

## TASK 2: Security Alert Monitoring & Incident Response

### 1. Environment Setup

- Tool used: Splunk Free Trial
  - Platform: Kali Linux / Browser
- 

## 2. Installing Splunk

To simulate a real SOC workflow, I needed to install and run **Splunk Enterprise** locally:

### Steps Taken:

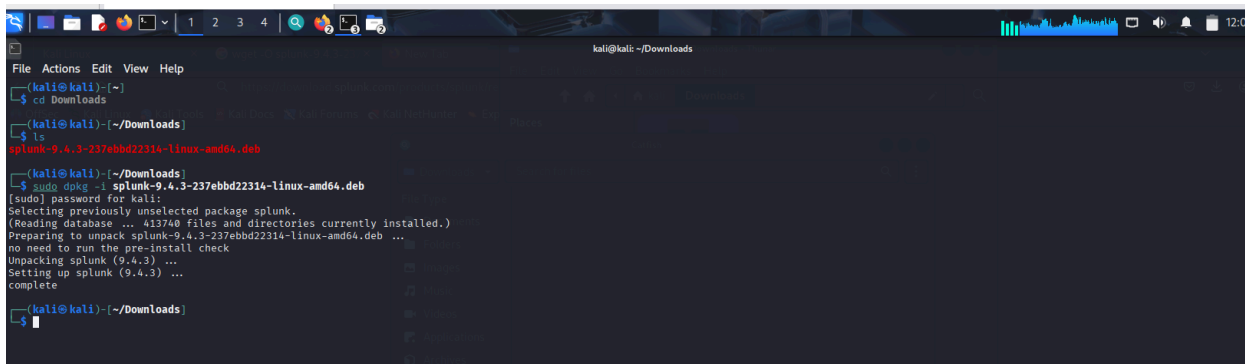
- Registered for a free account at: [splunk.com](https://splunk.com)
- Downloaded **Splunk Enterprise .deb** file for Linux (64-bit)
- Moved the file to Kali's **Downloads** directory

### Installation Command Used:

bash

`cd ~/Downloads`

`sudo dpkg -i splunk-9.4.3-xxxx-linux-amd64.deb`



```
kali@kali: ~/Downloads
File Actions Edit View Help
~(kali@kali)-[~]
└─$ cd Downloads
~(kali@kali)-[~/Downloads]
└─$ ls
splunk-9.4.3-237ebbd22314-linux-amd64.deb
~(kali@kali)-[~/Downloads]
└─$ sudo dpkg -i splunk-9.4.3-237ebbd22314-linux-amd64.deb
[sudo] password for kali:
Selecting previously unselected package splunk.
(Reading database ... 413740 files and directories currently installed.)
Preparing to unpack splunk-9.4.3-237ebbd22314-linux-amd64.deb ...
no need to run the pre-install check
Unpacking splunk (9.4.3) ...
Setting up splunk (9.4.3) ...
complete
~(kali@kali)-[~/Downloads]
└─$
```

```
kali@kali: ~/Downloads
File Actions Edit View Help
[kali@kali]~/Downloads
$ sudo /opt/splunk/bin/splunk start --accept-license
This appears to be your first time running this version of Splunk.

Splunk software must create an administrator account during startup. Otherwise, you cannot log in.
Create credentials for the administrator account.
Characters do not appear on the screen when you type in credentials.

Please enter an administrator username: admin
Password must contain at least:
  * 8 total printable ASCII character(s).
Please enter a new password:
Please confirm new password:
Copying '/opt/splunk/etc/openldap/ldap.conf.default' to '/opt/splunk/etc/openldap/ldap.conf'.
Generating RSA private key, 2048 bit long modulus
.....+++++
e is 65537 (0x10001)
writing RSA key

Generating RSA private key, 2048 bit long modulus
.....+++++
e is 65537 (0x10001)
writing RSA key

Moving '/opt/splunk/share/splunk/search_mrsparkle/modules.new' to '/opt/splunk/share/splunk/search_mrsparkle/modules'.

Splunk> Winning the War on Error

Checking prerequisites ...
  Checking http port [8000]: open
  Checking https port [8080]: open
  Checking appserver port [127.0.0.1:8065]: open
  Checking kvstore port [8191]: open
  Checking configuration ... Done
  Creating: /opt/splunk/var/lib/splunk
  Creating: /opt/splunk/var/run/splunk
  Creating: /opt/splunk/var/run/splunk/appserver/i18n
  Creating: /opt/splunk/var/run/splunk/appserver/modules/static/css
  Creating: /opt/splunk/var/run/splunk/upload
  Creating: /opt/splunk/var/run/splunk/search_telemetry
  Creating: /opt/splunk/var/run/splunk/search_log
  Creating: /opt/splunk/var/spool/splunk
  Creating: /opt/splunk/var/spool/dimnocache
  Creating: /opt/splunk/var/lib/splunk/authDb
```

```
kali@kali: ~/Downloads
File Actions Edit View Help
  Creating: /opt/splunk/var/run/splunk/search_telemetry
  Creating: /opt/splunk/var/run/splunk/search_log
  Creating: /opt/splunk/var/spool/splunk
  Creating: /opt/splunk/var/spool/dimnocache
  Creating: /opt/splunk/var/lib/splunk/authDb
  Creating: /opt/splunk/var/lib/splunk/hashDb
  Creating: /opt/splunk/var/run/splunk/collect
  Creating: /opt/splunk/var/run/splunk/sessions
New certs have been generated in '/opt/splunk/etc/auth'.
  Checking critical directories... Done
  Checking indexes...
    Validated: _audit _audit_configtracker _dsappevent _dsclient _dsphonehome _internal _introspection _metrics _metrics_rollup _telemetry _thefishbucket history main summary
  Done
  Checking filesystem compatibility... Done
  Checking conf files for problems...
  Done
  Checking default conf files for edits...
  Validating installed files against hashes from '/opt/splunk/splunk-9.4.3-237ebbd22314-linux-amd64-manifest'
  All installed files intact.
  Done
All preliminary checks passed.

Starting splunk server daemon (splunkd)...
Generating a RSA private key
.....+++++
writing new private key to 'privKeySecure.pem'

Signature ok
subject=/CN=kali/O=SplunkUser
getting CA Private Key
writing RSA key
PYTHONHTTPSVERIFY is set to 0 in splunk-launch.conf disabling certificate validation for the httplib and urllib libraries shipped with the embedded Python interpreter; must be set to '1' for increased security
Done

Waiting for web server at http://127.0.0.1:8000 to be available..... Done

If you get stuck, we're here to help.
Look for answers here: http://docs.splunk.com

The Splunk web interface is at http://kali:8000

[kali@kali]~/Downloads
$
```

- Accepted license and created admin login using:

```
sudo /opt/splunk/bin/splunk start --accept-license
```

- Accessed the Splunk Web Interface at:

`http://localhost:8000`

---

## 3. Preparing the Log Data

### Original Log Format:

The internship provided logs in a simple text format:

```
2025-07-03 06:13:14 | user=charlie | ip=10.0.0.5 | action=connection attempt
```

This format was not compatible with Splunk's event parsing engine. Thus, To make the data compatible with Splunk:

- Opened the text file in Kali's Text Editor
  - Reformatted the data into CSV format with headers
- 

## 4. Fixing the Log Format

To enable Splunk to correctly parse the logs:

- I opened **Text Editor** in Kali Linux
- Reformatted the logs into a proper `.csv` format with headers:

### ✓ Sample Format:

```
timestamp,user,ip,action,threat
```

```
2025-07-03 06:13:14,charlie,10.0.0.5,connection attempt,
```

```
2025-07-03 05:48:14,bob,10.0.0.5,malware detected,Trojan Detected
```

```
2025-07-03 07:02:14,alice,203.0.113.77,login failed,
```

- Saved the file as:

`SOC_Task2_Formatted.csv`

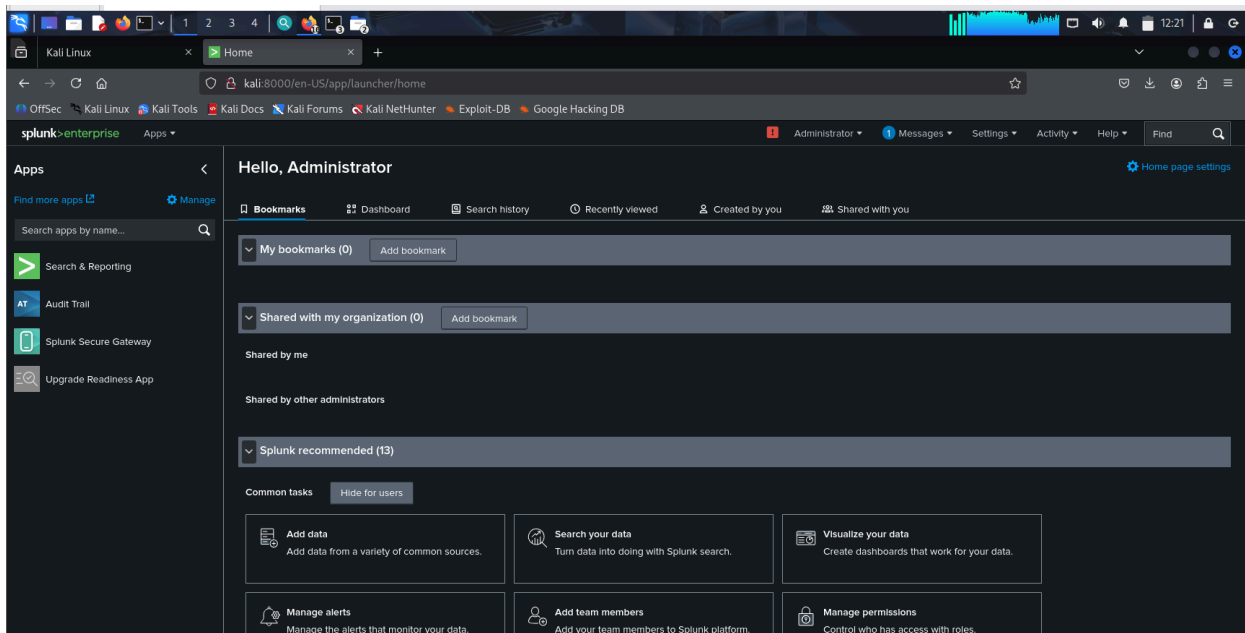
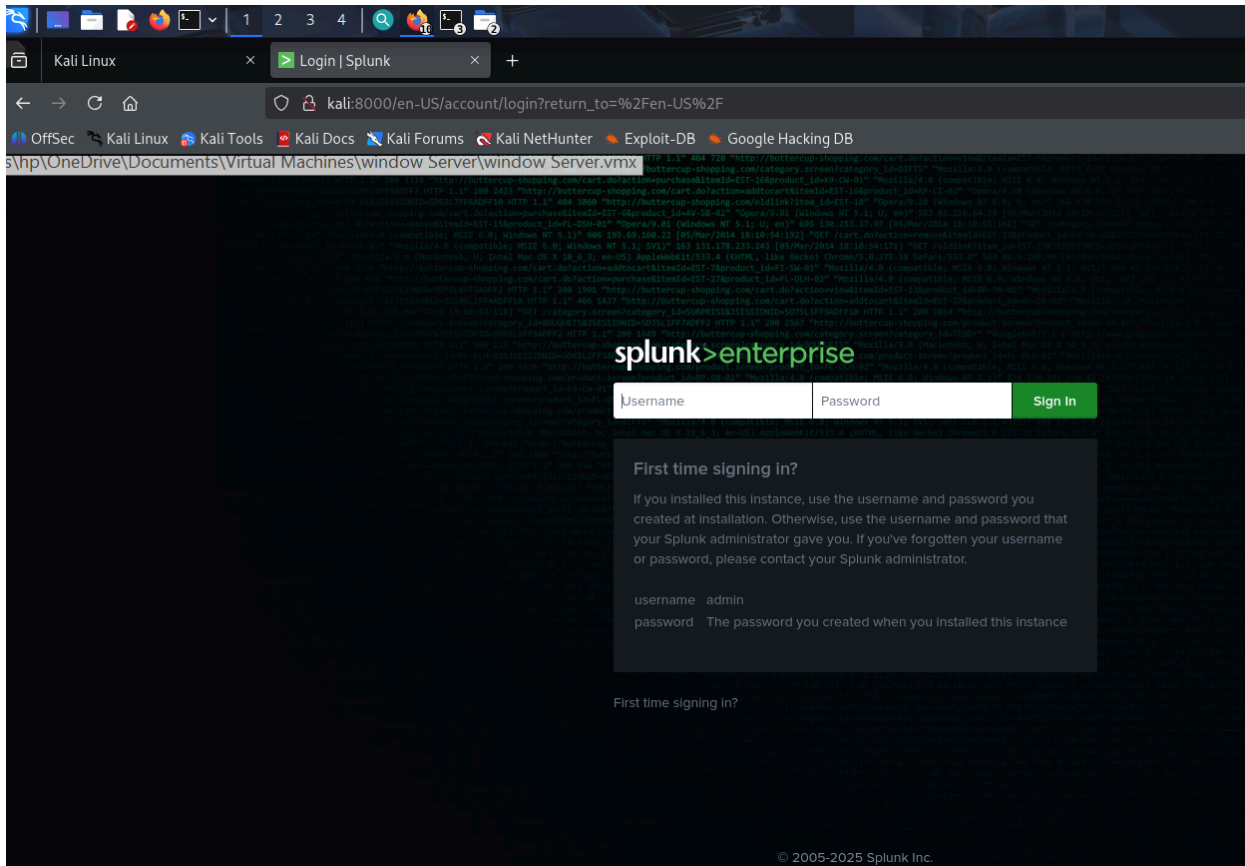
in the Kali `Downloads` folder.

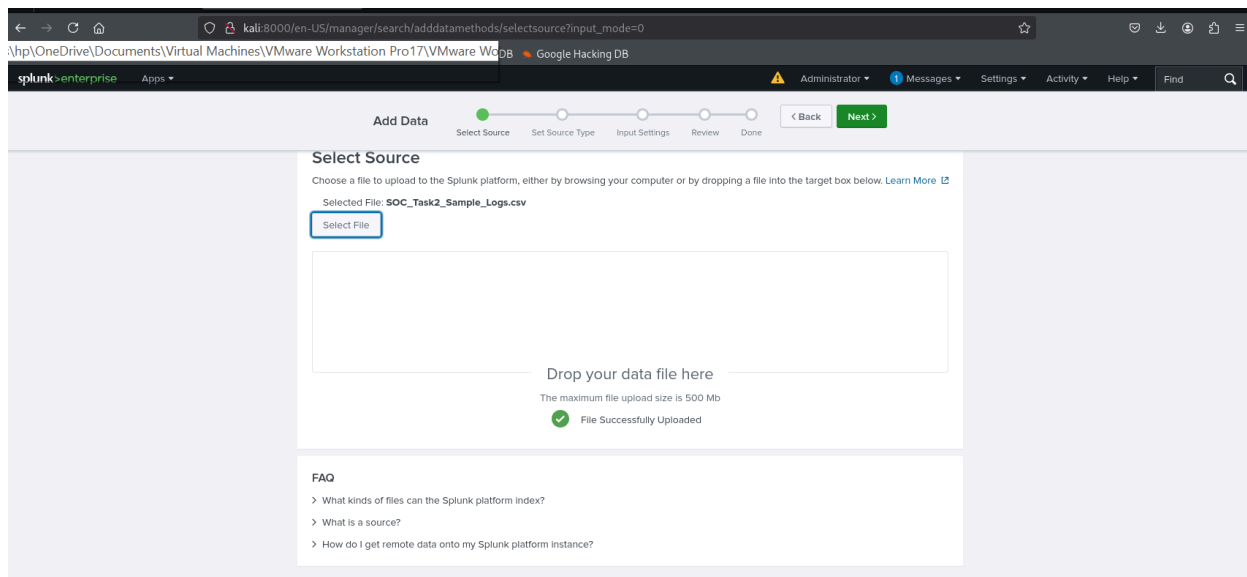
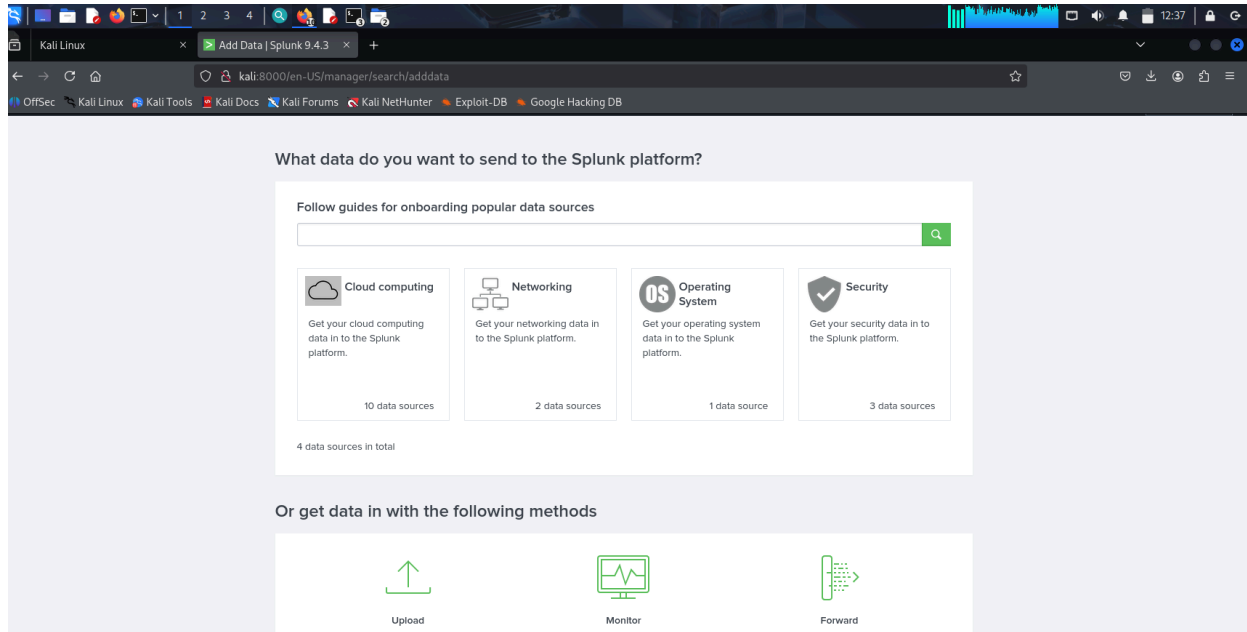
---

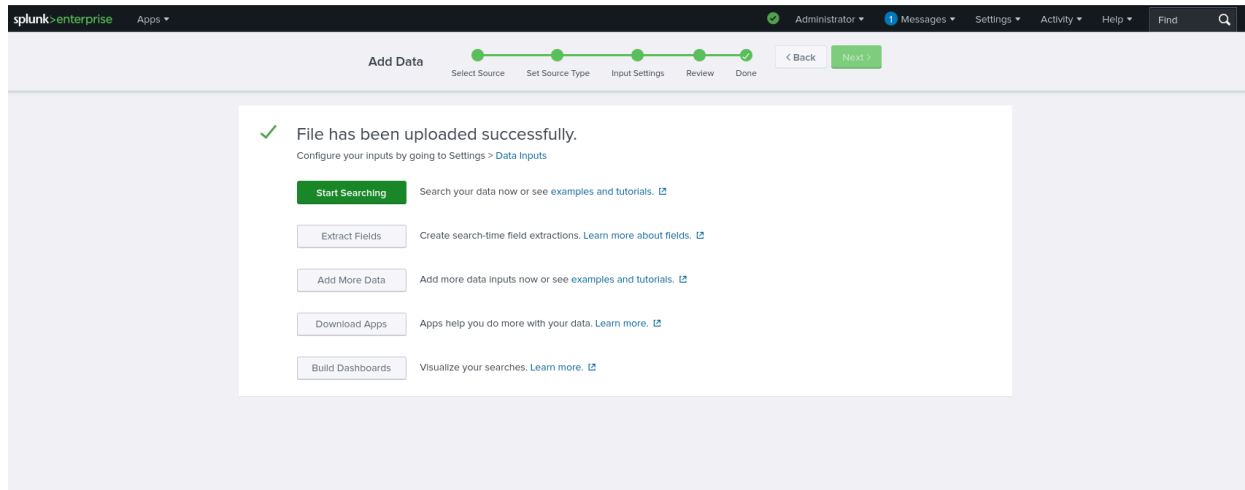
## 5. Uploading Log File into Splunk

### From Splunk Web Interface:

1. **Settings** → **Add Data**
2. **Upload** → Selected `SOC_Task2_Formatted.csv`
3. On **Set Source Type**:
  - Chose: `Structured > csv`
4. On **Input Settings**:
  - Index: `main`
5. Reviewed & clicked **Submit**







✓ Splunk confirmed that the data input was created successfully.

---

## 6. Next Steps (Performed)

### Ran Searches in Splunk using:

- `source="Soc_Task2_Formatted.csv" "malware detected"`
- `source="Soc_Task2_Formatted.csv" "login failed"`
- `source="Soc_Task2_Formatted.csv" "file accessed"`

Kali Linux Triggered Alerts Search | Splunk 9.4.3 Passwords

localhost:8000/en-US/app/search/search?earliest=0&latest=&q=search index%3Dmain&sid=175207171.73&display.page.search.mode=smart&dispatch.samp...

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Search Analytics Datasets Reports Alerts Dashboards Search & Reporting

### New Search

index=main All time

11 events (before 7/9/25 10:36:11.000 AM) No Event Sampling

Events (11) Patterns Statistics Visualization

Timeline format Zoom Out Zoom to Selection Deselect 1 day per column

Format Show: 20 Per Page View: List

	Time	Event
>	7/9/25 10:33:36.000 AM	timestamp user ip action threat timestamp host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 8:42:00.000 AM	7/3/2025 8:42 charlie 203.0.113.77 file accessed 7/3/2025 8:42 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 8:20:00.000 AM	7/3/2025 8:20 charlie 192.168.1.101 connection attempt 7/3/2025 8:20 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 7:45:00.000 AM	7/3/2025 7:45 charlie 172.16.0.3 malware detected Trojan Detected 7/3/2025 7:45 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 7:02:00.000 AM	7/3/2025 7:02 alice 203.0.113.77 login failed 7/3/2025 7:02 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample

**SELECTED FIELDS**  
# host 1  
# source 1  
# sourcetype 1

**INTERESTING FIELDS**  
# date\_hour 5  
# date\_mday 1  
# date\_minute 10  
# date\_month 1  
# date\_wday 1  
# date\_year 1  
# date\_zone 1  
# index 1

Kali Linux Triggered Alerts Search | Splunk 9.4.3 Passwords

localhost:8000/en-US/app/search/search?earliest=0&latest=&q=search index%3Dmain&sid=175207171.73&display.page.search.mode=smart&dispatch.samp...

OffSec Kali Linux Kali Tools Kali Docs Kali Forums Kali NetHunter Exploit-DB Google Hacking DB

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>	7/3/25 8:42:00.000 AM	7/3/2025 8:42 charlie 203.0.113.77 file accessed 7/3/2025 8:42 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 8:20:00.000 AM	7/3/2025 8:20 charlie 192.168.1.101 connection attempt 7/3/2025 8:20 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 7:45:00.000 AM	7/3/2025 7:45 charlie 172.16.0.3 malware detected Trojan Detected 7/3/2025 7:45 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 7:02:00.000 AM	7/3/2025 7:02 alice 203.0.113.77 login failed 7/3/2025 7:02 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 6:13:00.000 AM	7/3/2025 6:13 charlie 10.0.0.5 connection attempt 7/3/2025 6:13 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 6:01:00.000 AM	7/3/2025 6:01 bob 172.16.0.3 file accessed 7/3/2025 6:01 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 5:48:00.000 AM	7/3/2025 5:48 bob 10.0.0.5 malware detected Trojan Detected 7/3/2025 5:48 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 5:27:00.000 AM	7/3/2025 5:27 david 203.0.113.77 connection attempt 7/3/2025 5:27 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 5:04:00.000 AM	7/3/2025 5:04 bob 192.168.1.101 login success 7/3/2025 5:04 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample
>	7/3/25 4:18:00.000 AM	7/3/2025 4:18 alice 198.51.100.42 malware detected Rootkit Signature 7/3/2025 4:18 host = kali : source = Soc_Task2_Sample : sourcetype = Soc_Task2_Sample

**SELECTED FIELDS**  
# host 1  
# source 1  
# sourcetype 1

**INTERESTING FIELDS**  
# date\_hour 5  
# date\_mday 1  
# date\_minute 10  
# date\_month 1  
# date\_wday 1  
# date\_year 1  
# date\_zone 1  
# index 1  
# linecount 1  
# punct 3  
# splunk\_server 1  
# timeendpos 1  
# timestartpos 1

1 more field  
+ Extract New Fields



Kali Linux x Triggered Alerts x Search | Splunk 9.4.3 x Passwords x

localhost:8000/en-US/app/search/search?earliest=0&latest=&q=search source%3D"Soc\_Task2\_Sample"&display.page.search.mode=smart&dispatch.sample...

splunk>enterprise Apps Administrator Messages Settings Activity Help Find

Search Analytics Datasets Reports Alerts Dashboards Search & Reporting

### New Search

source="Soc\_Task2\_Sample" All time

11 events (before 7/9/25 11:04:22.000 AM) No Event Sampling

Timeline format Zoom Out Zoom to Selection Deselect 1 day per column

Format Show: 20 Per Page View: List

	Time	Event
>	7/9/25 10:33:36.000 AM	timestamp user ip action threat timestamp host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 8:42:00.000 AM	7/3/2025 8:42 charlie 203.0.113.77 file accessed 7/3/2025 8:42 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 8:20:00.000 AM	7/3/2025 8:20 charlie 192.168.1.101 connection attempt 7/3/2025 8:20 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 7:45:00.000 AM	7/3/2025 7:45 charlie 172.16.0.3 malware detected Trojan Detected 7/3/2025 7:45 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 7:02:00.000 AM	7/3/2025 7:02 alice 203.0.113.77 login failed 7/3/2025 7:02 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample

**SELECTED FIELDS**  
# host 1  
# source 1  
# sourcetype 1

**INTERESTING FIELDS**  
# date\_hour 5  
# date\_mday 1  
# date\_minute 10  
# date\_month 1  
# date\_wday 1  
# date\_year 1  
# date\_zone 1

Kali Linux x Triggered Alerts x Search | Splunk 9.4.3 x Passwords x

localhost:8000/en-US/app/search/search?earliest=0&latest=&q=search source%3D"Soc\_Task2\_Sample"&display.page.search.mode=smart&dispatch.sample...

splunk>enterprise Apps Administrator Messages Settings Activity Help Find

Search Analytics Datasets Reports Alerts Dashboards Search & Reporting

### New Search

source="Soc\_Task2\_Sample" All time

11 events (before 7/9/25 11:04:22.000 AM) No Event Sampling

Timeline format Zoom Out Zoom to Selection Deselect 1 day per column

Format Show: 20 Per Page View: List

	Time	Event
>	7/9/25 10:33:36.000 AM	timestamp user ip action threat timestamp host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 8:42:00.000 AM	7/3/2025 8:42 charlie 203.0.113.77 file accessed 7/3/2025 8:42 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 8:20:00.000 AM	7/3/2025 8:20 charlie 192.168.1.101 connection attempt 7/3/2025 8:20 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 7:45:00.000 AM	7/3/2025 7:45 charlie 172.16.0.3 malware detected Trojan Detected 7/3/2025 7:45 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 7:02:00.000 AM	7/3/2025 7:02 alice 203.0.113.77 login failed 7/3/2025 7:02 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 6:13:00.000 AM	7/3/2025 6:13 charlie 10.0.0.5 connection attempt 7/3/2025 6:13 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 6:01:00.000 AM	7/3/2025 6:01 bob 172.16.0.3 file accessed 7/3/2025 6:01 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 5:48:00.000 AM	7/3/2025 5:48 bob 10.0.0.5 malware detected Trojan Detected 7/3/2025 5:48 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 5:27:00.000 AM	7/3/2025 5:27 david 203.0.113.77 connection attempt 7/3/2025 5:27 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 5:04:00.000 AM	7/3/2025 5:04 bob 192.168.1.101 login success 7/3/2025 5:04 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample
>	7/3/25 4:18:00.000 AM	7/3/2025 4:18 alice 198.51.100.42 malware detected Rootkit Signature 7/3/2025 4:18 host = kali source = Soc_Task2_Sample sourcetype = Soc_Task2_Sample

**SELECTED FIELDS**  
# host 1  
# source 1  
# sourcetype 1

**INTERESTING FIELDS**  
# date\_hour 6  
# date\_mday 1  
# date\_minute 10  
# date\_month 1  
# date\_wday 1  
# date\_year 1  
# date\_zone 1  
# index 1  
# linecount 1  
# punct 3  
# splunk\_server 1  
# timeendpos 1  
# timestamppos 1

1 more field  
+ Extract New Fields

The screenshot shows the Splunk Enterprise search interface. The search query is `source="Soc_Task2_Sample" "malware detected"`. It returned 3 events. The events table is as follows:

Time	Event
7/3/25 7:45:00.000 AM	charlie 172.16.8.3 <b>malware detected</b> Trojan Detected 7/3/2025 7:45
7/3/25 5:48:00.000 AM	bob 10.0.0.5 <b>malware detected</b> Trojan Detected 7/3/2025 5:48
7/3/25 4:18:00.000 AM	alice 198.51.100.42 <b>malware detected</b> Rootkit Signature 7/3/2025 4:18

The screenshot shows the Splunk Enterprise search interface. The search query is `source="Soc_Task2_Sample" "login failed"`. It returned 1 event. The events table is as follows:

Time	Event
7/3/25 7:02:00.000 AM	alice 203.0.113.77 <b>login failed</b> 7/3/2025 7:02

These searches helped filter and retrieve relevant events for:

- Malware alerts
- Failed login attempts
- Suspicious file access activities

## 7. Threat Severity Summary:

Threat Type	Severity
Malware Detected	High
Multiple Failed Logins	Medium
Connection Attempts	Low
Rootkit Detected	Critical
File Accessed from 10.0.x or 198.x.x.x	Medium

## 8. Alert Categorization and Prioritization

- Timeline of events
- Alert classification (High/Med/Low)
- Recommendations

Below is a summary table showing the categorization and prioritization of security events identified during log analysis in Splunk.

Timestamp	User	Action	Threat / Detail	IP Address	Severity	Justification
2025-07-03 05:48:14	bob	malware detected	Trojan Detected	10.0.0.5	High	Malware poses high system risk
2025-07-03 04:18:14	alice	malware detected	Rootkit Signature	198.51.100.42	Critical	Rootkits are stealthy and dangerous
2025-07-03 07:45:14	charlie	malware detected	Trojan Detected	172.16.0.3	High	Trojan attack on internal IP
2025-07-03 07:02:14	alice	login failed	N/A	203.0.113.77	Medium	Failed login from external IP
2025-07-03 08:42:14	charlie	file accessed	N/A	203.0.113.77	Low	Normal file access unless repeated
2025-07-03 05:27:14	david	connection attempt	N/A	203.0.113.77	Medium	Suspicious repeated attempts
2025-07-03 05:04:14	bob	login success	N/A	192.168.1.101	Low	Valid login from known IP

### Analysis Summary

- Malware detected from users **bob, alice, charlie**
- Rootkit Signature detected from **alice**
- Failed login attempt from **alice**
- Suspicious connection attempts from IPs like **203.0.113.77**

## 9. Simulate Communication with Stakeholders about the Incident

**Subject:** Incident Alert: Trojan Malware Detected on Host 10.0.0.5

Dear Team,

This is to notify you that on **July 3, 2025**, at **05:48 AM**, our monitoring systems detected a **Trojan malware infection** on internal IP **10.0.0.5** associated with user **bob**.

**Incident Details:**

- **Type:** Malware Detected (Trojan)
- **IP:** 10.0.0.5
- **User:** bob
- **Severity:** High
- **Action Taken:** Logged and reported for immediate isolation

We recommend initiating malware scans, reviewing lateral movement, Patch and update systems and enforcing user authentication policies.

Please escalate to SOC Lead if further investigation is needed.

Regards,

*Mary-Claret Ogwuegbu*

SOC Intern – Future Interns

[futureinterns.com](https://futureinterns.com)

## How SOC Teams Track and Manage Threats Using Dashboards and Playbooks

### Dashboards in Splunk

As part of this simulation, I created a simple dashboard in Splunk to help visualize threat trends and track security events efficiently.

Under a section titled "**SOC Dashboard Panel – Malware Detection**",

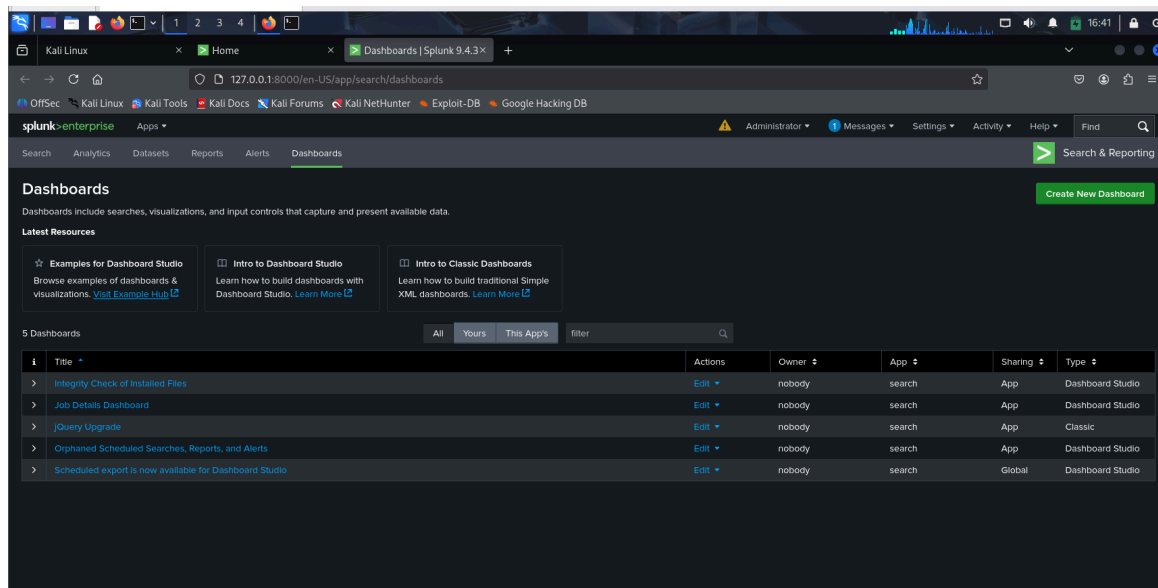
I navigated to **Search & Reporting**

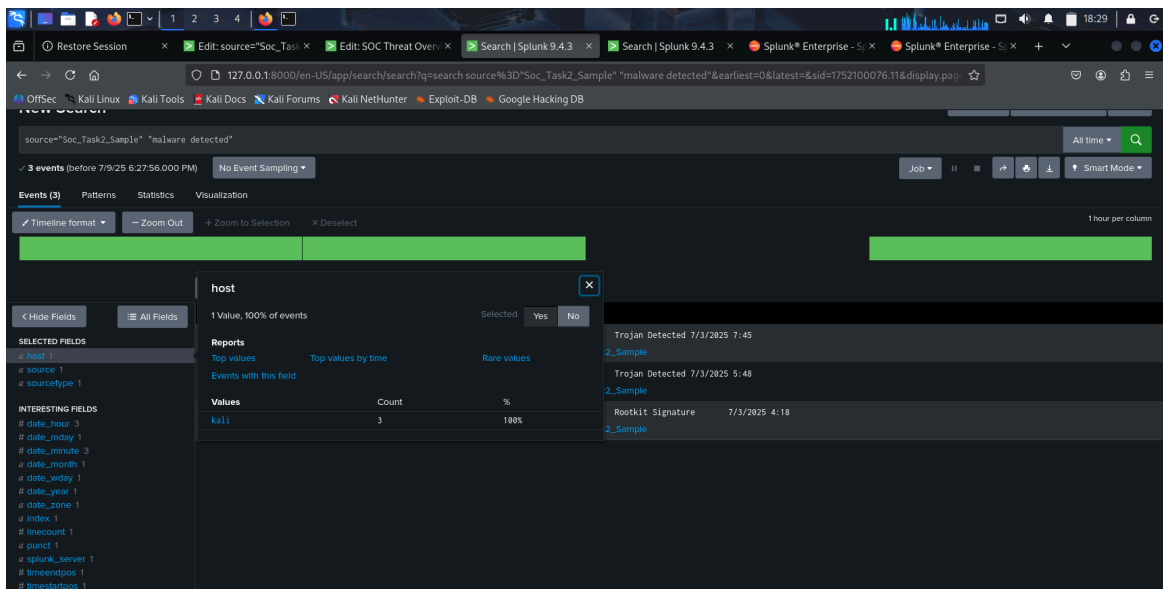
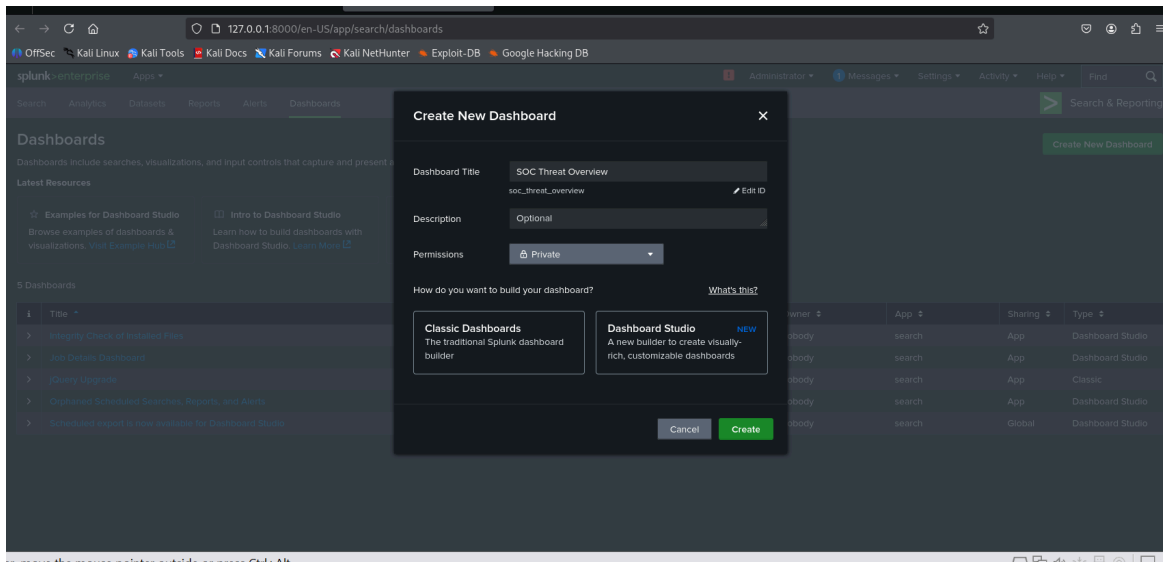
Filtered for malware incidents using:

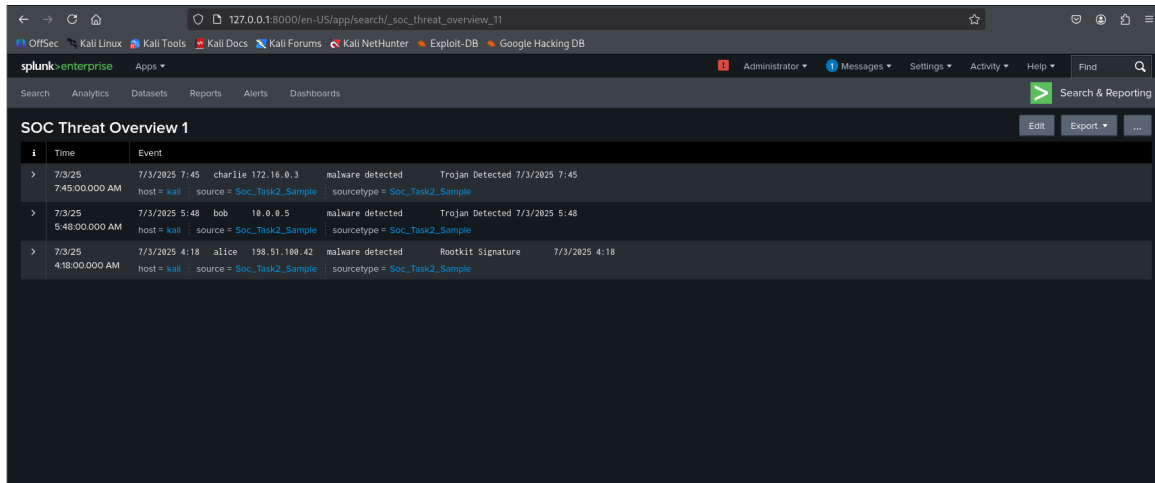
```
source="Soc_Task2_Sample" "malware detected"
```

- Switched to the **Visualization tab** and selected a **Bar Chart**
- Saved the panel to a dashboard titled: **SOC Threat Overview**
- Panel Name: **Malware Detections by User**
- This visual helped illustrate how many malware incidents were associated with each user

Screenshot of the dashboard was taken and added to the report under visual evidence.







### Purpose:

Dashboards like this help SOC analysts detect trends in user activity, identify frequent attackers or vulnerable systems, and present insights clearly to management.

## SOC Playbook (Simulated)

A playbook is a step-by-step guide used by SOC teams to handle specific security incidents efficiently and consistently.

### Simulated Malware Detection Playbook:

Step	Action	Description
1	Review Alert	Confirm malware alert is valid in Splunk logs
2	Isolate Affected Host	Remove infected host from the network
3	Investigate User Activity	Analyze behavior of user tied to infected machine
4	Run Malware Scan	Perform AV scan on affected host



5	Patch and Secure System	Ensure system updates and security patches applied
6	Report Incident	Notify stakeholders and update SOC incident logs

These structured steps help ensure that responses are quick, coordinated, and repeatable — which is vital in a real-world SOC environment.

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