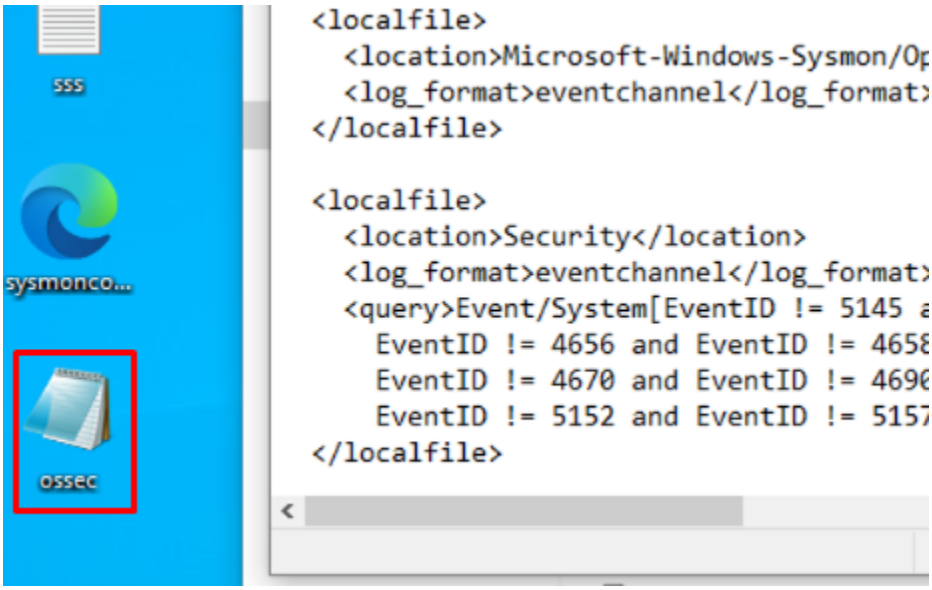


And the Agent is Active and integrated

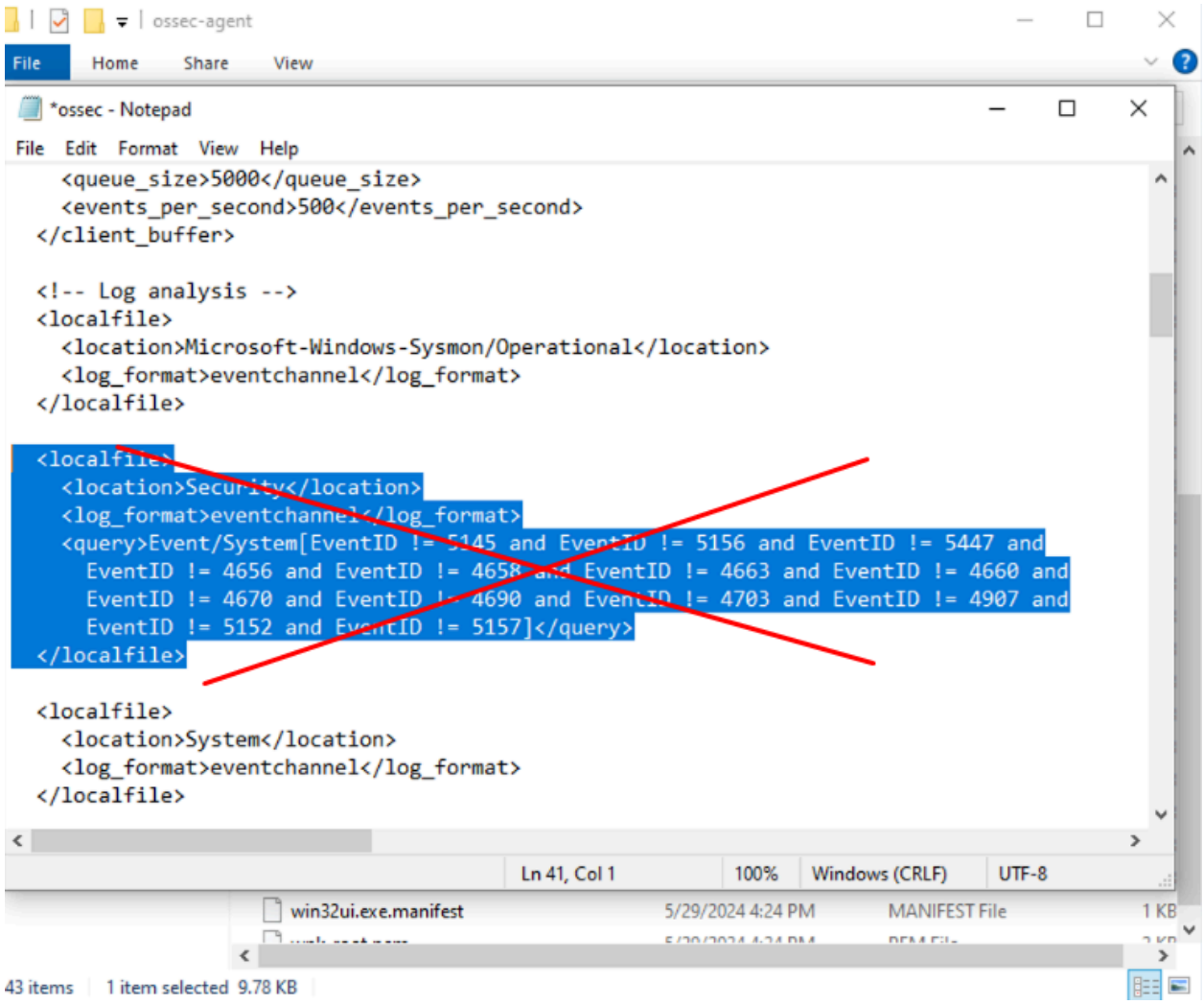
Part 3: Generate & Ingest Telemetry

I'll start by configuring the ossec.conf file on the Client Machine, I'll enable mimikatz log collection as well

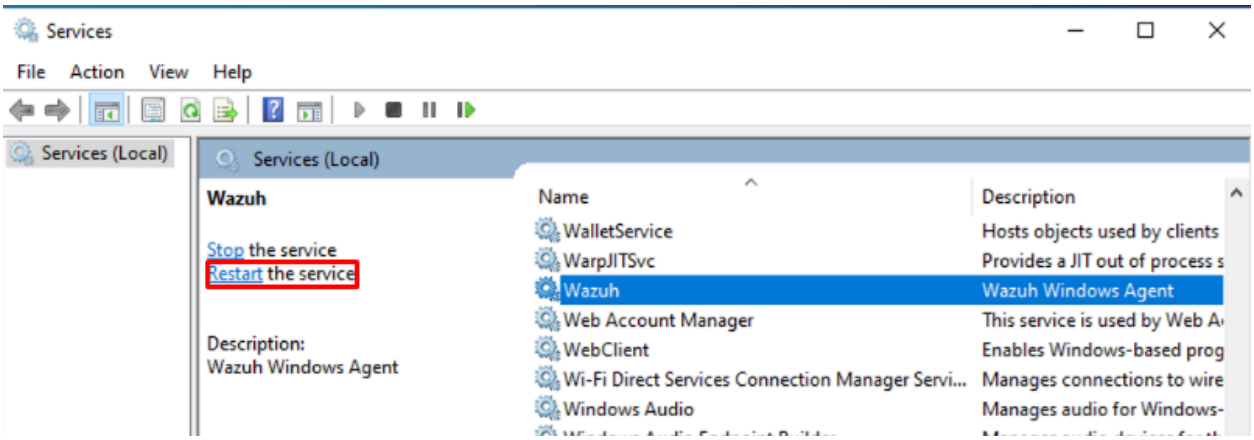
I'll start by making a backup of the ossec.conf file, in case something is misconfigured



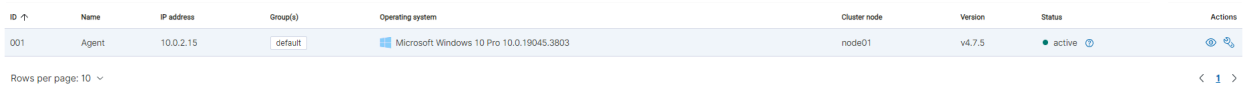
Security+System logs removed, I want to focus on Sysmon logs and implementing mimikats



Next I will restart Wazuh to apply the changes



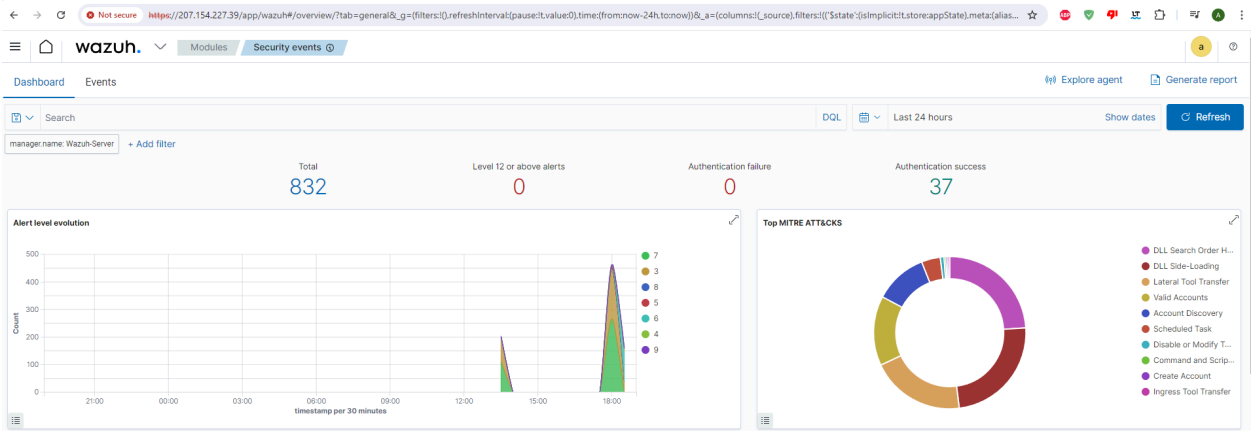
We see the agent is active



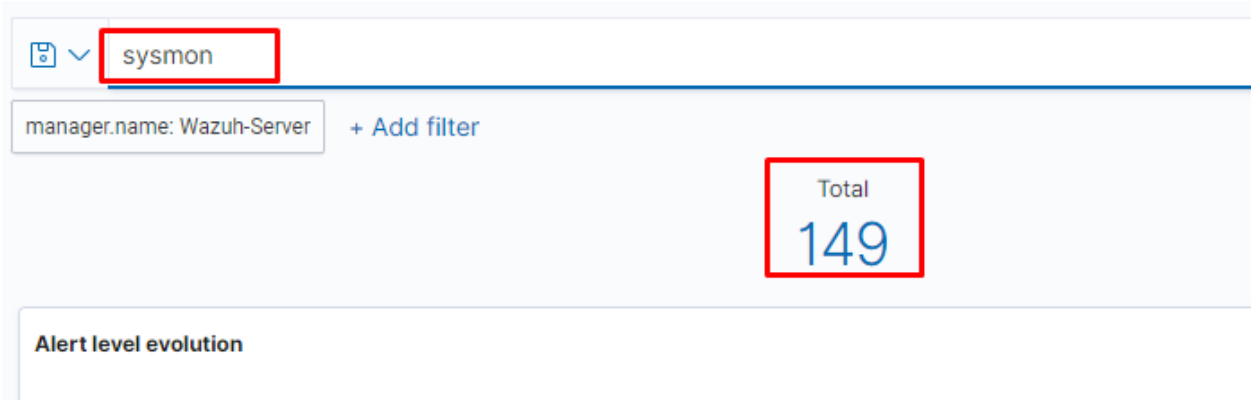
ID	Name	IP address	Group(s)	Operating system	Cluster node	Version	Status	Actions
001	Agent	10.0.2.15	default	Microsoft Windows 10 Pro 10.0.19045.3803	node01	v4.7.5	active	

Rows per page: 10 1

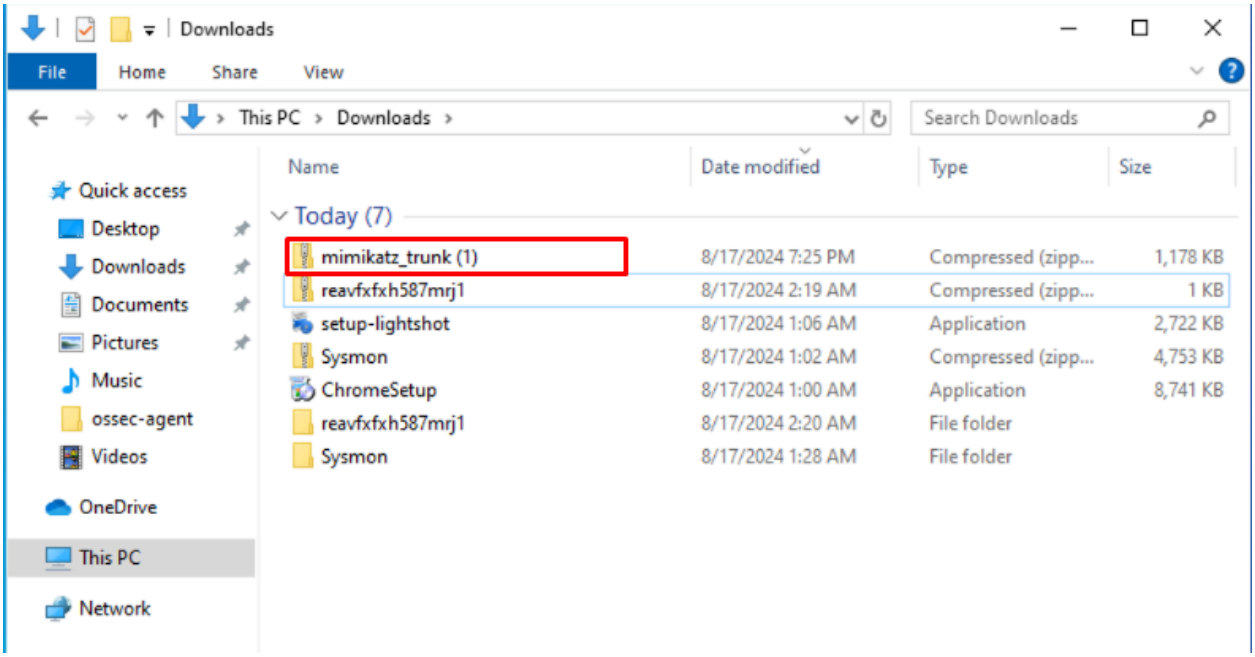
The Dashboard is active and responding



Sysmon Logs are querying



Next I'll download mimikats, mimikats is a PT tool used to extract credentials, I will need to disable the windows defender/create exclusions in order to do this



Mimikats is downloaded after using exclusion and temp disabling chrome defenses

Now I'll configure the Wazuh Server ossec file for better alert filtering, but first a BACKUP

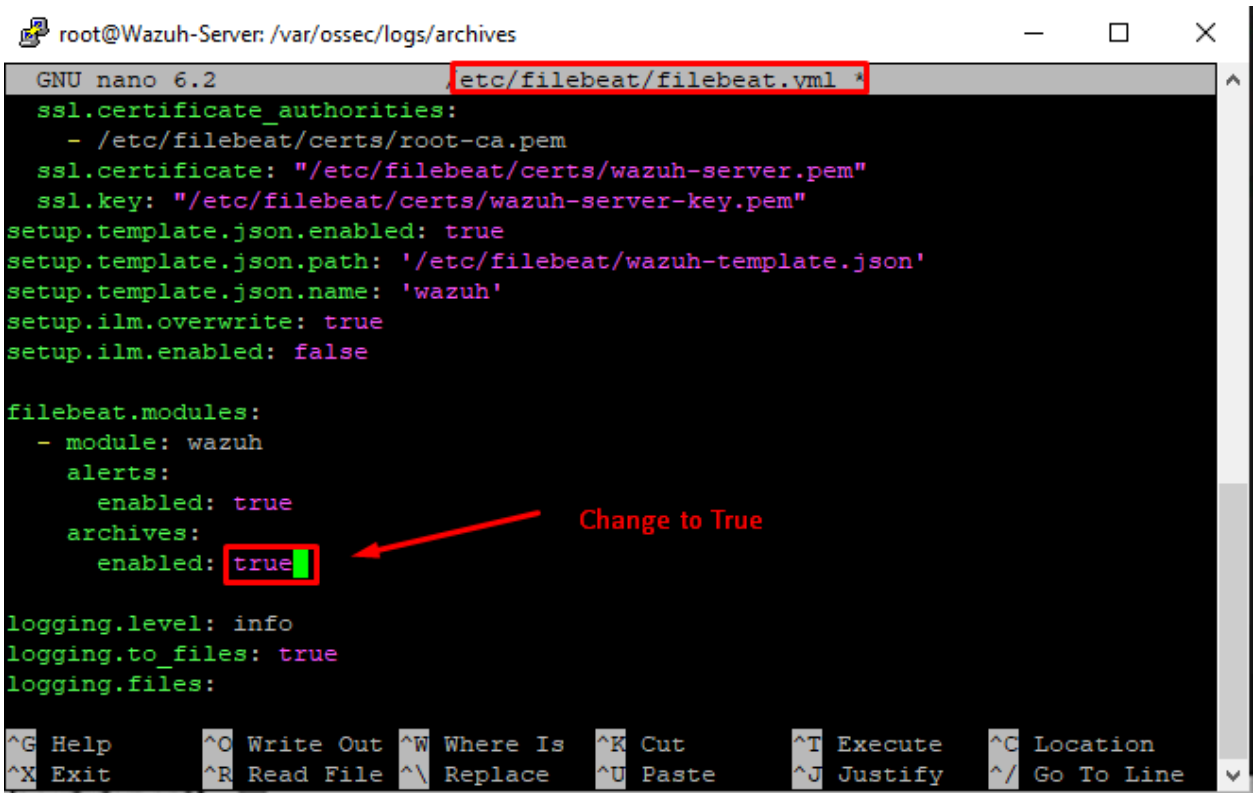
```
Last login: Sat Aug 17 10:29:19 2024 from 147.235.207.170
root@Wazuh-Server:~#
root@Wazuh-Server:~# cp /var/ossec/etc/ossec.conf ~/ossec-backup.conf
root@Wazuh-Server:~#
```

```
root@Wazuh-Server: ~
  GNU nano 6.2                    /var/ossec/etc/ossec.conf *
<!--
  Wazuh - Manager - Default configuration for ubuntu 22.04
  More info at: https://documentation.wazuh.com
  Mailing list: https://groups.google.com/forum/#!forum/wazuh
-->

<ossec_config>
  <global>
    <jsonout_output>yes</jsonout_output>
    <alerts_log>yes</alerts_log>
    <logall>yes</logall>                Changes To Yes
    <logall_json>yes</logall_json>
    <email_notification>no</email_notification>
    <smtp_server>smtp.example.wazuh.com</smtp_server>
    <email_from>wazuh@example.wazuh.com</email_from>
    <email_to>recipient@example.wazuh.com</email_to>
    <email_maxperhour>12</email_maxperhour>
    <email_log_source>alerts.log</email_log_source>
    <agents_disconnection_time>10m</agents_disconnection_time>
    <agents_disconnection_alert_time>0</agents_disconnection_alert_time>

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^/ Go To Line
```

This will make Wazuh archive the log files

```
Last login: Sat Aug 17 10:29:19 2024 from 147.235.207.170
root@Wazuh-Server:~#
root@Wazuh-Server:~# cp /var/ossec/etc/ossec.conf ~/ossec-backup.conf
root@Wazuh-Server:~# nano /var/ossec/etc/ossec.conf
root@Wazuh-Server:~# systemctl restart wazuh-manager.service
root@Wazuh-Server:~# cd /var/ossec/logs/archives/
root@Wazuh-Server:/var/ossec/logs/archives# ls
2024  archives.json  archives.log
root@Wazuh-Server:/var/ossec/logs/archives#
```

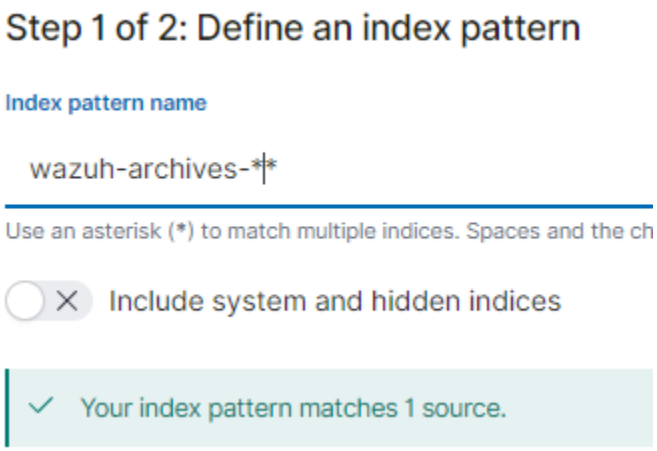
Now we want Wazuh to ingest the files, we edit the filebeat.vml file



After configuring the Wazuh Manager, I can edit the Wazuh index patterns

I want Wazuh to be able to Index the archives regardless if they triggered an alert or not

For everything



The new Archive Index is aggregating logs as expected

Wazuh is unique because on default it doesn’t collect logs unless a specific rule has been met, that's why I changed the configs to make it collect logs regardless if a rule is met.

Now its time to test it, I'll run mimikats on the client and see if we get the alert and logs from our SIEM/XDR Wazuh

```
PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64> .\mimikatz.exe

  .#####.   mimikatz 2.2.0 (x64) #19041 Sep 19 2022 17:44:08
 .## ^ ##.  "A La Vie, A L'Amour" - (oe.eo)
 ## / \ ##  /*** Benjamin DELPY `gentilkiwi` ( benjamin@gentilkiwi.com )
 ## \ / ##       > https://blog.gentilkiwi.com/mimikatz
 '## v ##'       Vincent LE TOUX             ( vincent.letoux@gmail.com )
  '#####'        > https://pingcastle.com / https://mysmartlogon.com ***/

mimikatz # exit
Bye!
PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64> get-date

Saturday, August 17, 2024 8:23:43 PM


PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64>
```

Now let's check if we can see the logs

NICE!

_source

full_log: {"win":{"system":{"providerName":"Microsoft-Windows-Sysmon","providerGuid":"{5770385f-c22a-43e0-bf4c-06f5698ffbd9}","eventID":"7","version":"3","level":"4","task":"7","opcode":"0","keywords":"0x8000000000000000","systemTime":"2024-08-18T03:22:06.5629576Z","eventRecordID":"4189","processID":"2904","threadID":"4524","channel":"Microsoft-Windows-Sysmon/Operational","computer":"DESKTOP-6QQ4GGF","severityValue":"INFORMATION","message":"\"Image loaded:\r\nRuleName: technique_id=T1574.002,technique_name=DLL Side-Loading\r\nUtcTime: 2024-08-18 03:22:06.555\r\nProcessGuid: {984dd485-68de-66c1-ae03-000000000200}\r\nProcessId: 7960\r\nImage: C:\\Users\\WazuhAgent\\Downloads\\mimikatz_trunk\\x64\\mimikatz.exe\r\nImageLoaded:

Now I'll create some specific sysmon rules using the Wazuh GUI

Rules (4372)
From here you can manage your rules.

Manage rules files | Add new rules file | Refresh | Export formatted

Search | WQL | Custom rules

ID	Description	Groups	Regulatory compliance	Level	File	Path
1	Generic template for all syslog rules.	syslog		0	0010-rules_config.xml	ruleset/rules
2	Generic template for all firewall rules.	firewall		0	0010-rules_config.xml	ruleset/rules
3	Generic template for all ids rules.	ids		0	0010-rules_config.xml	ruleset/rules
4	Generic template for all web rules.	web-log		0	0010-rules_config.xml	ruleset/rules
5	Generic template for all web proxy rules.	squid		0	0010-rules_config.xml	ruleset/rules
6	Generic template for all windows rules.	windows		0	0010-rules_config.xml	ruleset/rules
7	Generic template for all wazuh rules.	ossec		0	0010-rules_config.xml	ruleset/rules
200	Grouping of wazuh rules.	wazuh		0	0016-wazuh_rules.xml	ruleset/rules
201	Agent event queue rule	agent_flooding, wazuh		0	0016-wazuh_rules.xml	ruleset/rules
202	Agent event queue is **level** full.	agent_flooding, wazuh	PCI_DSS GDPR	7	0016-wazuh_rules.xml	ruleset/rules

Rows per page: 10 ‹ 1 2 3 4 5 ... 438 ›

I'll build a custom rule using 0800-sysmon_id_1

sysmon

File	Path	Action
0330-sysmon_rules.xml	ruleset/rules	
0595-win-sysmon_rules.xml	ruleset/rules	
0800-sysmon_id_1.xml	ruleset/rules	
0810-sysmon_id_3.xml	ruleset/rules	
0820-sysmon_id_7.xml	ruleset/rules	
0830-sysmon_id_11.xml	ruleset/rules	
0860-sysmon_id_13.xml	ruleset/rules	
0870-sysmon_id_8.xml	ruleset/rules	
0945-sysmon_id_10.xml	ruleset/rules	
0950-sysmon_id_20.xml	ruleset/rules	

Rows per page: 10

I'll copy one of these default Wazuh Sysmon_id_1 rules and build my own custom rule detecting mimikatz

local_rules.xml

Custom Rules

```
<!-- Local rules -->

<!-- Modify it at your will. -->
<!-- Copyright (C) 2015, Wazuh Inc. -->

<!-- Example -->
<group name="local,syslog,sshd,">

  <!--
  Dec 10 01:02:02 host sshd[1234]: Failed none for root from 1.1.1.1 port 1066 ssh2
  -->
  <rule id="100001" level="5">
    <if_sid>5716</if_sid>
    <srcip>1.1.1.1</srcip>
    <description>sshd: authentication failed from IP 1.1.1.1.</description>
    <group>authentication_failed,pci_dss_10.2.4,pci_dss_10.2.5,</group>
  </rule>

  <rule id="92000" level="4">
    <if_group>sysmon_event1</if_group>
    <field name="win.eventdata.parentImage" type="pcre2">(?i)\\(c|w)script\.exe</field>
    <options>no_full_log</options>
    <description>Scripting interpreter spawned a new process</description>
    <mitre>
      <id>T1059.005</id>
    </mitre>
  </rule>

</group>
```

Added this as the base for my New rule

The New Custom Mimikatz Rule

```
<!--
Dec 10 01:02:02 host sshd[1234]: Failed none for root from 1.1.1.1 port 1066 ssh2
-->
<rule id="100001" level="5">
  <if_sid>5716</if_sid>
  <srcip>1.1.1.1</srcip>
  <description>sshd: authentication failed from IP 1.1.1.1.</description>
  <group>authentication_failed,pci_dss_10.2.4,pci_dss_10.2.5,</group>
</rule>

<rule id="100002" level="15">
  <if_group>sysmon_event1</if_group>
  <field name="win.eventdata.originalFileName" type="pcre2">(?i mimikatz\.exe</field>
  <description>Mimikatz Usage Detected</description>
  <mitre>
    <id>T1003</id>
  </mitre>
</rule>

</group>
```

Alert will triggered regardless if attacker changed the file name

credential dumping

Now to test if this works, I'll run Mimikatz after changing the file name to memecats and see if the new rule is triggered

```
PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64> ./memecats.exe

  .#####.   mimikatz 2.2.0 (x64) #19041 Sep 19 2022 17:44:08
 .## ^ ##.  "A La Vie, A L'Amour" - (oe.eo)
 ## / \ ##  /*** Benjamin DELPY `gentilkiwi` ( benjamin@gentilkiwi.com )
 ## \ / ##       > https://blog.gentilkiwi.com/mimikatz
 '## v ##'       Vincent LE TOUX             ( vincent.letoux@gmail.com )
  '#####'        > https://pingcastle.com / https://mysmartlogon.com ***/

mimikatz # ?
ERROR mimikatz_doLocal ; "?" command of "standard" module not found !

Module :        standard
Full name :     Standard module
Description :   Basic commands (does not require module name)

            exit  -  Quit mimikatz
             cls  -  Clear screen (doesn't work with redirections, like PsExec)
          answer  -  Answer to the Ultimate Question of Life, the Universe, and Everything
          coffee  -  Please, make me a coffee!
           sleep  -  Sleep an amount of milliseconds
             log  -  Log mimikatz input/output to file
          base64  -  Switch file input/output base64
         version  -  Display some version informations
              cd  -  Change or display current directory
       localtime  -  Displays system local date and time (OJ command)
        hostname  -  Displays system local hostname

mimikatz # exit
Bye!
PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64> get-date

Saturday, August 17, 2024 8:53:54 PM


PS C:\Users\WazuhAgent\Downloads\mimikatz_trunk\x64>
```

The new custom rule is working as intended, it was able to alert about mimikatz usage despite a deception attempt

›	Aug 17, 2024 @ 20:53:23.052	001	Agent	T1003	Credential Access	Mimikatz Usage Detected	15	100002

Looking deeper into the log we can see the Original File name mimikats has triggered the alert

@timestamp	2024-08-17T17:53:23.052Z
_id	xkJ4YZEBWkWDxbv6__Ds
agent.id	001
agent.ip	10.0.2.15
agent.name	Agent
data.win.eventdata.commandLine	\"C:\\Users\\WazuhAgent\\Downloads\\mimikatz_trunk\\x64\\memecats.exe\"
data.win.eventdata.company	gentilkiwi (Benjamin DELPY)
data.win.eventdata.currentDirectory	C:\\Users\\WazuhAgent\\Downloads\\mimikatz_trunk\\x64\\
data.win.eventdata.description	mimikatz for Windows
data.win.eventdata.fileVersion	2.2.0.0
data.win.eventdata.hashes	SHA1=E3B6EA8C46FA831CEC6F235A5CF48B38A4AE8D69,MD5=29EFD64DD3C FC49F27A98AE456D8EDF
data.win.eventdata.image	C:\\Users\\WazuhAgent\\Downloads\\mimikatz_trunk\\x64\\memecats.exe
data.win.eventdata.integrityLevel	Medium
data.win.eventdata.logonGuid	{984dd485-4b8f-66c1-3452-040000000000}
data.win.eventdata.logonId	0x45234
data.win.eventdata.originalFileName	mimikatz.exe
data.win.eventdata.parentCommandLine	\"C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe\"
data.win.eventdata.parentImage	C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe
data.win.eventdata.parentProcessGuid	{984dd485-6fd1-66c1-2b04-000000000200}
data.win.eventdata.parentProcessId	5536

input.type	log
location	EventChannel
manager.name	Wazuh-Server
rule.description	Mimikatz Usage Detected
rule.firedtimes	1
rule.groups	local, syslog, sshd
rule.id	100002
rule.level	15
rule.mail	true
rule.mitre.id	T1003
rule.mitre.tactic	Credential Access
rule.mitre.technique	OS Credential Dumping
timestamp	2024-08-17T17:53:23.052+0000

Part 4: IMPLEMENTING AUTOMATION (SOAR)

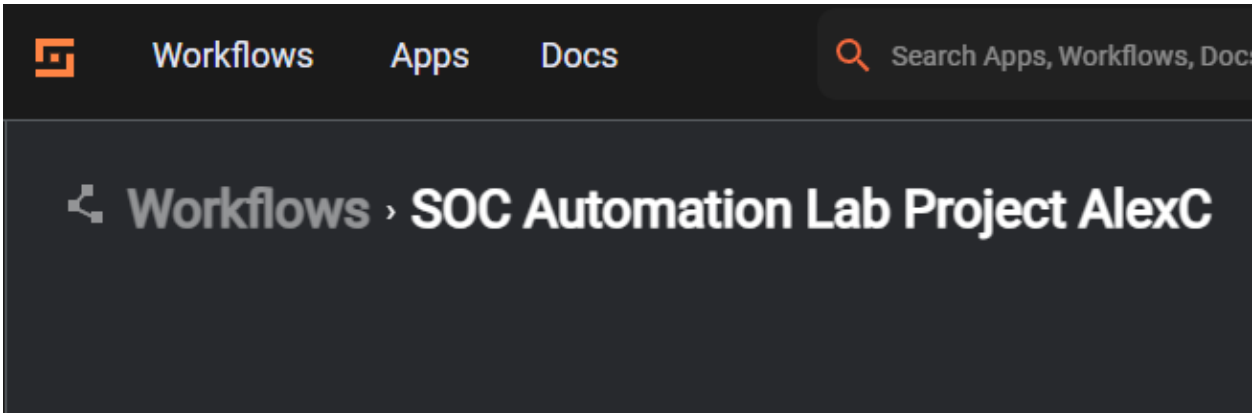
- CONNECT SHUFFLE (SOAR)
- SEND ALERTS TO THE HIVE
- SEND ALERTS VIA EMAIL TO THE SOC ANALYST

By the end of this, I'm going to have a fully functional live telemetry ingesting/digesting lab While implementing automation & orchestration Using:

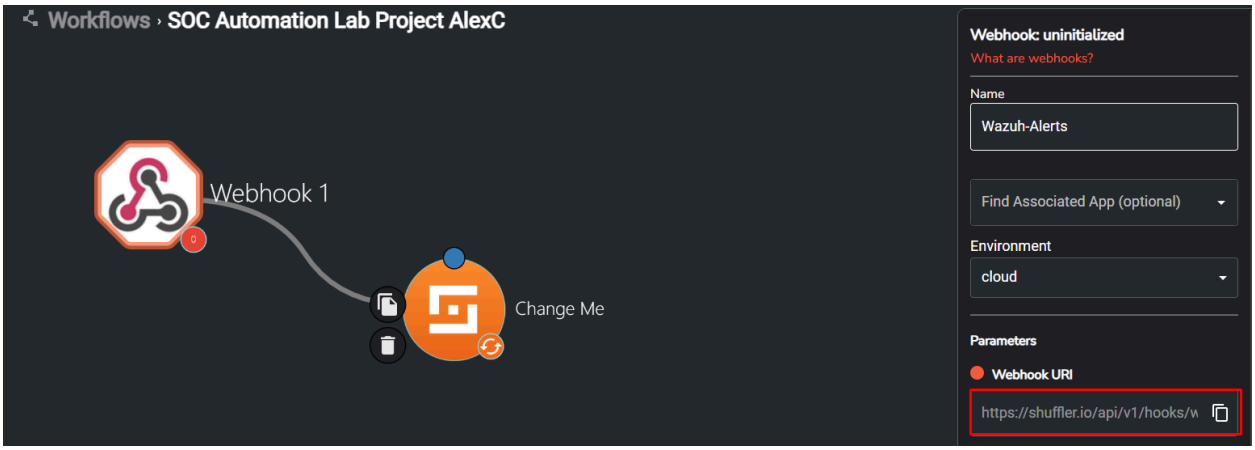
- Wazuh (SIEM/XDR)
- Shuffle (SOAR)
- The Hive (CaseManagmentSystem)

Also sending alerts in real time to the SOC analyst via email

Starting by using a Shuffle account to create “apps” or “triggers”



Next I’m going to copy the Webhook URI, to add it to my ossec conf file on the Wazuh-manager



Now I'm going to use the Wazuh-Server CLI to connect to shuffle by adding an integration tag in the ossec config file, and adding the hook_url

```
<integration>
  <name>shuffle</name>
  <hook_url>http://https://shuffler.io/api/v1/hooks/webhook_61f355e0-492e-4011-b1db-6bda0ef332a4 </hook_url>
  <level>3</level>
  <alert_format>json</alert_format>
</integration>
```

And I'll change it from sent all alerts above 3 to the special mimikatz rule I created

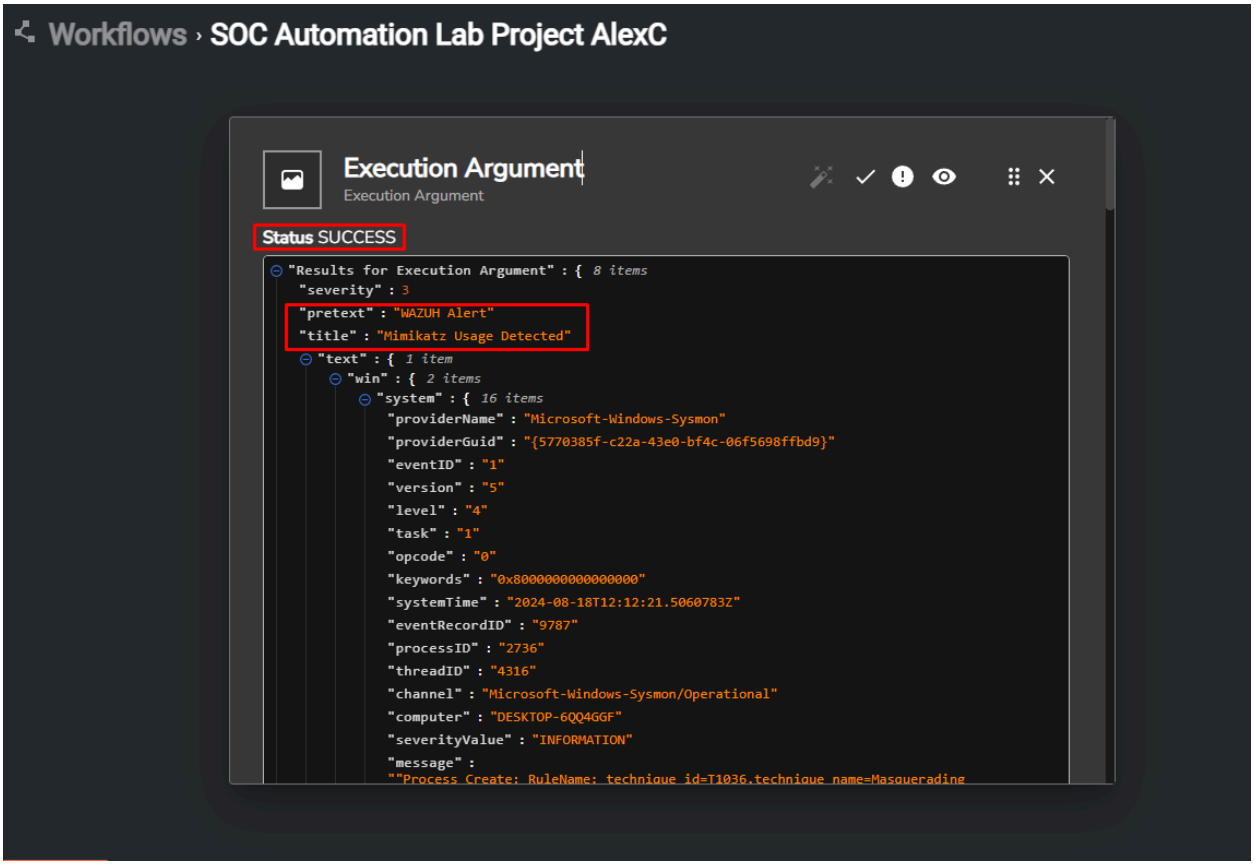
```
<integration>
  <name>shuffle</name>
  <hook_url>http://https://shuffler.io/
  <rule_id>100002</rule_id>
  <alert_format>json</alert_format>
</integration>
```

Troubleshooting by changing to https:// instead of http://https://

```
<integration>
  <name>shuffle</name>
  <hook_url>https://shuffler.io/api/v1
  <rule_id>100002</rule_id>
  <alert_format>json</alert_format>
</integration>
```

I’ll start the webhook and run memecats.exe again on the Client

And It's working, I’m getting the 100002 alert to shuffle + all the information generated by Wazuh itself into shuffle, pretty cool!



Next I will be creating this workflow:

1. Mimikatz alert sent to shuffle

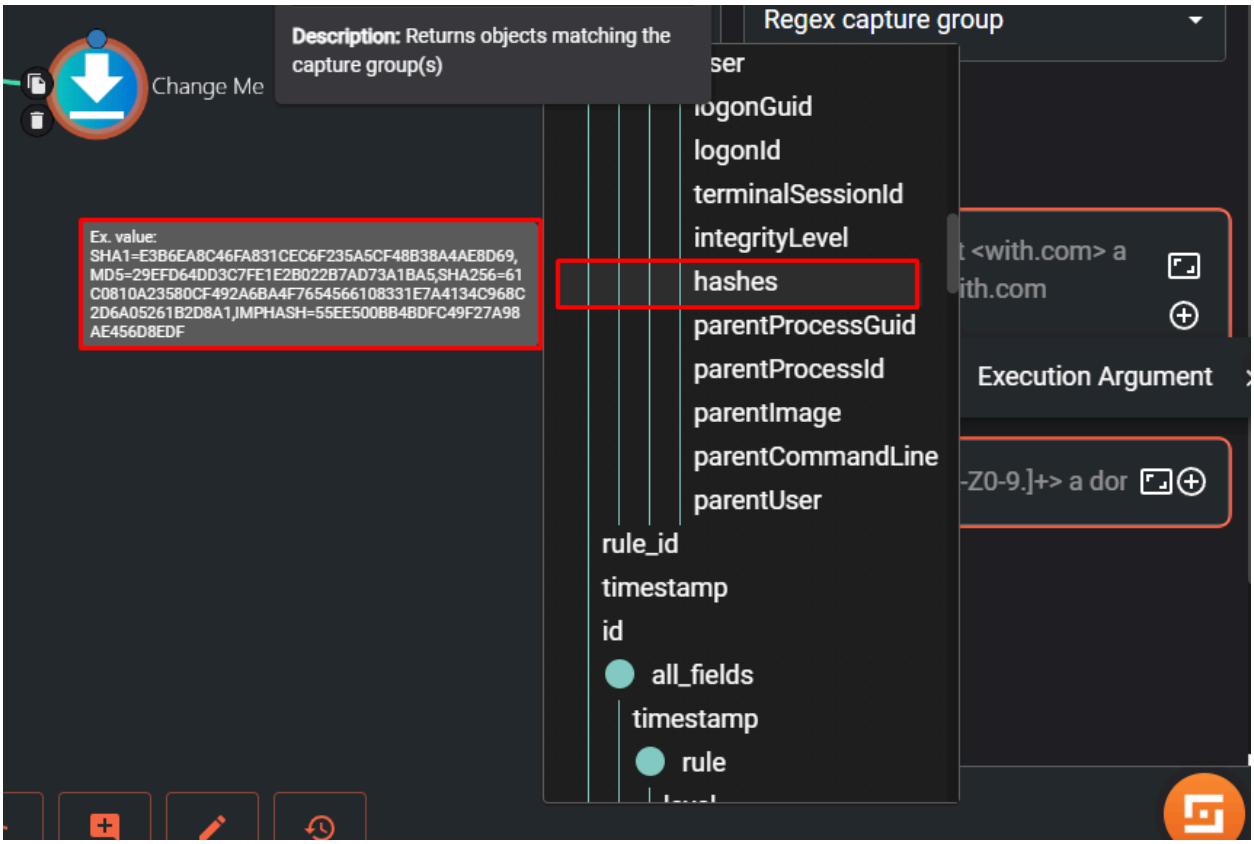
2. Shuffle receives alert and extracts SHA256 from the file

3. Check the reputation score using VirusTotal

4. Send Details to TheHive to create an Alert

5. Send Email to the SOC Analyst to being investigation

I'll start with creating a hash argument



Next, I will use chatGPT to parse the value of SHA256 of the hash

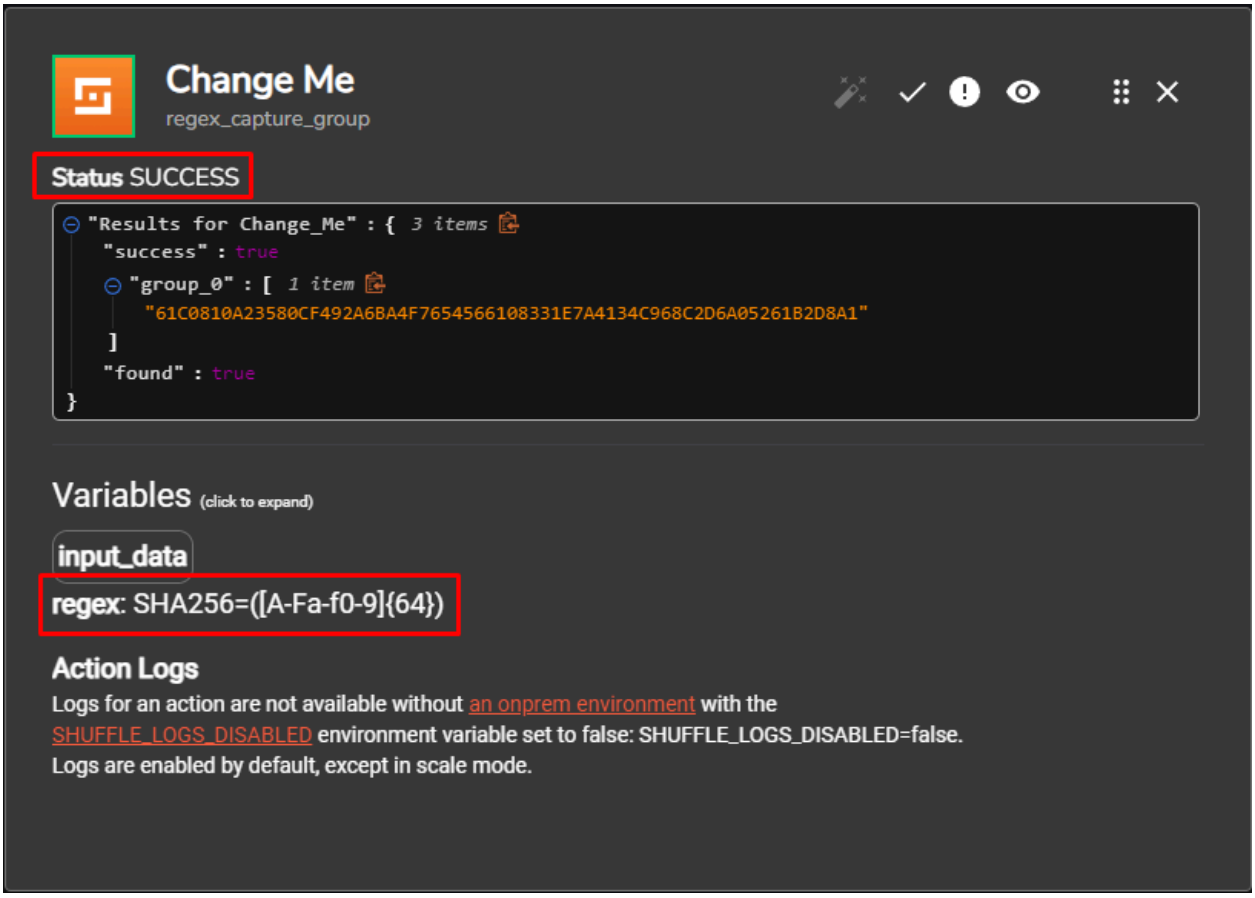
create a regex to parse the sha256 value Ex. value: "hashes":"SHA1=E3B6EA8C46FA831CEC6F235A5CF48B38A4AE8D69,MD5=29EFD64DD3C7FE1E2B022B7AD73A1BA5,SHA256=61C0810A23580CF492A6BA4F7654566108331E7A4134C968C2D6A05261B2D8A1,IMPHASH=55EE500BB4BDFC49F27A98AE456D8EDF"

To create a regex that extracts the SHA256 value from the given string, you can use the following pattern:

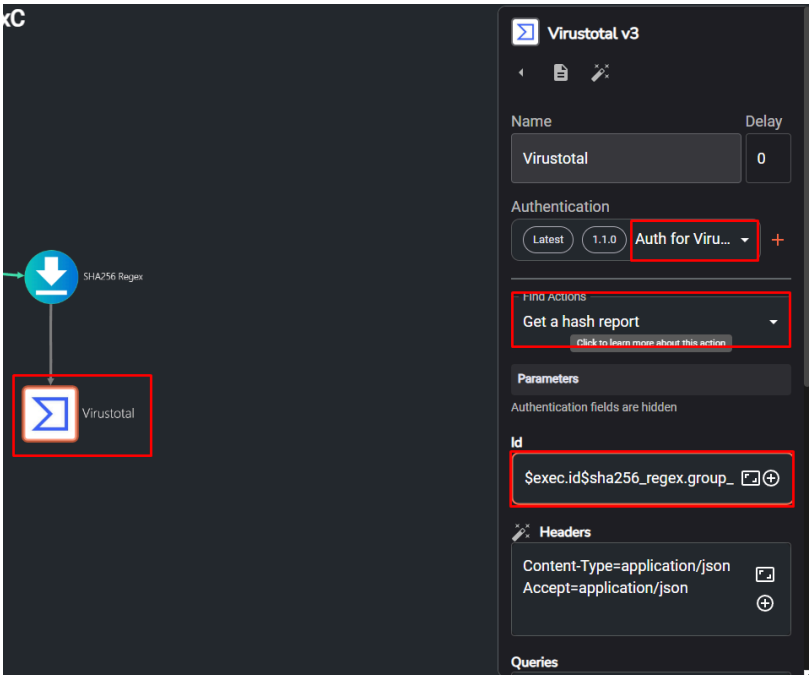
regex Copy code

```regex
SHA256=([A-Fa-f0-9]{64})
```

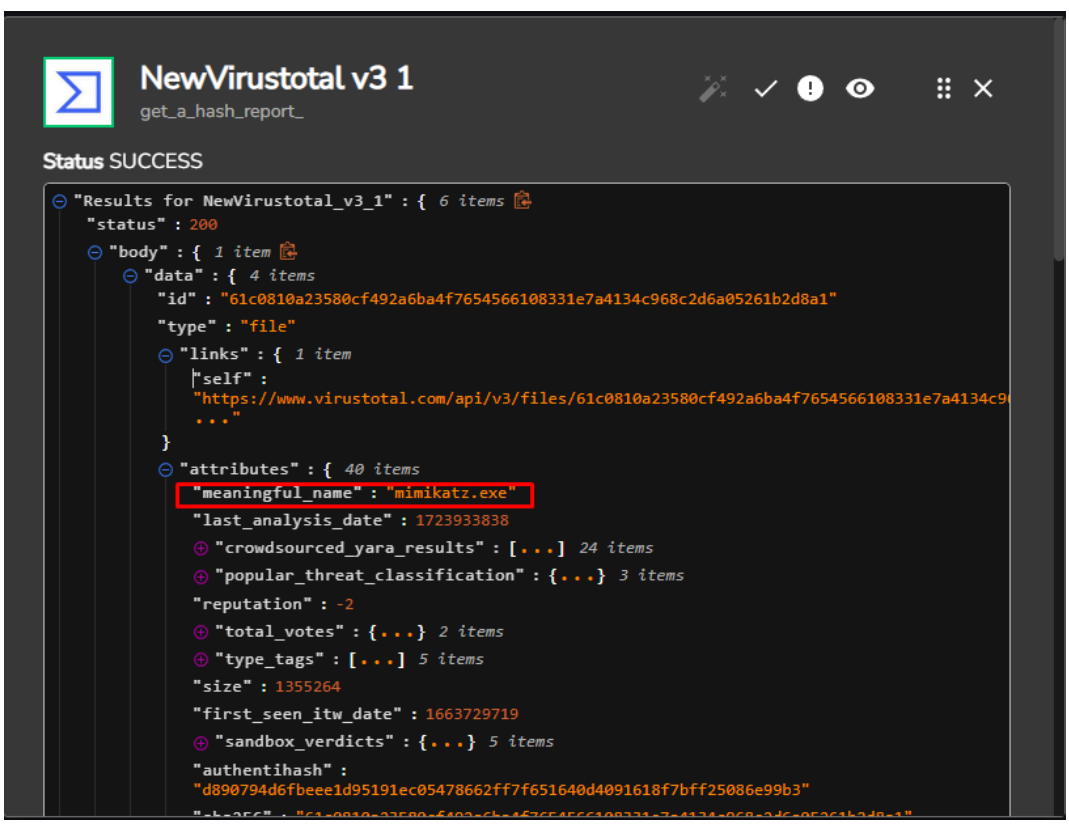
Success The SHA256 is parsed



Next I will use the VirusTotal API Key and integrated it into shuffle



After alot of time spend on troubleshooting, the Virustotal API is able to integrate with Shuffle



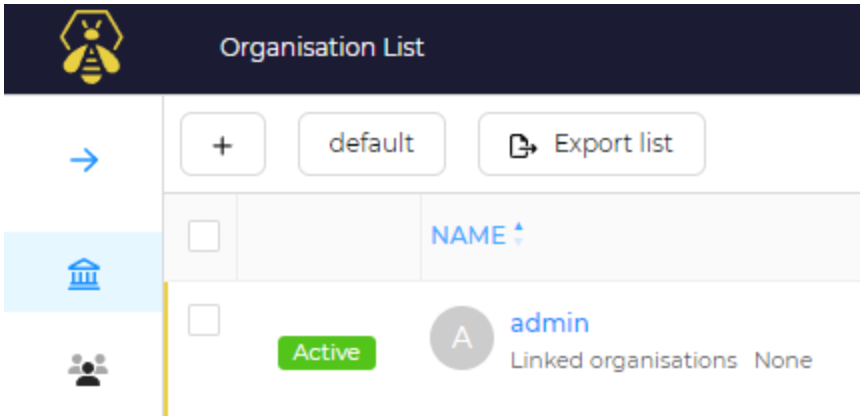
We can see that 67 vendors flagged it as Malicious

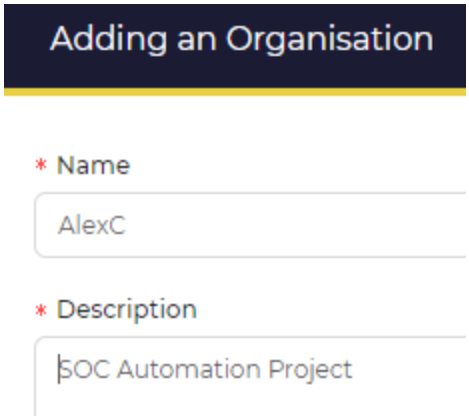

```
"creation_date" : 1663602279
"last_analysis_stats" : { 8 items
  "malicious" : 67
  "suspicious" : 0
  "undetected" : 8
  "harmless" : 0
  "timeout" : 0
  "confirmed-timeout" : 0
  "failure" : 0
  "type-unsupported" : 4
}
```


Everything is integrated, Great!

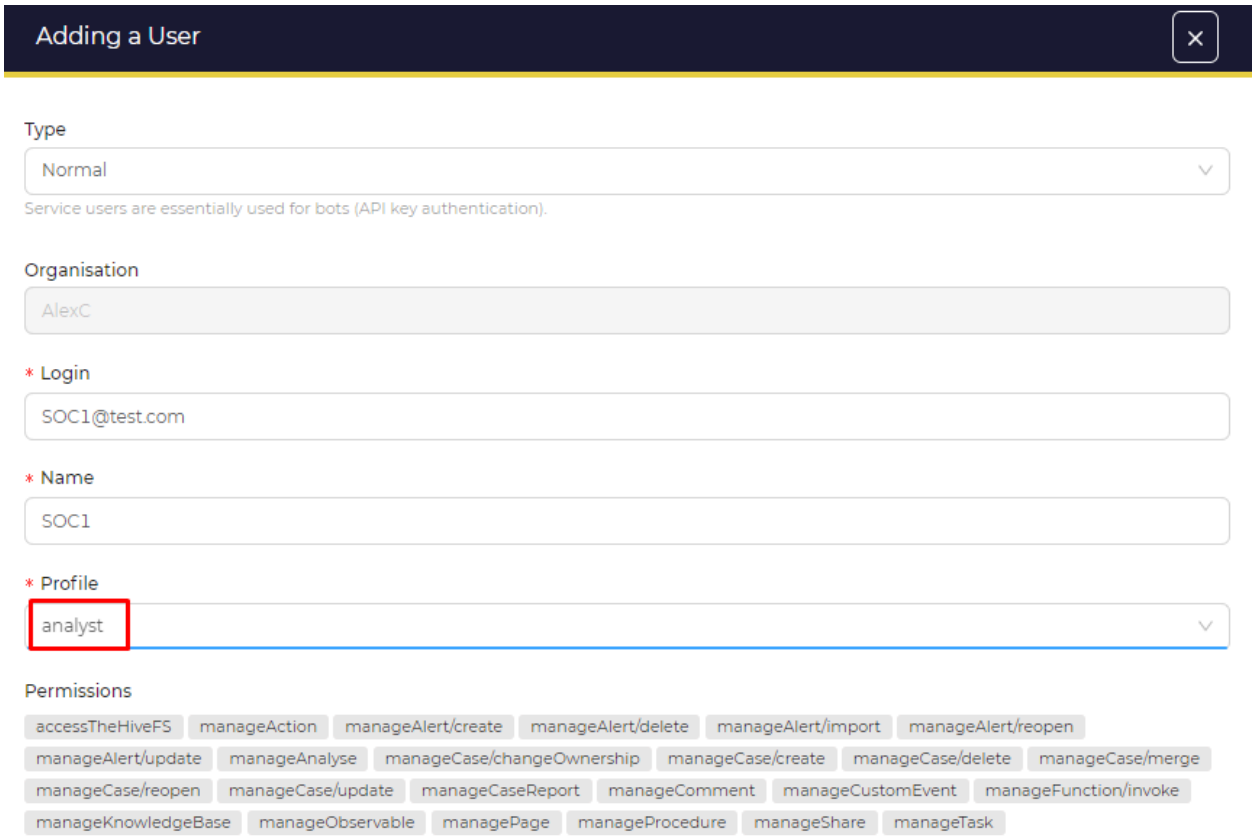
Quick recap: I setup my SOAR platform to receive the Wazuh alerts than performed regex to parse the SHA256 hash & integrated VirusTotal to check the reputation, Next I will send the details to TheHive

I'll login into TheHive GUI, I'll create a new org+new users

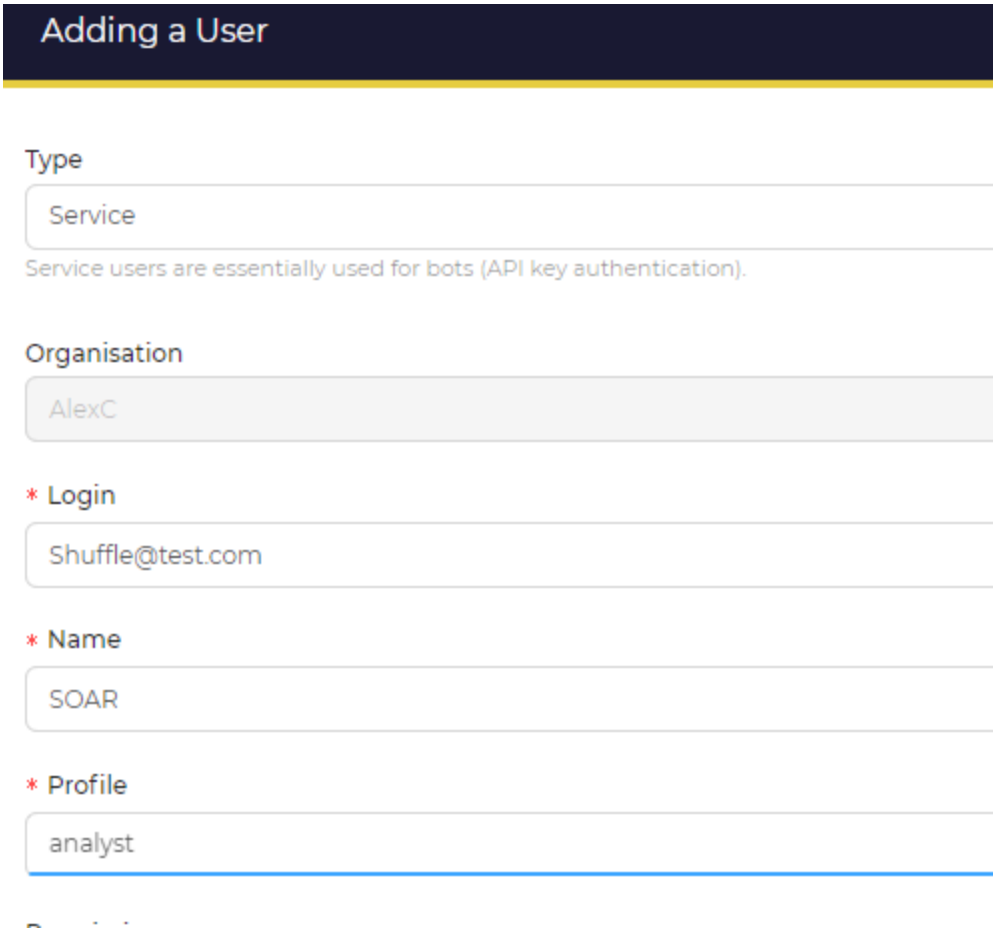




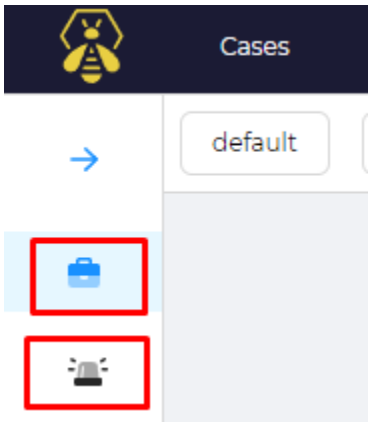
I'll create a new Analyst profile



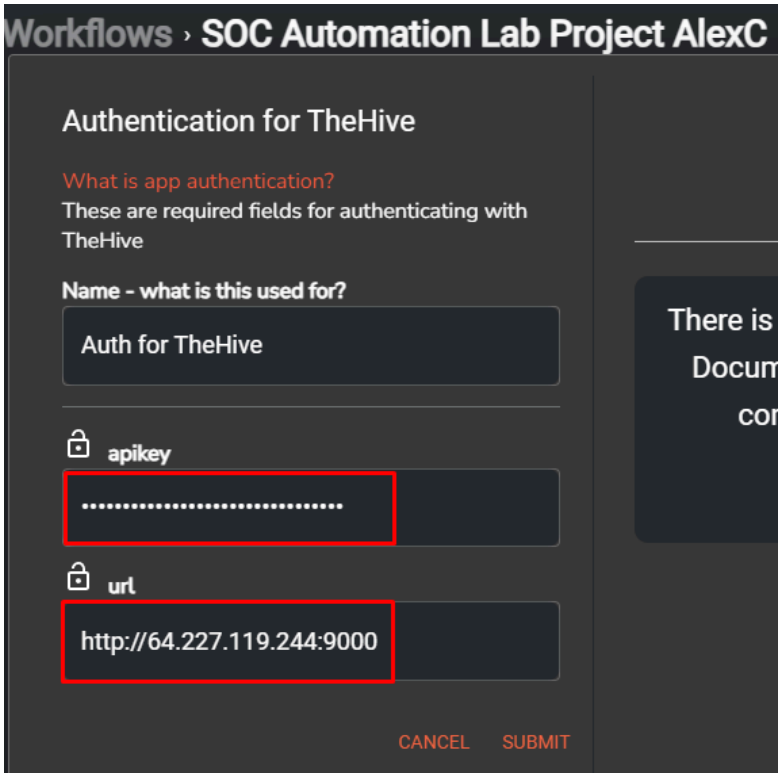
And I'll create a shuffle user, in a real world scenario there would be least privilege unique profiles for each user/groups, for the purpose of this Lab Project I'll be using the analyst profile



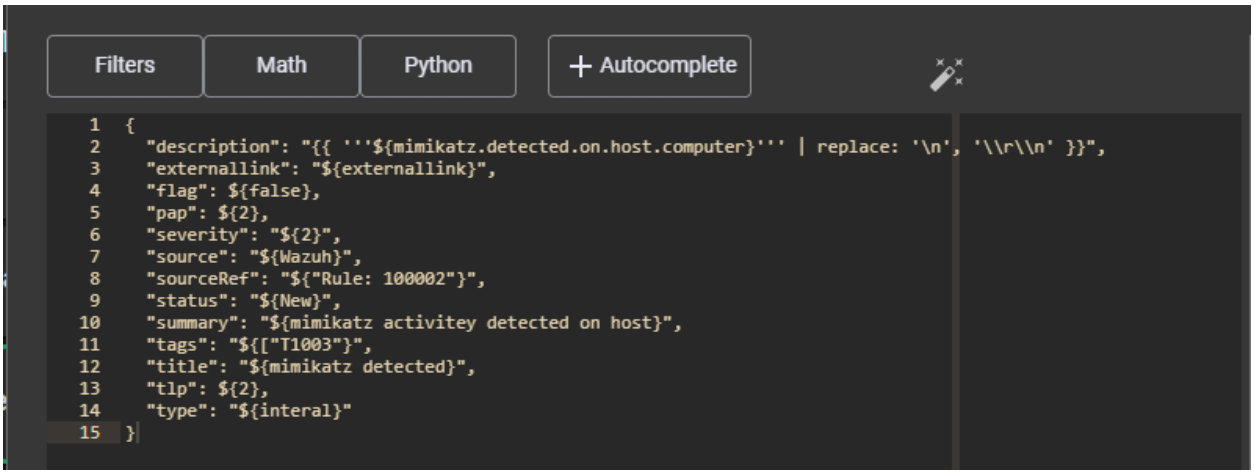
I'll copy the SOAR user API key & save it, next I will login into the SOC1@test.com user



Next I will auth TheHive in Shuffle with the APIkey



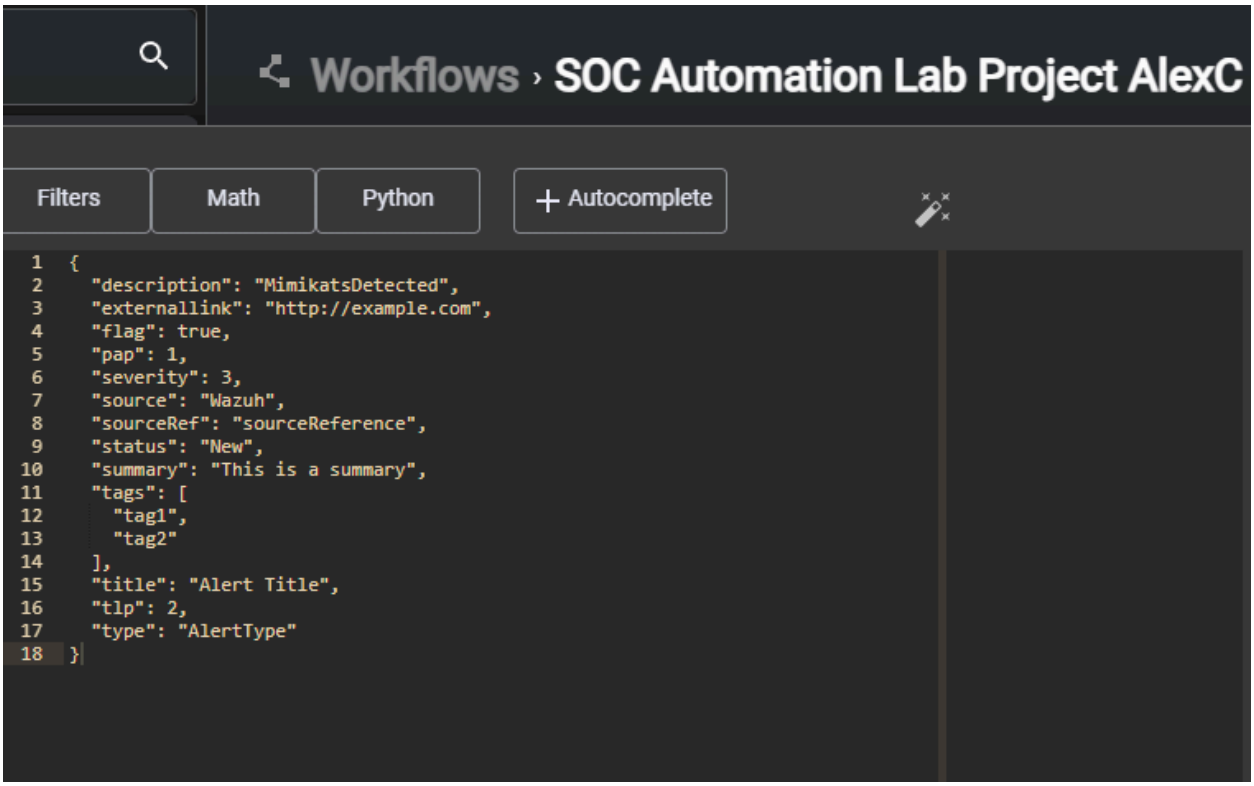
And I'll create an mimikatz alert



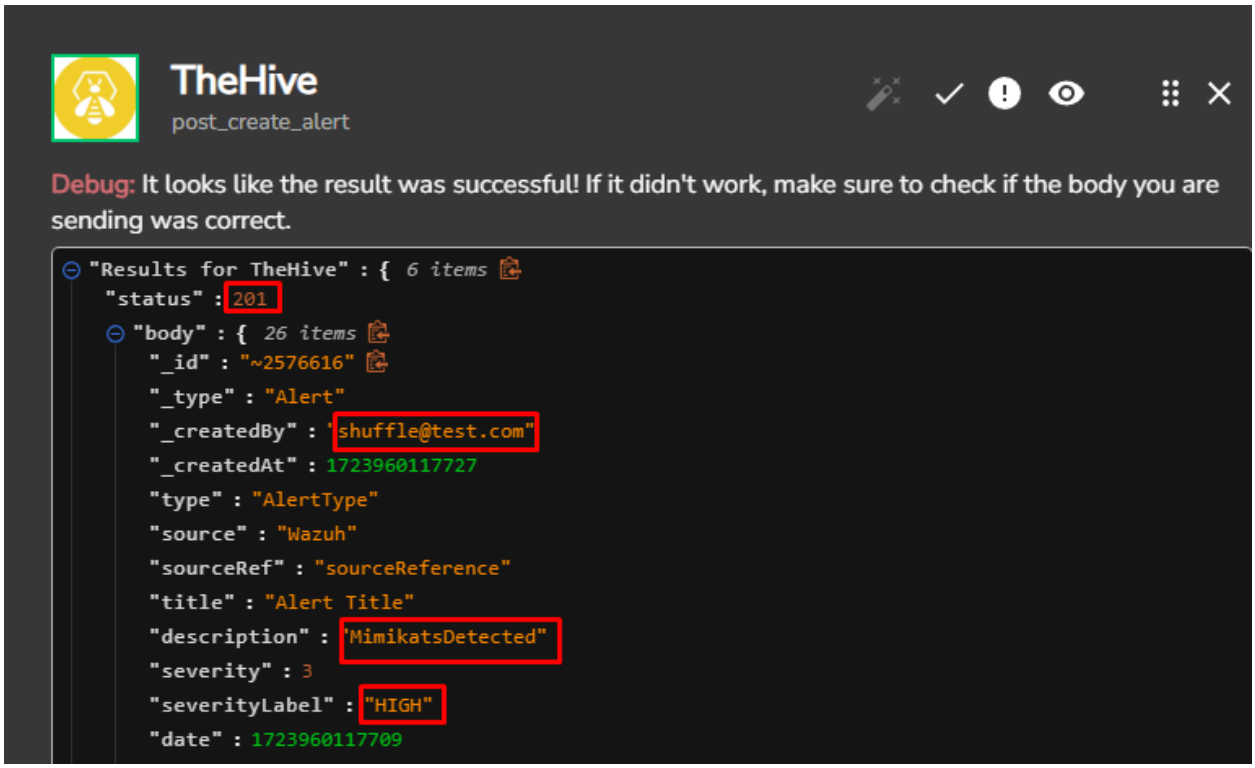
Now I'll add a new firewall rule in my cloud server in order to allow the Hive proper querying

Type	Protocol	Port Range	Sources	
All TCP	TCP	All ports	147.235.207.170	More
SSH	TCP	22	147.235.207.170	More
Custom	TCP	9000	All IPv4	More
All UDP	UDP	All ports	147.235.207.170	More

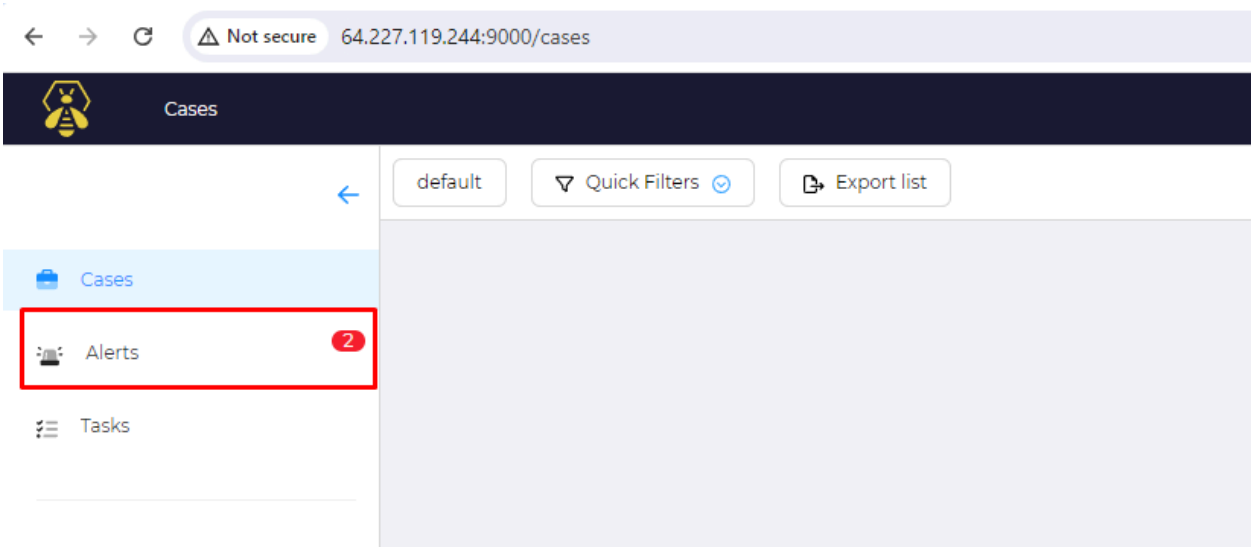
I'll create a custom create alert rule and test to see if the SOC analyst is getting live alerts



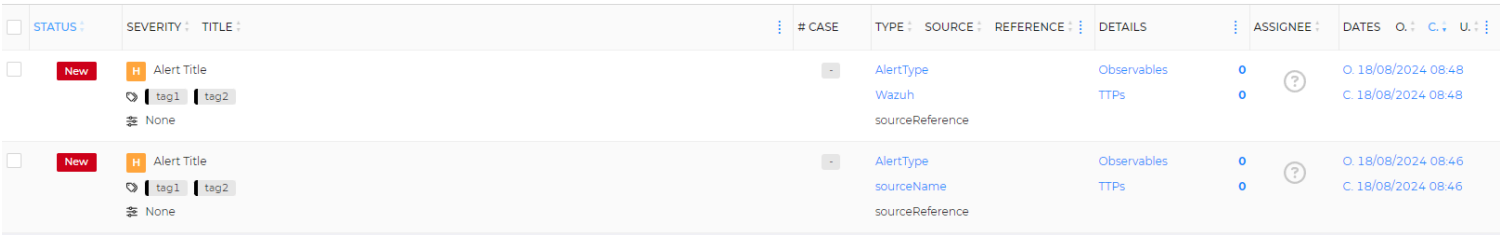
Great, it looks like it worked, now to check the SOC analyst station

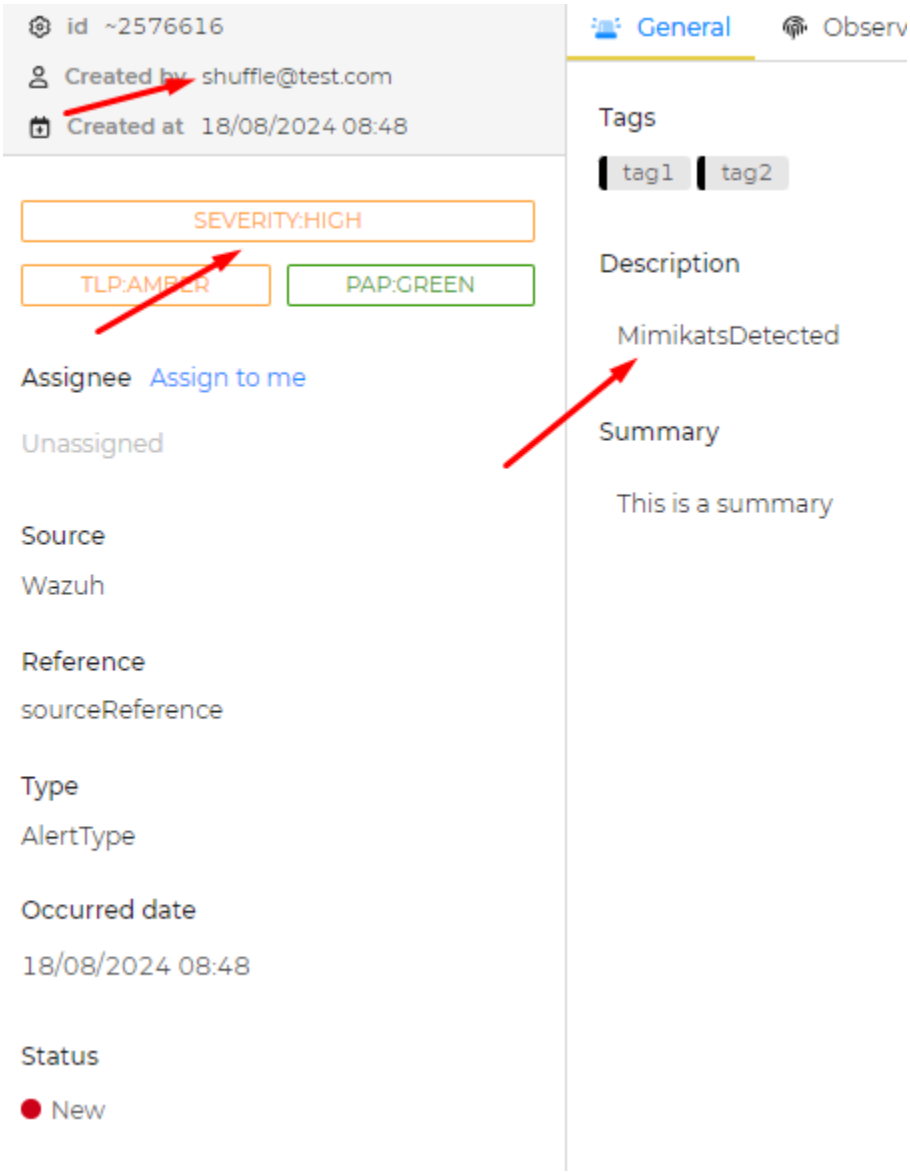


The SOAR has forwarded the alerts automatically to the SOC analyst, AWESOME!

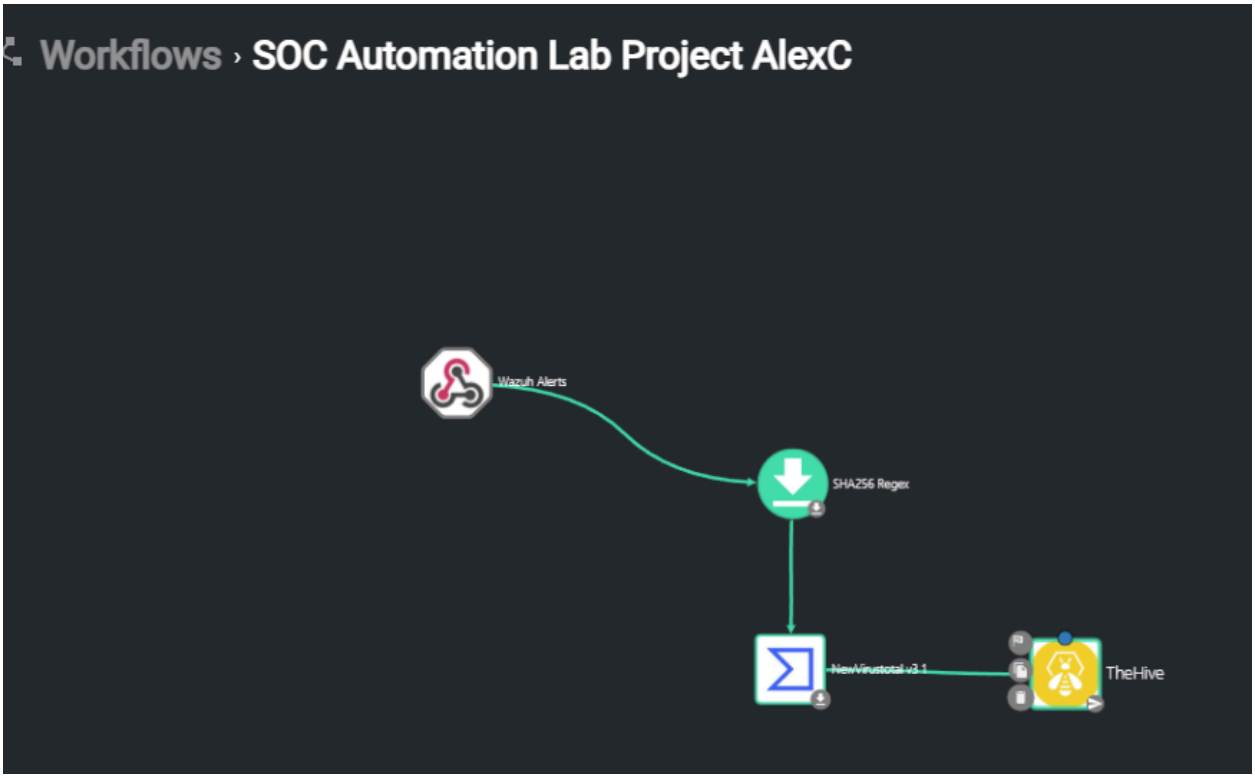


I can see the new alerts from the SOC Analyst dashboard, automatically created and forwarded using our SOAR & Wazuh/TheHive/VirusTotal

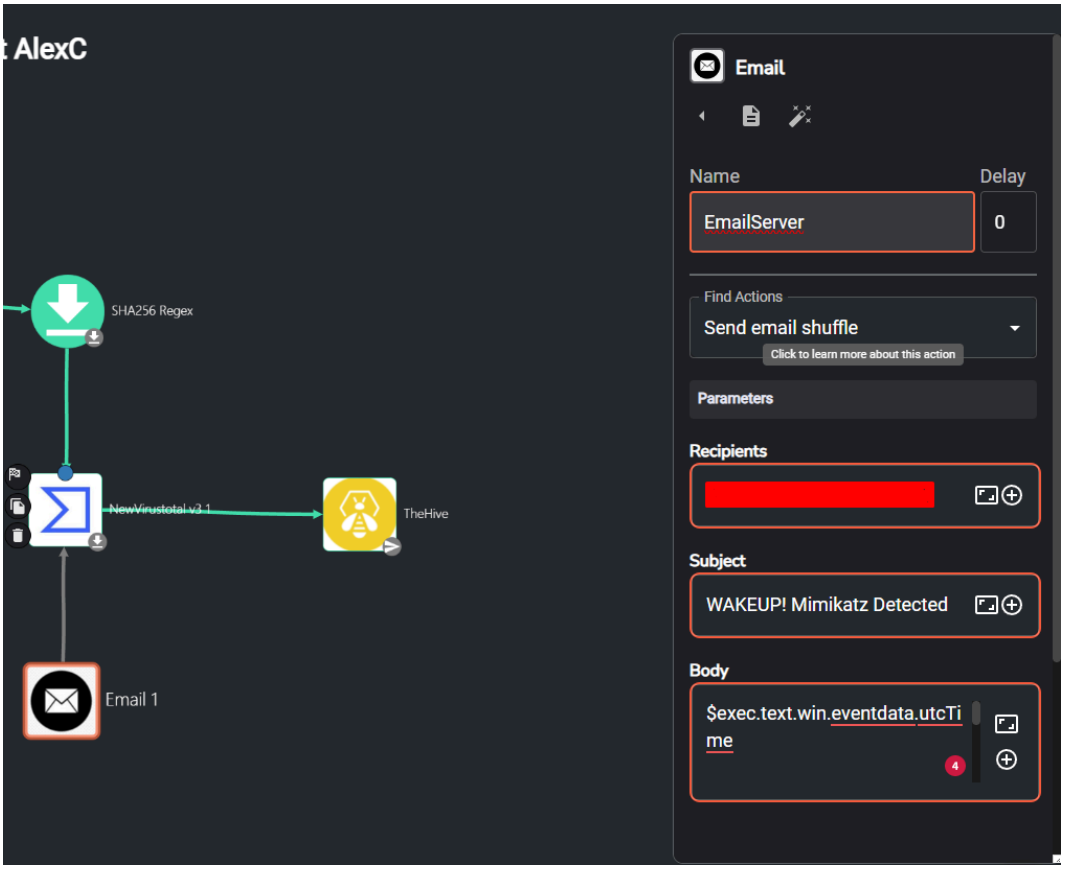




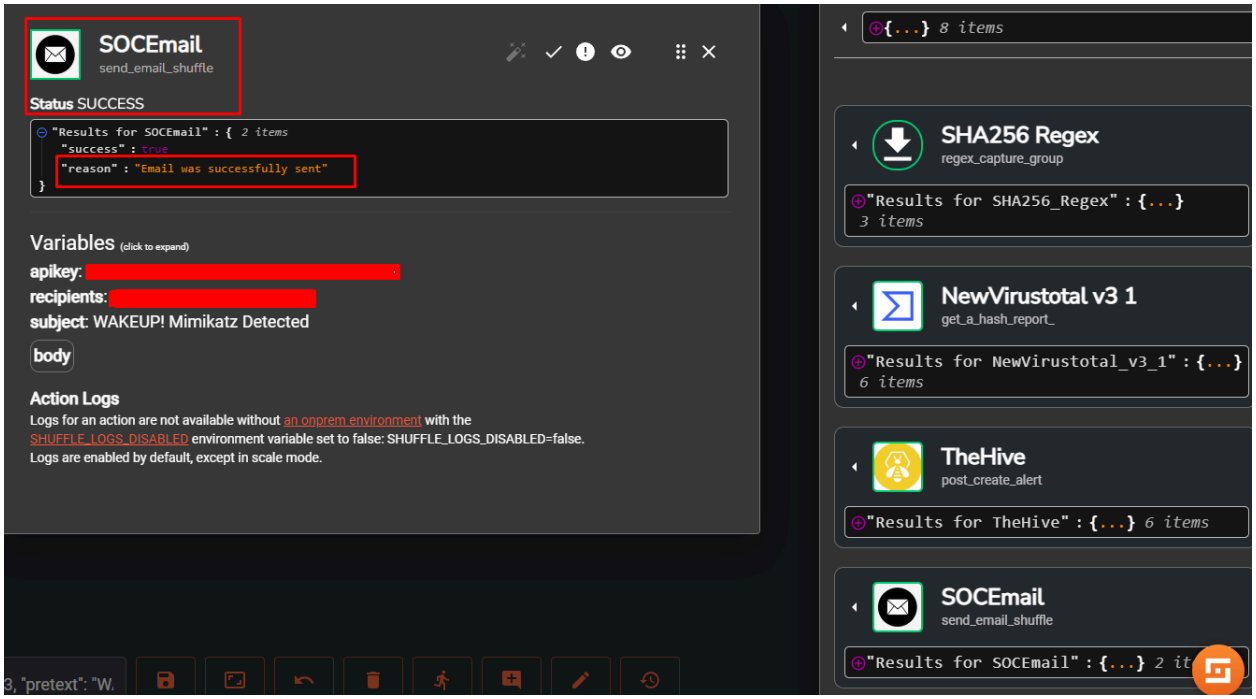
The workflow is working as intended!



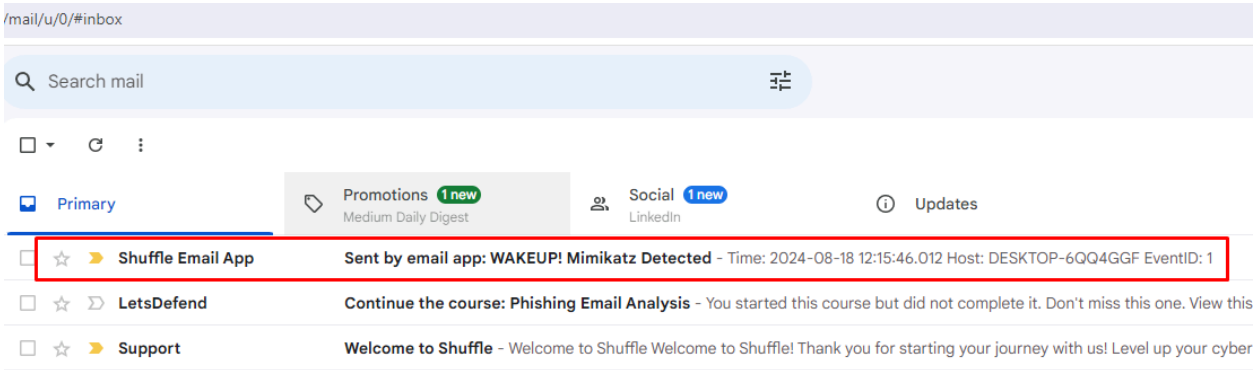
In the next step, I'll add an automated email alert for the SOC Analyst



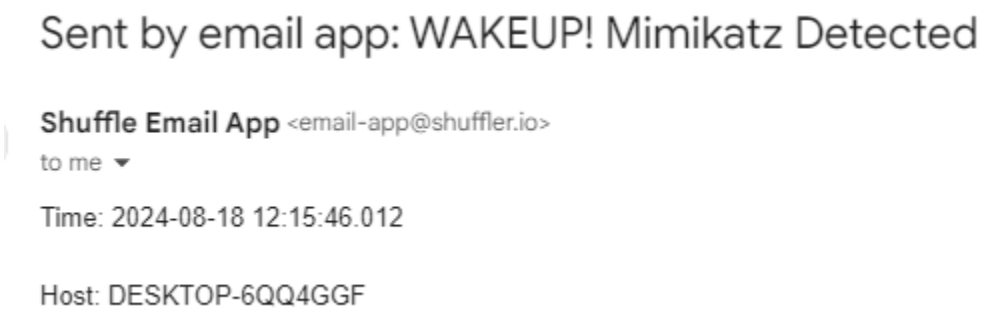
An email was sent now lets check if it was received



Success, our SOC Anaylst got an automated email for the mimikatz attack



Pretty cool! :)



End of Project Summary

By the conclusion of this SOC Automation Project, I have successfully established a fully operational live telemetry ingesting and digesting environment. This project leverages a robust stack of security tools and systems to enhance SOC (Security Operations Center) capabilities through advanced automation and orchestration.

Components Implemented:

- **Wazuh (SIEM/XDR)**: Deployed as the core SIEM and XDR solution, Wazuh efficiently collects, analyzes, and correlates security data. I have tailored custom rules and configurations to adapt to specific use cases, ensuring comprehensive monitoring and detection of threats.
- **Shuffle (SOAR)**: Integrated Shuffle to automate security workflows and orchestrate responses across the security stack. This includes the creation of automated playbooks and incident response processes, streamlining the handling of security alerts and reducing manual intervention.
- **The Hive (Case Management System)**: Implemented The Hive to manage and track security incidents. This system facilitates detailed case management, including alert aggregation, investigation tracking, and collaboration among SOC analysts.

Real-Time Alerting:

Configured the system to send real-time alerts to SOC analysts via email & live updated dashboards, ensuring that critical security events are promptly communicated and addressed. This real-time notification system is essential for rapid incident response and effective security posture management.

Live Testing and Customization:

- **Mimikatz**: Employed Mimikatz, validating the effectiveness of Wazuh's detection capabilities and refining custom rules based on the test results. This hands-on approach enhanced the SIEM's resilience.

- **Sysmon Log Implementation:** Conducted analysis of Sysmon logs to enhance threat detection & incident investigation. The analysis contributed to the development of more precise detection rules and improved overall system accuracy.

Skills learned:

- **Automation and Orchestration:** Successfully implemented advanced automation and orchestration techniques, significantly enhancing operational efficiency and response times within the SOC environment.

- **Custom Rule Development:** Created and optimized custom rules within Wazuh, tailored to the specific needs of the organization and the threats identified during testing.

- **Incident Management:** Established effective case management practices with The Hive, ensuring thorough documentation and tracking of security incidents.

- **Integration and Testing:** Demonstrated proficiency in integrating multiple security tools and performing rigorous live testing to ensure system reliability and effectiveness.