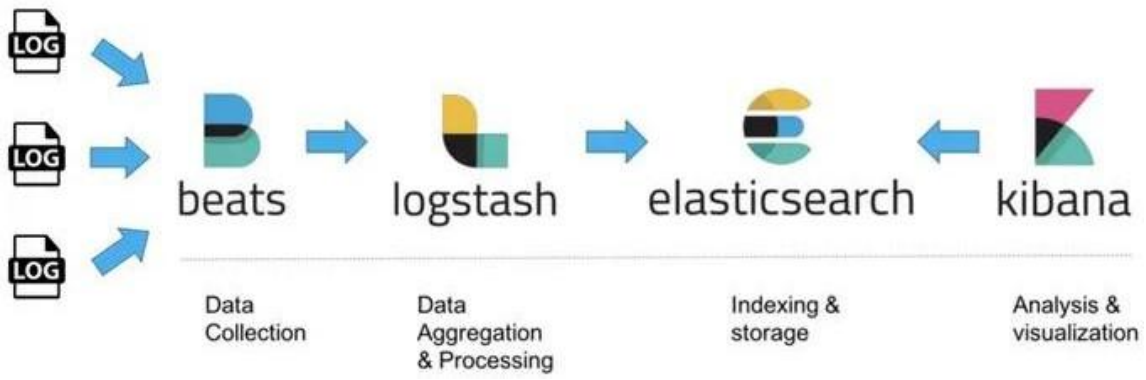
Agent-Based Ping Detection & Security Monitoring Using Elastic Cloud

Table of Contents:

1)- Introduction to ELK Stack and Objective
2)- Why We Chose Elastic Security
3)- Why We Used Elastic Cloud Services (Not Self-Hosted)
4)- Region Selection – GCP Iowa (us-central1)
5)- Elastic Security Interface – My Security Project
6)- Viewing Assets – Why We Used the Asset Option
7)- Fleet and Agent Deployment
-- Elastic Cloud Agent Policy
-- Add Agent – Purpose and Process
8)- Agent Installation Confirmation
-- What “Healthy” Status Means
9)- Using Discover Tab to View Logs
10)- Matching IP in Kali Linux Using ip a
11)- Using the Rules Tab and Creating a Custom Rule
-- Why We Selected a Custom Query
12)- Adding Integrations to Agent Policy
13)- Viewing and Expanding Log Details
-- Adding Fields like user.name, host.os.type
14)- Conclusion – What We Learned



Introduction to ELK Stack and Objective

The ELK Stack is a combination of three powerful tools — Elasticsearch, Logstash, and Kibana — which are used together for collecting, storing, analyzing, and visualizing log data in a centralized way.

Elasticsearch is the core engine that stores and searches the data.

Logstash helps in processing and sending data from multiple sources to Elasticsearch.

Kibana is the dashboard tool that allows us to visualize data, search logs, and monitor activity.

In cybersecurity, ELK Stack is especially useful for detecting suspicious behavior, tracking system activity, and performing threat hunting.

The main objective of this task was to:

Set up the **Elastic Agent** on a Linux system,

Connect it with the **ELK Stack**,

Use **Elastic Security** to monitor system activity, and

Create **custom detection rules** (like detecting ping commands) to generate alerts for unusual or malicious behavior.

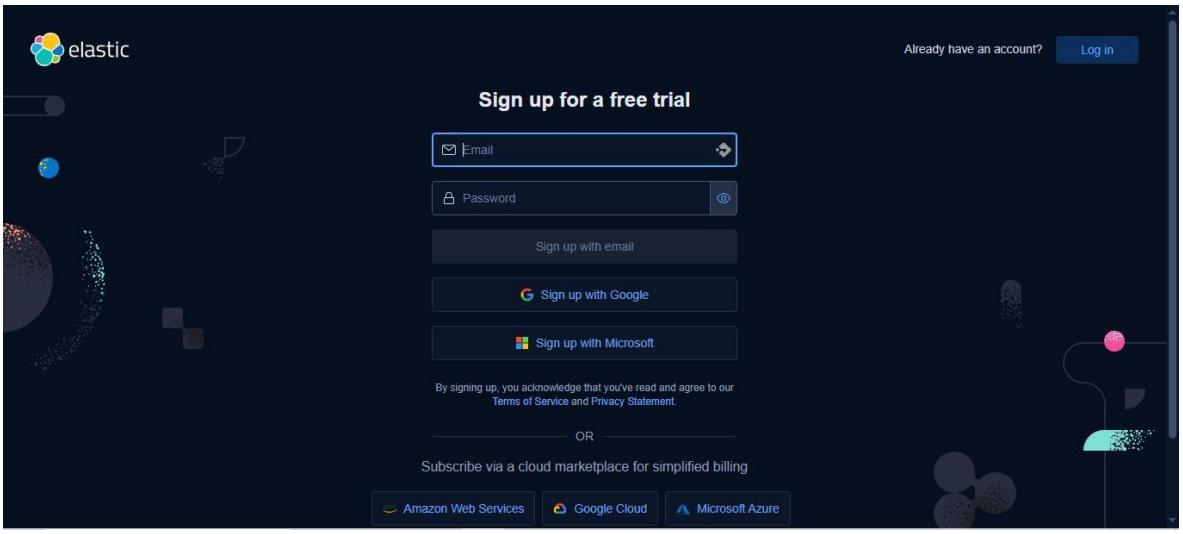
Through this, we will learn on how to build a basic detection system, which is a key skill in SOC (Security Operations Center) environments.

Sign Up on Elastic Cloud

1)- Go to: https://www.elastic.co/cloud

2)- Click on “Start Free Trial”

3)- Create a free Elastic Cloud account using email/password



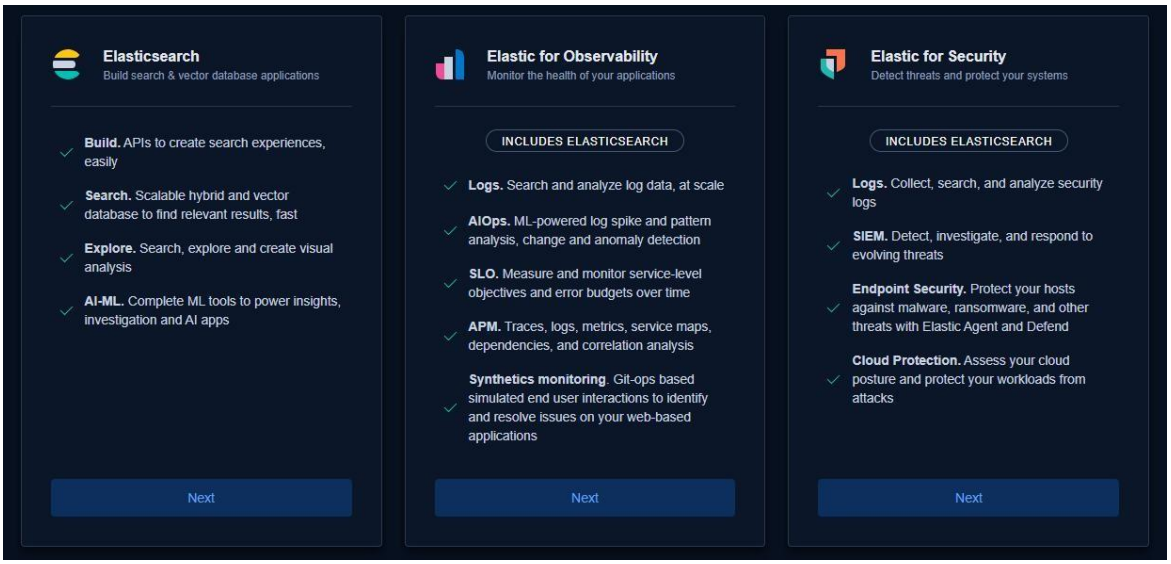
You will 3 options appear on your interface. But we will choose **Elastic Security** because our main goal was to detect, investigate, and respond to security threats like ping sweeps, network scans, and suspicious system behavior.Besides Elastic Security provides built-in features for:

1)- Creating and managing detection rules

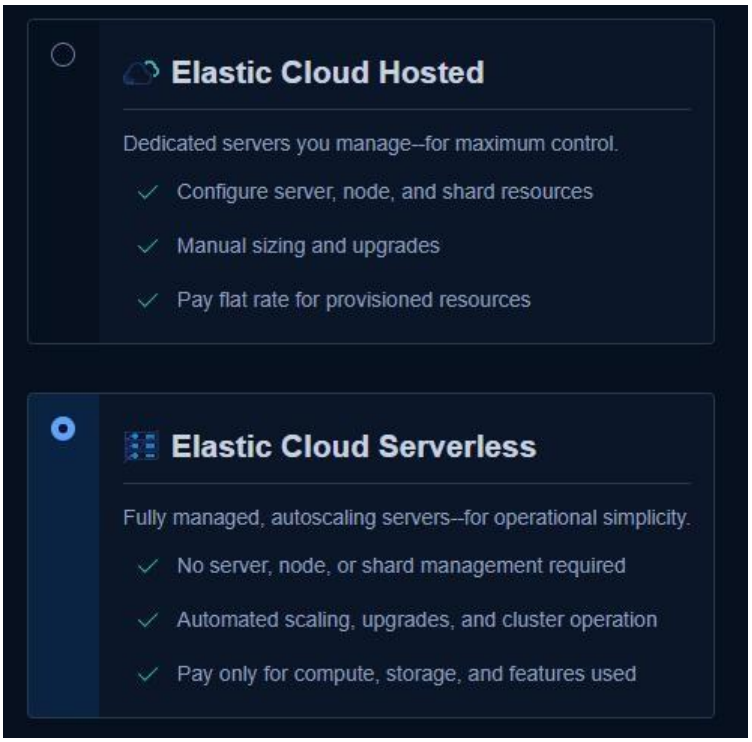
2)- Viewing alerts and timelines

3)- Tracking endpoint activity

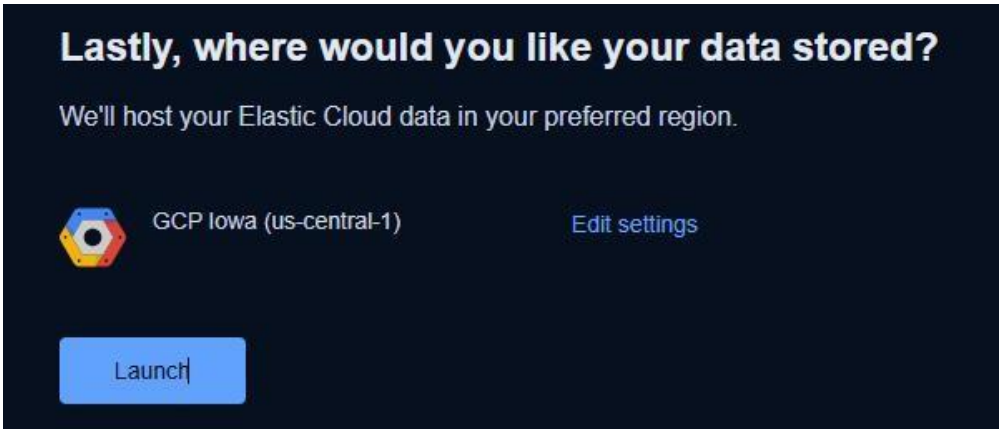
4)- Performing threat hunting and incident response



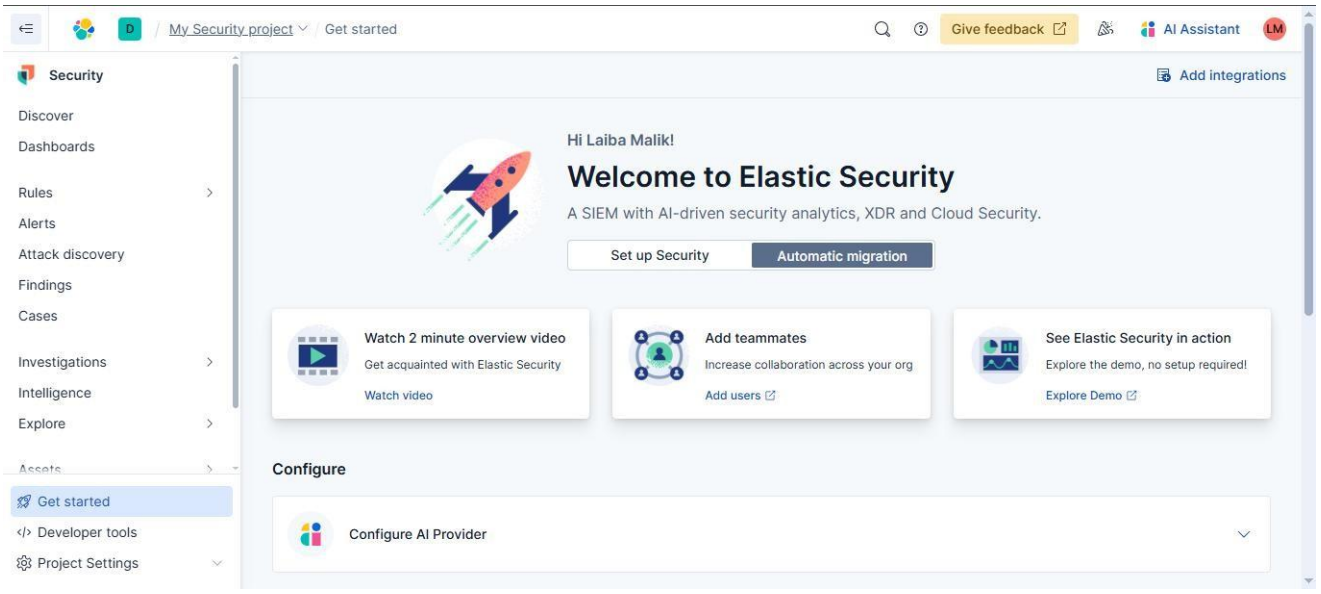
We used **Elastic Cloud Services** because it provides a ready-to-use, fully managed deployment of the ELK Stack without the need to set up or manage servers manually. It saved our time and effort, especially since we didn't have to deal with complex installation, configuration, or maintenance.



We chose **GCP Iowa (us-central1)** because it is a default and commonly available region in Elastic Cloud.It provides low-latency and stable performance for global access. Also, it ensured quick deployment without requiring advanced region selection.



The **“Welcome to Elastic Security”** interface under **“My Security Project”** is the main dashboard where we manage and monitor security operations. It provides access to features like alerts, rules, timelines, and integrations. From here, we can create detection rules, view threat data, and perform investigations — all in one place.



Virtual Box Installation:

1)- First, download the latest version of Oracle Virtual Box from its official website: https://www.virtualbox.org.

2)- Install it using the on-screen instructions. No need to change default settings during setup.

Downloading the Kali Linux Image File:

3)- Pre-configured Kali Linux image in .7z format through Google Drive.

4)- File name: kali-linux-2023.2-virtualbox-amd64.7z

5)- Download it from the provided link.

Extracting the Image File:

6)- After download, use **7-Zip** or **WinRAR** to extract the .7z file.

7)- The extracted file will be a **.vbox** file and a **.vdi** file.

Importing the Kali Linux VM into Virtual Box:

8)- Open Virtual Box.

9)- Click on **“Machine” > “Add”**, then navigate to the folder where you extracted the .vbox file.

10)- Select the .vbox file and click **Open**.

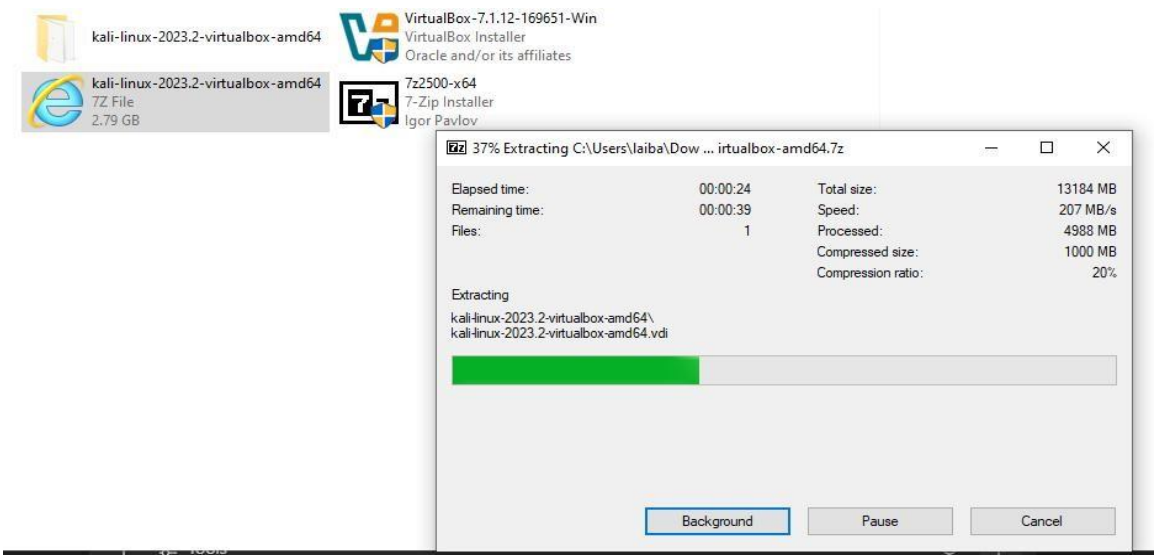
11)- The Kali Linux VM will be added to Virtual Box.

Starting the Virtual Machine:

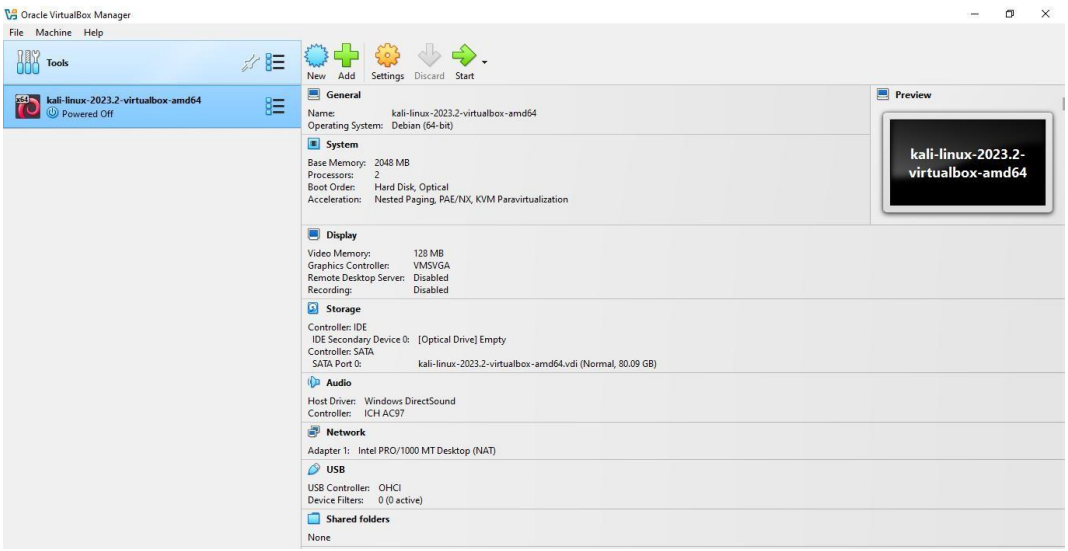
12)- Click on the newly added Kali Linux VM.

13)- Click **Start**.

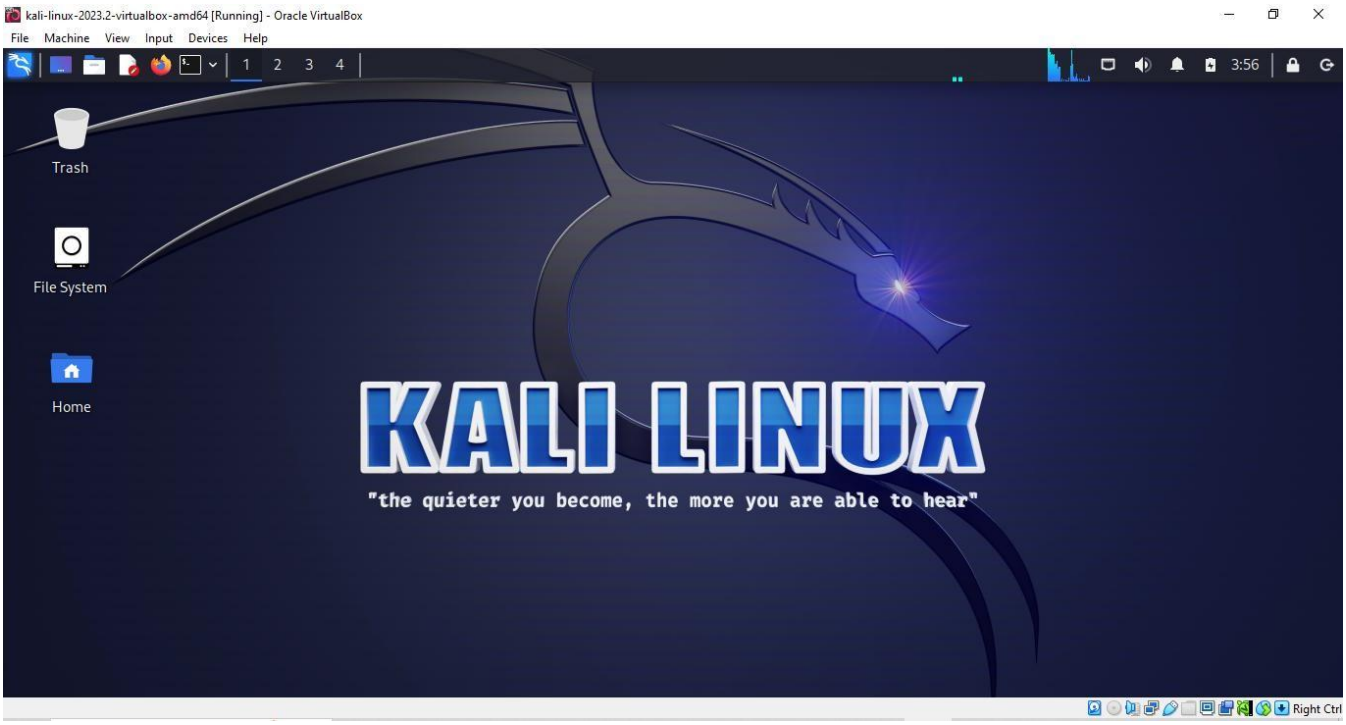
14)- Kali Linux will boot up without needing manual installation.



Power On [kali-linux-2023.2-virtualbox-amd64]

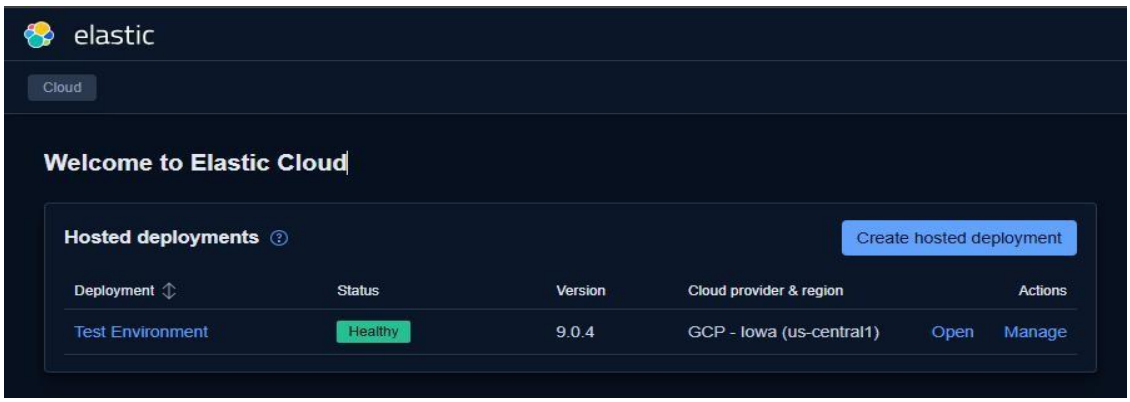


Finally the setup is **completed**.



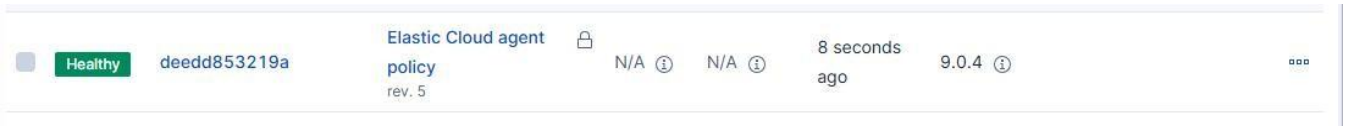
Go on given link as https://cloud.elastic.co/home as we are going to deploy the **Elastic Agent** on the Cloud

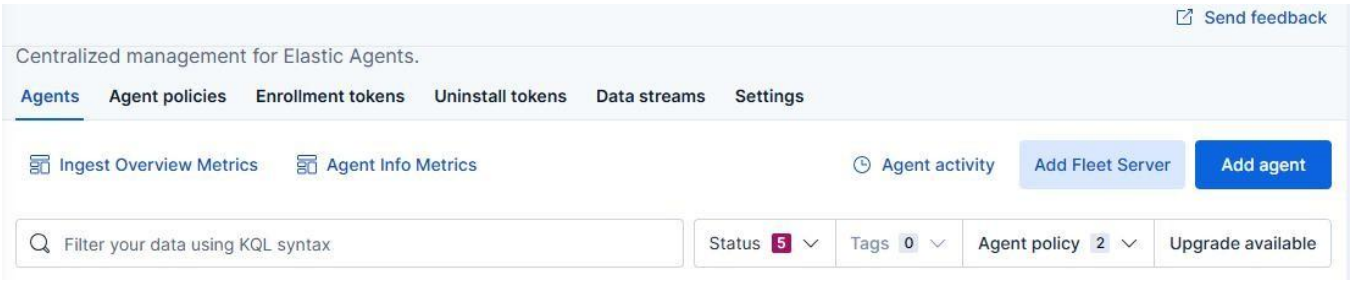
Choose the **Create hosted Deployment** option , from here you will deploy and choose any name of your environment I have selected **“Test Environment”** it will take a few moments **(5 min).**



We scrolled down to find the **Asset option** to view and manage connected hosts, endpoints, and network data**.**This helped us confirm that our **Linux system and agents** were properly integrated.It ensured that data was being collected and the system was ready for **threat detection**.

We chose the **Fleet** option to manage and monitor all agents from a centralized interface.Here, we saw the default **Elastic Cloud Agent Policy**, which defines what data the agent collects.To deploy our own agent, we clicked on **"Add Agent"** to connect our Linux machine. This step was essential to start sending system and network logs to Elastic Security.





Now Select the Policy, if mentioned, leave it as default **(mine: Agent Policy 1)**
Choose **Elastic Fleet Option (Recommended)**
Wait to proceed Further
A side command will appear copy it and that you will run on your setup
[kali-linux-2023.2-virtualbox-amd64]
Here below are the shown commands that I Run on Kali:
At First it might show you error, Paste the Command as it is by using **Ctrl+Shift+C**

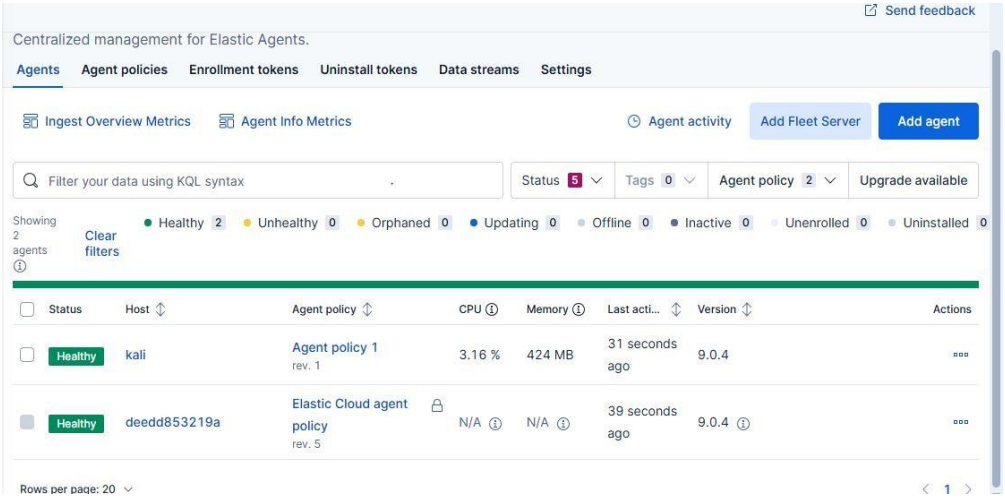
```
File  Actions  Edit  View  Help
┌──(kali㉿kali)-[~]
└─$ curl -L -O https://artifacts.elastic.co/downloads/beats/elastic-agent/ela
stic-agent-9.0.4-linux-x86_64.tar.gz
tar xzvf elastic-agent-9.0.4-linux-x86_64.tar.gz
cd elastic-agent-9.0.4-linux-x86_64
sudo ./elastic-agent install --url=https://4e39a0da5f114e81bce6c983171f167e.f
leet.us-central1.gcp.cloud.es.io:443 --enrollment-token=VFhVX1ZaZ0J2QjI2T3BJT
0ZFNTI6Wkx5RFhMVVR3QWZyakxCcm5XMHRSZw==

┌──(kali㉿kali)-[~]
└─$ ^[[200~curl -L -O https://artifacts.elastic.co/downloads/beats/elastic-ag
ent/elastic-agent-9.0.4-linux-x86_64.tar.gz
zsh: bad pattern: ^[[200~curl

┌──(kali㉿kali)-[~]
└─$ tar xzvf elastic-agent-9.0.4-linux-x86_64.tar.gz
tar (child): elastic-agent-9.0.4-linux-x86_64.tar.gz: Cannot open: No such fi
le or directory
tar (child): Error is not recoverable: exiting now
tar: Child returned status 2
tar: Error is not recoverable: exiting now

┌──(kali㉿kali)-[~]
└─$ cd elastic-agent-9.0.4-linux-x86_64
cd: no such file or directory: elastic-agent-9.0.4-linux-x86_64

┌──(kali㉿kali)-[~]
└─$ sudo ./elastic-agent install --url=https://4e39a0da5f114e81bce6c983171f16
7e.fleet.us-central1.gcp.cloud.es.io:443 --enrollment-token=VFhVX1ZaZ0J2QjI2T
3BJT0ZFNTI6Wkx5RFhMVVR3QWZyakxCcm5XMHRSZw==~
[sudo] password for kali:
sudo: ./elastic-agent: command not found
```

```
┌──(kali㉿kali)-[~]
└─$ curl -L -O https://artifacts.elastic.co/downloads/beats/elastic-agent/ela
stic-agent-9.0.4-linux-x86_64.tar.gz
tar xzvf elastic-agent-9.0.4-linux-x86_64.tar.gz
cd elastic-agent-9.0.4-linux-x86_64
sudo ./elastic-agent install --url=https://4e39a0da5f114e81bce6c983171f167e.f
leet.us-central1.gcp.cloud.es.io:443 --enrollment-token=VFhVX1ZaZ0J2QjI2T3BJT
0ZFNTI6Wkx5RFhMVVR3QWZyakxCcm5XMHRSZw==
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Curre
nt
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--
  0  423M    0 29172    0     0  22650      0  5:26:41  0:00:01  5:26:40 2264
  0  423M    0 4015k    0     0  1970k      0  0:03:40  0:00:02  0:03:38 1970
  1  423M    1 5996k    0     0  1973k      0  0:03:39  0:00:03  0:03:36 1973
  2  423M    2 12.3M    0     0  3121k      0  0:02:18  0:00:04  0:02:14 3122
  4  423M    4 18.3M    0     0  3731k      0  0:01:56  0:00:05  0:01:51 3787
  5  423M    5 23.8M    0     0  4049k      0  0:01:47  0:00:06  0:01:41 5140
  6  423M    6 28.9M    0     0  4207k      0  0:01:43  0:00:07  0:01:36 5119
  7  423M    7 33.5M    0     0  4275k      0  0:01:41  0:00:08  0:01:33 5674
  9  423M    9 38.9M    0     0  4416k      0  0:01:38  0:00:09  0:01:29 5461
 10  423M   10 44.4M    0     0  4539k      0  0:01:35  0:00:10  0:01:25 5353
 11  423M   11 49.9M    0     0  4637k      0  0:01:33  0:00:11  0:01:22 5347
 13  423M   13 55.7M    0     0  4743k      0  0:01:31  0:00:12  0:01:19 5496
 14  423M   14 60.9M    0     0  4789k      0  0:01:30  0:00:13  0:01:17 5616
 15  423M   15 65.4M    0     0  4770k      0  0:01:30  0:00:14  0:01:16 5412
 16  423M   16 70.5M    0     0  4799k      0  0:01:30  0:00:15  0:01:15 5320
 17  423M   17 75.5M    0     0  4822k      0  0:01:29  0:00:16  0:01:13 5232
 19  423M   19 80.5M    0     0  4839k      0  0:01:29  0:00:17  0:01:12 5069
 20  423M   20 85.5M    0     0  4854k      0  0:01:29  0:00:18  0:01:11 5023
 21  423M   21 89.8M    0     0  4834k      0  0:01:29  0:00:19  0:01:10 5014
 22  423M   22 94.8M    0     0  4844k      0  0:01:29  0:00:20  0:01:09 4981
 23  423M   23  100M    0     0  4867k      0  0:01:29  0:00:21  0:01:08 5011
```

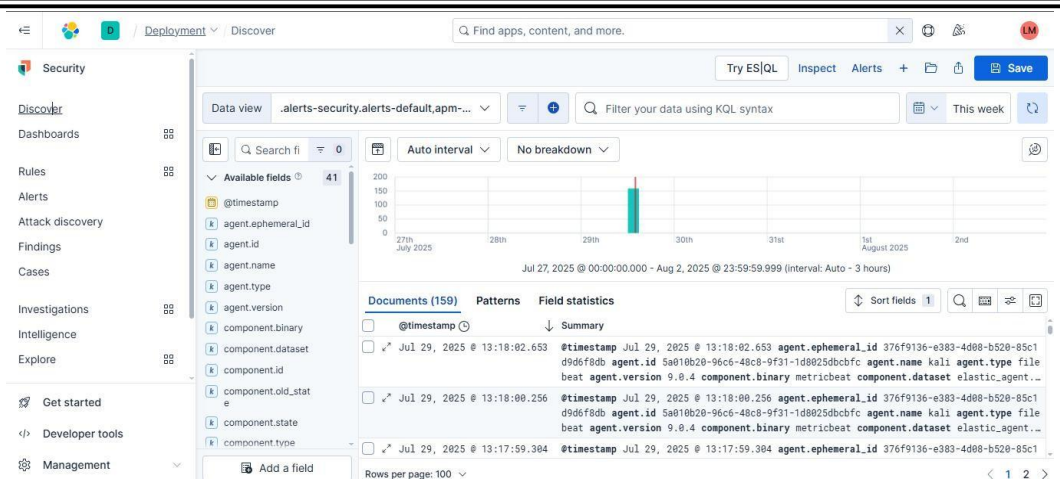
After completing the setup process, we saw a confirmation message that the **Elastic Agent was successfully installed**.This meant that our Linux system was now connected to Elastic Security and ready to send logs.It confirmed that the agent was active and following the assigned integration policy.

```
-agent
elastic-agent-9.0.4-linux-x86_64/data/elastic-agent-d49717/components/pf-host
-agent.spec.yml
elastic-agent-9.0.4-linux-x86_64/.elastic-agent.active.commit
elastic-agent-9.0.4-linux-x86_64/data/elastic-agent-d49717/elastic-agent
elastic-agent-9.0.4-linux-x86_64/LICENSE.txt
elastic-agent-9.0.4-linux-x86_64/elastic-agent.reference.yml
elastic-agent-9.0.4-linux-x86_64/data/elastic-agent-d49717/otelcol
elastic-agent-9.0.4-linux-x86_64/.build_hash.txt
elastic-agent-9.0.4-linux-x86_64/elastic-agent
Elastic Agent will be installed at /opt/Elastic/Agent and will run as a servi
ce. Do you want to continue? [Y/n]:Y
[=   ] Service Started  [17s] Elastic Agent successfully installed, starting
enrollment.
[   =] Waiting For Enroll...  [18s] {"log.level":"info","@timestamp":"2025-07
-29T04:17:35.983-0400","log.origin":{"function":"github.com/elastic/elastic-a
gent/internal/pkg/agent/cmd.(*enrollCmd).enrollWithBackoff","file.name":"cmd/
enroll_cmd.go","file.line":534},"message":"Starting enrollment to URL: https:
//4e39a0da5f114e81bce6c983171f167e.fleet.us-central1.gcp.cloud.es.io:443/","e
cs.version":"1.6.0"}
[===] Waiting For Enroll...  [22s] {"log.level":"info","@timestamp":"2025-07
-29T04:17:39.549-0400","log.origin":{"function":"github.com/elastic/elastic-a
gent/internal/pkg/agent/cmd.(*enrollCmd).daemonReloadWithBackoff","file.name"
:"cmd/enroll_cmd.go","file.line":497},"message":"Restarting agent daemon, att
empt 0","ecs.version":"1.6.0"}
[==  ] Waiting For Enroll...  [22s] {"log.level":"info","@timestamp":"2025-07
-29T04:17:39.606-0400","log.origin":{"function":"github.com/elastic/elastic-a
gent/internal/pkg/agent/cmd.(*enrollCmd).Execute","file.name":"cmd/enroll_cmd
.go","file.line":315},"message":"Successfully triggered restart on running El
astic Agent.","ecs.version":"1.6.0"}
Successfully enrolled the Elastic Agent.
[==  ] Done  [22s]
Elastic Agent has been successfully installed.
```

Now go back to **Elastic Cloud**, and you will see your deployed agent listed on the screen.If the status shows **“Healthy”**, it means the agent is working correctly, sending data, and following the assigned policies without any issues.
This confirms that the agent is **active**, connected, and successfully integrated with Elastic Security.

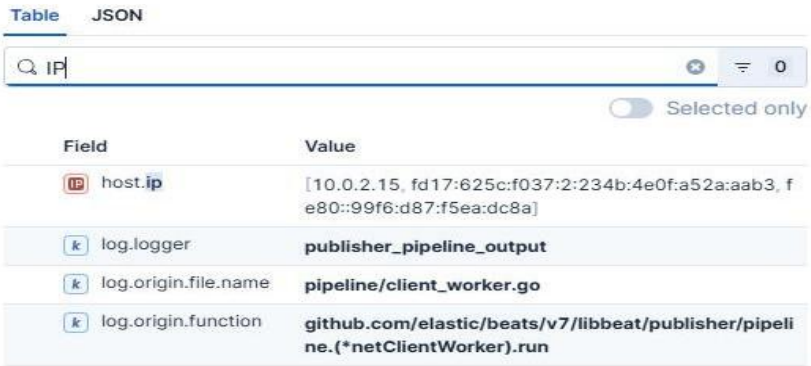


Scroll up and click on the **Discover** option to access raw log data from connected agents.An interface will appear where you can **search, filter, and analyze logs** in real-time.



Expand the fist one **July 29, 2025 13:18:02.653** and search the Host Name and also the IP.

To check the IP address, go to your **Kali Linux terminal** and run the command **ip a.** You will see that the **same IP address** displayed in Elastic is also shown here. This confirms that the agent is correctly installed on your Kali system.

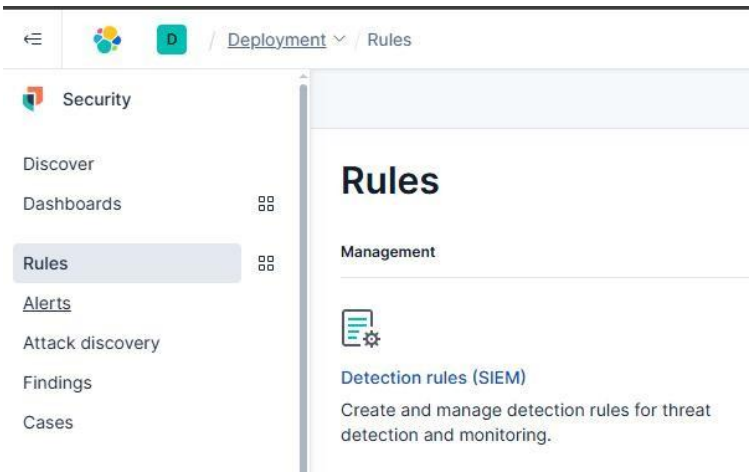


IP is **10.0.2.15** (highlighted).

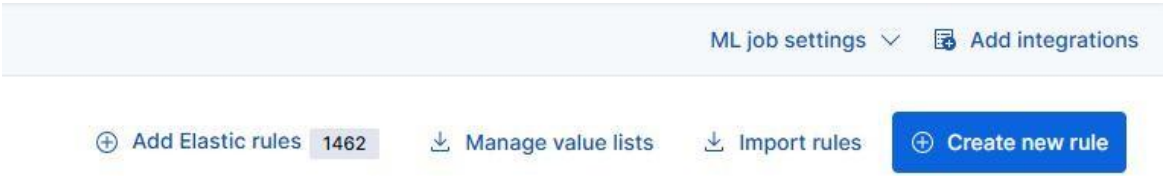
```
┌──(kali㉿kali)-[~/elastic-agent-9.0.4-linux-x86_64]
└─$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group def
ault qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:53:0c:ba brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute eth0
       valid_lft 84996sec preferred_lft 84996sec
    inet6 fd17:625c:f037:2:234b:4e0f:a52a:aab3/64 scope global dynamic nopref
ixroute
       valid_lft 86295sec preferred_lft 14295sec
    inet6 fe80::99f6:d87:f5ea:dc8a/64 scope link noprefixroute
```

We went to the **Rules tab** to view and manage detection rules that help identify.

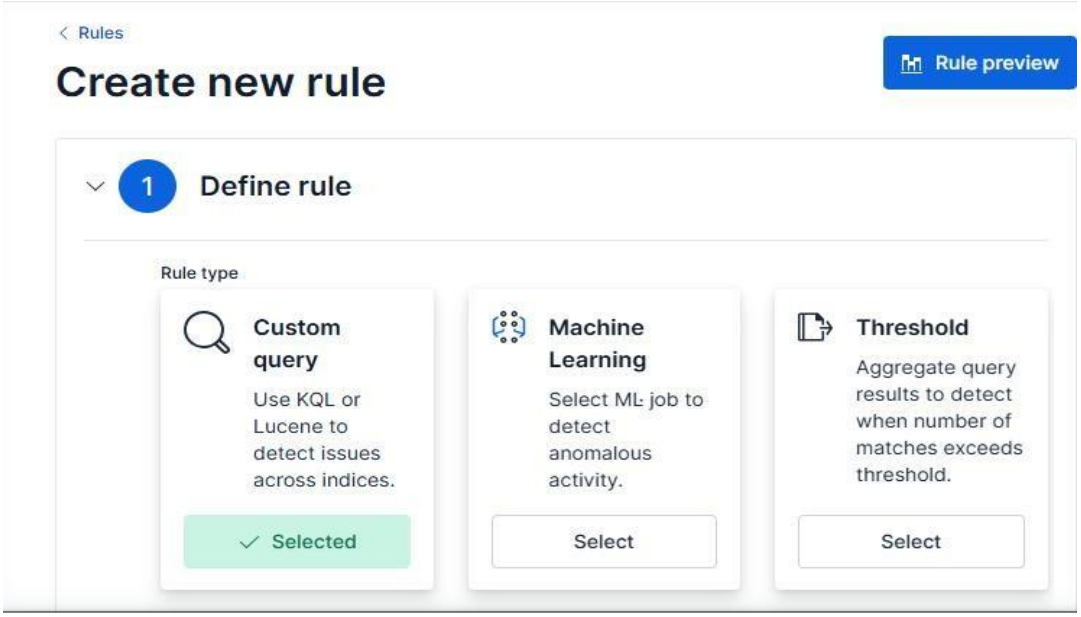
These rules automatically generate **alerts** when certain conditions are met in the logs.A **custom rule** is a rule that we create manually based on our own specific use case.We created a custom rule to **detect ping (ICMP) activity** from our Linux system for security monitoring.

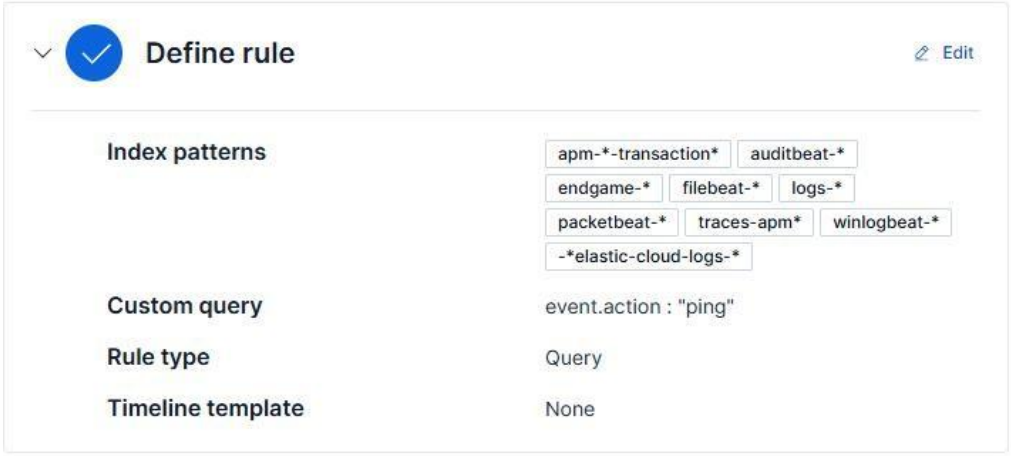


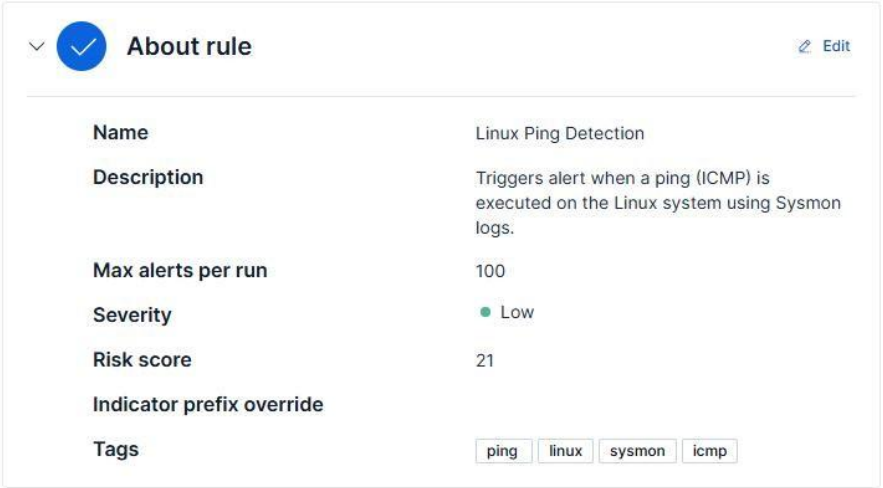
Create New Rule.



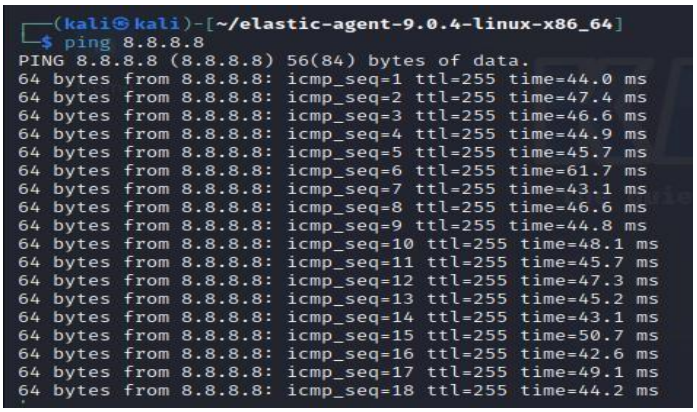
Select Custom Query option to define our own specific detection condition. This allowed us to **target ICMP (ping) traffic** that default rules might not cover.





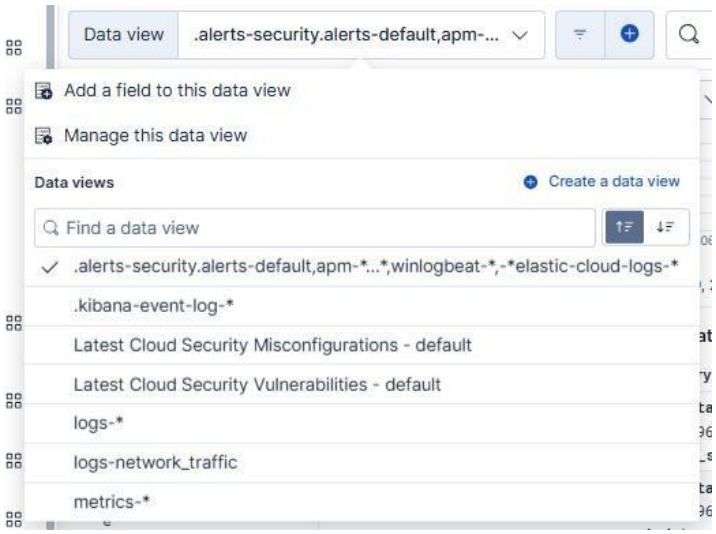


For further Proceed of result,Click **Create and Enable Rule**. Go on Linux Machine and then run this command

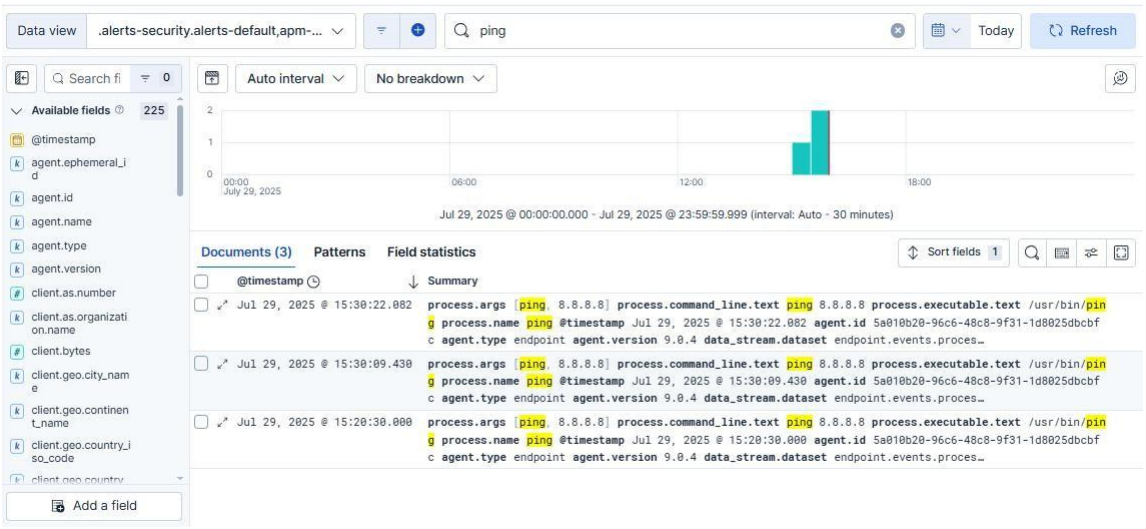


At first, you won't see any alerts in the **Discover tab** because no data is being collected yet.To fix this, you need to **add integrations** to the policy linked with your installed agent.These integrations tell the agent what kind of data to collect, like network traffic or system logs.
The added integrations are:

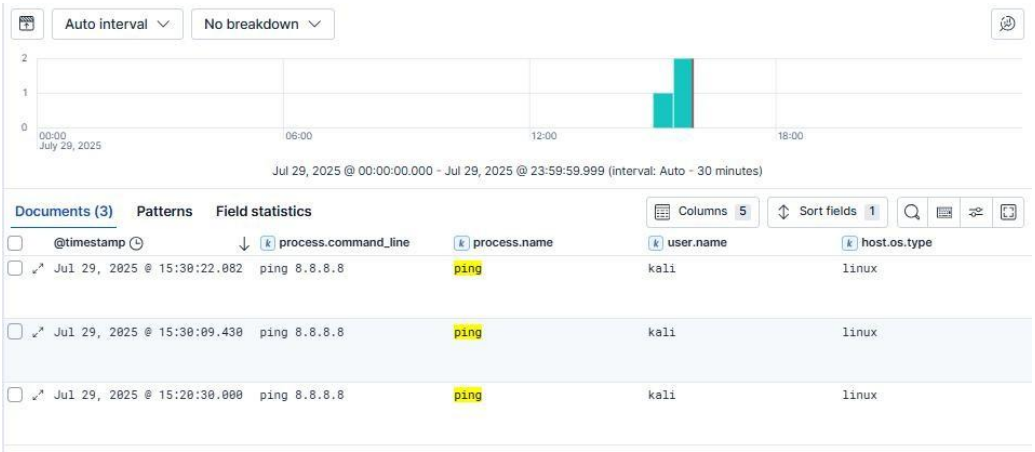
In-order to Add Integrations go on the tab **Assets > Fleet > Add Integration.**
Go back to the Linux and run the command **ping 8.8.8.8**.
Now move to the Discover Tab and choose the Data Review as marked shown below:



The **alerts** are displayed below shown in the Snap-Shot.



By expanding any log entry, we can view its detailed information.
We can also add relevant fields to the view based on what we need.
For example: **user.name, process.command_line, host.os.type, process.name**.



To set up email notifications for a detection rule in Elastic, go to the **Actions** tab while creating or editing the rule. Click **"Add action"** and choose **Elastic-Cloud-SMTP** as the notification method. Select **"Summary of alerts per rule run"** as the action type. In the message field, you can write something like:
“The detection rule '{{context.rule.name}}' has triggered {{state.signals_count}} alerts.”

Email Received

Conclusion:

Through this task, we learned how to set up and use the Elastic Security platform for threat detection.We understood how to install and connect an agent to start collecting logs from a Linux system. We explored the Discover tab

to view real-time data and verify system activity.We also created a custom detection rule to monitor **ping (ICMP) traffic**.Overall, this activity helped us gain hands-on experience in log analysis and security monitoring.