



## **Integration of Snort IDS with Wazuh!**

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## **What is Wazuh?**

Wazuh is a free and open-source security platform used for threat detection, compliance monitoring, and incident response. It helps organizations monitor their infrastructure in real-time by collecting and analyzing data from endpoints (like servers, desktops, or cloud instances). Wazuh works as a SIEM (Security Information and Event Management) and XDR (Extended Detection and Response) solution.

## **Snort**

Snort is an open-source Intrusion Detection System (IDS) that monitors network traffic in real time to detect and prevent suspicious activities. Developed by Cisco, Snort uses a rule-based language to analyze packets and identify potential threats such as malware, port scans, or unauthorized access. It's widely used for network security due to its flexibility, efficiency, and active community support.

## **Wazuh with Snort!**

Snort and Wazuh can be integrated to enhance network and host-based security monitoring. Snort detects and generates alerts for suspicious network traffic, while Wazuh collects, analyzes, and correlates these alerts with other system logs. By integrating both, security teams gain centralized visibility and improved threat detection, combining Snort's network-level insights with Wazuh's endpoint and log analysis capabilities.

## Snort Installation:

Command:

Sudo apt-get install snort -y

```
(kali@kali)-[~]
└─$ sudo apt-get install snort -y
[sudo] password for kali:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libdaq3 libestr0 libfastjson4 liblognorm5 oinkmaster rsyslog snort-common snort-common-libraries snort-rules-default
Suggested packages:
  rsyslog-doc rsyslog-mysql | rsyslog-pgsql rsyslog-mongodb rsyslog-elasticsearch rsyslog-kafka rsyslog-hiredis rsyslog-snmpp rsyslog-kubernetes rsyslog-docker rsyslog-clickhouse rsyslog-openssl | rsyslog-gnutls rsyslog-gssapi
  rsyslog-relp snort-doc
The following NEW packages will be installed:
  libdaq3 libestr0 libfastjson4 liblognorm5 oinkmaster rsyslog snort snort-common snort-common-libraries snort-rules-default
```

```
(kali@kali)-[/etc/snort]
└─$ snort -v

o")~  Snort++ 3.1.82.0

-----

Network Policy : policy id 0 :
-----

Inspection Policy : policy id 0 :
-----

pcap DAQ configured to passive.
-----

host_cache
  memcap: 33554432 bytes

Snort successfully validated the configuration (with 0 warnings).
o")~  Snort exiting

(kali@kali)-[/etc/snort]
└─$
```

now change the directory to /etc/snort/rules

command:

/etc/snort/rules/local.rules

```
(kali@kali)-[/etc/snort]
└─$ cd /etc/snort/rules

(kali@kali)-[/etc/snort/rules]
└─$ ls
attack-responses.rules  community-ftp.rules      community-oracle.rules  community-web-cgi.rules  dns.rules              imap.rules              oracle.rules             rservices.rules         virus.rules             web-php.rules
backdoor.rules          community-game.rules      community-policy.rules  community-web-client.rules  dos.rules              info.rules              other-ids.rules          scan.rules              web-attacks.rules      x11.rules
bad-traffic.rules       community-icmp.rules      community-rules          community-web-dos.rules    experimental.rules     local.rules             p2p.rules               shellcode.rules         web-cgi.rules          x11.rules
chat.rules              community-inap.rules      community-sip.rules     community-web-lis.rules    exploit.rules           misc.rules              pop2.rules              smtp.rules              web-client.rules       x11.rules
community-bot.rules     community-inappropriate.rules  community-smtp.rules    community-web-misc.rules   finger.rules           multimedia.rules         pop3.rules              snmp.rules              web-coldfusion.rules   x11.rules
community-deleted.rules  community-mail-client.rules  community-sql-injection.rules  community-web-php.rules   ftp.rules              mysql.rules             pop3.rules              sql.rules              web-frontpage.rules    x11.rules
community-dos.rules     community-misc.rules       community-virus.rules    ddos.rules                 icmp-info.rules        netbios.rules           ponn.rules              telnet.rules           web-lis.rules          x11.rules
community-exploit.rules  community-ntp.rules        community-web-attacks.rules  deleted.rules              icmp.rules             nntp.rules              rpc.rules               tftp.rules             web-misc.rules         x11.rules

(kali@kali)-[/etc/snort/rules]
└─$
```

# Open the local.rules file

## Nano local.rules

A screenshot of a terminal window with the nano text editor open. The title bar shows 'kali@kali: /etc/snort/rules' and 'local.rules +'. The editor content includes the standard Snort local.rules header: '# \$Id: local.rules,v 1.11 2004/07/23 20:15:44 bmc Exp \$', '# LOCAL RULES', and a comment about signatures. The cursor is at the end of the first line.

## Now add these rules in the file

alert tcp any any -> any any (msg:"[Snort] Nmap TCP Scan Detected"; flags:S; sid:1000002; rev:2;)

alert udp any any -> any any (msg:"[Snort] Nmap UDP Scan Detected"; sid:1000003; rev:2;)

alert icmp any any -> any any (msg:"[Snort] ICMP Ping Detected"; itype:8; sid:1000004; rev:2;)

alert tcp any any -> any any (msg:"[Snort] Nmap Version Scan (sV) Detected"; content:"|0d 0a|"; flags:PA; sid:1000005; rev:2;)

A screenshot of the nano editor showing the four rules added to the local.rules file. The rules are: 1. Nmap TCP Scan Detected (sid:1000002), 2. Nmap UDP Scan Detected (sid:1000003), 3. ICMP Ping Detected (sid:1000004), and 4. Nmap Version Scan (sV) Detected (sid:1000005). The cursor is at the end of the fourth rule.

## Now save the file and change the directory to snort.lua file.

### i.e /etc/snort

A screenshot of a terminal window showing the following commands and output: 1. '(kali@kali):~/etc/snort/rules' prompt, '\$ cd ..' command, output '(kali@kali):~/etc/snort'. 2. '\$ sudo nano snort.lua' command, output '(kali@kali):~/etc/snort'. 3. '\$ sudo nano snort.lua' command, output '(kali@kali):~/etc/snort'. Below this, another screenshot shows the nano editor open at '/etc/snort/snort.lua' with the title 'Snort++ configuration'.

After opening the **snort.lua** look for configure detection section

```
-----  
-- 5. configure detection  
-----  
  
references = default_references  
classifications = default_classifications  
  
ips =  
{  
  -- use this to enable decoder and inspector alerts  
  --enable_builtin_rules = true,  
  
  -- use include for rules files; be sure to set your path  
  -- note that rules files can include other rules files  
  -- (see also related path vars at the top of snort_defaults.lua)  
  
variables = default_variables  
}  
  
-- use these to configure additional rule actions
```

Now add this code in configure detection section.

```
enable_builtin_rules = true,  
include = {  
  RULE_PATH .. "/local.rules",  
},
```

```
references = default_references  
classifications = default_classifications  
  
ips =  
{  
  -- use this to enable decoder and inspector alerts  
  --enable_builtin_rules = true,  
  
  -- use include for rules files; be sure to set your path  
  -- note that rules files can include other rules files  
  -- (see also related path vars at the top of snort_defaults.lua)  
  
enable_builtin_rules = true,  
include = {  
  RULE_PATH .. "/local.rules",  
  },  
  
variables = default_variables  
}  
  
-- use these to configure additional rule actions  
-- react = { }  
-- reject = { }  
  
-- use this to enable payload injection utility  
-- payload_injector = { }  
  
-----  
-- 6. configure filters
```

Now save and test the file.

Note: I am adding again `-R` because I am facing rule path error

```
(kali㉿kali)-[/etc/snort]
└─$ snort -c snort.lua -T -R /etc/snort/rules/local.rules
-----
# Snort configuration
#
# references = default_references
# classifications = default_classifications
```

```
rule counts
  total rules loaded: 4
    text rules: 4
    option chains: 4
    chain headers: 3
-----
port rule counts
      tcp      udp      icmp      ip
  any      2      1      1      0
  total    2      1      1      0
-----
fast pattern groups
      any: 2
-----
search engine (ac_bnfa)
  fast pattern only: 1
-----
pcap DAQ configured to passive.

Snort successfully validated the configuration (with 0 warnings).
o")~  Snort exiting
```

Now again open the snort.lua file to configure output

Add this piece of code in the output configuration and save the file.

```
-- 7. configure outputs
-----
-- event logging
-- you can enable with defaults from the command line with -A <alert_type>
-- uncomment below to set non-default configs
--alert_csv = { }
--alert_fast = { }
--alert_full = { }
--alert_sfsocket = { }
--alert_syslog = { }
--unified2 = { }

-- packet logging
-- you can enable with defaults from the command line with -L <log_type>
--log_codecs = { }
--log_hex = { }
--log_pcap = { }

-- additional logs
--packet_capture = { }
--file_log = { }

outputs =
{
  {
    file = true,
    filename = "/var/log/snort/alert_fast.txt",
    format = "alert_fast"
  }
}
```

After writing again check the working by running this command

```
sudo snort -c /etc/snort/snort.lua -R /etc/snort/rules/local.rules -i eth0 -l /var/log/snort
```

```
(kali@kali)-[/var/log/snort]
$ sudo snort -c /etc/snort/snort.lua -R /etc/snort/rules/local.rules -i eth0 -l /var/log/snort

[sudo] password for kali:
o*)~  Snort++ 3.1.82.0
-----
Loading /etc/snort/snort.lua:
Loading snort_defaults.lua:
Finished snort_defaults.lua:
  classifications
  output:
    trace
    dce_http_server
    ips
    output
```

It's configured and running properly

```
match list memory: 27.3828
transition memory: 23.3398
fast pattern only: 1
appid: MaxRss diff: 3004
appid: patterns loaded: 300
-----
pcap DAQ configured to passive.
Commencing packet processing
+ [0] eth0
[0] Exit
```

To check go to **/var/log/snort** folder

After that open **Ossec.conf** Wazuh agent file to read the output.

## Nano ossec.conf

Now goto localfile tags section

```
c/ossec_config>
ossec_config>
<localfile>
  <log_format>journaldc/log_format>
  <location>journaldc/location>
</localfile>

<localfile>
  <log_format>apache</log_format>
  <location>/var/log/nginx/access.log</location>
</localfile>

<localfile>
  <log_format>apache</log_format>
  <location>/var/log/nginx/error.log</location>
</localfile>

<localfile>
  <log_format>apache</log_format>
  <location>/var/log/apache2/error.log</location>
</localfile>

<localfile>
  <log_format>apache</log_format>
```



Paste this code in the localfile path

```
<localfile>
  <log_format>snort-full</log_format>
  <location>/var/log/snort/alert_fast.txt</location>
</localfile>
```



The screenshot shows a file editor with the following XML configuration:

```
<ossec_config>
  <localfile>
    <log_format>journald</log_format>
    <location>journald</location>
  </localfile>

  <!-- Snort Alert here -->
  <localfile>
    <log_format>snort-full</log_format>
    <location>/var/log/snort/alert_fast.txt</location>
  </localfile>

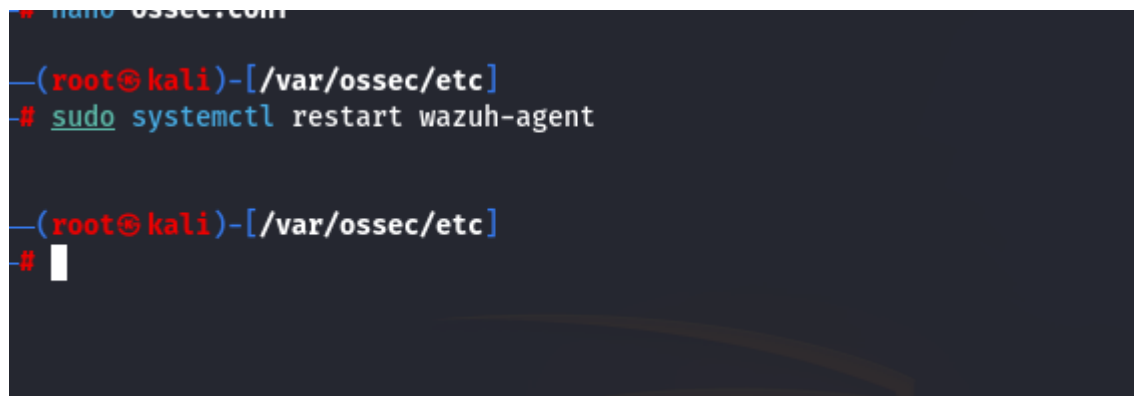
  <localfile>
    <log_format>apache</log_format>
    <location>/var/log/nginx/access.log</location>
  </localfile>

  <localfile>
    <log_format>apache</log_format>
    <location>/var/log/nginx/error.log</location>
  </localfile>

  <localfile>
    <log_format>apache</log_format>
    <location>/var/log/apache2/error.log</location>
  </localfile>
</ossec_config>
```

Now save the file and restart the Wazuh-agent

`sudo systemctl restart wazuh-agent`

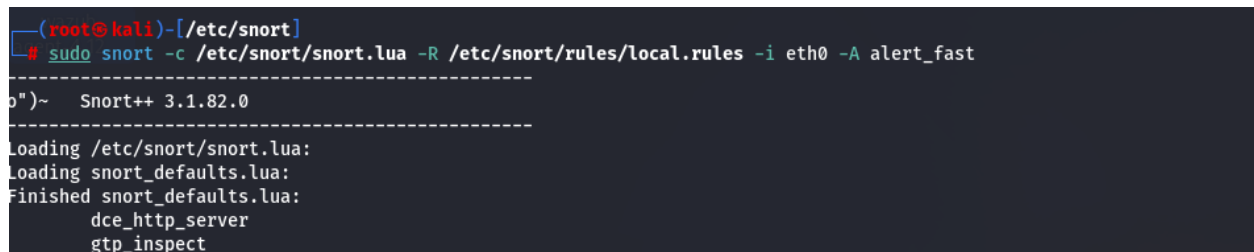


The screenshot shows a terminal window with the following commands and output:

```
(root@kali)-[/var/ossec/etc]
# sudo systemctl restart wazuh-agent

(root@kali)-[/var/ossec/etc]
#
```

Now run snort in ids mode



The screenshot shows a terminal window with the following commands and output:

```
(root@kali)-[/etc/snort]
# sudo snort -c /etc/snort/snort.lua -R /etc/snort/rules/local.rules -i eth0 -A alert_fast

-----
o")~  Snort++ 3.1.82.0
-----
Loading /etc/snort/snort.lua:
Loading snort_defaults.lua:
Finished snort_defaults.lua:
  dce_http_server
  gtp_inspect
```

Now scan the ip with nmap and it will generate alert on the console.

```
ppid: MaxRSS diff: 2944
ppid: patterns loaded: 300
-----
ncap DAQ configured to passive.
commencing packet processing
+ [0] eth0
06/17-15:49:16.003934 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27336 -> 192.168.0.101:1514
06/17-15:49:16.505528 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27336 -> 192.168.0.101:1514
06/17-15:49:17.005619 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27336 -> 192.168.0.101:1514
06/17-15:49:17.259193 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.103:5353 -> 224.0.0.251:5353
06/17-15:49:17.510284 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27336 -> 192.168.0.101:1514
06/17-15:49:18.011268 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27336 -> 192.168.0.101:1514
06/17-15:49:17.115585 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
06/17-15:49:27.217474 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
06/17-15:49:27.217486 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
06/17-15:49:27.217487 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
06/17-15:49:28.013160 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27338 -> 192.168.0.101:1514
06/17-15:49:28.513644 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27338 -> 192.168.0.101:1514
06/17-15:49:29.014345 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27338 -> 192.168.0.101:1514
06/17-15:49:29.514849 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27338 -> 192.168.0.101:1514
06/17-15:49:30.017111 [**] [1:1000002:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27338 -> 192.168.0.101:1514
06/17-15:49:30.587865 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
06/17-15:49:31.607872 [**] [1:1000003:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.0.1:1900 -> 239.255.255.250:1900
```

Ping the ip

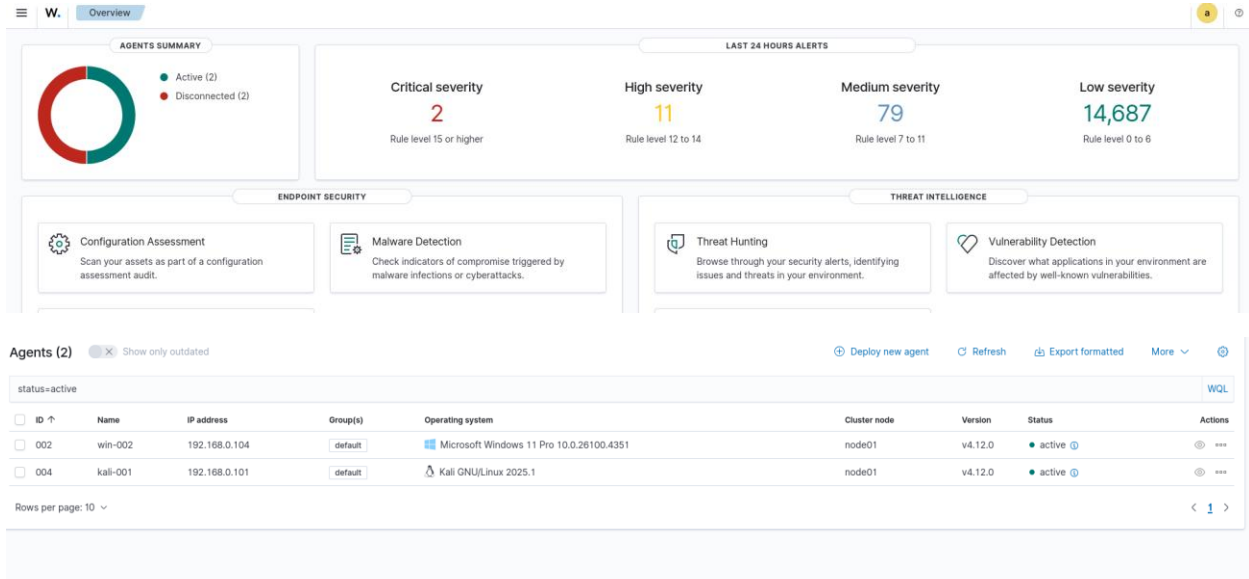
```
C:\Users\786>ping 192.168.0.101

Pinging 192.168.0.101 with 32 bytes of data:
Reply from 192.168.0.101: bytes=32 time<1ms TTL=64
Reply from 192.168.0.101: bytes=32 time<1ms TTL=64
Reply from 192.168.0.101: bytes=32 time<1ms TTL=64
Reply from 192.168.0.101: bytes=32 time<1ms TTL=64
```

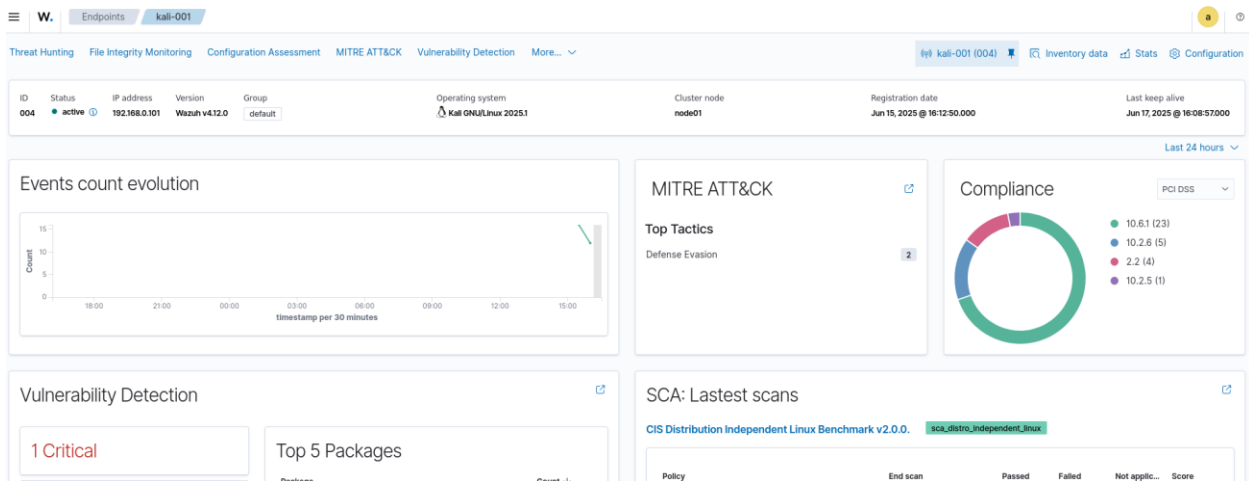
Output:

```
03:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.100.1:37445 -> 239.255.255.250:1900
04:2] "[Snort] ICMP Ping Detected" [**] [Priority: 0] {ICMP} 192.168.0.104 -> 192.168.0.101
04:2] "[Snort] ICMP Ping Detected" [**] [Priority: 0] {ICMP} 192.168.0.104 -> 192.168.0.101
03:2] "[Snort] Nmap UDP Scan Detected" [**] [Priority: 0] {UDP} 192.168.100.1:37445 -> 239.255.255.250:1900
04:2] "[Snort] ICMP Ping Detected" [**] [Priority: 0] {ICMP} 192.168.0.104 -> 192.168.0.101
02:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27372 -> 192.168.0.101:1514
04:2] "[Snort] ICMP Ping Detected" [**] [Priority: 0] {ICMP} 192.168.0.104 -> 192.168.0.101
02:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27372 -> 192.168.0.101:1514
02:2] "[Snort] Nmap TCP Scan Detected" [**] [Priority: 0] {TCP} 192.168.0.104:27372 -> 192.168.0.101:1514
```

## Now open Wazuh-dashboard:

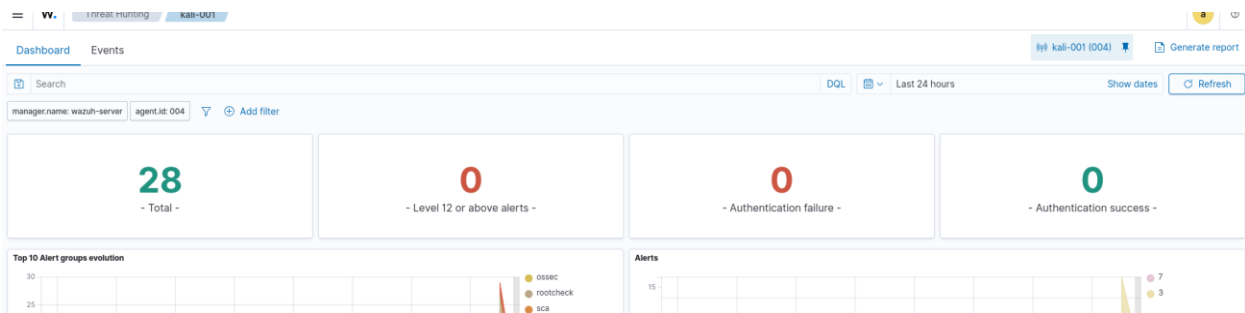


## Open the kali/Ubuntu agent:

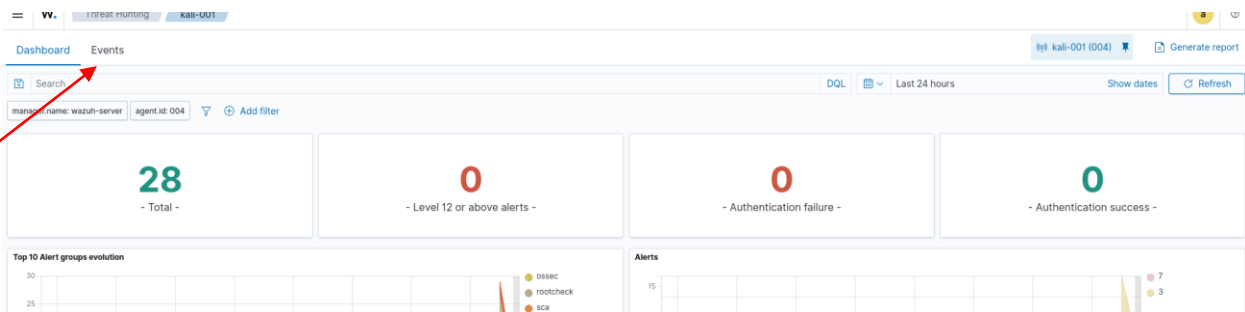


## Now click on threat hunting

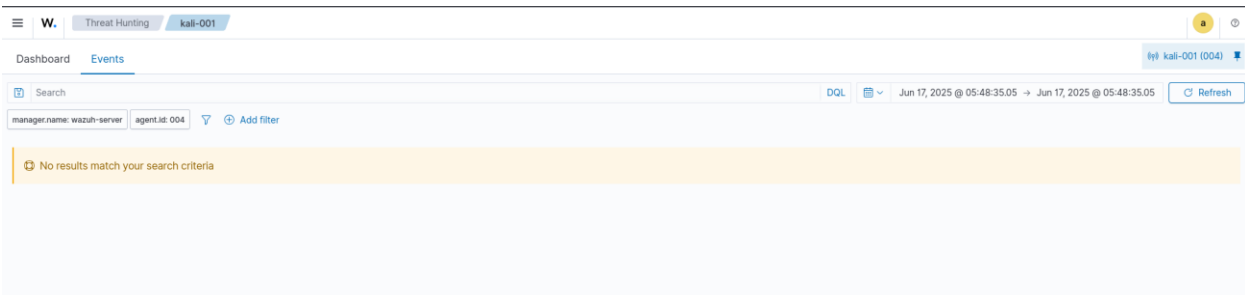




**Now click on Events:**



**After opening the events tab it's not showing logs**



To solve this problem we need to define decoder. Open decoder folder

**Cd /var/ossec/decoders**

If not found create it using: **sudo mkdir -p /var/ossec/etc/decoders**

And after that create custom decoder file for snort rules.

**sudo nano /var/ossec/etc/decoders/local\_decoder.xml**

```
(root@kali)-[/var/ossec/etc]
# sudo mkdir -p /var/ossec/etc/decoders

(root@kali)-[/var/ossec/etc]
# sudo nano /var/ossec/etc/decoders/local_decoder.xml
```

After creating the file add this decoding code:

```
<decoder name="snort-alert-fast">
```

```
<prematch>^\d\d\d\d\d\d:\d\d:\d\d\d\d\d\d+</prematch>
```

```
<regex>^\d\d\d\d\d\d:\d\d:\d\d\d\d\d\d+ \[.*\*] \[(\d+):(\d+):(\d+)] "(.+?)"
\[.*\*] \[Priority: (\d+)] \{(\w+)\} ([^:]+):(\d+) -> ([^:]+):(\d+)</regex>
```

```
<order>gid,sid,rev,msg,priority,protocol,src_ip,src_port,dst_ip,dst_port<
/order>
```

```
</decoder>
```

```
GNU nano 8.3 /var/ossec/etc/decoders/local_decoder.xml
decoder name="snort-alert-fast"
prematch="^\d\d\d\d\d\d:\d\d:\d\d\d\d\d\d+</prematch>"
regex="^\d\d\d\d\d\d:\d\d:\d\d\d\d\d\d+ \[.*\*] \[(\d+):(\d+):(\d+)] "(.+?)" \[Priority: (\d+)] \{(\w+)\} ([^:]+):(\d+) -> ([^:]+):(\d+)</regex>"
order="gid,sid,rev,msg,priority,protocol,src_ip,src_port,dst_ip,dst_port"
</decoder>
```

Now go to **local.rule** file

**sudo nano /var/ossec/etc/rules/local\_rules.xml**

```
(root@kali)-[/var/ossec/etc]
# sudo nano /var/ossec/etc/rules/local_rules.xml
```

Here's the IDS logs:

28 hits					
Jun 16, 2025 @ 16:11:12.782 - Jun 17, 2025 @ 16:11:12.783					
timestamp	agent.name	rule.description	rule.level	rule.id	
Jun 17, 2025 @ 16:01:48.5...	kali-001	SCA summary: CIS Distribution Independent Linux Benchmark v2.0.0: Score less than 50% (47)	7	19004	
Jun 17, 2025 @ 16:01:40.8...	kali-001	CIS Distribution Independent Linux Benchmark v2.0.0: Ensure rsyslog is installed: Status changed from failed to passed	3	19010	
Jun 17, 2025 @ 16:01:40.8...	kali-001	CIS Distribution Independent Linux Benchmark v2.0.0: Ensure rsyslog default file permissions configured: Status changed from failed to passed	3	19010	
Jun 17, 2025 @ 16:01:40.8...	kali-001	CIS Distribution Independent Linux Benchmark v2.0.0: Ensure rsyslog Service is enabled: Status changed from failed to passed	3	19010	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:08.4...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 16:01:03.6...	kali-001	Wazuh agent started.	3	503	
Jun 17, 2025 @ 16:01:00.3...	kali-001	Wazuh agent stopped.	3	506	
Jun 17, 2025 @ 15:59:11.2...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 15:59:11.2...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	
Jun 17, 2025 @ 15:59:11.2...	kali-001	Host-based anomaly detection event (rootcheck).	7	510	

## Summary:

Snort and Wazuh can be integrated to enhance network and host-based security monitoring. Snort detects and generates alerts for suspicious network traffic, while Wazuh collects, analyzes, and correlates these alerts with other system logs. By integrating both, security teams gain centralized visibility and improved threat detection, combining Snort's network-level insights with Wazuh's endpoint and log analysis capabilities.

---

Need training on Wazuh ?

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LinkedIn: <https://pk.linkedin.com/in/sameer-hassan-15a428255>

Other SIEM

1. IBM Qradar
2. Splunk
3. Azure Sentinel