

# Wazuh SIEM Lab and Rule Modification

## Overview

I wanted to gain experience in Wazuh and Linux by setting up an SIEM lab. This included generating telemetry, rule modification, and lab setup. I used a Ubuntu 22.04 VM on the cloud and a Windows 10 VM with sysmon using VMbox.

## What is Wazuh?

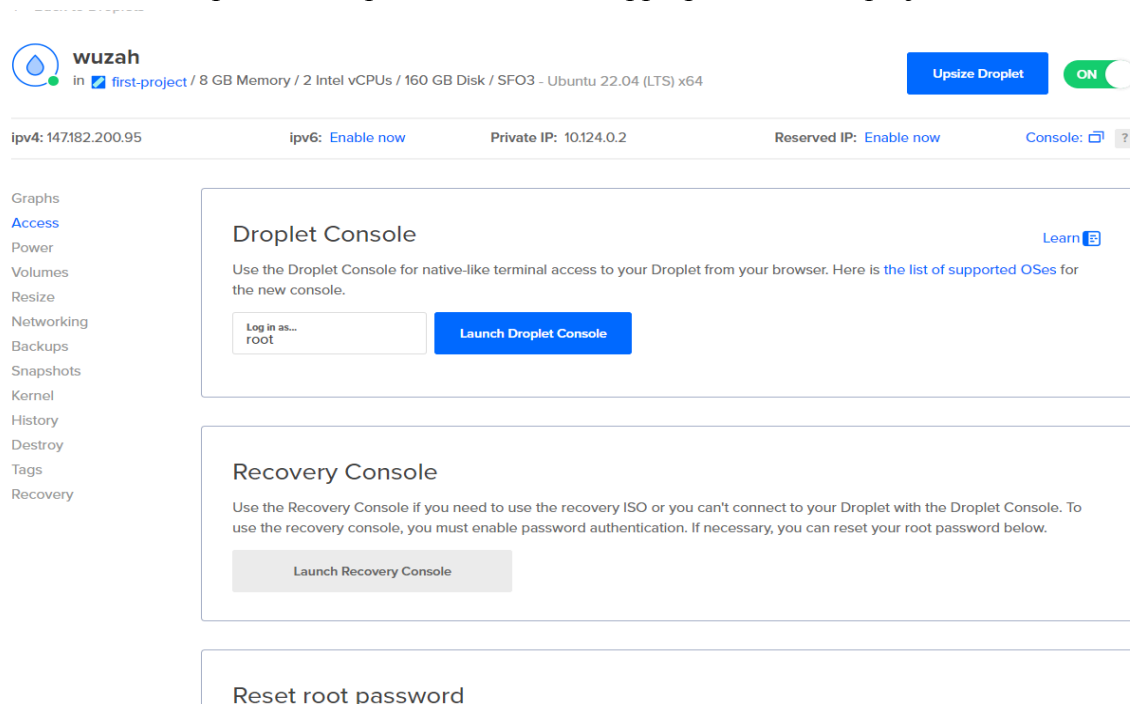
Wazuh is an open-source security platform that covers SIEM and unified XDR for the cloud and endpoints.

## How I used Wazuh

I used Wazuh as the platform for the SIEM. From the Wazuh dashboard, I was able to monitor the virtual machine. After generating telemetry, I was able to see the events and the data regarding it. Additionally, I modified the rules of Wazuh to increase detection and my understanding.

## Setting Up Wazuh

To set up Wazuh I used a free trial of Digital Ocean to host Ubuntu 22.04. The closest region was San Francisco and I picked the specs that would be appropriate for this project.



The screenshot shows the DigitalOcean interface for a Droplet named 'wuzah'. The instance is running Ubuntu 22.04 (LTS) x64 with 8 GB Memory, 2 Intel vCPUs, and 160 GB Disk. It is located in the SFO3 region. The page includes a sidebar with navigation options like Graphs, Access, Power, Volumes, Resize, Networking, Backups, Snapshots, Kernel, History, Destroy, Tags, and Recovery. The main content area features the 'Droplet Console' section, which provides instructions on using the console for native-like terminal access and includes a 'Launch Droplet Console' button. Below this is the 'Recovery Console' section, which offers instructions on using the recovery ISO and includes a 'Launch Recovery Console' button. At the bottom, there is a 'Reset root password' section.

**wuzah**  
in [first-project](#) / 8 GB Memory / 2 Intel vCPUs / 160 GB Disk / SFO3 - Ubuntu 22.04 (LTS) x64

[Upsize Droplet](#) [ON](#)

ipv4: 147.182.200.95    ipv6: [Enable now](#)    Private IP: 10.124.0.2    Reserved IP: [Enable now](#)    Console: [📄](#) [?](#)

**Droplet Console** [Learn](#)

Use the Droplet Console for native-like terminal access to your Droplet from your browser. Here is [the list of supported OSes](#) for the new console.

[Launch Droplet Console](#)


**Recovery Console**

Use the Recovery Console if you need to use the recovery ISO or you can't connect to your Droplet with the Droplet Console. To use the recovery console, you must enable password authentication. If necessary, you can reset your root password below.

[Launch Recovery Console](#)

**Reset root password**

I used Digital Ocean again to make a firewall and prevent the machine from being pinged. I set the inbound TCP and UDP to my IP address to prevent this.

 **firewall**  
5 Rules / 1 Droplet

[Rules](#) [Droplets](#) [Destroy](#)

Firewall rules control what inbound and outbound traffic is allowed to enter or leave a Droplet. [Learn](#)

### Inbound Rules

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

Type	Protocol	Port Range	Sources	
All TCP	TCP	All ports	[REDACTED]	<a href="#">More</a>
All UDP	UDP	All ports	[REDACTED]	<a href="#">More</a>

New rule

### Outbound Rules

Set the Firewall rules for outbound traffic. Outbound traffic will only be allowed to the specified ports. All other traffic will be blocked.

Type	Protocol	Port Range	Destinations	
ICMP	ICMP		All IPv4 All IPv6	<a href="#">More</a>

Error

I was having trouble connecting to the SSH when using the Digital Ocean launcher. To fix this I download Putty. With Putty, I just inputted my IP for the Wazuh and connected to port 9000.

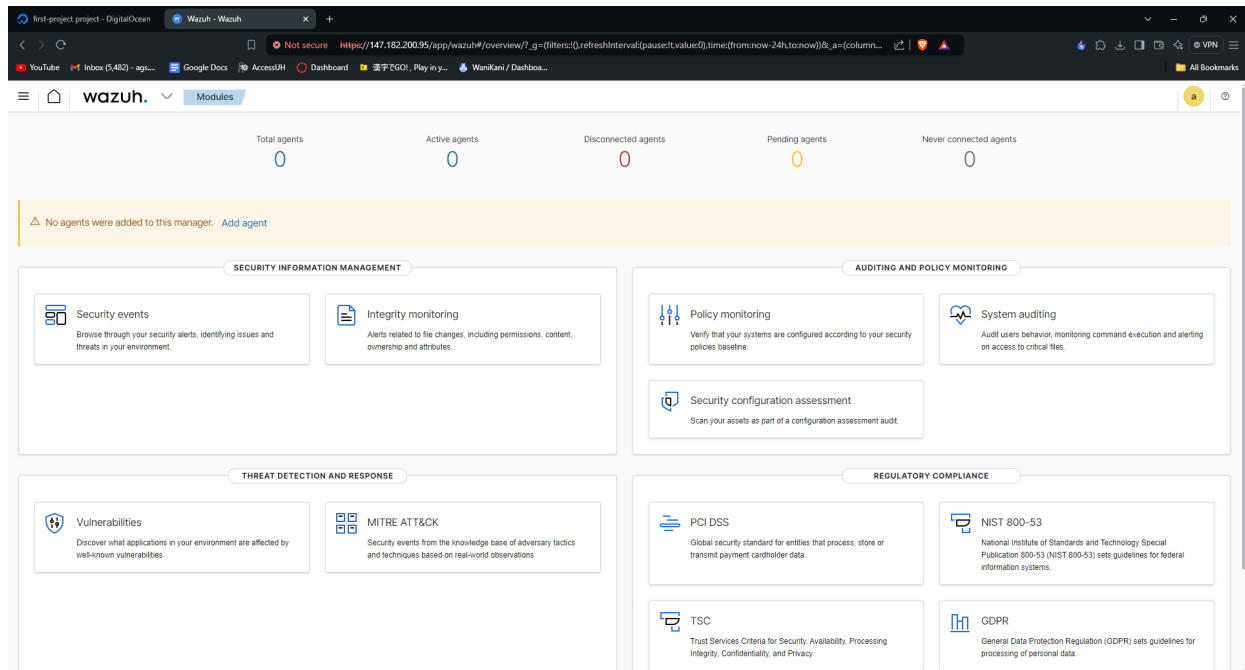
root@wuzah: ~

Scanning processes...  
Scanning candidates...  
Scanning linux images...  
  
Running kernel seems to be up-to-date.  
  
Restarting services...  
/etc/needrestart/restart.d/systemd-manager  
systemctl restart cron.service packagekit.service ssh.service systemd-journald.service systemd-networkd.service systemd-resolved.service systemd-timesyncd.service systemd-udev.service  
Service restarts being deferred:  
systemctl restart networkd-dispatcher.service  
systemctl restart systemd-logind.service  
systemctl restart unattended-upgrades.service  
systemctl restart user@0.service  
  
No containers need to be restarted.  
  
No user sessions are running outdated binaries.  
  
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
root@wuzah:~# curl -s0 https://packages.wazuh.com/4.7/wazuh-install.sh && sudo bash ./wazuh-install.sh -a

Port Range	Sources	
All ports	104.177.1.115	<a href="#">More</a>

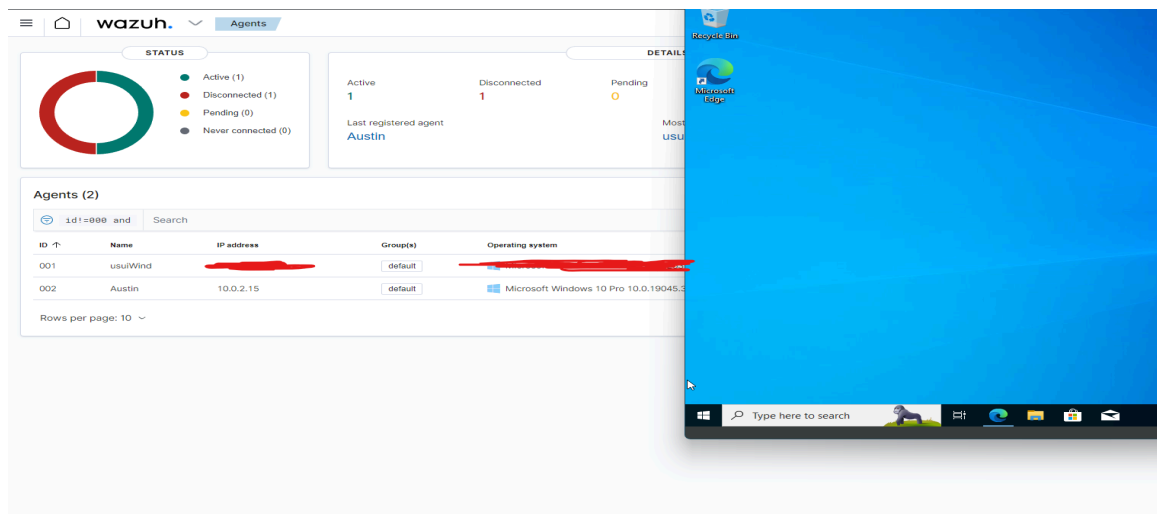
## Installing Wazuh

After stalling Wazuh using the kurl command available on their website and “apt-get update && apt-get upgrade”. I typed in the IP address into my search engine which takes me to my Wazuh login. Wazuh provides login info after the app is installed. Using this info I was able to access the dashboard.



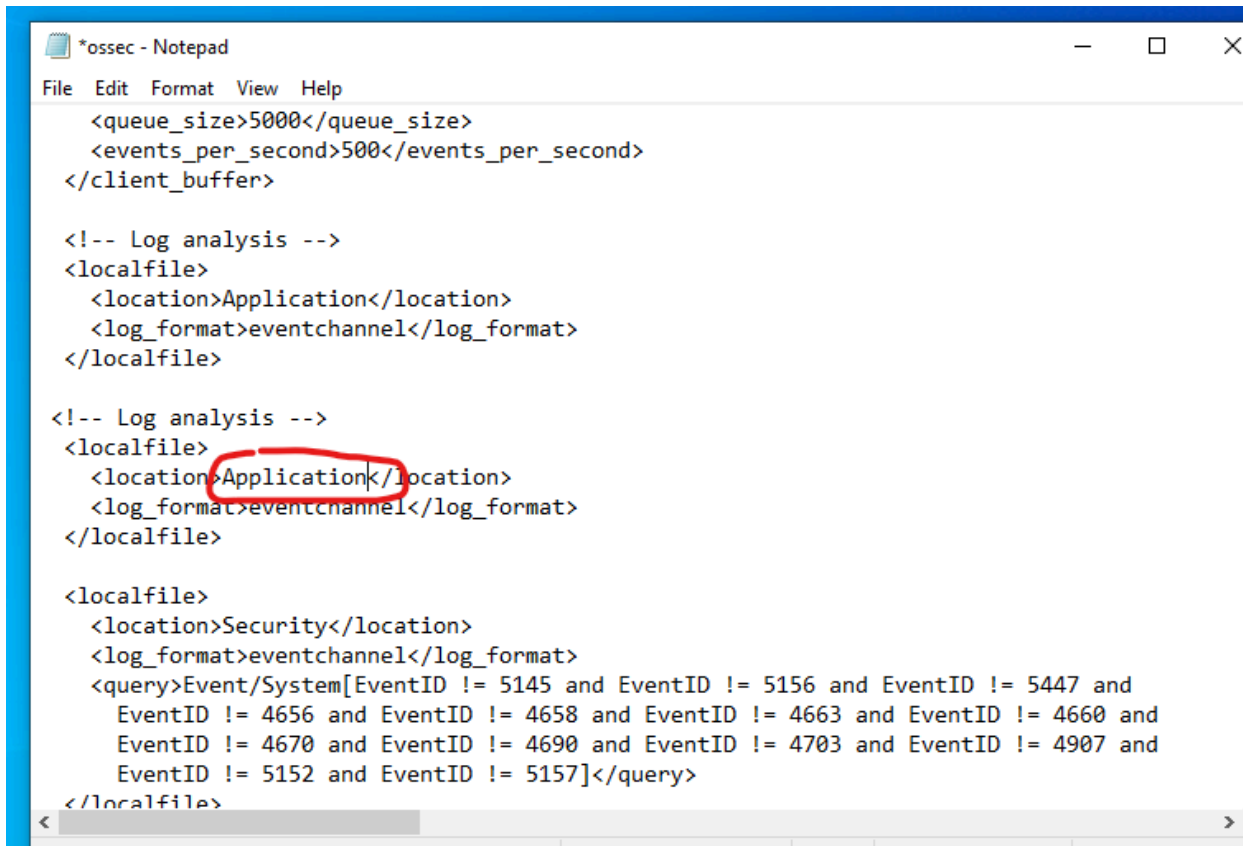
## Wazuh Agent on VM

To get the agent on wazuh. I simply go to the agent's tab from the hamburger menu. After clicking add agent. I will input my IP address since it is shared for the VM. I think copy pasted the commands to add the Wazuh agent. After accidentally adding it to my home computer and the VM. I have Wazuh on the Windows 10 VM.



## Modifying Wazuh

I modify the Wazuh files to create a log for Sysmon. Replacing 'application' for application location for sysmon.



```
*ossec - Notepad
File Edit Format View Help

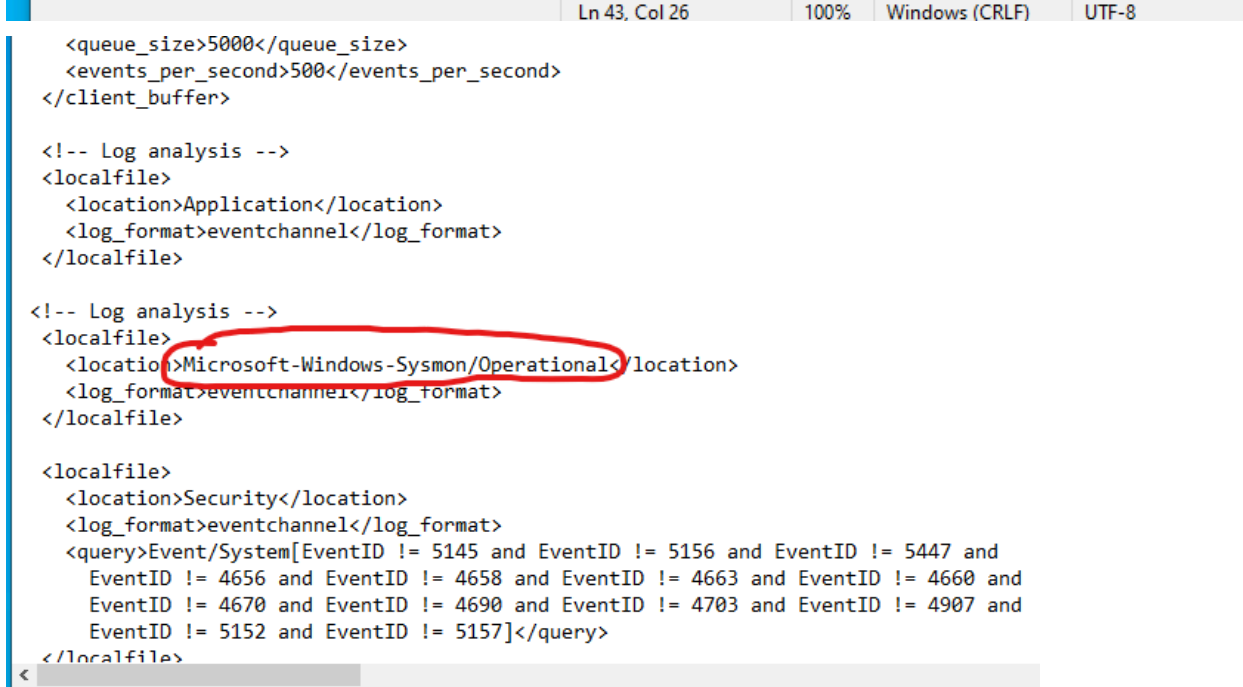
<queue_size>5000</queue_size>
<events_per_second>500</events_per_second>
</client_buffer>

<!-- Log analysis -->
<localfile>
  <location>Application</location>
  <log_format>eventchannel</log_format>
</localfile>

<!-- Log analysis -->
<localfile>
  <location>Application</location>
  <log_format>eventchannel</log_format>
</localfile>

<localfile>
  <location>Security</location>
  <log_format>eventchannel</log_format>
  <query>Event/System[EventID != 5145 and EventID != 5156 and EventID != 5447 and
    EventID != 4656 and EventID != 4658 and EventID != 4663 and EventID != 4660 and
    EventID != 4670 and EventID != 4690 and EventID != 4703 and EventID != 4907 and
    EventID != 5152 and EventID != 5157]</query>
</localfile>
```

Ln 43, Col 26 100% Windows (CRLF) UTF-8



```
<queue_size>5000</queue_size>
<events_per_second>500</events_per_second>
</client_buffer>

<!-- Log analysis -->
<localfile>
  <location>Application</location>
  <log_format>eventchannel</log_format>
</localfile>

<!-- Log analysis -->
<localfile>
  <location>Microsoft-Windows-Sysmon/Operational</location>
  <log_format>eventchannel</log_format>
</localfile>

<localfile>
  <location>Security</location>
  <log_format>eventchannel</log_format>
  <query>Event/System[EventID != 5145 and EventID != 5156 and EventID != 5447 and
    EventID != 4656 and EventID != 4658 and EventID != 4663 and EventID != 4660 and
    EventID != 4670 and EventID != 4690 and EventID != 4703 and EventID != 4907 and
    EventID != 5152 and EventID != 5157]</query>
</localfile>
```

I then delete all these parts of the Wazuh so only sysmon events are stored.

```
*ossec - Notepad
File Edit Format View Help

<!-- Log analysis -->
<localfile>
  <location>Application</location>
  <log_format>eventchannel</log_format>
</localfile>

<localfile>
  <location>Microsoft-Windows-Sysmon/Operational</location>
  <log_format>eventchannel</log_format>
</localfile>

<localfile>
  <location>Security</location>
  <log_format>eventchannel</log_format>
  <query>Event/System[EventID != 5145 and EventID != 5156 and EventID != 5447 and
    EventID != 4656 and EventID != 4658 and EventID != 4663 and EventID != 4660 and
    EventID != 4670 and EventID != 4690 and EventID != 4703 and EventID != 4907 and
    EventID != 5152 and EventID != 5157]</query>
</localfile>

<localfile>
  <location>System</location>
  <log_format>eventchannel</log_format>
</localfile>

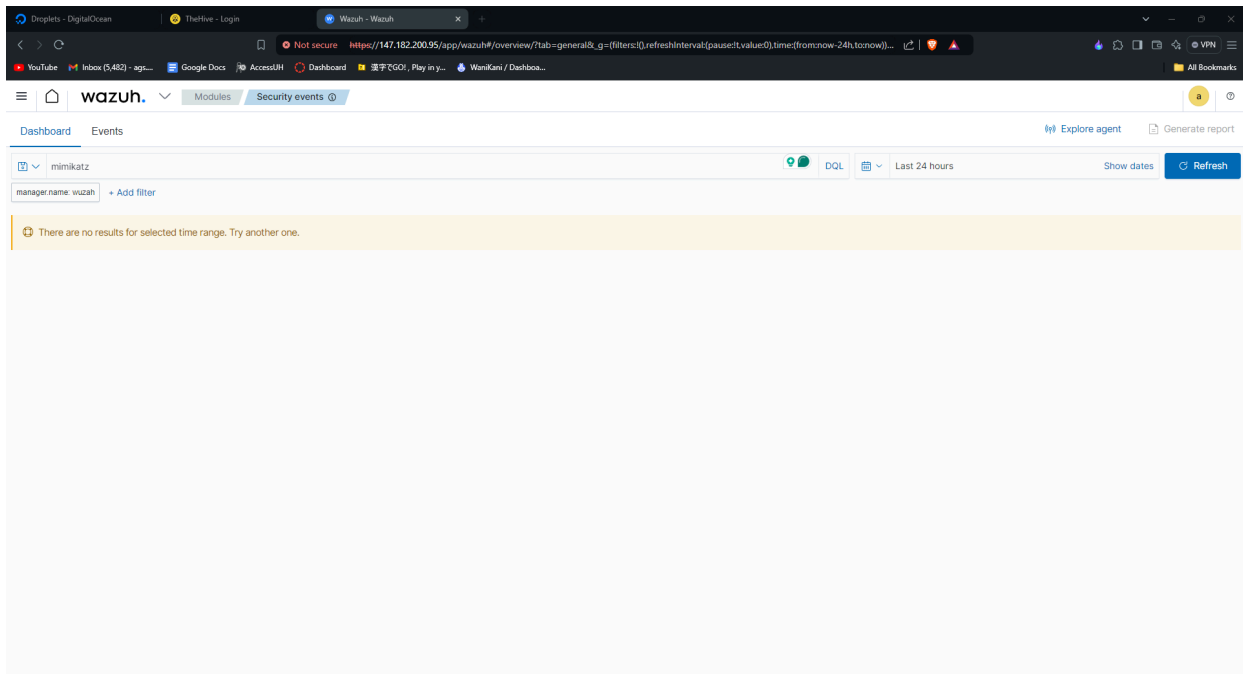
<localfile>
  <location>active-response\active-responses.log</location>
  <log_format>syslog</log_format>
</localfile>

<!-- Policy monitoring -->
<rootcheck>
  <disabled>no</disabled>
  <windows apps>./shared/win applications rcl.txt</windows apps>
</rootcheck>

Ln 39, Col 15    100%    Windows (CRLF)    UTF-8
```

## **Data Problem**

There are no events on mimikatz or sysmon. This is because there are no rules for mimikatz and Wazuh does not log everything. Consequently, I changed Wazuh to log all. Additionally, I changed the filebeat to ingest all of the logs.



```
root@wuzah:~# cp /var/ossec/etc/ossec.conf ~ossec-backup.conf
root@wuzah:~# nano /var/ossec/etc/ossec.conf
root@wuzah:~# systemctl restart wazuh-manager.service
root@wuzah:~# cd /var/ossec/logs/archives# ls
-bash: cd: too many arguments
root@wuzah:~# cd /var/ossec/logs/archives/
root@wuzah:/var/ossec/logs/archives# ls
2024 archives.json archives.log
root@wuzah:/var/ossec/logs/archives# ^C
root@wuzah:/var/ossec/logs/archives# nano /etc/filebeat/filebeat.yml
```

```
root@wuzah:~# cp /var/ossec/etc/ossec.conf ~ossec-backup.conf
root@wuzah:~# nano /var/ossec/etc/ossec.conf
```

```
<global>
  <jsonout_output>yes</jsonout_output>
  <alerts_log>yes</alerts_log>
  <logall>yes</logall>
  <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>
```

```
filebeat.modules:
- module: wazuh
  alerts:
    enabled: true
  archives:
    enabled: true
  logging_level: info
```

## Index Creation:

Next I created an index for all the logs. Then execute bash commands to see that mimikatz is in

the output of the archives (mimikatz in the red).

### Create index pattern

An index pattern can match a single source, for example, `filebeat-4-3-22`, or **multiple** data sources, `filebeat-*`.  
[Read documentation](#)

---

#### Step 2 of 2: Configure settings

Specify settings for your **wazuh-archives-\*** index pattern.

Select a primary time field for use with the global time filter.

Time field

Refresh

timestamp

▼

---

> Show advanced settings

< Back

Create index pattern

```
root@wuzah: /var/ossec/logs/archives
root@wuzah:/var/ossec/logs/archives# cat archives.json | grep -i mimikatz
root@wuzah:/var/ossec/logs/archives#
```
















the name of the file still yielded results showing our rule was a success.

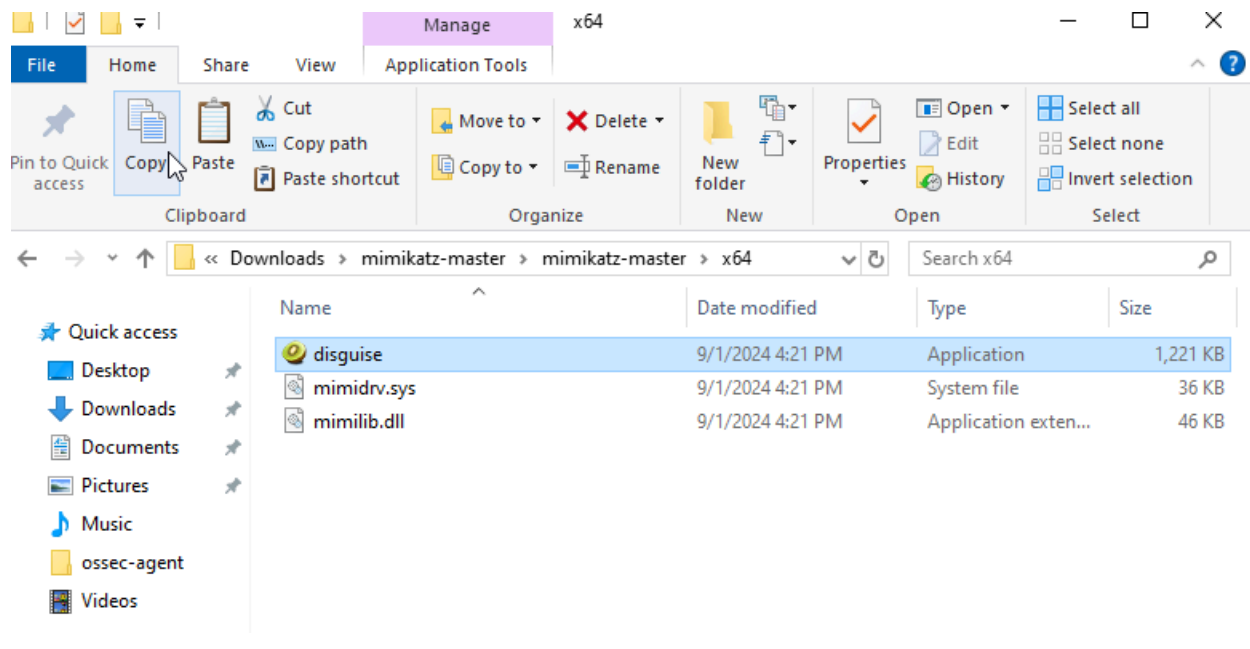
#### Rules files (10)

From here you can manage your rules files.

 Manage rules

sysmon		
File ↑	Path	Actions
0330-sysmon_rules.xml	ruleset/rules	
0595-win-sysmon_rules.xml	ruleset/rules	
0600-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 ▾		

```
1 <!-- Local rules -->
2
3 <!-- Modify it at your will. -->
4 <!-- Copyright (C) 2015, Wazuh Inc. -->
5
6 <!-- Example -->
7 <group name="local,syslog,sshd,">
8
9   <!--
10    Dec 10 01:02:02 host sshd[1234]: Failed none for root from 1.1.1.1 port 1066 ssh2
11    -->
12   <rule id="100001" level="5">
13     <if_sid>5716</if_sid>
14     <srcip>1.1.1.1</srcip>
15     <description>sshd: authentication failed from IP 1.1.1.1.</description>
16     <group>authentication_failed,pci_dss_10.2.4,pci_dss_10.2.5,</group>
17   </rule>
18
19   <rule id="100002" level="15">
20     <if_group>sysmon_event1</if_group>
21     <field name="win.eventdata.originalFileName" type="pcr2">(>i)mimikatz\.exe</field>
22     <description>Mimikatz Detected</description>
23     <mitre>
24       <id>T1003</id>
25     </mitre>
26   </rule>
27
28 </group>
29
```



#### ty Alerts

Time ↓	Agent	Agent name	Technique(s)	Tactic(s)	Description
Sep 1, 2024 @ 17:07:20.021	002	Austin	T1003	Credential Access	Mimikatz Detected
Sep 1, 2024 @ 17:04:04.444	000	wuzah			Wazuh server started.