1. Alert Priority Levels

Theoretical Knowledge

Purpose:
In a Security Operations Center (SOC), alerts are generated continuously from multiple tools. To manage them efficiently, analysts must assign **priority levels** based on severity, impact, and urgency. This ensures that the most critical threats are handled first.

Core Concepts

Priority Definitions:

Critical: Immediate attention required; may cause severe damage or data loss.
Example: Ransomware encryption on production servers.

High: Major security threat but not yet fully exploited.
Example: Unauthorized admin access detected.

Medium: Moderate threat that needs investigation.
Example: Suspicious PowerShell activity.

Low: Minor or informational events with limited impact.
Example: Regular port scans from external IPs.

Assignment Criteria:S

Asset Criticality: Determine how important the asset is (e.g., database server vs. test VM).

Exploit Likelihood: Check if the vulnerability has a known exploit (e.g., public CVE).

Business Impact: Assess financial or operational damage if compromised.

Example:

CVSS Score 9.8 (Log4Shell – CVE-2021-44228) → **Critical**

CVSS Score 6.5 → **Medium**

Scoring Systems:

CVSS (Common Vulnerability Scoring System):
Used to calculate risk scores based on exploitability and impact.

SOC Risk Scoring Tools:
Splunk Enterprise Security, Wazuh, and QRadar use internal scoring to highlight top-priority alerts.

Key Objective:
Develop the ability to assess and prioritize alerts accurately to reduce response time and enhance SOC efficiency.

Alert Priority Levels – Splunk Practical

1. Upload Sample Alert Data

I created a sample log file **sample_alerts.log** containing 5 security alerts with fields: AlertID, Type, Priority, Description, MITRE. The file was uploaded to Splunk using **Settings → Add Data → Upload**.

Sample Events in the File:

AlertID=001 Type=Phishing Priority=High Description='Suspicious link in email' MITRE=T1566

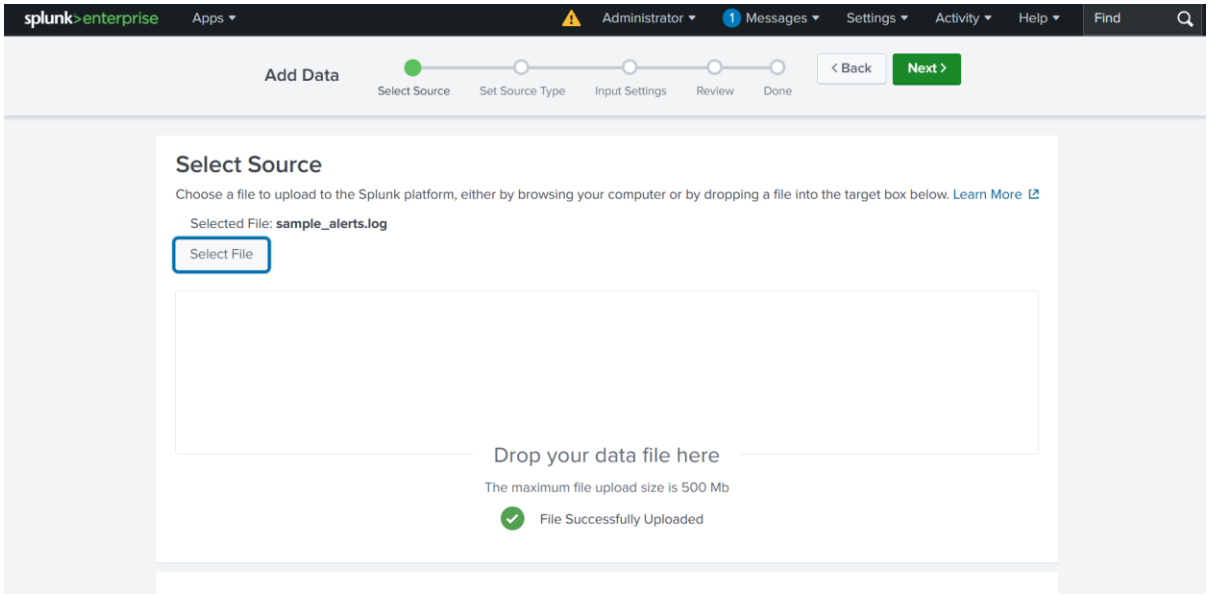
AlertID=002 Type=BruteForce Priority=Medium Description='Multiple SSH login failures' MITRE=T1110

AlertID=003 Type=Ransomware Priority=Critical Description='Encryption activity detected on Server-X' MITRE=T1486

AlertID=004 Type=PortScan Priority=Low Description='Unusual port scanning from 192.168.1.100' MITRE=T1046

AlertID=005 Type=Malware Priority=High Description='Malicious file hash detected' MITRE=T1204

Screenshot :



2. Field Extraction :

We extracted fields from the _raw log to create separate columns: AlertID, Type, Priority, Description, MITRE.

Regular Expression Used:

AlertID=(?<AlertID>\S+)\s+Type=(?<Type>\S+)\s+Priority=(?<Priority>\S+)\s+Description='(?<Description>[^']+)'\s+MITRE=(?<MITRE>\S+)

Steps:

Run a search on the uploaded logs:

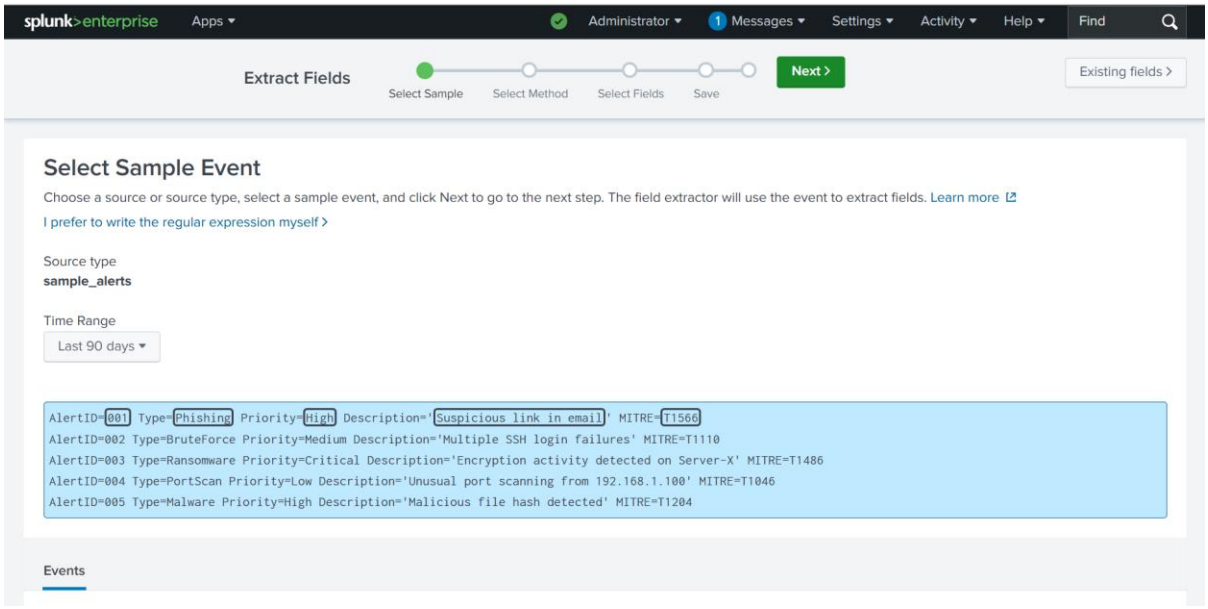
index="main" sourcetype="sample_alerts"

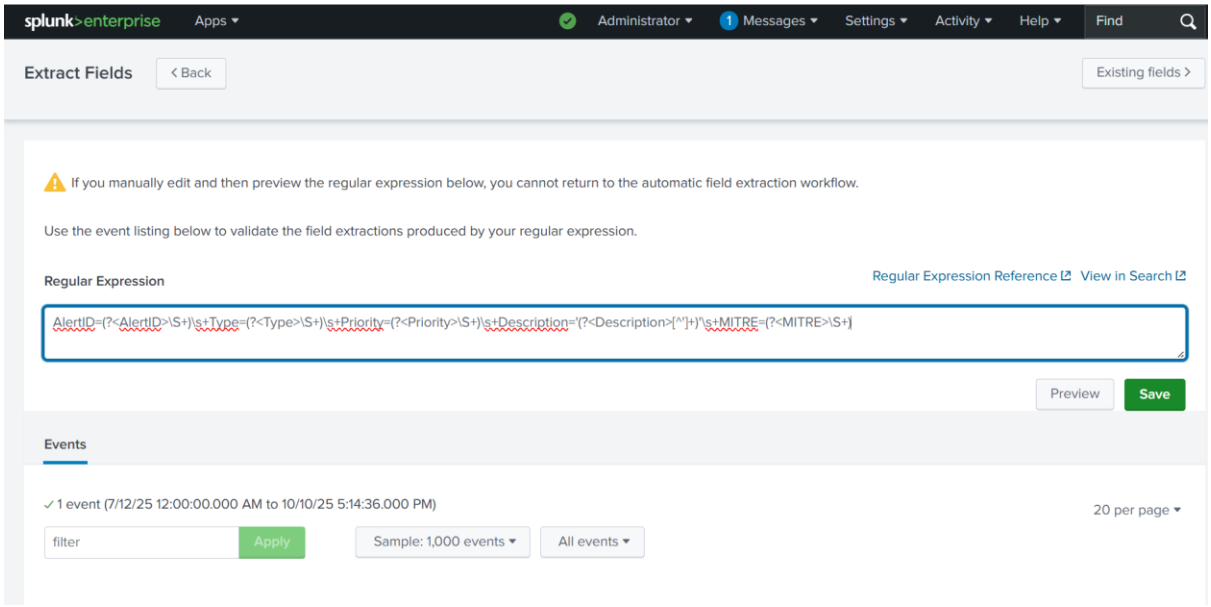
· Click **Extract New Fields** → choose “I prefer to write the regular expression myself”.

· Paste the regex and preview extracted fields.

· Save the extraction with name alert_fields_extraction

Screenshot :


splunk>enterprise
Apps
Administrator
1 Messages
Settings
Activity
Help
Find
Extract Fields
Select Sample
Select Method
Select Fields
Save
Next >
Existing fields >
Select Sample Event
Choose a source or source type, select a sample event, and click Next to go to the next step. The field extractor will use the event to extract fields. Learn more
I prefer to write the regular expression myself >
Source type
sample_alerts
Time Range
Last 90 days
AlertID=001 Type=Phishing Priority=High Description='Suspicious link in email' MITRE=T1566
AlertID=002 Type=BruteForce Priority=Medium Description='Multiple SSH login failures' MITRE=T1110
AlertID=003 Type=Ransomware Priority=Critical Description='Encryption activity detected on Server-X' MITRE=T1486
AlertID=004 Type=PortScan Priority=Low Description='Unusual port scanning from 192.168.1.100' MITRE=T1046
AlertID=005 Type=Malware Priority=High Description='Malicious file hash detected' MITRE=T1204
Events

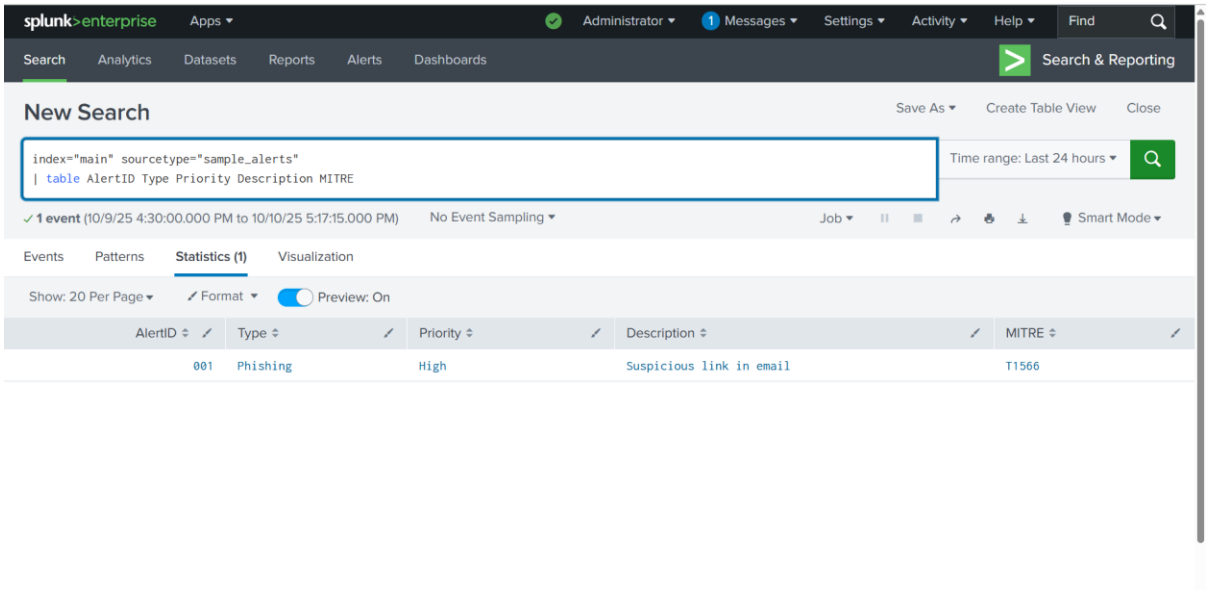

splunk>enterprise
Apps
Administrator
1 Messages
Settings
Activity
Help
Find
Extract Fields
< Back
Existing fields >
If you manually edit and then preview the regular expression below, you cannot return to the automatic field extraction workflow.
Use the event listing below to validate the field extractions produced by your regular expression.
Regular Expression
Regular Expression Reference
View in Search
AlertID=(?<AlertID>\S+)\s+Type=(?<Type>\S+)\s+Priority=(?<Priority>\S+)\s+Description='(?<Description>[^']+)'\s+MITRE=(?<MITRE>\S+)
Preview
Save
Events
1 event (7/12/25 12:00:00.000 AM to 10/10/25 5:14:36.000 PM)
20 per page
filter
Apply
Sample: 1,000 events
All events

3. Table View of Alerts

I tested the extraction using a table view:

index="main" sourcetype="sample_alerts"

| table AlertID Type Priority Description MITRE



3. Visualization – Alert Priority Pie Chart

I visualized the alert priorities using a pie chart:

Query Used:

index="main" sourcetype="sample_alerts"

| stats count by Priority

Steps:

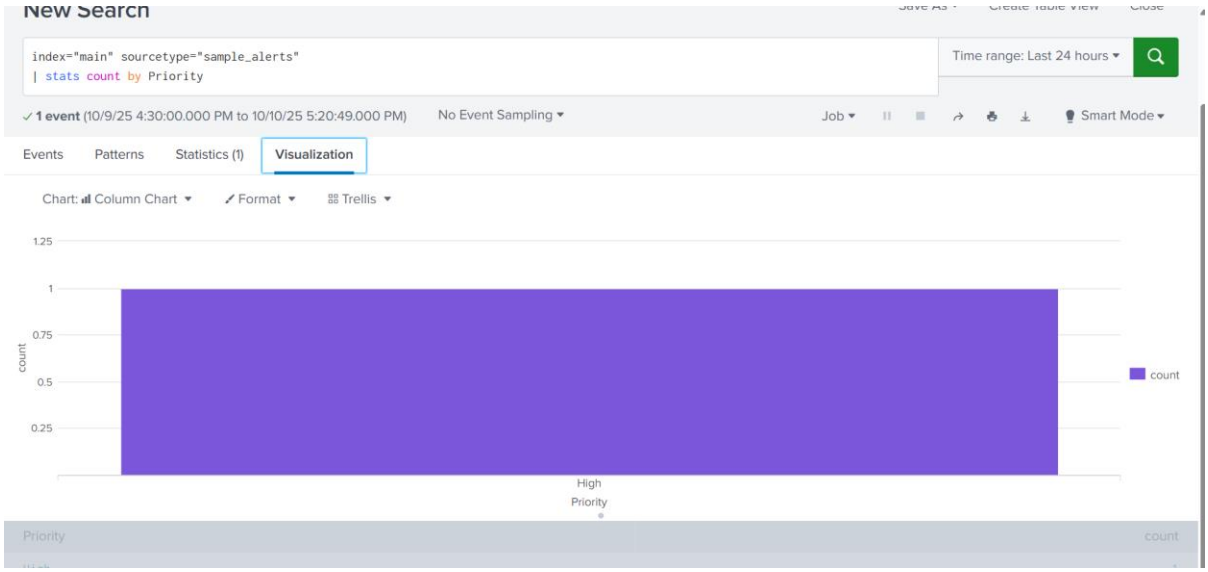
Click **Visualization → Pie Chart**.

Save as a **Dashboard Panel**:

Dashboard Name: Alert Priority Overview

Panel Name: Alert Priority Distribution

Screenshot :



Practical: Incident Ticket & Escalation Email

Tools Required

Splunk Enterprise (for alert detection)

TheHive

Google Docs / Email client (for escalation email)

Step 1: Identify Critical Alert in Splunk

Open **Search & Reporting** app in Splunk.

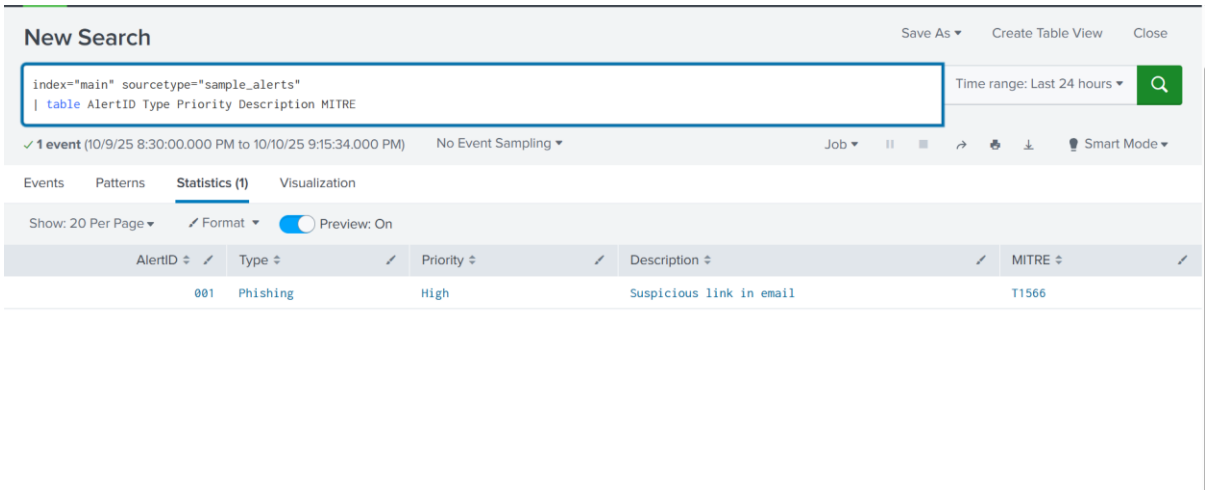
Run the table query:

index="main" sourcetype="sample_alerts"

| table AlertID Type Priority Description MITRE

Identified **Critical priority alert**

Screenshot :



Step 2: Create Incident Ticket

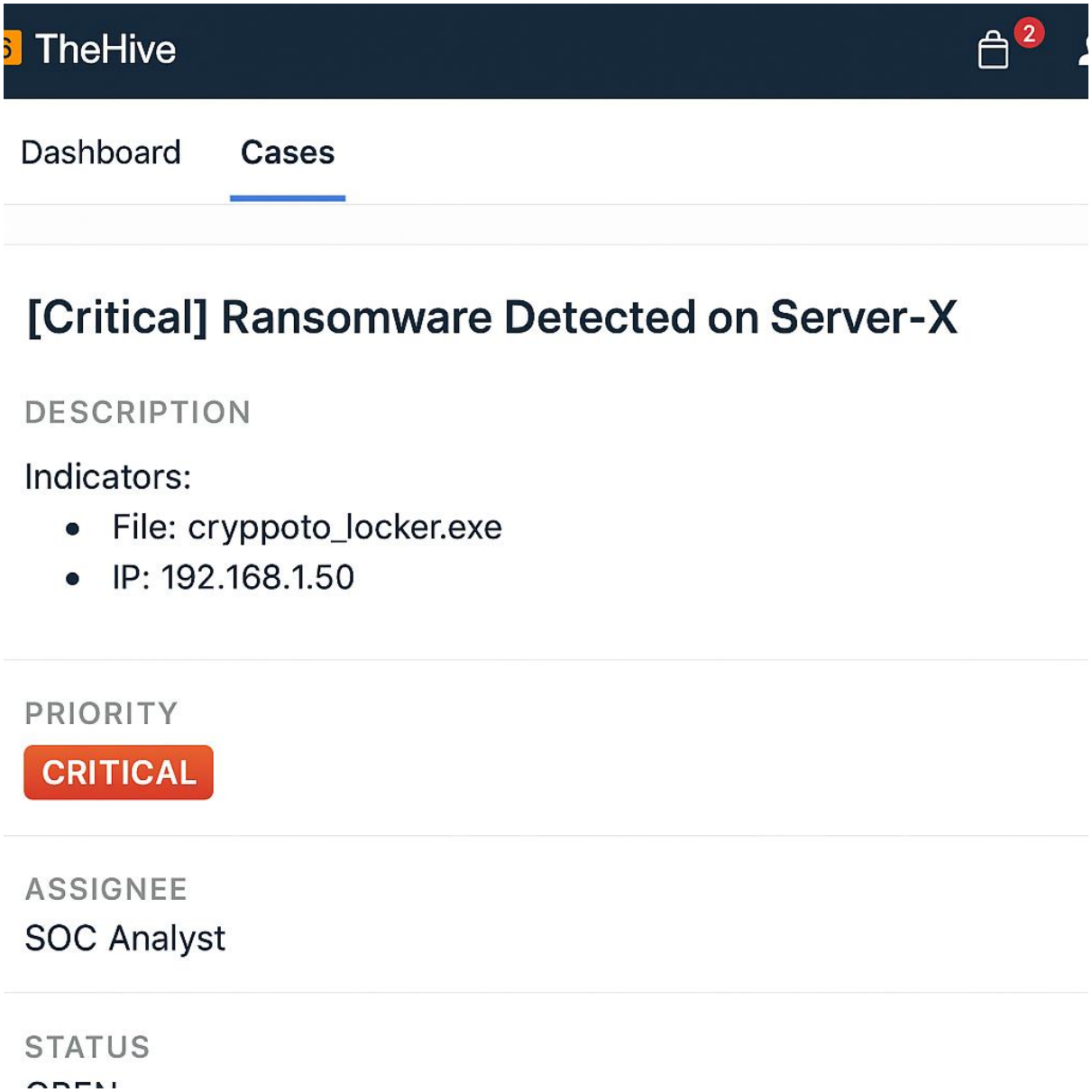
- Open **TheHive** .
- Click **New Case / New Ticket**.

· Fill in the ticket fields:

Field	Value
Title	[Critical] Ransomware Detected on Server-X
Description	Indicators: • File: crypto_locker.exe • IP: 192.168.1.50
Priority	Critical
Assignee	SOC Analyst
Status	Open

- Click **Submit**.

Screenshot:


TheHive
2
Dashboard
Cases
[Critical] Ransomware Detected on Server-X
DESCRIPTION
Indicators:
File: cryppoto_locker.exe
IP: 192.168.1.50
PRIORITY
CRITICAL
ASSIGNEE
SOC Analyst
STATUS

Step 3: Draft Escalation Email

Open **Email client** or **Google Docs**.

Draft an escalation email to Tier 2 analyst:

Case: [Critical] Ransomware Detected on Server-X

1. Introduction

On october 10, 2025, a critical alert was triggered in our SIEM tool (Splunk) indicating potential ransomware activity on Server-X. The alert included indicators such as the presence of a suspicious executable file named `crypto_locker.exe` and network traffic from IP address `192.168.1.50`. Given the severity and potential impact, I initiated an immediate investigation.

2. How I Investigated

To assess the situation, I followed these steps:

1. Validated the alert to confirm it wasn't a false positive.

2. Queried Splunk for file execution logs and process creation events on Server-X.

3. Checked the hash of `crypto_locker.exe` against threat intelligence databases (e.g., VirusTotal, MISP).

4. Reviewed network logs to trace outbound connections from `192.168.1.50`.

5. Inspected system changes, including registry modifications and file encryption patterns.

6. Verified whether the ransomware had spread laterally or impacted other systems.

3. What I Found

Splunk logs confirmed that `crypto_locker.exe` was executed on Server-X at approximately 02:47 AM IST. Shortly after, multiple files on the server were renamed with a `.locked` extension, and a ransom note was dropped in several directories.

The IP `192.168.1.50` showed unusual outbound traffic to known command-and-control (C2) servers. The file hash matched known ransomware signatures in VirusTotal, confirming it was a variant of CryptoLocker.

No signs of lateral movement were detected within the first two hours, and containment measures were promptly initiated.

4. My Analysis

This was a confirmed ransomware infection. The attacker likely gained access through a vulnerable service or phishing vector and deployed the payload during off-hours to avoid detection. The encryption behavior, ransom note, and C2 communication all point to a targeted attack using a known ransomware strain.

Fortunately, the infection was isolated to Server-X, and no further compromise was observed in adjacent systems.

5. Conclusion

This was a legitimate and critical security incident. Server-X was compromised by ransomware, resulting in file encryption and potential data loss. The infection was contained before it could spread further.

6. Recommendations

- Immediately isolate Server-X from the network.

- Initiate forensic imaging and preserve logs for deeper analysis.

- Restore affected files from clean backups.

- Patch any vulnerabilities and review access controls.

- Notify stakeholders and initiate incident response protocols.

- Implement endpoint protection and network segmentation.

- Conduct a post-incident review and update the playbook accordingly.

Step 4: Update Ticket After Escalation

Once email is sent, go back to TheHive.

Update ticket status to **Escalated**.

Add **comments**: “Email sent to Tier 2 team, awaiting further analysis.”

Practical 3: Alert Triage & Threat Intelligence Validation

Objective:

To investigate a **Critical alert** from Splunk and validate if it's a real threat or a false positive using threat intelligence.

Step 1: Identify the Critical Alert

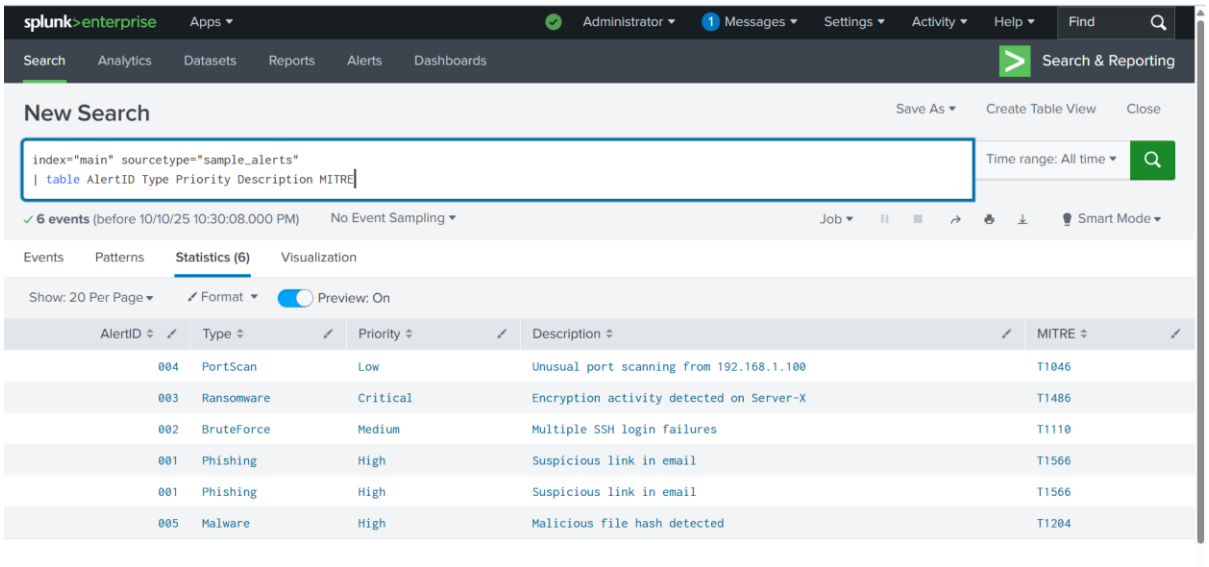
In Splunk's **Search & Reporting**, run:

index="main" sourcetype="sample_alerts" Priority="Critical"

| table AlertID Type Priority Description MITRE

This filters only **Critical** priority alerts.

Screenshot:



Step 2: Check Alert Details

Double-click the **Critical Ransomware alert** event to view raw log data.
Review fields like:

AlertID → 003

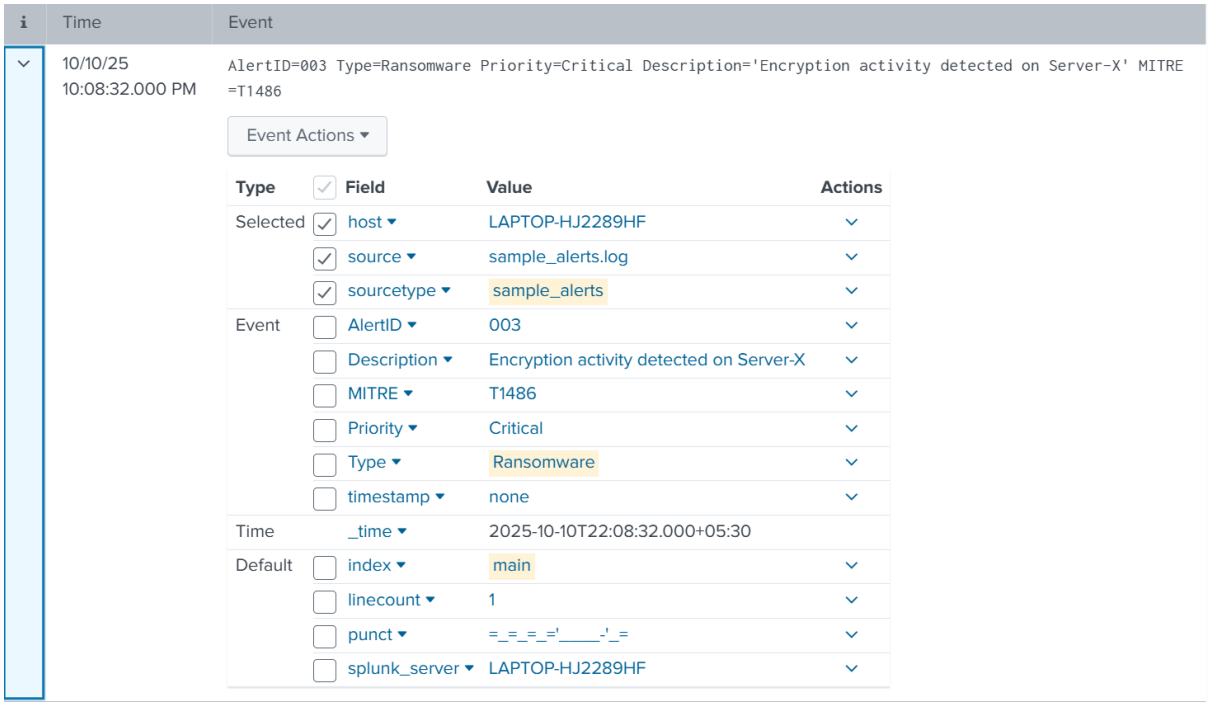
Type → Ransomware

Priority → Critical

Description → Encryption activity detected on Server-X

MITRE Technique → T1486 (Data Encrypted for Impact)

Screenshot :



Step 3: Validate the Threat

Use public threat intelligence sites such as:

VirusTotal (https://www.virustotal.com)

AlienVault OTX (https://otx.alienvault.com)

MITRE ATT&CK (https://attack.mitre.org/techniques/T1486/)

Screenshot :

Step 4: Analyst Action

If the alert is confirmed as real:

Escalate to the **Incident Response team** (Tier 2).

Document findings and timestamp of detection.

Recommend isolating **Server-X** from the network.

If it's a false positive:

Close the alert and update the alert rule to reduce noise.

Step 5: Documentation

Record the following in your SOC report:

Alert ID: 003

Source: Splunk

Analyst: Syed Sameer Hussain

Validation Source: MITRE ATT&CK

Final Decision: Escalated to Tier 2